







QA

Royal Brunswick Park – Preliminary Ecological Appraisal

Issue/Revision:	Draft	Final
Date:	August 2021	August 2021
Comments:		
Prepared by:	Olivia Guindon	Olivia Guindon
Signature:		
Authorised by:	James Bumphrey	James Bumphrey
Signature:		
File Reference:	551510ogJun21DV01_PEA.docx	551510ogJun21FV01_PEA.docx

CONTENTS

1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION	3
SITE DESCRIPTION	3
EXISTING ECOLOGICAL INFORMATION	4
3.0 METHODOLOGY	6
DESK TOP REVIEW	6
ON SITE SURVEYS	6
SURVEYORS	11
CONSTRAINTS	11
4.0 RESULTS	12
DESK TOP REVIEW	12
DETAILED DESCRIPTION OF SITE: HABITATS	16
DETAILED DESCRIPTION OF SITE: SPECIES	25
5.0 EVALUATION AND DISCUSSION	29
MITIGATION AND COMPENSATION	29
6.0 SUMMARY AND CONCLUSION	35
FIGURE 1 SITE PLAN AND HABITAT MAP	
APPENDIX 1 15/07932/OUT SURVEY REPORTS	
APPENDIX 2 RELEVANT LEGISLATION AND POLICY	
REFERENCES	

1.0 EXECUTIVE SUMMARY

- 1.1 Greengage Environmental Ltd was commissioned by Comer Homes to undertake a Preliminary Ecological Appraisal of a site known as the Royal Brunswick Park, New Southgate in the London Borough of Barnet.
- 1.2 This document is a report of this survey and has been produced to support a hybrid planning application for the phased comprehensive redevelopment of the North London Business Park to deliver a residential-led mixed use development. The detailed element comprises up to 466 residential units in five blocks reaching 9 storeys, the provision of a 5 form entry secondary school, a gymnasium, a multi-use sports pitch and associated changing facilities and improvements to open space and transport infrastructure, including improvements to the access from Brunswick Park Road and; the outline element comprises up to 1,967 additional residential units in buildings ranging from three to twelve storeys, up to 7,148 sqm of non-residential floor space (use Class E) and 20,250sqm of open space. Associated site preparation/enabling work, transport infrastructure and junction work, landscaping and car parking.
- 1.3 This survey aimed to establish the current ecological value of this site and the presence/likely-absence of notable and/or legally protected species in order to inform appropriate mitigation, compensation and enhancement actions in light of proposed development works. This survey updates one previously undertaken for an existing permitted development on the site (ref: 15/07932/OUT) and should be read in conjunction with the associated reports that are appended to this report.
- 1.4 The survey area extends to approximately 16 hectares. There are ten buildings on the site with the largest being office buildings and an associated car park, additional buildings include a nursery, a school, site security offices and storage sheds. Surrounding these buildings are areas of hardstanding roads and car parking as well as landscaping in the form of amenity grassland, introduced shrubs, a pond and scattered trees. There is an expanse of rough grassland and scattered scrub at the northern end of the site.
- 1.5 The site survey, undertaken on the 8th and 9th April 2021, alongside details received from a desk top study confirmed that the site conditions are largely consistent with those identified during previous ecology surveys at the site. The site has potential to support the following protected/notable species:
- Moderate potential to support roosting bats (previously confirmed likely absent);
 - Low value for foraging and commuting bats (previously low levels of foraging recorded);
 - High potential to support reptiles (with presence previously confirmed);
 - High potential to support foraging badger (with potential presence previously identified);

-
- High potential to support nesting birds;
 - High potential to support notable invertebrates (with presence previously confirmed); and
 - Moderate potential to support hedgehog.
- 1.6 Recommendations have therefore been provided for additional updated phase 2 surveys to be completed for bats, reptiles and invertebrates, with precautionary actions recommended for badger, hedgehog and breeding birds. The additional phase 2 surveys are due for completion in Summer 2021.
- 1.7 Japanese knotweed (*Fallopia japonica*) was recorded on site. This species is listed under Schedule 9 of the Wildlife and Countryside Act 1981, and therefore measures must be taken to ensure this plant is removed from site and disposed of following best practice guidance.
- 1.8 Preliminary protection, mitigation, compensation and enhancement concepts are outlined within this report, to be confirmed following the phase 2 survey work, with a view to the scheme achieving a net biodiversity gain.
- 1.9 Further to these mitigation and compensation actions, it is recommended that the site's ecological value is enhanced through the incorporation of:
- Wildlife friendly landscaping;
 - Biodiverse living roofs;
 - Invertebrate habitat features (e.g. bee bricks and stag beetle loggery); and
 - Bird and bat boxes integrated within the fabric of new buildings as well as on retained trees.
- 1.10 Details of the mitigation, compensation and enhancement actions should be detailed within an Ecological Management Plan and Construction Environmental Management plan for the site which could be secured through planning condition. Should these recommendations be adhered to, the proposals stand to be compliant with legislation and planning policy.

2.0 INTRODUCTION

- 2.1 Greengage was commissioned by Comer Homes to undertake a Preliminary Ecological Appraisal (PEA) of a site known as the Royal Brunswick Park, New Southgate in the London Borough of Barnet.
- 2.2 This document is a report of this survey and has been produced to support a hybrid planning application for the phased comprehensive redevelopment of the North London Business Park to deliver a residential-led mixed use development. The detailed element comprises up to 466 residential units in five blocks reaching 9 storeys, the provision of a 5 form entry secondary school, a gymnasium, a multi-use sports pitch and associated changing facilities and improvements to open space and transport infrastructure, including improvements to the access from Brunswick Park Road and; the outline element comprises up to 1,967 additional residential units in buildings ranging from three to twelve storeys, up to 7,148 sqm of non-residential floor space (use Class E) and 20,250sqm of open space. Associated site preparation/enabling work, transport infrastructure and junction work, landscaping and car parking.
- 2.3 This survey aimed to establish the current ecological value of this site and the presence/likely-absence of notable and/or legally protected species in order to inform appropriate mitigation, compensation and enhancement actions in light of proposed development works. This survey updates one previously undertaken for an existing permitted development on the site (ref: 15/07932/OUT).

SITE DESCRIPTION

- 2.4 The survey area extends to approximately 16 hectares and is centred on National Grid Reference TQ280935, OS Co-ordinates 528019, 193504.
- 2.5 There are ten buildings on the site with the largest being office buildings and an associated car park, additional buildings include a nursery, a school, site security offices and storage sheds. Surrounding these buildings are areas of hardstanding roads and car parking as well as landscaping in the form of amenity grassland, introduced shrubs, a pond and scattered trees. There is an expanse of rough grassland and scattered scrub to the north of the site.
- 2.6 The site is situated in a residential area in south Barnet and is surrounded by residential streets with terraced houses in all directions. It is bounded by the Southern Railway line to the west which runs from north to south.
- 2.7 The surrounding landscape is mainly comprised of parks and green open spaces including New Southgate Cemetery ~200m south east of the site, Brunswick Park ~200m east, Friary Park ~900m south west and Oak Hill Park ~1km north.
- 2.8 The survey area is shown in Figure 2.1 below.

Figure 2.1 Survey area

EXISTING ECOLOGICAL INFORMATION

2.9 A suite of surveys were undertaken and reported (see Appendix 1) in December 2015 in support of an existing permission for the site (ref: 15/07932/OUT). The surveys undertaken included:

- A Phase 1 habitat survey including a desk study using results from Greenspace Information for Greater London (GiGL);
- Bat surveys;
- Reptile surveys; and
- Invertebrate surveys.

2.10 The key findings included:

- The site was dominated by building/hardstanding surrounded by amenity grassland and mature ornamental trees. To the north of the site included a large expanse of poor semi-improved grassland and a lake was present to the southeast.
- Badger (*Meles meles*):
 - No badger setts were identified within or adjacent to the site boundary, although possible snuffle holes and a 'badger squeeze' hole with badger hair were noted to the north of the site.
- Bats:

-
- Bat emergence/re-entry surveys undertaken on several trees/groups of trees on site confirmed the likely absence of roosting bats from the site; and
 - The bat activity surveys recorded low levels of activity across the site and 5 species/species groups were recorded.
 - Reptile survey:
 - Surveys noted a 'low' population of slow worm (*Anguis fragilis*) in accordance with the criteria set out in the Froglife guidance.
 - Invertebrates:
 - Nine species of conservation interest previously recorded, largely associated with banks surrounding the car park.
 - Invasive species:
 - Japanese knotweed (*Fallopia japonica*), an invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981, was identified within the northern extent of the site.

3.0 METHODOLOGY

3.1 The PEA (which included an Extended Ecological Phase 1 Survey) was undertaken in accordance with guidance in the Joint Nature Conservation Committee (JNCC) (2010) Handbook for Phase 1 Habitat Survey¹ and the Chartered Institute of Ecological and Environmental Management (CIEEM) (2017) Guidelines for Preliminary Ecological Appraisal², in accordance with BS42020:2013: Biodiversity³. The overall assessment consisted of:

- A desktop assessment and review of available biological records; and
- A site walkover, protected species scoping assessment (including detailed scoping for badger and roosting bats) and phase 1 habitat survey.

3.2 The survey boundary and existing site is shown at Figure 1.

3.3 Greengage undertook the site walkover on the 8th and 9th April 2021 during mild and sunny weather conditions. Features within the site boundary and accessible features immediately bordering it were evaluated and the extent and distribution of habitats and plant communities were recorded, and supplemented with target notes on areas or species requiring further commentary. Fauna using the area were recorded and areas of habitat suitable for statutorily protected species were identified where present, with an active search carried out for evidence of such use.

DESK TOP REVIEW

3.4 A review of readily available ecological information and other relevant environmental databases (included Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) website⁴) was undertaken for the site and its vicinity. In addition, local authority websites and a biological records search from GiGL (Greenspace Information for Greater London) were reviewed to identify the location and citations of local non-statutory designated sites and presence of records for notable and protected species. This provided the overall ecological context for the site, to better inform the Phase 1 Survey.

ON SITE SURVEYS

Flora

3.5 The extent and distribution of different habitats on site were identified and mapped according to the standard Phase 1 Survey methodologies, supplemented with target notes describing the dominant botanical species and any features of interest. Any present protected plant species and invasive/non-natives were also noted. A habitat map has been produced to illustrate the results, as shown at Figure 1.

Fauna

- 3.6 The Phase 1 Survey specifically included assessments to identify the potential value for notable, rare and protected species at site. This involved identifying potential habitats in terms of refugia, breeding sites and foraging areas in the context of species known to be present locally and regionally.
- 3.7 The likelihood of occurrence is ranked as follows:
- Negligible - While presence cannot be absolutely discounted, the site includes very limited or poor-quality habitat for a particular species. The site may also be outside the known national range for a species;
 - Low - On-site habitat is poor to moderate quality for a given species, with few or no information about their presence from desk top study. However, presence cannot be discounted due to the national distribution of the species or the nature of on-site and surrounding habitats;
 - Moderate - The on-site habitats are of moderate quality, providing most or all of the key requirements for a species. Several factors may limit the likelihood of occurrence, habitat severance, habitat disturbance and small habitat area;
 - High - On-site habitat of high quality for given species. Site is within a regional or national stronghold for that particular species with good quality surroundings and good connectivity; and
 - Present - Presence confirmed for the survey itself or recent, confirmed records from information gathered through desk top study.
- 3.8 The species surveyed for included:

Badger (Meles meles)

- 3.9 The potential for badger to inhabit or forage within the study area was assessed. Evidence of badger activity includes the identification of setts (a system of underground tunnels and nesting chambers), grubbed up grassland (caused by the animals digging for earthworms, slugs, beetles etc.), badger hairs, paths, latrines and paw prints.

Bat Species (Chiroptera)

- 3.10 The site visit was undertaken in daylight and the evaluation of bat potential comprised an assessment of natural features on site that aimed to identify characteristics suitable for bat roosts, foraging and commuting. In accordance with Bat Conservation Trust's *Good Practice Guidelines*⁵ and methods given in English Nature's (now Natural England) *Bat Mitigation Guidelines*⁶ consideration was given to:
- The availability of access to roosts for bats;
 - The presence and suitability of crevices and other places as roosts; and

-
- Signs of bat activity or presence.
- 3.11 Definite signs of bat activity were taken to be:
- The bats themselves;
 - Droppings;
 - Grease marks;
 - Scratch marks; and
 - Urine spatter.
- 3.12 Signs of possible bat presence were taken to be:
- Stains; and
 - Moth and butterfly wings.
- 3.13 Features with potential as roost sites include mature trees with holes, crevices or splits (the most utilised trees being oak, ash, beech, willow and Scots pine), caves, bridges, tunnels and buildings with cracks or gaps serving as possible access points to voids or crevices.
- 3.14 Additionally, linear natural features such as tree lines, hedgerows and river corridors are often considered valuable for commuting and semi-natural habitats such as woodland, meadows and waterbodies can provide important foraging resources. Consideration was given to the presence of these features both immediately within and adjacent to the assessment area.

Great Crested Newt (*Triturus cristatus*)

- 3.15 An assessment was carried out to identify any potential habitats that may support great crested newt (GCN) and other native amphibians. The aquatic and terrestrial habitats required generally include small, still ponds or water bodies suitable for breeding; and woodland or grassland areas where there is optimal invertebrate prey potential.

Reptiles

- 3.16 The potential for reptile species on site was assessed during the walkover survey. Possible species include grass snake (*Natrix natrix*), smooth snake (*Coronella austriaca*), adder (*Vipera berus*), common and sand lizard (*Lacerta vivipara* and *L. agilis*) and slow worm (*Anguis fragilis*). These native reptile species generally require open areas with low, mixed-height vegetation, such as heathland, rough grassland, and open scrub or,

in the case of grass snake, waterbody margins. Suitable well drained and frost-free areas are needed so they can survive the winter.

Dormouse (Muscardinus avellanarius)

- 3.17 During the walkover survey the potential for dormouse to be present on site was assessed. This included observations for suitable habitat such as well-layered woodland, scrub and linking hedgerows, particularly those comprised of species offering suitable food sources such as honeysuckle and hazel, in addition to direct evidence such as characteristically gnawed hazelnuts, chewed ash keys and honeysuckle flowers, or nests.

Water Vole (Arvicola terrestris)

- 3.18 Water vole potential was assessed during the walkover survey. The potential is identified by the presence of ditches, rivers, dykes and lakes with holes and runs along the banks. Latrines, footprints or piles of food can also be noted.

Otter (Lutra lutra)

- 3.19 Where desktop review or consultation indicates the presence of otter in a river catchment, the presence of water bodies with good cover and potential holt (den) sites would be noted. Spraint, footprints or food remains can also be noted.

Birds

- 3.20 During the walkover survey, the potential for breeding, wintering and migratory birds was assessed. In particular, this includes areas of trees, scrub, heathland and wetlands that could support nests for common or notable species.

Invertebrates

- 3.21 As part of the walkover survey the quality of invertebrate habitat and the potential for notable terrestrial and aquatic invertebrate species was considered. There is a wide variety of habitats suitable for invertebrates including wetland areas, heathland, areas of bare sandy soil, ephemeral brownfield vegetation and meadows.

Biodiversity Action Plan priority species/ Species of Principal Importance

- 3.22 Where consultation and desk-study indicates the presence of BAP priority species (Species of Principal Importance) not protected by statute, effort was made to establish the potential for the site to support these species.

Species Specific Scoping***Badger***

- 3.23 The potential for badger to inhabit or forage within the study area was assessed through identifying the presence of the following field signs:
- sett entrances, e.g. entrances that are 25cm in diameter with a flattened oval appearance;
 - badger paths;
 - latrines;
 - badger hairs on fences or bushes;
 - scratching posts;
 - signs of digging for food;
 - badger footprints; and
 - large spoil heaps outside sett entrances.

Bat species (Chiroptera)

- 3.24 The site visit was undertaken in daylight and the evaluation of bat potential comprised an assessment of natural features on site that aimed to identify characteristics suitable for bat roosts, foraging and commuting. In accordance with Bat Conservation Trust survey guidelines⁸ and methods given in English Nature's (now Natural England) Bat Mitigation Guidelines⁹ consideration was given to:
- The availability of access to roosts for bats;
 - The presence and suitability of crevices and other places as roosts; and
 - Signs of bat activity or presence.
- 3.25 Definite signs of bat activity were taken to be:
- The bats themselves;
 - Droppings;
 - Grease marks;
 - Scratch marks; and
 - Urine spatter.
- 3.26 Signs of possible bat presence were taken to be:
- Stains; and
 - Moth and butterfly wings.

- 3.27 Features with potential as roost sites include mature trees with holes, crevices or splits (the most utilised trees being oak, ash, beech, willow and Scots pine), caves, bridges, tunnels and buildings with cracks or crevices serving as entrance or exit holes.
- 3.28 Additionally, linear natural features such as tree lines, hedgerows and river corridors are often considered valuable for foraging and commuting. Consideration was given to the presence of these features both immediately within and adjacent to the assessment area.

SURVEYORS

- 3.29 James Bumphrey, who undertook the badger and roosting bat scoping survey and reviewed this report, has an undergraduate degree in Environmental Sciences (BSc Hons), a Master's degree in Environmental Consultancy, a Natural England Great Crested Newt Licence (2018-35160-CLS-CLS). James has 8 years' experience in ecological surveying and has undertaken and managed numerous ecological surveys and assessments.
- 3.30 Olivia Guindon, who undertook the PEA survey and wrote this report, has a Bachelor's degree in Ecology and Wildlife Conservation (BSc Hons), a Master's degree in Species Identification and Survey Skills and is a Qualifying member of CIEEM. Olivia has over three years' experience in the commercial sector.
- 3.31 This report was written by Olivia Guindon and reviewed and verified by James Bumphrey who confirms in writing (see the QA sheet at the front of this report) that the report is in line with the following:
- Represents sound industry practice;
 - Reports and recommends correctly, truthfully and objectively;
 - Is appropriate given the local site conditions and scope of works proposed; and
 - Avoids invalid, biased and exaggerated statements.

CONSTRAINTS

- 3.32 The PEA, badger and bat scoping survey visits were undertaken during an optimal time of year during ideal conditions by a suitably qualified ecologist. It was possible to access all areas of the site.
- 3.33 No significant constraints that stand to impact conclusions drawn in this report therefore presented themselves.

4.0 RESULTS

DESK TOP REVIEW

Designations

- 4.1 Consultations with the local biological record centres (GiGL) and the MAGIC dataset have confirmed that there are no statutory designations of national or international importance within the boundary of the site.
- 4.2 There are however two Local Nature Reserves (LNR) within a 2km radius.
- 4.3 The search radius was extended to 10km for statutory designated sites of national and international importance with three identified.
- 4.4 Records from GiGL also identified 12 non-statutory Sites of Importance for Nature Conservation (SINCS) within 2km of the site boundary. SINCs are recognised by LPAs as important wildlife sites.
- 4.5 Table 4.1 below gives the locations and descriptions the notable local designations.

Table 4.1 Notable Statutory and Non-Statutory Designated Sites within Search Radius

Site Name	Approximate Location	Description
Statutory Designations (National and International Importance)		
Lee Valley (Special Protection Area and Ramsar)	7.8km southeast	Comprises a series of embanked water supply reservoirs, sewage treatment lagoons and former gravel pits that display a range of man-made and semi-natural wetland and valley bottom habitats. Qualifying species include: <ul style="list-style-type: none"> • Bittern <i>Botaurus stellaris</i> • Gadwell <i>Anas strepera</i> • Shoveler <i>Anas clypeata</i> • Whorled water-milfoil <i>Myriophyllum verticillatum</i>
Walthamstow Reservoirs – part of Lee Valley (Site of Special Scientific Interest)	7.8km southeast	The Walthamstow Reservoirs contain one of the country’s major heronries and a particularly large concentration of breeding wildfowl. They are also an important gathering area for moulting tufted duck and in winter attract nationally significant populations of wildfowl and other wetland birds
Epping Forest (Special Protection Area (SAC))	9.8km east	Epping Forest is a large ancient wood-pasture with habitats of high nature conservation value including ancient semi-natural woodland, old grassland plains, wet and dry heathland and scattered wetland. The semi-natural woodland is particularly extensive but the Forest plains are also a major feature and contain a variety of unimproved acid grasslands. Qualifying habitats:

Site Name	Approximate Location	Description
		<ul style="list-style-type: none"> Atlantic acidophilous beech forests European dry heaths North Atlantic wet heaths Qualifying species: <ul style="list-style-type: none"> Stag beetle <i>Lucanus cervus</i>
Statutory Designations (Local Importance)		
Oak Hill Wood (LNR)	~1.4km north	This site comprises of woodland (oak, hornbeam, hazel, elm, holly, elder), grassland and tall herbs. The woodland is bisected by a small stream, a tributary of the Pymmes Brook, that has ferns on its banks. The grassland and tall herb communities are exceptionally rich in flora in places e.g. buttercup, harebell, imperforate St. John's wort, bird's foot trefoil, stitchwort and sorrel. Over 70 species of bird, 19 butterflies, 74 moths, 9 mammals, 82 fungi and 2 amphibians have been recorded on the site.
Coppetts Wood and Glebelands (LNR)	~1.6km south	Coppetts Wood is mainly oak, supported by old coppice hazel and hornbeam. There is also a pond that provides wetland habitat, and compartments containing grassland and tall herb habitats. These are diverse and in places exceptionally rich in flora. Over 38 species of bird and 21 butterfly species have been recorded, and the site is rich in invertebrates, fungi, bats and other mammals. Glebelands is a woodland belt dominated by mature hawthorn. It is remarkable for its boggy conditions and supports locally rare aquatic herbs.
Non-Statutory		
New Southgate Cemetery (SINC – Borough Grade II)	40m east	Support mature trees, breeding bird assemblage, dusky cockroach <i>Ectobius lapponicus</i> .
Barfield Allotments Nature Park (SINC – Borough Grade I)	145m west	A former allotment which supports a reptile population including slow worm and common lizard.
Oakleigh Park Rail Cutting (SINC – Borough Grade I)	510m north	An important wildlife corridor, the site supports goldfinch <i>Carduelis carduelis</i> , chiffchaff <i>Phylloscopus collybita</i> , lesser whitethroat <i>Sylvia curruca</i> and willow warbler <i>Phylloscopus trochilus</i> .
Pymme's Brook (SINC – Borough Grade II)	~700m east	The Pymme's Brook, a small tributary of the River Lea, flows southwards through the eastern part of the borough of Barnet. Two sections of the brook are included in this site. The first is a 500 metre stretch from where the brook leaves Monken Hadley Common to Park Road. The southern section is just over 3 kilometres in length, from Brookside to the borough boundary with Enfield, where it enters Arnos Park on its way to join the River Lea at Edmonton. Between these two sections, the brook flows for about a kilometre between back gardens in a concrete channel of limited nature conservation interest, and then in a short culvert. In the northern section of the site, the brook flows through an attractive strip of rough grassland and scattered

Site Name	Approximate Location	Description
		scrub, with a narrow belt of oak (<i>Quercus robur</i>) woodland beside the river. There is little aquatic vegetation because of the shade. The southern section is also largely wooded. The brook in this section has fairly natural banks and a gravel bed, though the dense shade restricts aquatic vegetation.
Friary Park (SINC – Borough Grade I)	750m southeast	A public park which supports veteran trees which pre-date the park, and a stream. The site supports parkland birds including nuthatch <i>Sitta europaea</i> and treecreeper <i>Certhia familiaris</i>
North Middlesex Golf Course Ponds (SINC – Borough Grade II)	~1.2km west	The two ponds on North Middlesex Golf Course support a breeding colony of palmate newts, a rare species in London, as well as the commoner smooth newt. The upper pond, which is close to the club house, is rather formal, with a fountain and lights, and the marginal vegetation is cut regularly. The lower pond is less formal, and has a fringe of yellow iris (<i>Iris pseudacorus</i>), reed sweet-grass (<i>Glyceria maxima</i>), water mint (<i>Mentha aquatica</i>) and brooklime (<i>Veronica beccabunga</i>). Rigid hornwort (<i>Ceratophyllum demersum</i>) and Nuttall's waterweed (<i>Elodea nuttallii</i>) grow beneath the water's surface
Arnos Park (SINC – Borough Grade I)	~1.5km south east	A small but varied park with a range of habitats including the Pymme's Brook which flows through the park. The park's woodland has a diverse range of tree species. To the northeast of the park is an extensive area has been allowed to revert to rough grassland. The Pymme's Brook is largely channelled and of limited ecological value. The Piccadilly line crosses the park on a viaduct at its western end and the site is extended to include its railsides, and the Bounds Green Brook running south from the park.
Bluebell Wood and Muswell Hill Golfcourse (SINC – Borough Grade I)	~2km south	Bluebell Wood is a small area of ancient woodland covering just over one hectare found towards the eastern edge of Muswell Hill. It is open to the public at all times and is regularly used by local people. There is wild service-tree (<i>Sorbus torminalis</i>) and Midland hawthorn (<i>Crataegus monogyna</i>) in the understorey, indicating the ancient origin of the wood. The ground flora includes further ancient woodland indicators, including bluebell (<i>Hyacinthoides non-scripta</i>), wood anemone (<i>Anemone nemorosa</i>) and wood millet (<i>Milium effusum</i>), the latter at its only Haringey site

Biodiversity Action Plans

- 4.6 UK Biodiversity Action Plans (BAPs) have been developed which set priorities for nationally important habitats and species. To support the BAPs, Species/Habitat Statements (otherwise known as Species/Habitat Action Plans) were produced that provide an overview of the status of the species and set out the broad policies that can be developed to conserve them. A list of priority species of conservation importance was also developed.
- 4.7 The UK BAP was succeeded in 2012 by the *UK-Post 2012 Biodiversity Framework* which informed the creation of the *Biodiversity 2020* strategy; England's contribution towards the UK's commitments under the *United Nations Convention of Biological Diversity*.

- 4.8 Despite this, the UK BAP priority species lists and conservation objectives still remain valid through integration with local BAPs (which remain valid), and in the form of the Habitats and Species of Principle Importance list (as required under section 41 of the Natural Environment and Rural Communities (NERC) Act).
- 4.9 Local Biodiversity Action Plans (LBAPs) ensure that national action plans (the UK BAP/Biodiversity 2020) are translated into effective action at the local level and establish targets and actions for locally characteristic species and habitats.
- 4.10 There is currently no active Barnet BAP and therefore the London BAP would be considered to be of most relevance to the site.

London BAP

- 4.11 The London BAP lists 214 priority species and eight Species Action Plans (SAPs), in addition to four priority habitats and 11 Habitat Action Plans (HAPs) There are also many species listed on the BAP which are priority species and are of conservation concern. Of these, the features relevant to this report include:
- The onus placed on the importance of built structures to local wildlife;
 - The bat Species Action Plan (SAP);
 - Reptiles (SAP);
 - Stag Beetle (*Lucanus cervus*) SAP;
 - House sparrow (*Passer domesticus*) SAP.

Species Record

- 4.12 The information provided in the biological data search from GiGL identified records of a number of protected and BAP priority species within 2km search radius of the site. Among others, these include the following species of relevance to the site:
- Mammals (excluding bats) – West European hedgehog (*Erinaceus europaeus*) and harvest mouse (*Micromys minutus*).
 - Bat species including serotine (*Eptesicus serotinus*), natterer's (*Myotis nattereri*), common noctule (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared (*Plecotus auritus*).
 - Reptiles and amphibians – common toad (*Bufo bufo*); common frog (*Rana temporaria*), great crested newt (*Triturus cristatus*), common lizard (*Zootoca vivipara*), grass snake (*Natrix helvetica*) and slow worm (*Anguis fragilis*).
 - Birds – swift (*Apus apus*), cuckoo (*Cuculus canorus*), house sparrow (*Passer domesticus*), starling (*Sturnus vulgaris*), song thrush (*Turdus philomelos*).
 - Invertebrates – stag beetle (*Lucanus cervus*).

- 4.13 The species listed above are primarily those known to be in the area that may be impacted by any proposals at the site, or that stand to benefit as a consequence of potential ecological enhancements at the site and inform site-specific mitigation and enhancement recommendations described in the following chapter.

DETAILED DESCRIPTION OF SITE: HABITATS

- 4.14 The habitats presented across the assessment site consist of the following Joint Nature Conservation Committee (JNCC) Phase 1 Habitat categories, as mapped at Figure 1:

- Building and Hardstanding (J3.6);
- Amenity grassland (J1.2);
- Poor semi-improved grassland (B6);
- Dense scrub (A2.1);
- Scattered scrub (A2.2);
- Tall ruderal (C3.1);
- Introduced shrub (J1.4);
- Standing water (G1.2);
- Species poor intact hedgerow (J2.1.2); and
- Species poor hedge with trees (J2.3.2).

Building and hardstanding (J3.6)

- 4.15 There are ten buildings on the site with the primary use being office building and associated car parking. Additional uses include a nursery, a school, site security offices and storage sheds.

Building 1 - Nursery

- 4.16 Building 1 located to the north of the site is currently used as a nursery. It is a one storey brick building with a shallow pitched roof made with corrugated metal.

Plate 4.1 The nursery (building 1)



Buildings 2, 8 and 10 – Small Storage Buildings

- 4.17 Building 2, 8 and 10 are all small one storey shed-like buildings. Building 2 has timber cladding and a pitched tiled roof; building 10 is of brick construction with a flat concrete roof; and building 8 is of brick construction with a flat concrete roof.

Plate 4.2 Building 8



Buildings 7 and 9 – Security Buildings

- 4.18 Building 7 and 9 are security offices both situated at an entrance of the business park.
- 4.19 Building 7 is a single storey brick building with a flat roof and building 9 is a one storey building of steel and brick framing with glazing.

Plate 4.3 Building 7



Building 3 – Large Main Office Building

- 4.20 Building 3 is a large office building made up of four different office blocks joined via annexes to form a large square building footprint with a central ornamental garden. Its construction is modern with metal and glazed cladding and a flat roof with small plant rooms.

Plate 4.4 Building 3



Building 5 – Additional Office Block

- 4.21 Building 5 is a two-storey office block with metal and glazed cladding and a flat roof.

Plate 4.5 Building 5



Building 6 – Car park

4.22 Building 6 is a two-storey car park of concrete construction and open on all aspects.

Plate 4.6 Building 6



Building 4 – School building

4.23 Building 4 is a two-storey building used as a school with glazed and metal cladding and a flat roof.

Amenity Grassland (J1.2)

- 4.24 The majority of the grassland throughout the site comprised of heavily managed amenity grassland dominated by few species including perennial rye grass (*Lolium perenne*), daisy (*Bellis perennis*) and white clover (*Trifolium repens*).

Plate 4.7 Amenity grassland



Poor Semi-improved Grassland (B6)

- 4.25 To the north of the site is an expanse of well-established rough grassland seemingly left unmanaged. The sward is tall and tussocky and is dominated by grasses including common couch (*Elymus repens*), false oat grass (*Arrhenatherum elatius*), Yorkshire fog (*Holcus lanatus*), and creeping bent (*Agrostis stolonifera*). Wildflower species within the grassland are of a ruderal nature with species such as creeping thistle (*Cirsium arvense*), common nettle (*Urtica dioica*) and others including creeping buttercup (*Ranunculus repens*), wild carrot (*Daucus carota*) and meadow vetchling (*Lathyrus pratensis*).

Figure 4.1 Area of poor semi-improved grassland to the north of site



4.26 Several areas of grassland displayed a more diverse composition including species such as ladies' bedstraw (*Galium verum*), bird's-foot-trefoil (*Lotus corniculatus*), selfheal (*Prunella vulgaris*), common knapweed (*Centaurea nigra*), oxeye daisy (*Leucanthemum vulgare*) and red clover (*Trifolium pratense*). It is understood from previous ecological assessments of the site that these areas have likely been seeded to increase diversity.

Figure 4.2 Diverse composition of area of poor semi-improved grassland areas



Tall ruderal (C3.1)

4.27 A large mound was present along the eastern boundary of the grassland area to the north of the site which has been colonised by tall ruderal species including bristly

oxtongue (*Picris echioides*) and common nettle (*Urtica dioica*) which implied this area has been subject to disturbance fairly recently.

Figure 4.3 Mound with tall ruderal species



Scattered scrub (A2.2)

- 4.28 The area of poor semi-improved grassland to the north of the site was also colonised in places by some areas of scattered scrub mainly comprised of bramble (*Rubus fruticosus*).

Figure 4.4 Scattered scrub within grassland



Dense scrub (A2.1)

- 4.29 Areas of dense bramble scrub were also present around the peripheries of the site and around the lake to the south. Urban scrub species such as bramble (*Rubus fruticosus*)

and butterfly bush (*Buddleia davidii*) are dominating throughout the site with goat willow (*Salix caprea*) and dogwood (*Cornus sanguinea*) present around the lake's margins.

Figure 4.5 Dense scrub



Introduced shrub (J1.4)

- 4.30 Small areas on the site are landscaped with typical ornamental introduced shrubs including *Laurus sp.*, *Hebe sp.*, *Cotoneaster sp.*, and *Fatsia japonica*.

Figure 4.6 Introduced shrub



Standing water (G1.2)

- 4.31 A large waterbody is present in the southeastern area of the site. Its banks are steep sided and some sides have been reinforced with steel supports. Vegetation within the pond was limited to small areas of common reed (*Phragmites australis*). An island is present within the waterbody with large mature trees. The pond does not meet any of the criteria for it to be considered a BAP Priority Habitat⁷

Figure 4.7 Lake



Species poor intact hedgerow (J1.2.1)

- 4.32 The car park to the north of the site is surrounded by small hedgerows composed of hawthorn (*Crataegus monogyna*). Although intact in their length, the small hedgerows are no more than 1m in height and therefore do not meet the criteria for the UK BAP priority habitat 'Hedgerow'⁸.

Figure 4.8 Species poor intact hedgerow



Species poor hedge with trees (J2.3.2)

- 4.33 To the north of the car park area is a hedgerow mainly composed of garden privet (*Ligustrum ovalifolium*) with a number of mature trees including oak (*Quercus sp.*) and ash (*Fraxinus excelsior*). Whilst the hedgerow is intact in its full length and above 3m on average in height and it does not meet the criteria for the UK BAP priority habitat 'Hedgerow' given it is predominately comprised of a non-native species.

Figure 4.9 Hedge with trees



- 4.34 Further to the hedgerows, a large resource of trees is present on site, many of which are likely to have been planted in association with the existing development. As a consequence most trees were early to semimature in age and in good condition. Amongst non-native and ornamental species, a large amount of native trees including lime (*Tilia x europaea*), oak, horse chestnut (*Aesculus hippocastanum*) and yew (*Taxus baccatta*) were present scattered across the site.

DETAILED DESCRIPTION OF SITE: SPECIES

- 4.35 Protected species potential is described below with target notes shown at Figure 1.

Badger

- 4.36 There are no records of badger within 2km of the site, however the rough grassland habitat on site is suitable for foraging badger with potential evidence of badger recorded on site during the badger scoping in the form of snuffle holes (Target Note 1). Snuffle holes were also previously recorded, in addition to badger hair on a 'squeeze hole' (Appendix 1). No setts were identified however, given the evidence previously recorded there is considered to be **high** potential for foraging badger to be present on site.

Bats

Foraging

- 4.37 The site includes areas of rough grassland, scrub, large mature trees and a lake which provide a suitable foraging resource for bats. The grassland to the north is also unlit, increasing further its potential to support foraging bat species, including those that are intolerant of light. The mature trees and railway line to the west of the site provide good

commuting habitat for bats and are well connected to the residential gardens and parks and open green spaces that make up the wider surroundings. However, the previous surveys at the site recorded limited levels of foraging and consequently the value is considered to be **low**.

Roosting

- 4.38 No field signs of roosting bats were observed during the bat scoping survey. The findings of the bat scoping of the buildings is consistent with the previous assessment of the site (see Appendix 1 for further details). None of the buildings supported any suitable features such as cracks, crevices, missing bricks and other structural features suitable to support roosting bats. The buildings on site are therefore considered to have **negligible** potential to support roosting bats.
- 4.39 Moderate potential roosting features were identified on four of the trees on site. Trees 1,2,3, 4 and 5 (see Figure 1) included woodpeckers holes, ivy and splitting bark with potential to support roosting bats and were therefore considered to have **moderate** potential to support roosting bats. Several other trees were noted as having low potential (primarily associated with the tree group containing T1).

Table 4.2 Trees with bat roosting potential

Tree	Species	Description	Bat roosting potential	Target Note
T1	Pedunculate oak (<i>Quercus sp.</i>)	Mature tree with ivy, woodpecker hole and missing limb	Moderate	2
T2	Weeping willow (<i>Salix babylonica</i>)	Mature tree which has recently fallen down. Woodpecker holes and splitting bark present on north facing elevation	Moderate	3
T3	Lime (<i>Tilia sp.</i>)	Mature tree; two woodpecker holes on east facing side of stem	Moderate	4
T4	Pedunculate oak (<i>Quercus sp.</i>)	Mature tree; ivy clad and woodpecker hole present	Moderate	5
T5	Pedunculate oak (<i>Quercus sp.</i>)	Mature tree; woodpecker hole present	Moderate	6

Great Crested Newt

- 4.40 The assessment of the potential for great crested newt to be present on site is consistent with that undertaken previously (see Appendix 1). There are records of great crested

newt within 2km of the site, however the pond on site contained large fish and waterfowl and is sufficiently well isolated from other waterbodies present within 500m. In addition, there is a lack of suitable aquatic vegetation for egg laying.

- 4.41 The site is therefore considered to have **negligible** potential to support great crested newts.

Reptiles

- 4.42 Habitats across the site were largely unsuitable for reptile species being heavily managed and lacking structure. However the area of rough grassland to the north of the site and scrub habitats are suitable to support common and widespread reptile species. In addition, piles of logs, green waste and debris throughout the site provide suitable hibernacula for species such as common lizard and slow worm. The site's connectivity to other habitats is also provided via the railway line to the west of the site.
- 4.43 Furthermore, surveys completed in 2014 (Appendix 1) confirmed the presence of a 'good' population of slow worm.
- 4.44 As such the site is considered to have **high** potential to support reptiles.

Dormouse

- 4.45 There are no records for dormouse within 2km of the site and the hedges and trees on site lack diversity in fruiting species and provide little suitability for the species. In addition there are no woodlands or suitable habitats connected to the site.
- 4.46 The habitats on site are therefore considered to have **negligible** potential for dormouse.

Water Vole and Otter

- 4.47 There are no records of water vole and otter within 2km of the site and there are no suitable habitats on site. The existing man-made waterbody is highly isolated from suitable offsite habitats and subject to a high level of disturbance. Therefore the site is considered to be of **negligible** value for water vole and otter.

Birds

- 4.48 The range of habitats on site have the potential to support an assemblage of common and widespread breeding bird species. There are records of priority bird species within 2km of the site including house sparrow, swift and cuckoo.
- 4.49 Notable species identified during the 2021 walkover included dunnoek (*Prunella modularis*, BoCC amber listed and NERC species) and starling (*Sturnus vulgaris*, BoCC red listed and NERC species). These species were also recorded during the 2015 surveys.
- 4.50 Canada geese were numerous around the lake and fledglings were spotted during a site visit in May 2021.

4.51 The site is therefore considered to have **high** potential to support breeding birds.

Invertebrates

4.52 The site is likely to support a range of largely common invertebrate species with habitats of value including trees, dense scrub and rough grassland. There are records of several invertebrate priority species/species of principal Importance within 2km of the site including stag beetle.

4.53 Previous surveys of the site (Appendix 1) identified nine species of conservation interest with all but one of these associated with the banks surrounding the car park area (Target Note 7).

4.54 Whilst stag beetle have been recorded in the locality, none have been recorded on site with areas of deadwood being relatively limited.

4.55 The site is considered to have **high** potential to support notable invertebrates with presence previously confirmed.

Protected Plant Species

4.56 Given the nature of the habitats across the majority of the site and the fact that grass species dominated the grassland and scrub habitats on site, the potential for the site to support protected plant species is considered to be **negligible**.

Invasive/Non-native species

4.57 Japanese knotweed (*Fallopia japonica*), an invasive species listed on Schedule 9 of the Wildlife and Countryside Act, was identified within the northern extant of the site (Target Note 8).

Other BAP Species

4.58 Habitats present across the site including the dense scrub and hedgerow habitats have **moderate** potential to support hedgehog and there are multiple records of this species within 2km of the site.

5.0 EVALUATION AND DISCUSSION

- 5.1 The assessment site and its surroundings have potential to support the following ecological receptors of note, which could therefore be impacted upon by any future prospective development proposals. Discussion on appropriate mitigation, compensation and enhancement actions is therefore provided below.
- 5.2 The additional phase 2 surveys described below are due for completion in Summer 2021.

MITIGATION AND COMPENSATION

Designated Sites

- 5.3 There are several statutory designated sites within 2km of the site boundary including Oak Hill Wood LNR ~1.4km north and Coppetts Wood and Glebelands LNR ~1.6km south. There are also 12 non-statutory Sites of Importance for Nature Conservation (SINCs) within the 2km radius including Pymme's Brook Borough Grade II SINC ~700m east and New Southgate Cemetery Borough Grade II SINC ~200m south east.
- 5.4 Construction phase impacts associated with the development such as pollution events, dust deposition and noise pollution/vibration are considered unlikely due to distance and the nature of the surrounding environment being already densely urban. Potential operational impacts such as increased footfall and litter will also be minimal given the designated sites are already in a suburban context and subject to existing management.

Habitats

- 5.5 It is understood that the pond will be reconstructed as a part of the development works and will therefore be drained. Consideration will therefore be required with regards to the existing fish present and also the breeding birds around the pond. There are significant opportunities to increase the ecological value of the pond through the incorporation of marginal planting and naturalising the banks.
- 5.6 Whilst the hedgerows on site are unlikely to meet the criteria for the associated UK BAP Priority Habitat it still has existing value as a linear feature providing foraging opportunities for birds, bats and invertebrates. All hedgerow that is lost should be replaced and enhanced with a diverse species mix utilised.
- 5.7 Given the existing cover of landscaping on site, in order to create net gains in biodiversity value on site, green infrastructure should be planned at a site wide level, considering wider ecological features and green corridors. Green space should be multifunctional with high floral diversity and support native species where possible.
- 5.8 In accordance with the above, the following measures are recommended for incorporation into proposals and are largely consistent with recommendations previously provided in Appendix 1:

-
- Biodiverse living roofs – including wildflower grass and substrate-based systems which are seeded and plug planted, incorporating at least 30 wildflower species of known value to wildlife, should be provided on suitable flat roof areas. The roofs should be further enhanced through the inclusion of features such as log piles, rope coils, sandy piles and ephemeral water features for invertebrates;
 - Wildlife friendly planting – new landscaping should provide a diverse mix of species of demonstrable value for wildlife known to be at site/have the potential to be encouraged to the site. Landscaping should account for climate risk through providing appropriate species mixes which are drought resilient, or suitable for use in rain gardens or for surface water control where appropriate. New trees and hedgerows should be considerate of their wildlife value (providing fruit and berries) and wider function such as pest resilience and air quality control ability. The creation of wildflower meadow and species rich ‘turf’ in formal recreational areas with seasonal bulb planting should be considered;
 - Bird boxes – Nesting opportunities for birds, particularly targeting BAP species such as house sparrow, should be provided. Specialised house sparrow terraces can be included that are fully integrated within new buildings or attached to mature trees. These boxes should be positioned near to any area of vegetation and should be placed at least 2m above ground level;
 - Bat boxes – Bat boxes should be located on the eastern and southern elevations of the buildings and like the bird boxes should be incorporated into the masonry or attached to mature trees;
 - Invertebrate habitat features – Invertebrate habitat features should be incorporated within public landscaped areas to provide features of interest as well as ecological function. Stag beetle loggeries, solitary beehives and habitat panels should be placed in suitable locations. Stag beetle loggeries should be placed in shady areas amongst trees to provide forage and shelter for saproxylic invertebrates in larval stage, whereas beehives and habitat panels should be located in sunny areas; and
- 5.9 The above recommendations are provided with an aim of achieving Biodiversity Net Gain in order to comply with emerging planning policy. Should the recommendations made in this report be adhered to, proposals should be fully compliant with local, regional and national planning policy and biodiversity conservation legislation both which encourage new developments to deliver measurable gains in biodiversity.
- 5.10 The measures described above, once integrated within designs, should be described in an Ecological Management Plan (EMP) for the scheme, which, alongside the Construction Environmental Management Plan (incorporating ecological protection measures), could be secured through planning condition. A Biodiversity Net Gain/Biodiversity Impact Assessment should also be produced.
-

Badgers

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

Bats

Foraging

- 5.13 The mature trees, areas of scrub and open grasslands provide suitable foraging habitats for multiple bat species. The proposed developments plans seek to clear most suitable habitat including the area of rough grassland and scrub. Additionally, increased lighting levels associated with the development threaten the site's value for foraging bats and could sever potential flight lines.
- 5.14 Further surveys are therefore recommended to determine whether bats are using these habitats on site. A sensitive lighting strategy should be implemented, and should the hedgerows not be retained, new hedgerow should be created on at least a like for like basis within the development proposals.

Roosting

- 5.15 The survey established that five trees on site have moderate potential to support roosting bats and these trees will be lost as a result of the development.
- 5.16 In order to establish the presence/likely absence of roosting bats emergence/re-entry surveys will be required. In accordance with BCT Good Practice Guidelines moderate potential features require two emergence/re-entry surveys to be undertaken at dusk and/or dawn. These surveys should be undertaken between May-August, with at least one of the surveys completed between June to July to cover the bat maternity season.
- 5.17 An assessment of impact and identification of appropriate mitigation, compensation and enhancement should be informed by the results of these further surveys.
- 5.18 In accordance with the aforementioned BCT guidelines, trees with low roosting potential are not recommended to be subject to emergence re-entry surveys. However, any such trees that are to be recommended will be subject to a pre-works inspection and soft felled in a controlled manner.

Reptiles

- 5.19 The proposals could result in the loss of potential reptile habitat, Further reptile surveys are recommended to be undertaken to reconfirm the presence/likely absence of reptiles on the site and to inform mitigation requirements. However, as is referenced above, slow-worm have previously been recorded on the site.
- 5.20 To ensure that slow worms (and any other reptiles) are protected from injury/harm, a receptor area will be created along the western boundary which will be followed by a trapping exercise which excludes reptiles from the working area (the rough grassland and scrub habitats in the north of the site). The working areas would be fenced off with reptile exclusion fencing and a trapping exercise undertaken between March to September/October, when weather conditions are optimal. Reptiles that are caught would be transferred directly to the receptor site. A destructive search of any suitable hibernation features would be undertaken and the area made unsuitable for reptile occupation.
- 5.21 The receptor site, located on the north-western boundary, would be managed to achieve conservation benefits for the existing reptile population. This would be specifically designed to improve both the botanical and structural diversity of vegetation in order to benefit reptiles. These measures would include low intensity management to establish grassland and scrub mosaic, and the provision of a series of additional hibernation features. The detailed design of the habitats would be achieved through the implementation of a Management Plan, which would ensure the successful establishment and maintenance of all retained and newly created habitats, ensuring the favourable conservation status of reptiles is maintained.

- 5.22 The receptor site would be created in advance of any construction works; this would therefore ensure that the habitat has developed adequately to ensure that it can support the translocated reptile population. The area proposed for the reptile reserve would require a degree of tree and shrub removal and grassland establishment. Once the habitat has developed the future management would be secured into perpetuity, with specific management measures outlined within the Management Plan.

Birds

- 5.23 Impacts upon nesting birds can be fully avoided through scheduling works that would stand to impact them. As nesting value exists within the trees, hedgerows and scrub habitats, if removal of these habitats is required as part of the development proposals, clearance should be undertaken outside of the nesting bird season (taken to run from March to August inclusive). If clearance within this window is not possible, a nesting bird check by a qualified ecologist would be required prior to clearance.
- 5.24 Should an active nest be identified, works that would stand to destroy the nest/eggs and/or kill birds building nests must cease until the nest is vacated.
- 5.25 To compensate for any loss in nesting bird habitat in scattered trees or the building, landscaping proposals should utilise native tree and shrub planting, as well as providing integrated nesting boxes within the new buildings. Compensatory planting should focus on the provision of winter berry producing species as well as species with dense shrubby growth within which birds may construct nests. This would not only provide nesting opportunities, but also deliver a vital food resource for birds over the winter months. Species which could be included in the design include, dogwood (*Cornus sanguinea*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), and red currant (*Ribes rubrum*).

Invertebrates

- 5.26 Given the value for invertebrates associated with the banks surrounding the car park, it is proposed to recreate this habitat at roof level on the biodiverse green roofs which will incorporate a diverse mix of plant species and features such as log piles, rope coils, sandy piles and ephemeral water features.

Additional Notable species: Hedgehog

- 5.27 Hedgehog are not afforded protection under UK and European law however are protected under the Wild Mammals (Protection) Act (1996) (Appendix 2). This Act requires hedgehog and other small mammals to be protected during site works. Furthermore, given their status as a s41 species, their conservation is a material consideration in the planning process. Measures to protect hedgehog and retain suitable habitat on site for the species, allowing continued connectivity, should therefore be followed.

-
- 5.28 In order to minimise the potential for killing or injuring of hedgehogs (and other small to medium sized mammals) during site clearance, removal of dense vegetation and tall grass should be undertaken in two phases, by cutting to 30cm in the first instance, then to ground level after that. The vegetation should be checked for mammals between these two cuts. Should any hedgehogs be found, they should be moved to a suitable area of habitat that is not subject to clearance.
- 5.29 Inclusion of dense shrub and scrub species within the soft landscaping design proposals will help to compensate for the loss of suitable hedgehog habitat. This will provide hedgehogs with a foraging resource, as well as shelter from predators. This type of planting would be most effective around the perimeter of the site particularly towards the woodland to the south. Any fence lines or walls which may create barriers for hedgehog movement should have hedgehog highways created through them (~20x20cm holes).

6.0 SUMMARY AND CONCLUSION


















- 6.1 Greengage was commissioned by Comer Homes to undertake a PEA a site known as the North London Business Park, New Southgate in the London Borough of Barnet in order to establish the ecological value of this site and its potential to support notable and/or legally protected species.
- 6.2 This survey updates one previously undertaken for an existing permitted development on the site (ref: 15/07932/OUT).
- 6.3 The site survey, undertaken on the 8th and 9th April 2021, alongside details received from a desk top study confirmed that the site has the potential to support the following protected/notable species:
- Moderate potential to support roosting bats (previously confirmed likely absent);
 - Low value for foraging and commuting bats (previously low levels of foraging recorded);
 - High potential to support reptiles (with presence previously confirmed);
 - High potential to support foraging badger (with potential presence previously identified);
 - High potential to support nesting birds;
 - High potential to support notable invertebrates (with presence previously confirmed); and
 - Moderate potential to support hedgehog.
- 6.4 The following update phase 2 protected species surveys are recommended to be undertaken:
- Bat emergence/re-entry survey;
 - Bat activity survey;
 - Reptile survey; and
 - Invertebrate survey.
- 6.5 The additional phase 2 surveys are due for completion in Summer 2021.
- 6.6 Key mitigation, compensation and enhancement actions which should be included within EMP and CEMP documents for the site and could be secured through planning condition. Should these recommendations be adhered to, the proposals stand to be compliant with legislation and planning policy.

FIGURE 1 SITE PLAN AND HABITAT MAP

This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material is used with the permission of The Controller of HMSO, Crown copyright 100018896.



-  Survey Boundary
-  Scattered Scrub
-  Dense Scrub
-  Standard Tree
-  Tree with Bat Potential and Reference
-  Semi-improved Grassland
-  Ruderal
-  Standing Water
-  Hedgerow with Reference
-  Building with Reference
-  Amenity Areas (grassland and ornamental planting)
-  Hardstanding
-  Target Note
-  Static Bat Detector Locations
A: August
B: September
-  Reptile Tin Locations with Number of Refugia
-  Reptile Sightings
-  Badger Evidence
SN - Snuffle Hole
SQ - Squeeze

fpcr Comer Group
 North London Business Park
 London
 PHASE 1 HABITAT PLAN, SURVEY RESULTS &
 STATIC DETECTOR LOCATIONS 2014

NTS @ A3 TJL / HES 01.12.2015
Figure 10.2 6457-E-10.2

APPENDIX 1 15/07932/OUT SURVEY REPORTS



Comer Group

North London Business Park

Ecological Appraisal

APPENDIX 10.3

December 2015

FPCR Environment and Design Ltd

Registered Office: Lockington Hall, Lockington, Derby DE74 2RH

Company No. 07128076. [T] 01509 672772 [F] 01509 674565 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

This report is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of FPCR Environment and Design Ltd. Ordnance Survey material is used with permission of The Controller of HMSO, Crown copyright 100018896.

Rev	Issue Status	Prepared / Date	Approved/Date
A	Draft	HES / 16.10.14; DAH / 03.12.14	JSE / 12.12.14
			DAH / 18.12.14
B	Final	TJL HES / 15.12.15	DAH / 15.12.15

CONTENTS

1.0	INTRODUCTION	3
2.0	METHODOLOGY.....	5
3.0	BASELINE CONDITIONS.....	15
4.0	DISCUSSION & RECOMMENDATIONS.....	41
5.0	NON-TECHNICAL SUMMARY	51

TABLES

Table 1: Bat Survey Protocol for Trees
Table 2: Habitat Suitability Index Scores and Pond Suitability
Table 3: Survey Dates & Weather Conditions
Table 4: Key Reptile Site Survey Assessment Categories
Table 5: Details of Statutory and Non-Statutory Sites
Table 6: Details of Trees with Bat Potential
Table 7: Static Survey Results Table
Table 8: Scoring Values for Commuting Routes
Table 9: Scoring Values for Foraging Habitats
Table 10: HSI Scores for Pond P1
Table 11: Date and Weather Conditions During Reptile Surveys

FIGURES

Figure 1: Consultation Results Plan
Figure 2: Phase One Habitat Plan, Survey Results & Static Detector Locations 2014
Figure 3: Pond Location Plan

APPENDICES

Appendix A & B: Bat Transect 28 th August 2015 (Dusk): Table and Figure
Appendix C & D: Bat Transect 29 th August 2015 (Dawn): Table and Figure
Appendix E & F: Bat Transect Plan 29 th September 2015: Table and Figure

Intentionally Blank

1.0 INTRODUCTION

- 1.1 The following report details the results of an ecological appraisal undertaken by FPCR Environment and Design Ltd on behalf of Comer Homes Group on land at North London Business Park, East Barnet, London (central OS Grid Reference TQ 280 935).
- 1.2 An extended Phase 1 habitat assessment and a preliminary protected species survey were undertaken during August/September 2014. These surveys were commissioned to assess potential ecological constraints to the proposed residential development of the site arising from the presence of any rare/notable habitats or the presence, or potential presence, of protected species. A bat survey was undertaken on the buildings within the site, which included internal assessments where roof voids were present and access granted. During the season additional bat surveys were undertaken which included activity transects, automated static detector surveys and tree assessments.
- 1.3 During the bat activity surveys only common bat species were recorded around the peripheries of the site, with no roosts found in any buildings or trees within the site.
- 1.4 Reptile surveys were also conducted within an area of semi-improved grassland in the north west of the site, during which a 'good' population of slow worms *Anguis fragilis* were recorded.
- 1.5 A subsequent walkover survey was undertaken in November 2015, to confirm the consistency of habitats and note any additional evidence related to protected species.

Site Context

- 1.6 The site comprises approximately 16.8 ha of land, the majority of which is a built environment with amenity grassland areas. A large resource of native and ornamental trees are scattered across the site and a lake is present within the eastern extent. A compartment of land which appears to have been left unmanaged is present within the northern extent of the site, comprising derelict buildings, a hardstanding sports area, rough grassland which was the remains of a sports pitch and large bunds generally comprising of ruderal vegetation.
- 1.7 The site is situated within a highly urbanised environment within East Barnet, Greater London. The surrounding landscape is largely dominated by residential development with a number of parks in the local vicinity. A railway runs along the site's western boundary, with Brunswick Park Road and Oakleigh Road South running adjacent to the east and south.

Intentionally Blank

2.0 METHODOLOGY

- 2.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations including:
- Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.defra.gov.uk);
 - Local Records Centre – Greenspace Information for Greater London
- 2.2 Further inspection of colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.
- 2.3 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:
- 10km around the application area for sites of International Importance (e.g. Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites).
 - 2km around the application area for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest (SSSIs).
 - 1km around the application site for sites of County Importance (e.g. Sites of Importance for Nature Conservation (SINC) / Local Wildlife Sites (LWS) and species records (e.g.: protected, Species of Principal Importance as listed on Schedule 41 of the NERC Act [2006]¹ or other notable species).

Flora

- 2.4 The initial survey was undertaken in August 2014 using the standard Extended Phase I Habitat Survey Methodology as recommended by Natural England², to identify specific habitats and features of ecological interest. Habitats were marked on a base plan and, where appropriate, target notes were made. An inspection of the site for the presence of any invasive weed species was also carried out. Features such as trees were considered with regard to their ecological value and potential to provide suitable habitats for protected species. A subsequent survey was undertaken on 30th November 2015 to confirm the habitats present and note any changes in circumstance.
- 2.5 Hedgerows were surveyed individually using the Hedgerow Evaluation and Grading System (HEGS)³ to enable identification and evaluation of hedgerows of nature conservation importance within the site. Hedgerows were graded on a scale of 1-4, within which grades 1 and 2 are generally considered to be of nature conservation priority:

1= high to very high value

2 = moderately high to high value

¹ The Natural Environment and Rural Communities Act 2006. [Online]. Available from: <http://www.legislation.gov.uk/ukpga/2006/16/contents> [Accessed 11/11/2013]

² JNCC. (1990). *Handbook for Phase 1 habitat survey – a technique for environmental audit*. Peterborough: JNCC

³ Clements, D. & Toft, R. (1992). *Hedgerow Evaluation and Grading System (HEGS) – a methodology for the ecological survey, evaluation and grading of hedgerows*. Countryside Planning and Management

3 = moderate value

4 = low value.

- 2.6 Hedgerows were also considered against the Hedgerow Regulations 1997 Wildlife and Landscape criteria⁴, to identify any hedgerows, which would be classified as “important” for nature conservation under this part of the act. Under this methodology, hedgerows are considered according to the average number of woody species per 100m of hedgerow. Additional features which enhance hedgerows, when found in association with the hedge, such as mature trees, ditches and hedge banks are also considered.
- 2.7 It should be noted that hedgerows may also qualify as Important under the Archaeological criteria of this Act, which is beyond the scope of this assessment.

Fauna

- 2.8 During the survey of the site, observations, signs of or suitable habitat for any species protected under Part 1 of the Wildlife and Countryside Act 1981 (as amended), the Conservation of Habitats and Species Regulations 2010 (as amended)⁵ and the Protection of Badgers Act 1992⁶ were noted with particular attention being given to the potential presence of bats, reptiles, great crested newt *Triturus cristatus*, and badger *Meles meles*. Throughout the survey consideration was also given to the existence and use of the site by other protected species or locally notable fauna such as Species of Principal Importance as listed on Section 41 of the NERC Act (2006), reptiles, birds and any Local Biodiversity Action Plan (LBAP) or Red Data Book (RDB) species.

Badgers

- 2.9 As part of the survey all hedgerows, woodlands, scrub and other suitable habitats within the site and immediately adjacent (where access was possible), were searched for evidence of badger activity. The standard methodology was used, as outlined by Harris, Creswell and Jefferies⁷ (1989). This involved a thorough search for evidence of the presence of badgers, including:
- Setts, including earth mounds, evidence of bedding and runways between setts;
 - Latrines, often located close to setts, at territory boundaries or adjacent to favoured feeding areas;
 - Prints and paths or track ways;
 - Hairs caught on rough wood or fencing;
 - Other evidence including snuffle holes, feeding and playing areas and scratching posts.

⁴ *The Hedgerow Regulations 1997 – Statutory Instrument 1997 No. 1160*. [Online]. London: HMSO. Available from: <http://www.legislation.gov.uk/ukSI/1997/1160/contents/made> [Accessed 11/11/2013].

⁵ *The Conservation of Habitats and Species Regulations* (as amended 2012). [Online]. Available from: <http://www.legislation.gov.uk/ukSI/2010/490/contents/made> [Accessed 11/11/2013]

⁶ *The Protection of Badgers Act 1992 (as amended)*. London: HMSO [Online]. Available from: <http://www.legislation.gov.uk/ukpga/1992/51/contents> [Accessed 03/05/2013].

⁷ Cresswell, P., Harris, S. & Jefferies, D.J. (1989). *Surveying Badgers*. The Mammal Society Publication No.9 Mammal Society

- 2.10 The identification of snuffle holes, scratching posts or feeding signs on their own are not necessarily conclusive evidence of the presence of badgers. A number of such signs need to be seen in conjunction before they can be said to be conclusive of badger activity.

Bats

Tree Assessments

- 2.11 Tree assessments were undertaken from ground level, with the aid of a torch and binoculars where required, on all trees within the site. During the survey features considered to provide suitable roost sites for bats such as the following were sought:
- Trunk cavity – Large hole in trunk caused by rot or injury.
 - Branch cavity - Large hole in branch caused by rot or injury.
 - Trunk split – Large split / fissure in trunk caused by rot or injury.
 - Branch spilt – Large split / fissure in branch caused by rot or injury.
 - Branch socket cavity – Where a branch has fallen from the tree and resulted in formation of an access point in to a cavity.
 - Woodpecker hole – Hole created by nesting birds suitable for use by roosting bats.
 - Lifted bark – Areas of bark which has rotted / lifted to form suitable access point/roost site for bats.
 - Hollow trunk – Decay in heartwood leading to internal cavity in trunk.
 - Hazard beam failure- Where a section of the tree stem/branch has failed causing collapse and leading to longitudinal fractures / splits / cracks along its length.
 - Ivy cover – Dense / mature ivy cover where the woody stems could create small cavities / crevices.
- 2.12 The trees were classified into general bat roost potential groups based on the presence of features listed above. This assessment was completed by an experience ecologist from FPCR during August 2014 and checked again in November 2015.
- 2.13 Table 1 below classifies the potential categories as accurately as possible. For ease of reference, this table is based upon Table 8.4 in Bat Surveys- Good Practice Guidelines⁸. The table within the guidelines has been designed to inform assessments completed prior to the completion of arboricultural works. Consequently, the suggested survey methods have been refined to suit development works and considers the definition of a breeding site or resting place as described in the Habitat Regulations.

Table 1: Bat Survey Protocol for Trees

Tree category and description	Survey requirements prior to determination.	Recommended mitigation works and/or further surveys.
Category 1 Confirmed bat roost with field evidence	Identified on a plan and in the field. Further assessment such as climb and inspect and/or dusk/dawn surveys should be	Avoid disturbance where possible. Felling or other works that would affect the roost would

⁸ Hundt L (2012) Bat Surveys: Good Practice Guidelines, 2nd edition, Bat Conservation Trust

Tree category and description	Survey requirements prior to determination.	Recommended mitigation works and/or further surveys.
of the presence of bats, e.g. live / dead bats, droppings, scratch marks, grease marks and / or urine staining.	undertaken, if the trees are affected by the development, to provide an assessment on the likely use of the roost, numbers and species of bat present.	require an EPS licence with like for like roost replacement as a minimum. Works may also be subject to timing constraints.
<p>Category 2a Trees that have a high / moderate potential to support bat roosts.</p>	<p>Identified on a plan and in the field to assess the potential use of suitable cavities, based on the habitat preferences of bats. Where the tree(s) will be affected by the proposed development, further assessment such as climb and inspect and/or dusk/dawn surveys (up to 2/3 nocturnal surveys) should be undertaken (as appropriate), to ascertain presence/absence of roosting bats. Trees may be upgraded if presence of roosting bats is confirmed or downgraded following further surveys if features present are of low suitability and / or no evidence of a breeding site or resting place * is found within features that can be assessed fully.</p>	<p>Trees where no bat roost confirmed after further surveys: Avoid disturbance where possible. In situations where disturbance cannot be avoided and where no evidence of occupation of suitable cavities has been confirmed during the initial surveys or nocturnal surveys (as appropriate), further precautionary survey work following the granting of planning permission and prior to works being completed is recommended to ensure features have not been occupied by bats.</p> <p>The additional precautionary survey work could comprise further nocturnal surveys during the active bat season immediately prior to felling or management works or the completion of additional aerial inspections. Use “soft felling” techniques, removing ivy cover by hand and avoid cutting through tree cavities is recommended once the presence of a roost has been discounted.</p>
<p>Category 2b Trees with a low potential to support bat roosts.</p>	<p>Identified on a plan and in the field to assess the potential use of suitable cavities, based on the habitat preferences of bats. Where the tree(s) will be affected by the proposed development, further assessment such as climb and inspect and/or dusk/dawn surveys (one nocturnal survey) should be undertaken (as appropriate), to ascertain</p>	<p>Trees where no bat roost confirmed after further surveys: Avoid disturbance where possible. In situations where disturbance cannot be avoided and where no evidence of occupation of suitable cavities has been confirmed during the</p>

Tree category and description	Survey requirements prior to determination.	Recommended mitigation works and/or further surveys.
	<p>presence/absence of roosting bats. Trees may be upgraded if presence of roosting bats is confirmed or downgraded following further surveys if features present are not suitable for bats and / or no evidence of a breeding site or resting place* is found within features that can be assessed fully.</p>	<p>initial surveys or nocturnal surveys (as appropriate), further precautionary survey work following the granting of planning permission and prior to works being completed is recommended to ensure features have not been occupied by bats.</p> <p>The additional precautionary survey work could comprise further nocturnal surveys during the active bat season immediately prior to felling or management works or the completion of additional aerial inspections. Use “soft felling” techniques, removing ivy cover by hand and avoid cutting through tree cavities is recommended once the presence of a roost has been discounted.</p>
<p>Category 3 Trees with no / negligible potential to support bat roosts.</p>	<p>Identified on a plan and in the field to assess the potential use of suitable cavities, based on the habitat preferences of bats.</p>	<p>None.</p>

* The Conservation of Habitats & Species Regulations 2010 (as amended) affords protection to breeding sites or resting places at all times. For an area to be classified as a breeding site or resting place, the Regulations require there to be a reasonably high probability that the species will return to the sites and / or place.

Confirmation of a breeding site or resting place in trees can be established through the completion of aerial inspection and / or nocturnal surveys (as appropriate). In situations where nocturnal surveys are completed and a breeding site or resting site is not confirmed, the survey effort is considered to be sufficient to reasonably discount the presence of roosting bats (for a period of time as defined in Natural England’s current Standing Advice). However, further precautionary works may be recommended if the trees is affected by works.

Where features of a tree are identified as providing potential to be used as a breeding site or resting place, evidence of current or previous use of the feature should be identified during an aerial inspection to necessitate the completion of further detailed nocturnal survey work prior to the granting of planning permission. In situations where no evidence of use is identified it is reasonable to conclude that a feature is not being used as a breeding site or resting place as defined by the Regulations but further precautionary measures maybe recommended if a tree is affected by development to ensure occupation has not occurred following completion of the survey. If the presence of a breeding site or resting place cannot be discounted from ground level or aerial inspections, nocturnal survey work to confirm the presence of a breeding site or resting place should be completed.

Internal / External Building Assessment

- 2.14 Consideration was given to the potential for roosting bats within buildings on site through internal and external inspections. The buildings were of a mixed construction period, with older buildings externally clad with metal sheets. The majority of these buildings were all flat roofed with no roof voids, however there were lift and ventilation rooms on some roof tops which were inspected.
- 2.15 The exterior of buildings were visually assessed for features such as small gaps under barge/soffit/fascia boards and cladding, which have potential as access points. Evidence that bats actively used potential access points includes staining, either within gaps from bat droppings or urine staining, a note being made wherever these were present. Indicators that potential access points had not been recently used included the presence of cobwebs and general detritus within potential access points.
- 2.16 The interior of buildings (where access was possible), including roof voids (where present/accessible) and roof top ventilation/lift rooms, were visually assessed for evidence of bat activity and/or for the potential to be used by roosting bats. Evidence of a roost could be determined through the presence of a dead or live bat(s), concentrated piles or scattered droppings, food remains such as insect wing fragments and/or scratch marks and staining.

Activity Surveys

- 2.17 Two dusk and one dawn activity transect were undertaken on 28th/29th August and 29th September 2014. All surveys were undertaken in accordance with current statutory and best practice guidelines (Natural England⁹, Bat Conservation Trust¹⁰ and JNCC¹¹). The primary objective of transects completed was to identify foraging areas, commuting routes and species utilisation of the site. The site falls within a large site classification as it was over 15ha (16.8ha), however the majority of the site consists of hardstanding car parks, roads and buildings, natural habitats were restricted to small areas, particularly in the north. The habitats within the site were evaluated as being low in quality; therefore it was determined using the BCT guidance to require no more than seasonal surveys (spring, summer and autumn).
- 2.18 The transect routes were predetermined prior to surveys in order to comprehensively cover all areas of the site and included point count stops, to identify activity levels around the features of potential value to bats, including those which are to be most affected by proposals (i.e. hedgerows and tree lines which are to be removed).
- 2.19 The dusk transects commenced approximately 15 minutes prior to sunset, and were 2 to 3 hours in duration. The dawn surveys commenced at least 2 hours prior to sunrise and finished at sunrise.
- 2.20 Each transect was walked at a steady pace and when a bat passed by, the species, time and behaviour was recorded on a site plan. This information provides a general view of the bat activity on site and identifies the key foraging areas and commuting routes. Bat Box Duets bat detectors were utilised in conjunction with MP3 recorders to provide back-up information and enable identification of bats encountered, if necessary. The results of these surveys were used to

⁹ English Nature (2004) Bat Mitigation Guidelines

¹⁰ Bat Conservation Trust (2012) Bat Surveys- Good Practice Guidelines

¹¹ JNCC (1999) Bat Workers Manual

assess the level of bat activity across the site in relation to the abundance of individual species foraging and commuting.

- 2.21 The transect surveys included nine point counts. Each point count was 6 minutes in duration during which time all bat activity was recorded. The point counts were strategically located throughout the site to ensure a comprehensive coverage of habitats present (see Appendices A to F for transect routes and point count locations).
- 2.22 Transects surveys were undertaken by licenced or experienced bat workers during suitable conditions (i.e. when the ambient air temperature exceeded 10°C and there was little wind and no rain).
- 2.23 Post-survey, where necessary, bat calls were analysed using BatSound (version 4), by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. This analysis was completed by a suitably experienced ecologist from FPCR.

Static Bat Detector Survey

- 2.24 Static bat detectors were used to record the passing behaviours of bats from a fixed position. These automated logging systems (SM2BAT+, Wildlife Acoustics) saved all recordings onto to an internal storage device for analysis. A single static unit was deployed on site for at least 3 consecutive nights from the 28th August to 1st September and 25th to 29th September 2014. This information was used to supplement transect survey data and species composition at different points within the site.
- 2.25 The static bat detector was placed along features considered to be of value to bats, such as hedgerows, scrub and tree lines (see Figure 2 for locations) which are likely to be affected by the development proposals. Devices were placed in each location for an extended period of time of suitable weather conditions (little or no rain/wind and temperatures above 10°C). Detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise. The output from this detector was subjected to computer analysis using the AnalookW (Titley Electronics) and Batsound (version 4) software packages.

Great Crested Newts

- 2.26 Any water bodies to which access could be legally gained were noted and described so as to indicate their potential to support an amphibian population, including GCNs. Where access was granted and where there were no barriers to dispersal between the pond and site, ponds within a 500m radius of the site were surveyed and assessed for suitability. These ponds were assessed using the GCN Habitat Suitability Index (HSI).

Habitat Suitability Index (HSI)

- 2.27 All water bodies within and surrounding the site were assessed (where access was available and no barriers to dispersal occurred), to determine their potential to support an amphibian population during their terrestrial phase, including GCNs. In addition, any water bodies found within the site were noted and described to assess their potential to support an amphibian population, including GCNs.

2.28 The HSI provides a measure of the likely suitability that a water body will support newts (Evaluating the suitability for the Great Crested Newt, *Herpetological Journal* 10(4); Oldham et al). In general, ponds with a higher score are more likely to support GCNs than those with a lower score and there is a positive correlation between HSI scores and ponds with newts recorded. Ten separate attributes are assessed for each pond:

- Geographic location
- Pond area
- Pond drying
- Water quality
- Shade
- Presence of waterfowl
- Presence of fish
- Number of linked ponds
- Terrestrial habitat
- Macrophytic coverage

2.29 A score is assigned according to the most appropriate criteria level set within each attribute and a total score calculated of between 0 and 1. Pond suitability is then determined according to the following scale:

Table 2: Habitat Suitability Index Scores and Pond Suitability

HSI Score	Pond Suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Reptiles

2.1 A strategic reptile presence / absence survey was undertaken at specific locations identified as offering potential habitat within the area of survey, which was isolated to the overgrown habitats in the north. The survey was undertaken based on methodology detailed in the *Herpetofauna Workers Manual*¹² and the *Froglife Advice Sheet 10 - Reptile Survey*¹³. Methods involved a search for basking reptiles on / under naturally occurring and strategically positioned artificial refugia. These were placed in locations that offered the most suitable habitat for common reptiles, i.e. structurally diverse grassland habitats with areas of bare ground/short vegetation.

¹² Gent, T. and Gibson, S. (1998) *Herpetofauna Workers' Manual*. Joint Nature Conservation Committee, Peterborough.

¹³ Froglife (1999). *Froglife Advice Sheet 10: reptile survey*. Froglife, London.

2.2 The surveys within the site were carried out following those guidelines within the Froglife Advice Sheet, surveys were undertaken whenever suitable conditions were achieved, which sometimes fell outside of the recommended times of day. The Guidelines recommends the following:

- At temperatures of between 9°C-18°C;
- On sunny/cloudy days with little or no wind;
- Between 09:00 & 11:00 and between 1600 & 1900 hrs;

In addition guidance also recommends:

- Using regularly spaced corrugated tin sheeting/similar (0.5m²) as artificial refugia with a black upper side;
- Approaching refugia from downwind, casting no shadow and with care so as to not disturb basking animals when checking;
- That lifting and replacing tins, to check for the presence of reptiles underneath in hot weather is undertaken with care, to avoid potential harm to any animals underneath;
- That the location and number of tins are mapped to aid survey and avoid the possibility of leaving tins *in situ* after completion of the survey.

2.3 Froglife recommends between five and ten refuges per hectare, however the only areas of suitable habitat identified within the site was restricted to the northern parts of the site, which consisted of overgrown sports fields. This field is approximately 3.7 hectares, therefore between 18 and 37 refuges is the recommended density, a total of 42 refugia were spread during these surveys. The location of the reptile refuges can be seen in figure 2.

2.4 To confirm the presence / absence of reptiles within the site and inform the population assessment the refugia were checked on seven suitable occasions. Survey dates and weather conditions are shown in Table 3.

Table 3: Survey Dates & Weather Conditions

Survey Occasion	Date	Weather
1	01/09/2014 10:00	16°C overcast, 40% high cloud cover, windy.
2	15/09/2014 11:00	16°C, 50% cloud cover, slight breeze and rain.
3	18/09/2014 10:00	17°C, 60% cloud cover, light breeze and no rain.
4	22/09/2014 11:00	14°C, 20% cloud cover, light breeze and no rain.
5	25/09/2014 18:00	17°C, 20% cloud cover, windy and no rain.
6	29/09/2014 14:00	18°C, 50% cloud cover, light breeze and no rain.

Survey Occasion	Date	Weather
7	27/10/2014 10:30	15°C, 5% cloud, medium wind, no rain.

- 2.5 Reptile populations were assessed in accordance with population level criteria as stated in the Key Reptile Site Register¹³. This system classifies populations of individual reptile species into three population categories assessing the importance of the population (Table 4). These categories are based on the total number of adult reptiles observed during individual survey occasions.

Table 4: Key Reptile Site Survey Assessment Categories (HGBI 1998)

Species	Low Population (No. of individuals)	Good Population (No. of individuals)	Exceptional Population (No. of individuals)
Adder	<5	5 - 10	>10
Common lizard	<5	5 - 20	>20
Grass snake	<5	5 - 10	>10

Protected Species Survey Constraints

- 2.6 The passive recording units do not discern between individual bats or a single bat passing the microphone several times and therefore the data recorded can only provide an indication of bat activity as bat passes per unit time.
- 2.7 The project was commissioned during August, therefore a spring bat surveys was not undertaken, however based on the limited habitat available on site and the surveys already conducted, the absence of spring data is unlikely to have an effect on the evaluation of the sites function for the local bat population.
- 2.8 The reptile surveys were all undertaken during September and October, and not spread out during the survey period between March and October; however the Froglife advice sheet does state that the most profitable months for surveying includes September. It is therefore, considered that a robust data set was obtained that is presentative of the local reptile population.

3.0 BASELINE CONDITIONS

Desk Study (Figure 1)

- 3.1 The Multi-Agency Geographic Information for the Countryside (MAGIC) website indicates that there are two internationally designated sites within 10km of the site boundary. There are, however, no nationally statutory designated sites within 2km of the site boundary.
- 3.2 Lee Valley Ramsar and SPA (Special Protection Areas) is located 7.8km to the south east and is separated from the application site by large residential areas of north London, including Wood Green and Tottenham. There are no habitat linkages between the application site and Lee Valley. Within the Ramsar/SPA designation there is also a Site of Special Scientific Interest (SSSI) called Walthamstow Reservoirs. The Lee Valley is designated for its water features such as large areas of open water, which support a number of Annex I birds and regular migratory species, this includes the northern shoveler *Anas clypeata*, gadwell *Anas strepera* and Eurasian bittern *Botaurus stellaris*.
- 3.3 Epping Forest Special Area of Conservation (SAC) is located approximately 9.8km east of the site. Designated for its Atlantic acidophilous beech forests, European dry heaths and North Atlantic wet heath habitats; the site supports a number of veteran trees and deadwood invertebrates including the stag beetle *Lucanus cervus*. The SAC is separated from the site by large residential areas, with no habitat linkages between them.

Non-Statutory Designated Sites

- 3.4 Data received from the local records centre identified five non-statutorily designated sites within 1km of the application boundary, known as Sites of Importance for Nature Conservation (SINC).
- 3.5 These include New Southgate Cemetery (40m east); Barfield Allotments Nature Park (145m west); Pymme's Brook (384m east); Oakleigh Park Rail Cutting (510m north); and Friary Park (750m southwest).
- 3.6 Details of all of the statutory and non-statutory site designations are provided in Table 5.

Table 5: Details of Statutory and Non-Statutory Sites

Site Name	Designation	Approximate Location	Size (ha)	Reasons for Designation
Lee Valley	SPA / Ramsar	7.8km southeast	447.87	<p><u>SPA</u></p> <p>Article 4.1 of the Directive (79/409/EEC) by supporting Annex I species of over wintering Bittern <i>Botaurus stellaris</i></p> <p>Article 4.2 of the Directive (79/409/EEC) by supporting Gadwell <i>Anas strepera</i> and shoveler <i>Anas clypeata</i>.</p>

Walthamstow Reservoirs (part of Lee Valley)	SSSI	7.8km SE	178.30	<p><u>Ramsar</u></p> <p>Criterion 2 – Supports nationally scarce whorled water-milfoil <i>Myriophyllum verticillatum</i>; and rare/vulnerable invertebrates including a water-boatman <i>Micronecta minutissima</i></p> <p>Criterion 6 – Supports populations of international level of importance of northern shoveler and gadwell</p> <p>Supports a notable variety of breeding wetland birds.</p>
Epping Forest	SAC	9.8km east	1604.95	<p><u>SAC</u></p> <p>Annex I Habitats (Primary): Atlantic acidophilous beech forests</p> <p>Annex I Habitats (not primary): European dry heaths North Atlantic wet heaths</p> <p>Annex II Species: Stag beetle <i>Lucanus cervus</i></p>
New Southgate Cemetery	SINC – Grade II Borough Importance	40m east	21.99	Support mature trees, breeding bird assemblage, dusky cockroach <i>Ectobius lapponicus</i>
Barfield Allotments Nature Park	SINC – Local Importance	145m west	0.5	A former allotment which supports a reptile population including slow worm and common lizard.
Pymme's Brook	SINC – Grade II Borough Importance	384m east	10.8	A small tributary to the River Lea. The banks support ancient woodland and rough grassland
Oakleigh Park Rail Cutting	SINC – Local Importance	510m north	7.99	An important wildlife corridor, the site supports goldfinch <i>Carduelis carduelis</i> , chiffchaff <i>Phylloscopus collybita</i> , lesser whitethroat <i>Sylvia</i>

				<i>curruca</i> and willow warbler <i>Phylloscopus trochilus</i>
Friary Park	SINC – Local Importance	750m southwest	9.1	A public park which supports veteran trees which pre-date the park, and a stream. The site supports parkland birds including nuthatch <i>Sitta europaea</i> and treecreeper <i>Certhia familiaris</i>

Protected / Notable Species Records

3.7 Records of protected and notable species were returned by GiGL. No records were provided from within the site boundary, a number of records were provided from within 1km of the site. The locations of these records are illustrated on Figure 1 Consultation Results Plan.

- No records for GCN *Triturus cristatus* were returned from within 1km of the site boundary.
- Following consultation no records of badger *Meles meles* were returned from within 1km of the site boundary.
- Records of common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared *Plecotus auritus* were returned from within 1km of the site boundary. The nearest record was for a common pipistrelle 241m north of the site (2007). A record for a soprano pipistrelle was returned from 976m southwest of the site (2007) and brown long-eared bat recorded approximately 959m southwest of the site (2004). There were no habitat corridors connecting these records to the site. These records also do not specify if the records were roosts or in flight contacts.
- Two records of reptiles including a common lizard *Zootoca vivipara* and a slow worm *Anguis fragilis* were returned from 450m west of the site (2002) within the area of a school.
- A single record of a hedgehog was returned from 826m west of the site from within a residential area (2002).

Field Results – Habitats/Flora

3.8 Habitat descriptions of the site are provided below. Target Notes (TN) and the locations of the habitats described below can be found on Figure 2 Phase One Habitat Plan, Survey Results & Static Detector Locations 2014.

Semi-improved Grassland

- 3.9 The northern extent of the site was characterised by an expanse of land which appeared to have been left unmanaged. This area was largely dominated by rough grassland, with a number of derelict buildings and hardstanding present within its south-western extent. The encroachment of scrub around and within the buildings and peripheries has resulted in the establishment of a mosaic of habitats (scrub, ruderal and tussock grassland).
- 3.10 The main body of this abandoned area was largely characterised by broad-leaved grasses, such as timothy *Phleum pratense*, common couch *Elymus repens* and false oat-grass *Arrhenatherum*

elatius, indicative of neutral grassland. Finer grass species such as creeping bent *Agrostis stolonifera* and Yorkshire fog *Holcus lanatus* were recorded frequently with occasional creeping soft grass *Holcus mollis* and giant fescue *Festuca gigantea*. The diversity of forbs present was fairly limited and many of those present tended to be isolated to the margins, likely to be a product of natural management (e.g. rabbit grazing). The herb component largely comprised a ruderal nature marked by an abundance of creeping thistle *Cirsium arvense*, common nettle *Urtica dioica* and common ragwort *Senecio jacobaea*. Other localised frequently encountered herbs included yarrow *Achillea millefolium*, creeping buttercup *Ranunculus repens*, wild carrot *Daucus carota* and meadow vetchling *Lathyrus pratensis*.

- 3.11 The peripheries of the grassland, particularly along the western and south-western boundaries, were found to be slightly more herb rich, although limited in extent. Further species included wood sage *Teucrium scorodonia*, creeping cinquefoil *Potentilla reptans*, common fleabane *Pulicaria dysenterica*, hairy tare *Vicia hirsuta* and bird's-foot-trefoil *Lotus corniculatus*.
- 3.12 A large bund was present along the eastern boundary of this area, which had been colonised by ruderal herbs; but dominated by bristly-ox-tongue *Picris echioides* and common nettle, which suggests this area had been subject to disturbance fairly recently.
- 3.13 During the walkover survey in November 2015 it was noted that the grassland at the north of site had been mown and areas of ruderal which had developed atop the bund had also been removed.



Photograph 1. Unmanaged Grassland (2014)



Photograph 2. Amenity Grassland

- 3.14 Much of the grassland around the site was heavily mown for amenity purposes and largely comprised a species poor rye-grass *Lolium perenne* dominated habitat. A small area of amenity grassland (Tn1) present on top of a large bund within the eastern extent of the site displayed a herb rich composition. This had been mown heavily and is likely the result of seeding. In addition to species recorded previously, ladies bedstraw *Galium verum*, selfheal *Prunella vulgaris*, common knapweed *Centaurea nigra*, oxeye daisy *Leucanthemum vulgare* and red clover *Trifolium pratense* were recorded.

Hedgerows

- 3.15 There was a limited resource of hedgerows on site and due to the nature of the site, all were heavily managed and largely comprised of non-native species. Hedgerow H1 comprised a 15m section of snowberry *Symphoricarpos albus* within the centre of the site. This hedgerow scored

4+ in accordance with HEGS and is therefore considered to be of low conservation value. This hedgerow was not considered under the Hedgerow Regulations as it was less than 20m in length and dominated by a non-native species.

- 3.16 Hedgerow H2 lies within the northern extent of the site and is dominated by garden privet *Ligustrum ovalifolium* with a number of mature trees scattered along its length. Tree species comprised pedunculate oak *Quercus robur* and ash *Fraxinus excelsior* and further species within the hedgerow included snowberry, holly *Ilex aquifolium*, and elder *Sambucus nigra*. Due to its connectivity with further habitats along the western boundary, an abundant tree resource and intact structure, the hedgerow scored -2 in accordance with HEGS and is considered to be of moderately high nature conservation value. The hedgerow was not classified as being important under the Wildlife and Landscape Criteria of the Hedgerow Regulations 1997.



Photograph 3. Hedgerow H2



Photograph 4. Hedgerow H3

- 3.17 Hedgerow H3 comprised four separate hedgerows located within one of the car parks on site. All hedgerows were found to be of the same structure and composition and have been assessed together. These hedgerows had been heavily managed and were no more than 1m in height and width. The only species present was hawthorn *Crataegus monogyna*. These hedgerows were unconnected to each other or any further habitats and scored -4 in accordance with HEGS, characterising them as low nature conservation value. The hedgerow was not classified as being important under the Wildlife and Landscape Criteria of the Hedgerow Regulations 1997.

Trees

- 3.18 A large resource of trees was present on site, many of which are likely to have been planted in association with the existing development. As a consequence most trees were early to semi-mature in age and in good condition. Amongst non-native and ornamental species, a large amount of native trees including lime *Tilia x europaea*, Pedunculate oak, horse chestnut *Aesculus hippocastanum* and yew *Taxus baccatta* were present scattered across the site.
- 3.19 In addition to the planted resource, a line of mature Leyland cypress *X Cupressocyparis leylandii* separated the site from the railway line along the western boundary. A group of trees within the eastern extent of the site (TG2) had established, many of which were likely self-set. Species included sycamore *Acer pseudoplatanus*, rowan *Sorbus aucuparia*, pedunculate oak and silver birch *Betula pendula*. This area had received less management and an understorey of hawthorn, elder dogwood and bramble was present. The ground flora was largely composed of ivy *Hedera*

helix and other shade tolerant species such as herb Robert *Geranium robertianum*, garlic mustard *Alliaria petiolata* and wood avens *Geum urbanum*. Many of these trees supported ivy within their canopies.

- 3.20 A small number of mature trees across the site were identified as providing roosting potential for bats, displaying features such as ivy coverage, woodpecker holes, canopy dead wood and cavities. These trees are discussed in more detail within the fauna section below.

Scrub

- 3.21 Scrub was limited to the peripheries of the site, where management was less intensive. The derelict buildings within the northern extent of the site had been engulfed by bramble *Rubus fruticosus agg* and butterfly-bush *Buddleja davidii*, typical pioneers of abandoned urban areas. The north-western periphery of the site was demarked by a line of scrub including hazel *Coryllus avellana*, hornbeam and field maple *Acer campestre*. The ground flora in this area was sparse due to a heavy canopy and limited to wood avens, common nettle and hedge woundwort *Stachys sylvatica*.

Water Bodies



Photograph 5. Water body within site boundary

- 3.22 A large water body, approximately 4250m² was present within the eastern extent of the site. This was observed to be supporting large fish, as these were seen breaching during the surveys. The margins were less manicured than other habitats on site; with areas of bramble surrounding the southern and eastern peripheries which extended approximately 1-2 from the water's edge. Low growing scrub was also present and included goat willow *Salix caprea*, ash and dogwood *Cornus sanguinea*. The remaining banks were steep sided with exposed soil/clay. The south western banks were re-enforced with steel supports and backed onto building B7, with no vegetation present. The very limited marginal vegetation comprised small pockets of common reed *Phragmites australis* in the south. There was, however, no aquatic vegetation seen in the pond. Within the water body was an island towards the western bank with three mature trees present, two lombardy poplar *Populus nigra* and a single crack willow *Salix fragilis*. It was not possible to access the island, however observations from the bankside indicated a scrubby form, with underdeveloped tree species including ash and sycamore.
- 3.23 During the subsequent walkover survey undertaken in November 2015, it was observed that the scrub surrounding the pond had increased with a dense scrub, colonising the majority of the banks. The south-western section of the pond was dry and had developed a scrubby form

dominated by young crack willow, with field maple, rowan and bramble also present. Aquatic species recorded comprised abundant soft rush *Juncus effusus* and common reed.

Built Environment

- 3.24 Due to the nature of the site, buildings and hardstanding dominated with associated amenity grassland, ornamental shrub and tree planting. These areas were heavily managed and due to their situation within a highly urbanised environment provided limited value for native wildlife.

Invasive Species

- 3.25 Japanese knotweed *Fallopia japonica* (Tn2, Figure 2) was identified within the northern extent of the site. This covered a small area, approximately 15m² within the undergrowth of tree group TG2. This species is considered to be an invasive species and it is listed on Schedule 9, Part II of the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is an offence to plant or otherwise cause the species to grow in the wild.

Fauna

Badger

- 3.26 During the initial surveys in 2014, no evidence of badger, including the presence of setts, latrines, hairs, prints and snuffle holes were observed at the time of survey. However, during walkover survey undertaken in November 2015, three snuffle holes were recorded within the semi-improved grassland compartment towards the north of site. Additionally a badger squeeze was discovered along the north-eastern boundary, where badger hair found. The site provides commuting and foraging opportunities along hedgerow bases and arable margins, however there was a lack of habitat linkage to surrounding areas to facilitate colonisation.

Bats

Site Habitats

- 3.27 The site was situated within a highly urbanised area and the network of hedgerows and trees across the site provided only limited potential roosting, foraging and commuting habitats for bats. Within the locality of the site were small fragments of suitable habitats such as the railway line, parks and golf courses, which may provide some limited stepping-stone habitats providing limited linkages to habitats outside the application boundary.

Tree Roosts

- 3.28 Seven mature trees and two tree groups were identified as providing bat roosting potential, details of these are found below within Table 6.

Table 6: Details of Trees with Bat Potential

Tree Number	Species	Description	Tree Category
T1	Lime	Mature specimen; small, shallow crevice in western side of main stem, approximately 5m high exposed to elements and not deep enough to provide protection.	3
T2	Weeping willow	Mature tree; three woodpecker holes in east and west facing sides of main stem.	2a
T3	Pedunculate oak	Mature tree; ivy clad; west - facing woodpecker hole approx. 9m up, slightly cluttered environment; canopy dead wood.	2a
T4	Pedunculate oak	Mature tree; north facing woodpecker hole approx. 9m high, canopy dead wood.	2a
T5	Pedunculate oak	Mature tree, ivy clad.	3
T6	Crack willow	Mature, with loose bark near base of tree	3
T7	Hybrid Black Poplar <i>Populus x canadensis</i>	Trunk cavity, ivy clad (latticed)	2b
TG1	<i>Sa</i>	Heavy ivy coverage	2b
TG2	<i>Qr, Ap, Bp, Sa, Salix</i> sp	Group of trees supporting ivy	2b

Key to Species: *Qr Quercus robur* Pedunculate oak, *Ap Acer pseudoplatanus* Sycamore, *Bp Betula pendula* Silver birch, *Sa Sorbus aucuparia* Rowan, *Salix* sp Willow.

- 3.29 Trees T2, T3 and T4 were all assessed as having features that could be utilised by roosting bats, however during the initial surveys there was no evidence to suggest that these were used by bats. During the survey period the extent of the application boundary was not finalised. Therefore, a precautionary approach was undertaken, where additional nocturnal surveys were undertaken to establish presence or absence of roosting bats of all trees identified as offering roosting potential.
- 3.30 On the 28/29th August a dusk (emergence) and pre-dawn (re-entry) survey was undertaken on these trees. As potential roosting features associated with trees T3 and T4 were on a single aspect one surveyor was used to monitor each feature; two surveyors monitored tree T2 during the dusk (emergence) survey and this was reduced to a single surveyor during the pre-dawn survey.
- 3.31 The surveys of the trees found there to be no evidence of any bats emerging / entering features associated with the trees. No swarming or false return behaviour was recorded in association with the trees during the pre-dawn survey which further confirms the absence of roosting bats. During the surveys of T3 & T4 a number of bat passes were recorded along the southern boundary. Commuting and foraging behaviour was recorded from both common and soprano pipistrelle bats, although, common pipistrelle was the most frequently recorded species.

Activity Surveys

- 3.32 Nocturnal activity surveys were carried out seasonally in accordance with the BCT guidance, however as the project was received late in the season a spring survey was not undertaken. The

walked transects covered all features considered to be suitable for bats, with 6 minute point counts located within areas that are to be lost to development and/or have features which could be used by bats.

Transect 1: 28th August 2014 Dusk (Appendix A & B)

- 3.33 This transect was undertaken from 15 minutes before sunset. There was 90% cloud cover with a slight breeze during short periods of the survey, with temperatures around 18 degrees at the start of survey, but finishing at 16 degrees.
- 3.34 A total of nine bat contacts were recorded during the walked transect, all of which were common pipistrelle bats. The first bat contact was at 20:29 in the north of the site near tree group TG2, comprising 2 passes from a single common pipistrelle bat. There were three areas of the site which had pockets of activity: the peripheries of the northern semi-improved grassland field; habitats around the pond in the south east and the southern boundary. The southern boundary recorded the most bat activity comprising continuous commuting and foraging common pipistrelle bats from 21:49 until 21:58.
- 3.35 Nine six minute point counts were undertaken, during which 9 bat contacts were recorded over five of the point counts. Point counts 5, 6 and 7 only had single contacts from commuting common pipistrelle bats.
- 3.36 Point count 4 recorded seven common pipistrelle contacts comprising commuting and foraging. Point Count 9 recorded five common pipistrelle bat contacts foraging and commuting along the southern boundary of the site along a tree groups which backed on to housing.

Transect 2: 29th August 2014 Dawn (Appendix C & D)

- 3.37 Temperatures started at 13 degrees and finished at 12 degrees. There was no cloud cover or rain but there were periods with a strong breeze. Surveys commenced at 04:06 two hours before sunrise at 06:06.
- 3.38 A total of three bat contacts were recorded during the activity transect, all were common pipistrelle bats which consisted of no more than 2 passes, with no foraging or feeding behaviour exhibited. Two of these contacts occurred in the north of the site around the northern boundary and around tree group TG2; the third contact occurred down the western boundary along a group of leylandii which backed onto a railway line.
- 3.39 No bats were heard during any of the nine point counts undertaken.

Transect 3: 29th September Dusk (Appendix E & F)

- 3.40 Cloud cover during this period was 100%, with temperatures at 17 degrees at the start of the survey dropping to approximately 15 degree at the end. There was no rain during this survey and only a slight breeze was recorded. The activity transect commenced at 18:38, with sunset occurring at 18:53.
- 3.41 Seven common pipistrelle contacts were recorded during this period, with five occurring in the northern sections of the site, which were focused around tree group TG2. Continuous foraging was recorded around tree group TG2. The contacts in the south occurred in two areas: in the south west near the site entrance and residential buildings; and near the existing car park with surrounding trees. Foraging was recorded during both of these contacts.

- 3.42 The only bat contacts recorded during the point counts occurred around the tree group TG2, however only five foraging passes were recorded during the 6 minutes, all passes were faint and were from common pipistrelles.
- 3.43 Common pipistrelle was the only species recorded during the survey.

Static Detector Surveys (Figure 2 & Table 7)

- 3.44 The static detector surveys followed the BCT guidance for a medium site of low habitat quality, therefore, detectors were deployed on site for three consecutive nights.

29th August to 1st September

- 3.45 During the survey period, average daytime temperatures were 20°C degree, whilst average overnight temperatures were 13°C. There were periods of rain, however these were not intense and fell only for short periods in the early afternoon/evening. Winds averaged around 14km/h during the survey period, with the occasional gust. The weather conditions during the survey period were considered representative given the time of year. The static detector was positioned within the north western corner of the site within areas of scrub, which backed onto the railway line, boundary fencing and residential gardens along the northern boundary.
- 3.46 During this survey period 278 bat contacts were recorded, of these 234 were common pipistrelle (average 6.93 contacts per hour), 27 were soprano pipistrelle (0.80cph), 11 were unidentifiable pipistrelle species (0.33cph), 1 Nathusius' pipistrelle *Pipistrellus nathusii* (0.03cph) and 5 *Nyctalus* species (0.15cph). There did not appear to be any set patterns with the bat contacts during this period, for common pipistrelles the highest number of contact were 23 recorded between 20:15 and 21:00 on 29th August, with occasional contact throughout the night until 05:30. The *Nyctalus* contacts were only recorded during the evening of 31st and morning of the 1st September.

25th to 28th September

- 3.47 The average temperature for this period was 20 degrees, with temperature not dropping below 15 degrees in the evenings. There were brief periods of rainfall but these were not intense. This static detector was positioned along the southern boundary of the site, as earlier surveys had indicated increased bat activity in this area.
- 3.48 A total of 154 bat contacts were recorded during this period, of which 153 contacts were with common pipistrelle bats (3.92phr) and 1 contact with an unidentified *Myotis* species which occurred at 22:30 on the 27th September. There were no obvious peaks in activity for common pipistrelles during the survey period, however the majority of the activity occurred each evening between 19:15 and 23:45. Outside this period, bat activity dropped to occasional passes.

Table 7: Static Survey Results Table

Recording Period (2014)	Species Recorded and Data Analysis (in order of peak numbers recorded)																		
	No. of Hours Analysed	Common Pipistrelle			Soprano pipistrelle			Pipistrelle Species			<i>Nyctalus</i>			Nathusius' Pipistrelle			<i>Myotis</i>		
		Period Total	Peak Nightly Count	Av.per Hour	Period Total	Peak Nightly Count	Av.per Hour	Period Total	Peak Nightly Count	Av.per Hour	Period Total	Peak Nightly Count	Av.per Hour	Period Total	Peak Nightly Count	Av.per Hour	Period Total	Peak Nightly Count	Av.per Hour
29th August-1st September	33.75	234	105	6.93	27	13	0.80	11.00	4.00	0.33	5.00	3.00	0.15	1.00	1.00	0.03	0.00	0.00	0.00
25th - 28th August	39	153	4	3.92	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.03

Intentionally Blank

Constraints

- 3.49 The passive recording units do not discern between individual bats or a single bat passing the microphone several times and, therefore, the data recorded can only provide an indication of bat activity as bat passes per unit time.
- 3.50 Where calls could not be identified to species level, for example due to the lower quality of those recordings or where there are similarities between species echolocation calls (particularly for *Myotis* and *Nyctalus* genus bats) making a definite identification difficult, a likely species identification is provided. This is based on the features displayed by the calls when analysed using the Analook data analysis software package and taking in to account the geographical location of the site and the habitats present. It was therefore considered that:
- Pipistrelle species bats were either common, soprano or Nathusius' pipistrelle;
 - *Nyctalus* species bats were either noctule or Leisler's *Nyctalus leisleri* bats;
 - *Myotis* species bats were likely whiskered / Brandt's *Myotis mystacinus* / *brandti* and Daubenton's *Myotis daubentonii* bats.
- 3.51 Due to the timing of the project no spring static survey was undertaken. However the surveys that have been undertaken have consistently recorded the same common species at relatively low activity levels. The most frequently recorded species throughout the survey periods was common pipistrelle with just a small number of soprano pipistrelle, Pipistrelle species, *Myotis* species, *Nyctalus* species and Nathusius' pipistrelle bats. It is considered that the data set obtained is representative of bat activity within the site and suitable to determine any likely development impacts.

Buildings

- 3.52 There were seven buildings within the site; these were all assessed for their potential to support roosting bats. Below is a breakdown of each building and the bat roosting potential they provide. The building layout including building reference numbers is shown in Figure 2. The majority of buildings were either modern office buildings constructed out of metal and glass, or were older buildings clad with modern material to improve the aesthetics of the building.

Building B1

- 3.53 This building is made up of four different office blocks joined via annexes to form a large square building footprint, within which is a central ornamental garden. From the results of the surveys it was determined that all the buildings within B1 had negligible roosting potential for bats, this was due to the modern construction methods used, which resulted in no gaps or crevices being available for roosting bats. Detailed descriptions for the sections of B1 are provided below.

Building B1a/B1b

Photographs 6 & 7. Photo 6 (left) shows building B1b from B1a, both have the same construction. Photo 7 (right) shows the roof of B1a, which is similar to B1b.

- 3.54 These four storey buildings were of a modern construction comprising an internal frame and external (metal and glazed) curtain walling. The expansion joints between each external sheet section were sealed with rubber which would exclude bats from entering. No potential access points, potential roosting habitat or evidence of occupation was observed in association with the exterior curtain walling of the buildings.
- 3.55 The roofs of both B1a and B1b were flat and comprised a similar construction. Prefabricated parapet walls were present around the edge of the building. No potential access points, potential roosting habitat or evidence of occupation was observed in association with the roof materials.
- 3.56 Small plant rooms of metal construction were present on both roofs. These were of a metal frame construction clad with double skinned metal sheets with insulation. Fine metal mesh covered all cavities associated with external louvre-type vents. The external cladding was generally in good condition on all roof top buildings, however there were some damaged panels on the plant room associated with building B1a. Further inspection of the resultant cavities confirmed no evidence of current or historic bat occupation, and that the features were unsuitable for bat roosting given the metal construction materials. The internal structure of these structures was modern in construction with steel support beams and cladding, these were all clean with no bat evidence seen.
- 3.57 There were no roof voids within the main buildings of B1a and B1b, although suspended ceilings were present on every floor with air conditioning and lighting services above. The cavities above the ceiling tiles were not accessible from the outside of the building.

Building B1c

- 3.58 Building B1c was a three storey buildings (circa 1930's) of steel and brick construction with a more recent outer metal cladding. All expansion joints between the metal cladding sections comprised rubber seals, which were in good condition where observations were made. The roof was flat and covered with a corrugated metal cladding. All external building materials were in good condition with no potential bat access points present. A walk around the perimeter of this building found no evidence of any bats or any potential access point behind the cladding.
- 3.59 A small section of the roof in the south had a single storey pitched roof plant room. This was of a modern metal construction with steel beams which were clad with double skinned corrugated

steel sheets. A number of ventilation grills were present, which were covered with fine mesh to stop ingress by wildlife. No potential access points, potential roosting habitat or evidence of occupation was observed in association with the exterior or interior of the plant room.

- 3.60 A further single storey, flat roofed building was present on the roof along the northern elevation. This was a steel structure clad in steel sheets.

Building B1d

- 3.61 Building B1d was a three storey building section (circa 1930's) of steel and brick construction with a more recent outer metal cladding. The roof comprised a single void space, with a covering comprising double skinned corrugated metal sheets and the sides comprised louvre-type vents with a fine mesh covering. No potential access points, potential roosting habitat or evidence of occupation was observed in association with the exterior or interior of the building.

B1c / B1d Outbuildings

- 3.62 Around the ground floor of both building B1c/B1d were a number of outbuildings, these were single storey flat roofed buildings constructed out of brick that adjoined these main buildings. The majority of these housed substations/rubbish bins and other infrastructure. Potential access points comprised open gates where bins were stored but substations were well sealed with no access into the buildings, however, no potential roosting habitat or evidence of current or past occupation by bats was observed in association with the exterior or interior of the buildings.

Building B1e

- 3.63 To the south of building B1c was a two storey warehouse constructed out of brick with a flat roof. A metal constructed canopy was present over the entrance for deliveries. The interior of the building comprised exposed brick walls, which did not appear to be double skinned, there was also no roof void present. Potential bat access points were possible when the shutter gates were open, however when closed there were very little gaps. No potential roosting habitat was present in association with the exterior or interior of the building. Furthermore, no current or historic evidence of bat occupation was observed in association with this building.

Building B1f

- 3.64 A single storey building section (B1f) was present between B1c and B1d. The roof comprised of a number of small gable roof sections. Access to the roofs was not possible for detailed inspection. These roofs were of metal construction with no potential bat access or evidence of occupation observed during the survey. The buildings was considered to offer negligible roosting potential.



Photographs 8 & 9. Photo 8 (left) shows B1c from B1a. Photo 9 (right) shows the roof of B1c and the joining roof of B1d.

Building B1g



Photograph 10. Single storey flat roofed reception of building B1g

3.65 This is a single storey building that is the annex to buildings B1a/B1b with a flat concrete roof that was inaccessible internally but viewable from the surrounding buildings. The exterior was constructed from a metal frame with a glazed curtain wall covering. No potential access points, roosting habitat or evidence of occupation by bats were present either in association with the exterior or interior of the building.

Building B2 – Disused Recreation Building



Photographs 9 & 10. Showing the external and internal features of building B2

- 3.66 This building was a single storey breeze block building with a flat single skinned corrugated metal roof, supported by steel beams. There were barge boards around the entire building, which had no gaps between the boards and the external wall. Potential access points comprised the open door into the structure, no other entry points were seen.
- 3.67 The internal structure had exposed breeze block walls and steel roof sheets, with no roof void. There were high levels of detritus throughout the building and a large amount of fox faeces. The building offered little/no roosting potential given the fabric of the building. Building B2 had negligible roosting potential for bats and there was no evidence seen to suggest it has been used.

Building B3



Photograph 11 & 12. Building B3 external features

- 3.68 This was a single storey brick built building with a shallow pitched/hipped roof with double skinned corrugated concrete fibre sheets with similar material used along the ridge. The two gable ends were clad with diagonal clad wooden panels which had ventilation and air-conditioning units attached. Wooden ventilation slats were covered with a mesh impeding any access into the building. Metal soffits and fascia boards were present around the building which also supported the drainage. The lintels around the windows and doors were covered with fascia panels and provided no potential bat access into the building. A small flat corrugated plastic overhanging roof was present on the eastern elevation. No potential bat access points were present at the time of the survey. No potential roosting habitat was associated with the exterior of the building.
- 3.69 There was no accessible roof void, as this was limited by the presence of a suspended ceiling, which followed the pitch in the roof whereby a void would consist of a narrow space with room for ventilation and very little else. During the external surveys there were no access points seen that could provide roosting opportunities as the modern construction and fabric of the building lacked any gaps or crevices.
- 3.70 Building B3 was considered to have negligible bat roosting potential and no evidence of current or historic bat occupation was observed in association with the exterior or interior of the building.

Building B4



Photograph 13. Building B4

- 3.71 Building B4 comprised two adjoined timber clad sheds with pitched concrete fibre roof tiles and ridges. There were wooden soffits and fascias with attached drainage. The building fabric was in good condition and offered no potential bat access points. The interior of this structure was currently being used as a kitchen and staff room; this had a suspended ceiling with a shallow void that was inaccessible.
- 3.72 No gaps were seen around the building and no evidence of bats was recorded, the absence of access points would suggest that this offers negligible roost potential.

Building B5



Photograph 14. Building B5

- 3.73 This building was located in the eastern part of the site and was constructed out of brick with a flat concrete roof with a small brick parapet. The building housed an electrical substation therefore no access was granted. However, the only potential access into this was from a door and vents above, both of which were well sealed and a fine mesh was also installed around the vent. There were a number of loose bricks along the parapet on the southern aspect, here mortar was missing. Following an endoscope inspection it was confirmed that the cavity was shallow and no evidence of any bats was present.
- 3.74 This building had negligible bat roosting potential and no evidence of bats was recorded.

Building B6**Photograph 15. Building B6**

- 3.75 This security lodge was a single storey building comprised a steel frame with external elevations comprising brickwork and glazing. The roof was flat roof with a large metal soffit which extended from the structure forming an overhanging porch at the front of the building. There was some damage to the southern aspect to the roof, however the metal cladding was still intact and provided no internal access. All doors and windows were constructed using metal and glass and were well sealed.
- 3.76 The internal structure had a suspended ceiling with no roof void. This building had negligible roosting potential for bats and no evidence of occupation was observed.

Building B7**Photographs 16 & 17. Building B7 external and roof features (seen from B1a)**

- 3.77 This building was made up of two buildings B7a/B7b. Building B7a was a two storey office building with a flat roof which had a corrugated sheet roof covering. B7a was a brick built building that was covered with a metal cladding with inset metal framed windows over the two storeys. This external cladding provided no crevices around windows or doors, and the expansion joints had rubber seals preventing any bat access. The ground floor had areas where the brick work was exposed and not covered with cladding, these were around side doors and fire escapes. No potential access points were observed in association with the exterior of the building.
- 3.78 Building B7b was a single storey building constructed of brick with a flat roof, which was also covered with corrugated sheets. A large metal fascia was present on all building elevations.

Lintels over doors and windows were well sealed, and there were no gaps or crevices seen elsewhere; no evidence of bats was recorded.

- 3.79 The internal structure of B7b consisted of suspended ceilings, with no roof void above. Due to the construction material and efficiency in the construction method, gaps and crevices were absent. These buildings provided negligible bat roosting potential.
- 3.80 There were a number of brick built outbuildings associated with B7a. All were either flat roofed or had a corrugated steel covered gable roofs. These buildings had a number of vents around the sides, however, these were covered with mesh, excluding access. No potential access points, roosting habitat or evidence of bat occupation was observed in association with any of the outbuildings.

Building B8



Photograph 18. Building B8

- 3.81 This building was a single storey brick built annex which had a flat concrete roof, with a brick parapet along its length. This building provided a linkage corridor between building B9 and B7. All brickwork, doors and windows were well sealed with no gaps or missing mortar. The building was considered to offer no bat roosting potential and no evidence of occupation was observed.

Building B9



Photograph 19. External features of building B9

- 3.82 This building was a two storey office block which comprised a steel frame with external metal and glazed curtain walling and a flat roof. The exterior of the building was well sealed and offered no potential access for bats.
- 3.83 Internal access was not possible, however given the flat roof it was considered unlikely that a roof void was present.
- 3.84 Due to the modern construction techniques and materials used this building provided no potential bat access points and no roost potential for bats. No evidence of occupation was observed at the time of survey.

Building B10 – Car park



Photograph 20 & 21. Building B10 car park

- 3.85 This was a two storey car park constructed out of concrete and which was open on all aspects. The only potential roosting opportunities comprised with the only potential roosting available was between expansion joints within the ceiling, as the expansion joints around the exterior were sealed and provide no access. An internal survey was undertaken which focussed on these expansion joints, the majority of which were shallow and filled. Where cavities were present there was no evidence of current or historic occupation by bats.
- 3.86 Due to the exposed nature of this structure and the limited refuge available, this building was considered to offer negligible potential to roosting bats.

Building B11



Photograph 22. Building B11

- 3.87 A single storey brick building with a concrete flat roof, with parts covered with roofing felt. The only structural feature of note comprised fascia boards on all elevations. Some gaps were present in a small number of places between the fascia board and brick walls. Subsequent inspection of the gaps confirmed no bats to be present. Potential access points comprised broken windows. No external evidence of bat occupation was present at the time of survey.
- 3.88 The internal structure comprised steel support beams and the building was open to the underside of the roof materials (i.e. no roof void). No potential roosting habitat was observed in association with the interior of the building.
- 3.89 This lack of internal refuge and roosting opportunities, along with the lack of any evidence, would conclude that this building is of negligible value to bats as a roosting site.

Building 12



Photograph 23. Building B12.

- 3.90 This is a single storey brick built building with a shallow lean-to roof with large plastic soffit/fascia boards on all elevations. The exterior of the building was well sealed and offered no potential bat access points. No roof void was present and the interior of the building offered no potential as bat roosting habitat.

Underground Shelters

- 3.91 There were a number of underground shelters within the site; these were emergency support centres which date back to the Second World War. A number of these were decommissioned in the early 1990s when Nortel refurbished the site; the remainder were removed in 2000 when the car park was built. These structures are no longer present within the site and therefore do not provide any potential roosting opportunities.

Birds

- 3.92 The hedgerows, trees and scrub within the application site provided limited suitability for nesting and foraging for bird species, due to their poor species content and structure. During the walkover survey common birds such as blackbird *Turdus merula*, magpie *Pica pica* and crow *Corvus corone* were recorded. In addition, a large flock of starling *Sturnus vulgaris* were recorded within the northern extent of the site. This species is listed as a priority species under the provision of the Natural Environment and Rural Communities (NERC) Act (2006) and are

BoCC (Birds of Conservation Concern) red listed. Dunnock was also recorded on the eastern site boundary, a BoCC amber listed and NERC species.

Great Crested Newts (Figure 3)

- 3.93 There were three water bodies located within a 500m radius of the site and a single pond within the development boundary. The project commenced during the later stages of the summer and therefore outside of the aquatic survey period for GCNs.

Pond P1 (Onsite)

- 3.94 Pond P1 occurs within the site and is approximately 4250m², it is surrounded immediately by small narrow sections of scrub, beyond which were large areas of well managed amenity grassland, hardstanding paths, roads and car parks. The majority of the access roads through the site had tall kerbs with gully pots, which would represent a partial barrier for any potential migration away from the pond. During a number of protected species surveys large fish were seen breaching and a number of waterfowl were present.

Pond P2

- 3.95 This pond was located approximately 430m south west of the site, and occurs within Bethune Park, according to aerial photographs and OS plans, this is a small ditch. This water body is separated from the site by:
- large areas of grassland within the park, which are well managed possibly exposing GCNs to predation.
 - allotments – if GCN present they are more likely to use these habitats than continue migration towards the site
 - a number of residential dwellings – these have front and rear gardens, which would need to be negotiated.
 - the busy A109 Oakleigh Road North – which has a kerbs and gully pots, restricting possible access, and
 - a railway line – this has steep banks either side with scrub edges, although where rails are habitats are very exposed.

- 3.96 The above factors represent a significant barrier to possible dispersal for GCN to migrate into the site, therefore this pond will not require surveying.

Pond P3

- 3.97 This pond is located 370m north of the site within the residential development of Fitzwilliam Close. This is a private estate with gated access therefore no initial survey of the pond could be undertaken. However, aerial photographs show that the location of the pond is now a roundabout within the estate which does not appear to have a water body present. If there is a water body at this location there is a sufficient barrier to dispersal as it is within an urbanised area, with large expanses of hardstanding surfaces including the B1453 and a number residential estates. Due to the distance from the application site and barriers to dispersal, this pond will not require further surveys.

Pond P4 – Pymmes Brook

- 3.98 This brook is located approximately 400m east of the site and is separated by a number of residential estates and the busy Brunswick Park Road. The brook was not assessed during 2014 as the barriers to dispersal were too great, and as this feature is likely to be running water it is less likely to support GCNs.
- 3.99 A HSI assessment was only undertaken on pond P1 as this was the only pond potentially accessible to amphibians within a commutable distance without any barriers to dispersal.

Table 10: HSI Scores for Pond P1

Pond	Site	Area / m ²	Dry	H ₂ O qual.	% Shade	Fowl	Fish	Ponds	Terr. Hab	% Mac	HSI	Predict.
P1	A	4250	Never	Good	20	Major	Major	3	Poor	10	0.28	Poor
	1	0.45	0.9	1	1	0.01	0.01	0.55	0.33	0.33		

- 3.100 The HSI score for pond P1 was assessed as being of 'poor' suitability to provide conditions that could be utilised by GCNs.

Reptiles

- 3.101 Habitats across the site were largely unsuitable for reptile species, being heavily managed and lacking the vegetation structure favoured by reptiles. The land within the northern extent of the site was unmanaged and dominated by rough grassland. The peripheries of this area supported a mosaic of habitats including ruderal, scrub and tussock grassland providing optimal habitat for commuting, foraging and basking reptiles. In addition, piles of green waste, office furniture and building remains provided suitable hibernating material for species such as grass snake *Natrix natrix*, common lizard and slow worm.
- 3.102 The presence of an expanse of suitable habitat necessitated further presence / absence surveys. This involved placing 42 artificial refugia (0.5m² roofing felt tiles) throughout the grassland habitat (Figure 2). Once these tiles had been left to bed in for two weeks, seven surveys were carried out during September and October 2014 in suitable weather conditions, see table 11.
- 3.103 Adult and juvenile slow worm were recorded during all surveys, with a peak count of five adults identified on the 18th September. This constitutes a good population of slow worm in accordance with information detailed in Froglifes Advice Sheet 10¹³. Locations of reptiles are detailed on Figure 2.

Table 11: Date and Weather Conditions During Reptile Surveys

Survey	Date	Time	Temp.	Weather	Results
1	01.09.2014	10:00	16	40% cloud, no rain, light wind	2 female, 1 male, 1 juvenile slow worm
2	15.09.2014	11:00	16	50%, no rain, light breeze	2 female, 1 juvenile slow worm

3	18.09.2014	10:00	17	60% cloud, no rain, light breeze	3 female, 2 male slow worm
4	22.09.2014	11:00	14	20% cloud, no rain, light breeze	2 female, 2 male and 2 juvenile slow worm
5	25.09.2014	18:00	17	20% cloud, no rain, light breeze	2 male slow worm
6	29.09.2014	14:00	18	50% cloud, no rain, light breeze	1 juvenile slow worm
7	03.10.2014	10:30	15	5% cloud, no rain, windy periods.	2 males and 6 juvenile slow worms

Other

- 3.104 Fox *Vulpes vulpes* was observed during the initial walkover and bat surveys within the northern and southern extents of the site. Numerous fox droppings were seen within the disused building B2 and around the grassland surrounding it.
- 3.105 The site is also used by Canada Geese *Branta canadensis* which assemble around the water body and associated amenity grassland habitats. These are an introduced species to the UK from North America and have no status in the Birds of Conservation Concern (BoCC). During the surveys of the site numbers ranged between 7 to 12 individuals, however large assemblages have been seen by locals.

Intentionally Blank

4.0 DISCUSSION & RECOMMENDATIONS

Proposals

- 4.1 The proposed development will be facilitated through the entire removal of all buildings; the majority of the amenity grassland and some tree groups within the central regions and eastern extent of the site. A mixed density residential estate and school with associated sports facilities will be created on site. The associated green infrastructure retains a large proportion of the existing tree resource as well as the large on-site waterbody and small areas of amenity and rough grassland. In addition to the retained habitats, new native hedgerows, trees, species-rich meadow and tussock grassland and green roofs will be created. The waterbody and surrounding area will be enhanced. Off-site mitigation will include the implementation of a cycle route linking to existing routes further east.

Statutory and Non-Statutory Designated Sites

- 4.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) website indicates that there are three internationally designated sites within 10km of the site boundary. There are, however, no nationally designated statutory sites within 2km of site.
- 4.3 Lee Valley Ramsar and SPA is located 7.8km south west which also contains Walthamstow Reservoirs SSSI. The main designation is for its range of Annex I birds. These species are not likely to be present within the proposed development as the habitats available are not conducive with the requirements of the birds. The dominance of hardstanding environments and the constantly maintained amenity grassland and ornamental areas create habitats that are of little value to the SPA species.
- 4.4 Epping Forest SAC/SSSI is located approximately 9.8km east from the proposed development and is designated for its beech woodlands and heath habitats. This is separated from the site by large residential areas with no direct habitat linkages.
- 4.5 The London Plan (2011¹⁴) under Policy 7.19 states that development proposals should
“..c) not adversely effect the integrity of European sites and be resisted where they have significant adverse impact on European or nationally designated sites or on the population or conservation status of a protected species or a priority species or habitat identified in a UK, London or appropriate regional BAP or borough BAP.”
- 4.6 Due to the distance which the proposed development is located from both Lee Valley and Epping Forest, there are unlikely to be any direct effects. Increased visitor pressure resulting from the proposed development is also considered unlikely given the distance to each of these sites. Both of these sites are approximately a 30 minute car journey from the application site, whilst Lee Valley is a 45 minute journey and Epping Forest a 2 hour journey on public transport. Given the availability of alternate recreation areas in closer proximity to the site comprising Brunswick Park, New Southgate Recreation Ground and Bethune Park it is unlikely that increased visitor pressure would occur on the designated sites.
- 4.7 Current framework plans contain areas of public open space (POS), specifically within the three main public parks and areas of play, which will be used by local residents for play and

¹⁴ The London Plan -Greater London Authority, July 2011. Available online <https://www.london.gov.uk/priorities/planning/london-plan>. (accessed on 8/12/14)

recreational activities; this includes residential parkland that incorporates the existing water body. The open space will contain a number of walking and cycling routes which will meander through the main open spaces and lead into the wider area creating potential for circular walks that could be used for recreational activities such as dog walking.

- 4.8 The non-statutory sites which are close to the site include New Southgate Cemetery (40m east) and Barfield Allotments Nature Park (145m). The cemetery is designated for its mature trees and breeding bird assemblages; this will not be affected directly by the development as construction precautions will be undertaken to ensure that dust particles are not released during dry periods. When the development is operational the cemetery is unlikely to be used for recreational activities, due to the nature of the site but also onsite POS and the availability of specific recreational areas such as Brunswick Park, New Southgate Recreation Ground and Bethune Park; which provide more suitable features for recreation. The new off-site cycle route leading to the east will comprise formalised paths suitable for bicycles, providing links to existing cycle routes through Pymme's Brook SINC.
- 4.9 Barfield Allotments is located 850m from the southern part of the proposed development, which runs along Oakleigh Road North. There is no public access into the allotments therefore the effects during the operational phase of development will be negligible.
- 4.10 Pymme's Brook is approximately 385m east from the site and is accessible from Benfleet Way and New Southgate Cemetery. A new cycle route is proposed to run along the existing paths within the Cemetery SINC to meet existing cycleways along Pymme's Brook. It is expected that additional public pressure as a result of this route will be negligible as the designated sites are already likely to withstand high levels of public access and formalised paths will deter the informal access and trampling of the ancient wooded banks. The cycle routes are also expected to be used for public commuting uses as these provide scenic links to railway stations. The development will not have any direct effects on the brook as all drainage will utilise existing infrastructure.

Habitats/Flora

- 4.11 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:
- Inclusion within specific policy (e.g. veteran trees, ancient woodland and linear habitats in NPPF, or non-statutory site designation),
 - Identification as a habitat of principal importance for biodiversity under Natural Environment and Rural Communities Act (NERC) 2006 and consequently identification as a Priority Habitat within England and the local area.
- 4.12 Under the NPPF development should seek to contribute a net gain in biodiversity with an emphasis on improving ecological networks and linkages where possible.
- 4.13 The London Plan also states that "*New development should improve existing or create new habitats or use design (green roofs, living walls) to enhance biodiversity and provide for its on-going management.*" The scheme currently lacks more natural habitats, as it is dominated by well managed areas and large expanses of hardstanding; the framework plan will endeavour to create, enhance and maintain more beneficial habitats that will increase biodiversity.

- 4.14 The hedgerows and mature trees are of conservation value as they generally provide commuting routes, shelter, forage and nesting sites for wildlife. The majority of the hedgerows currently on site are poorly represented as they are heavily managed with very few species; the proposals will result in the loss of all hedgerows, however new native-species hedgerow networks, and tree lines will be created throughout the providing greater structural and botanical diversity. The current framework includes linear features running through the site, along access roads and around residential plots. These would provide ideal places for native hedgerows to be planted that will compensate for those lost, but also to enhance the biodiversity and commuting potential within site. Such hedgerow planting will be managed to enhance structure (creating dense, wide, tall structures); which would be achieved through a three year rotational trimming of the hedgerows, and replacing dead or dying species with similar species.
- 4.15 All the mature trees present on site provide potential habitats for invertebrates, nesting birds and other wildlife; the majority of these are to be retained. These will be protected from damage and from soil compaction during works by maintaining fenced Root Protection Areas (RPAs) in accordance with section 4.6 of British Standard BS5837. Where tree losses occur, substantial re-planting will be undertaken across the site and associated with new planted hedgerows creating structural diversity which will benefit birds and bats. The framework plan shows that further native tree planting will be incorporated around the site, between residential dwellings and open space and along the peripheries of site and road infrastructure, thus increasing semi-natural linkages through and around the site for wildlife.
- 4.16 The majority of habitats comprised amenity grassland, with no notable or rare species recorded. There is some botanical interest within the grassland present within the eastern extent; however, this appears to be tightly managed through mowing. These grassland areas will be lost to facilitate construction of residential dwellings and school facilities including sports fields. Areas of green space will be created around the school facilities which, where possible, should include wildflower grassland mixes along pathways. Such habitats should continue through the site with native shrub planting, which will provide a nectar source through the site for invertebrates.
- 4.17 Three public parks will be provided centrally within the residential development and between this and the school. This will incorporate new species-rich grassland habitats, which will be seeded with meadow grassland mixes and managed as hay meadows with one cut per year during late summer to allow flowering and seeding. These areas will compensate for the species-poor grassland to be lost and will enhance opportunities for local wildlife, particularly invertebrates. Tussock grassland will also be created along the western extent of the site (forming a reptile receptor area) and this will also provide undisturbed foraging, cover and commuting facilities for local wildlife, specifically reptiles (see below). Areas which will receive high levels of public pressure should be seeded with mixes tolerant of trampling and public pressure, however could include species which benefit invertebrates such as white and red clover *Trifolium repens/pratense*.
- 4.18 The planting scheme will use locally native woody species, with an emphasis on species bearing nectar, berries, fruit and nuts, as these enhance the foraging opportunities for local wild fauna including birds and invertebrates. Suitable small tree species for inclusion in hedgerow and garden planting schemes include field maple, silver birch, wild cherry *Prunus avium*, bird cherry *P. padus*, holly, crab apple *Malus sylvestris* and rowan. Other shrub species suitable for inclusion within the soft landscaping design include hawthorn, hazel, blackthorn *Prunus spinosa*, dog rose *Rosa canina*, honeysuckle *Lonicera periclymenum* and wild privet *Ligustrum vulgare*.

- 4.19 Where possible planting within the site should seek to provide additional habitat for urban and suburban wildlife. While native species are often of value to biodiversity generally it is now clear that many cultivated varieties and exotic plants are also good for wildlife provided that their flowers are not too complex or that hybrid varieties, which may produce little or no pollen or nectar and so are not of interest to bees, butterflies or other pollinating insects, are not used. The planting strategy, both within private and public areas, should therefore combine a range of native species and where appropriate, such as gardens and more formal areas, with a range of ornamental species with an accepted value for biodiversity. A range of small shrubs, low growing woody species, grasses and perennials, would provide a range of forms, sizes and finer scale variation to enhance the future structural and three dimensional complexity of the site.
- 4.20 To further enhance opportunity for invertebrates, the development would use different types of mulch, such as gravel, bark, compost and leaf mould would be used in planting beds to encourage different microhabitats for faunal basking, foraging and shelter. Deadwood piles would be created in less formal areas, such as within the species-rich meadows within the parks, around the waterbody and within the reptile receptor area. These would be formed from the existing trees to be lost and located beneath dense vegetation.
- 4.21 The existing pond within site will be reconstructed and sympathetically designed to enhance biodiversity, involving the draining of the waterbody to remove the concrete lining. Whilst de-watering, the fish would be removed and taken away, under Environment Agency approval to appropriate fisheries or similar. Such works would be undertaken during the winter to avoid stress to fish and any loss of bird breeding refuge sites.
- 4.22 Through reconstruction of the waterbody, substantial ecological enhancements can be achieved and through the creation of shallow drawn down zones, scalloped edges and deep central areas and planted with locally native marginal and aquatic vegetation. Marginal species would include common reed *Phragmites australis* and reedmace *Typha latifolia* along with rush species which would form swathes of vegetation within the shallows, providing enhanced opportunities for birds and cover habitats for aquatic invertebrates and fish fry. Further planting should include tall emergent plants and floating-leaved plants such as yellow water-lily *Nuphar lutea* within the deeper areas of water. The pond can be made more visually attractive through the planting of selected species including marsh marigold *Caltha palustris*, water dock *Rumex hydrolapathum* and common water plantain *Alisma plantago-aquatica*. A denser and taller area of vegetation will be planted around the peripheries of the pond to provide additional habitats for invertebrates and terrestrial habitats for amphibians. Bankside vegetation will be managed to ensure that scrub does not encroach.
- 4.23 A treatment programme for Japanese knotweed will be put in place prior to the commencement of any construction works, in which the species will be removed via chemical or mechanical operations. The method used will depend upon speed of eradication required. The area should be fenced off approximately 7m away from the visible edge of the stand and signed to avoid any further spread. Chemical treatment can take a number of years to achieve and the mechanical removal of Japanese knotweed would require it to be disposed of at a licensed facility.

Protected Species

- 4.24 The principal pieces of legislation protecting fauna are Part 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats and Species Regulations 2010.

Some species, for example badgers, also have their own protective legislation (Protection of Badgers Act 1992). The impact that this legislation has on the planning system is outlined in ODPM 06/2005 Government Circular: Biodiversity and Geological Conservation – Statutory obligations and their impact within the Planning System.

- 4.25 This guidance states that as the presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals is established prior to planning permission being granted. Furthermore, where protected species are present and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions for example.
- 4.26 In addition to protected species, there are those that are otherwise of conservation merit, such as species of principal importance for the purpose of conserving biodiversity under the Natural Environment and Rural Communities (NERC) Act 2006. These are recognised in the NPPF which advises that when determining planning applications, LPA's should aim to conserve and enhance biodiversity by applying a set of principles including:
- *If significant harm resulting from a development cannot be avoided....., adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - *Development proposals where the primary objective is to conserve or enhance biodiversity should be encouraged.*
- 4.27 The implications that various identified species, or those that are thought reasonably likely to occur, may have for developmental design and programming considerations are outlined below.

Badgers

- 4.28 Badgers are protected under the Protection of Badgers Act 1992 against direct killing, injuries or taking.
- 4.29 During the subsequent walkover survey undertaken November 2015, evidence of badger activity was noted with three snuffle holes and a squeeze recorded within the compartment of semi-improved grassland at the north of site. It is therefore considered that badgers use suitable habitats within the site for movement and foraging. The green infrastructure to be incorporated within the development ensures habitat corridors are retained around the boundaries, particularly adjacent to the railway line, providing access to wider foraging areas.
- 4.30 As badgers are likely to continue to commute through the site during the construction phase, precautions should be taken to avoid accidental injury or death of the badgers. During the construction phase holes, trenches and other open voids should be covered overnight, where this is not possible a means of escape should be provided.

Bats

- 4.31 All bat species and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. In summary it is an offence to damage, destroy or obstruct any place used by bats for breeding and shelter, disturb a bat, or kill, injure or take a bat.

Desk Study

- 4.32 The consultees provided records of brown long-eared bats and both common and soprano pipistrelle bats within the wider area. No further information on the status of the records (e.g. roost, individual bat) was available.

Trees

- 4.33 Three trees (T2, T3 & T4) were considered to have features that could provide roosting opportunities. These trees will be retained through proposals, however as a precautionary measure nocturnal surveys were undertaken and no evidence of bat roosting was observed. As such, there is no statutory constraint to development from the presence of roosting bats in trees T2, T3 and T4.
- 4.34 All further trees with bat roosting potential are to be retained through proposals (T1, T5, T6 and tree groups TG1 & TG2). These trees are considered to offer negligible potential to roosting bats.
- 4.35 All trees to be removed / disturbed through proposals will be reassessed prior to construction works to ensure no new features have formed and that the trees do not contain roosting bats.

Activity & Static Surveys

- 4.36 During the activity and static surveys the majority of the contacts were with common pipistrelle bats. The most regular contacts were around the northern part of the site around tree group TG2, whilst a number of common pipistrelle passes were also noted along the southern boundary. During the three activity surveys conducted between three and seven bat contacts were recorded over each survey period.
- 4.37 The static surveys recorded 278 bat contacts in August and 154 during September. Of these common pipistrelles accounted for almost 60%, with only single contacts recorded of unidentified *Myotis* and *Nyctalus* pipistrelle.
- 4.38 A small proportion of trees will be lost to development and these are likely to provide good foraging resources due to their ages and canopy cover, which provides protection from the elements and possible predation. The potential GI through the site will provide increases in linear features such as hedgerow and tree groups, which will enhance the navigational and foraging potential in the future.
- 4.39 The current levels of activity within the site has been assessed as being of negligible value to the local bat population; with only northern sections around tree group TG2 and southern areas having at best site/local value.
- 4.40 The inclusion of more semi-natural habitats such as meadow grassland, tussock grassland and wetland planting around the waterbody will provide extra foraging resources for the local bat population. As mentioned above hedgerows/tree lines will create linkages through the site and specific planting of early flowering native species such as hawthorn, blackthorn, hazel, honeysuckle and ivy, would also benefit prey items.
- 4.41 Where feasible within the development design, consideration should be given to the provision of enhancements for the local population of bats through the creation of suitable roost features on some buildings within the site or the installation of bat boxes on mature trees. Such features could include Ibstock bat bricks or Schwegler 1FR Bat Tubes which can easily be incorporated

into the walls of the new buildings. Schwegler 1F and 2FN bat boxes can be incorporated at different heights and aspects, affixed to trees would maximise roosting opportunities. These provisions would be in accordance with National and Local Planning Policies helping to enhance biodiversity within the local area.

- 4.42 It is recommended that a sensitive external lighting scheme is designed to minimise light spill onto retained and new habitats. The lighting scheme should be designed with regard to guidance, such as the Bat Conservation Trust (May 2011) Statement on the impact and design of artificial light on bats and the Institution of Lighting Professionals Guidance Notes. Therefore, in accordance with the recommendations outlined in the existing ecological assessment, the lighting scheme should include the following:
- The avoidance of direct lighting of existing trees, scrub, woodland, open water or proposed areas of habitat creation / landscape planting;
 - Where appropriate the road and flood lighting should use low pressure sodium or high pressure sodium instead of mercury or metal halide lamps;
 - Lighting will be directional so that unnecessary light spillage is avoided;
 - Lighting columns would in general be as short as possible, although in some locations taller columns would allow reduced horizontal spill, and
 - Lighting levels would be as low as guidelines permit and only used where required for public safety
 - Where appropriate new offices, residential building should have external lighting on a timer, whereby there will be periods of dark during the nocturnal period.
- 4.43 The careful design of the lighting scheme will ensure that the potential effects of artificial lighting upon the local bat population are negligible
- 4.44 Further surveys for bats are not considered necessary, as the activity levels within the site were thought to be indicative of the habitats available, and that surveys in spring would not alter the assessment.
- 4.45 It can be concluded that the site is currently of negligible value to the local bat population, with possible foraging areas of site/local value in the north around TG2 and along southern boundary. The development will increase the number of residential dwellings, however the creation of POS and linear features provides new foraging and commuting corridors which will be available to the local bat population. It is thought that the new habitats will provide at least a long term minor beneficial effect for foraging bats at a site/local level.

Buildings

- 4.46 The majority of the buildings within the site were of modern construction, consisting of steel and glass whilst older buildings were covered with modern steel cladding to improve their aesthetics. The buildings within the site have no features that could be utilised by bats and during the surveys no evidence was seen that would suggest any current or historic use by bats. The absence of roof voids and external cavities and crevices limits the potential for roosting opportunities. All buildings will be lost to the development and these have negligible value to the local bat population as roosts, therefore no further surveys are required. There are no constraints to their demolition.

- 4.47 The consultees have not specified any roosts within a 1km radius of the site. The species recorded within the site are unlikely to utilise the buildings available, especially as modern construction materials are designed to fit without any gaps or crevices; this therefore limits the potential for crevice dwelling species such as pipistrelles.

Birds

- 4.48 The publication Birds of Conservation Concern (BoCC) (Eaton *et al*, 2009) lists the status of birds in the UK. The list is divided into three sections:
- Red list species are those that are Globally Threatened according to IUCN criteria; those whose population has declined rapidly (50% or more) in recent years; and those that have declined historically and not shown a substantial recent recovery.
 - Amber list species are those with an unfavourable conservation status in Europe; those with a population or range that has declined moderately (between 25% and 49%) in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.
 - Green list species fulfil none of the above criteria.
- 4.49 All birds are protected whilst on the nest. Any vegetation, such as a section of hedge required to be removed for access, should therefore be removed outside of the bird breeding season (March to Aug/Sept) if this is not possible, vegetation (including any areas which may provide habitat for ground nesting birds) should be checked prior to any vegetation removal being undertaken by an experienced ecologist. If active nests are found vegetation would be left untouched and suitably buffered until all birds have fledged.
- 4.50 New native hedgerows, trees and scrub planting will provide potential nesting habitat for a range of bird species potentially present in the local area, including a range of BoCC amber and red list species such as song thrush *Turdus philomelos*, house sparrow *Passer domesticus*, dunnock *Prunella modularis* and starling *Sturnus vulgaris*. The introduction of fruiting species will also increase the foraging potential for bird species, which are currently absent within the site.
- 4.51 It is recommended that consideration be given to the provision of bird boxes, to be affixed to suitable retained trees or new buildings to enhance nesting opportunities for birds in the local area and therefore contribute to the requirements of NPPF via biodiversity enhancement. A selection of hole and open fronted designs should be used in order to encourage a variety of species.

Great Crested Newts

- 4.52 GCNs and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (as amended), and by the Conservation of Habitats and Species Regulations 2010. These make it an offence to damage, destroy or obstruct any place used by great crested newts for breeding or shelter, disturb a great crested newt, or kill, injure or take any great crested newt. In addition, great crested newt is listed as a Species of Principal Importance under the provisions of the NERC Act 2006.
- 4.53 There was only one pond within the site, this was created to provide surface water storage for the office buildings. The pond was subjected to further tree planting in the 1980s to increase the ornamental value of the feature. The site has no linkages to surrounding water bodies, due to the

large extent of the urban environments with concentrations of residential dwellings and transport infrastructure. Those offsite ponds identified during this assessment are separated from the site by significant barriers to dispersal. There were no consultation records of GCNs within a 1km radius of the site.

- 4.54 Pond P1 is a man-made pond created for the initial business park which is situated within a highly urbanised area with no previous or existing linkages to any natural ponds in the area. The absence of any GCN records within a 1km radius and the limited commuting range of newts (250m where suitable habitat present (Cresswell & Whitworth, 2004¹⁵) would suggest that GCNs are absent from this pond as there was no possible means of colonisation.
- 4.55 The HSI also recorded a score of 0.28 which gives a 'poor' suitability for GCNs, this is largely due to the presence of fish and waterfowl; absence of aquatic vegetation and areas of refuge. This pond was approximately 4250m², and Natural England's Standing Advice states that GCNs prefer small to medium size ponds, rather than garden ponds or lakes.
- 4.56 It is thought that there is no need for further GCN surveys on the ponds in the surroundings due to their distance/location and pond P1 also requires no further survey work based on the following factors:-
- Historical isolation of the land within North London Business Park from surround water features and terrestrial linkages;
 - Construction of pond P1 within this isolated habitat means, it is unlikely to have been colonised, especially as there are no historical records of GCN within 1km;
 - Surrounded by barriers to dispersal including roads with kerbs and urban landscape with open habitats;
 - Pond P1 has a poor suitability for GCNs with fish present and a lack of aquatic habitats.
- 4.57 To conclude there are no constraints to the development concerning GCNs, as the water body within the site is unsuitable and the terrestrial habitat are not within a commutable distance of know GCN populations.

Reptiles

- 4.58 All common reptile species, including slow worm, common lizard and grass snake are partially protected under Section 9(1) and 9(5) of Schedule 5 of the Wildlife and Countryside Act 1981 (*as amended*). This legislation protects these animals from:
- Intentional killing and injury;
 - Selling, offering for sale, possessing or transporting for the purpose of sale or publishing advertisements to buy or sell a protected species.
- 4.59 This partial protection does not directly protect the habitat of these reptile species. Where these animals are present on land that is to be affected by development, the implications of legislation are that providing that killing can *reasonably be avoided* then an operation is legal. This requires that:
- the animals must be protected from injury or killing;

¹⁵ Cresswell W & Whitworth R (2004). English Nature: Assessment of the efficiency of capture techniques and the values of different habitats for great crested newts *Triturus cristatus*. Report number 576.

- mitigation should be provided to maintain the conservation status of the species;
 - following operations the population should be monitored.
- 4.60 All common reptile species, including common lizard, are species of principal importance under section 41 of the Natural Environment and Rural Communities Act 2006 (NERC) and priority species in England.
- 4.61 A good population of slow worms were recorded within the site. These were isolated to the north western part of the site around the disused hardstanding sports ground. The development proposals will result in the entire loss of reptile habitat. The reptiles are currently associated with the western and northern boundary, adjacent to a railway, which are typically ideal commuting corridors for reptiles due to basking potential on ballast and largely undisturbed scrub along embankments.
- 4.62 There are records of slow worms and common lizards 450m to the west of the site, however there are no habitat linkages between these records and the proposed development.
- 4.63 The Government Circular ODPM06/2005 (ODPM (2006) Planning for Biodiversity and Geological Conversation – A Guide to Good Practice¹⁶) states that the presence of a protected species is “... a material consideration when a planning authority is considering a development proposal which, if carried out, would be likely to result in harm to the species or its habitat”.
- 4.64 To ensure that slow worms are protected from injury/harm, a receptor area will be created along the western boundary (in close proximity to the population recorded) which will be followed by a trapping exercise which excludes reptiles from the working area (the rough grassland and scrub habitats in the north of the site). The working areas would be fenced off with reptile exclusion fencing and a trapping exercise undertaken between March to September/October, when weather conditions are optimal. Reptiles that are caught would be transferred directly to the receptor site. A destructive search of any suitable hibernation features would be undertaken and the area made unsuitable for reptile occupation.
- 4.65 The receptor site, located on the north-western boundary, would be managed to achieve conservation benefits for the existing reptile population. This would be specifically designed to improve both the botanical and structural diversity of vegetation in order to benefit reptiles. These measures would include low intensity management to establish grassland and scrub mosaic, and the provision of a series of additional hibernation features. The detailed design of the habitats would be achieved through the implementation of a Management Plan, which would ensure the successful establishment and maintenance of all retained and newly created habitats, ensuring the favourable conservation status of reptiles is maintained.
- 4.66 The receptor site would be created in advance of any construction works; this would therefore ensure that the habitat has developed adequately to ensure that it can support the translocated reptile population. The area proposed for the reptile reserve would require a degree of tree and shrub removal and grassland establishment. Once the habitat has developed the future management would be secured into perpetuity, with specific management measures outlined within the Management Plan.

¹⁶ The Government Circular ODPM06/2005 Planning for Biodiversity and Geological Conversation – A Guide to Good Practice, Department of Communities and local Government, 2006

5.0 NON-TECHNICAL SUMMARY


















- 5.1 Lee Valley Ramsar/SPA is approximately 7.8km south west of the site and Epping Forest SAC/SSSI is 9.8km east. Due to the distance that these sites are located there will be no direct effects on these from the proposed development. Recreational effects will also be limited by the accessibility of alternate local recreational sites and the provision of POS within the application site. It is concluded that there will be no effects on both Lee Valley and Epping Forest from the proposed development.
- 5.2 There are a number of non-statutory sites within close proximity to the site, some of these sites are unlikely to be used by residents as they do not contain appropriate features or they are isolated from the site by busy roads. As such, residents are more likely to use the onsite POS for recreation purposes. POS will be designed to enable adequate features for recreation which will include circular walks with potential dog off-lead exercise fields, areas of play and off-site cycle routes. There will a negligible effect on the surrounding non-statutory sites.
- 5.3 The habitats within the site were of limited conservation value due to the dominance of buildings, hardstanding and well managed amenity grassland. Tree groups and the limited hedgerows provided some potential for commuting and foraging, however these lacked structural and botanical diversity. It was evaluated that the current habitats on site are of negligible conservation value. The proposed development will have biodiversity enhancements, which will include native planting of hedgerows and trees, but also areas of wildflower grassland which will be included within the public parks and reptile receptor site. These will create a nectar source for invertebrates and increased foraging potential for other wildlife species. It is thought that such enhancements would have a minor beneficial effect at site level in the long term.
- 5.4 Fauna within the site was limited due to poor habitat availability. Evidence of badgers using the site was located within the semi-improved grassland compartment at the north of site where a number of snuffle holes and a squeeze were identified. It is recommended that sufficient precautions are taken during the construction phase.
- 5.5 Relatively low levels of bat activity were recorded during both activity and static surveys, with common pipistrelles being the most frequently recorded species. A total of five species recorded, however the majority consisted of no more than five contacts; it was therefore assessed that the site was of negligible value to local bat populations. The buildings and trees to be lost to the development have no roosting opportunities and/or no evidence was recorded, therefore there are no constraints concerning roosting bats.
- 5.6 The inclusion of appropriately designed GI within the proposed development will create additional navigational and foraging opportunities, especially as invertebrates will be encouraged to the development through more native planting and increased nectar sources. The habitat enhancements and creation will have a long term minor beneficial effect for foraging bats at a site level.
- 5.7 Pond P1 was a large manmade water body, constructed in the 1980's, that lacked aquatic vegetation but had fish and a large number of waterfowl present. The HSI assessed this waterbody as poor suitability for GCNs. The location of the pond within an urbanised area, isolated from any records of GCNs, meant that colonisation is unlikely to have occurred. These combined factors have concluded that GCNs are absent, and no further surveys are required, hence there is no constraint to the development concerning GCNs.

- 5.8 A 'good' population of slow worms were found within the north western parts of the site, these will be translocated to a nearby receptor site during the construction works to avoid any offence under the Wildlife & Countryside Act 1981 (as amended). The GI will be designed to incorporate new suitable habitats for reptiles, ensuring that a favourable conservation status can be maintained into the future. This will have at least minor beneficial effects in the long term for reptile populations within the site.
- 5.9 To conclude, the current site is of poor conservation value due to the intense management practises and the built environments; this is reflected by the habitats and fauna found during the surveys. Areas in the north had a higher value due to the absence of any recent management and given that slow worms were found and bats were recorded around tree groups in this area. The mitigation measures proposed will ensure that the conservation status of species are maintained and enhanced through habitat creation, incorporation of hibernacula and the provision of bat and bird boxes. The possible habitats to be created within the site will provide more opportunities for biodiversity, however due to the context of the development, isolated within a highly urban area, it is thought that there would only be a minor beneficial effect in the long term at a site level.

This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material is used with the permission of The Controller of HMSO, Crown copyright 100018896.



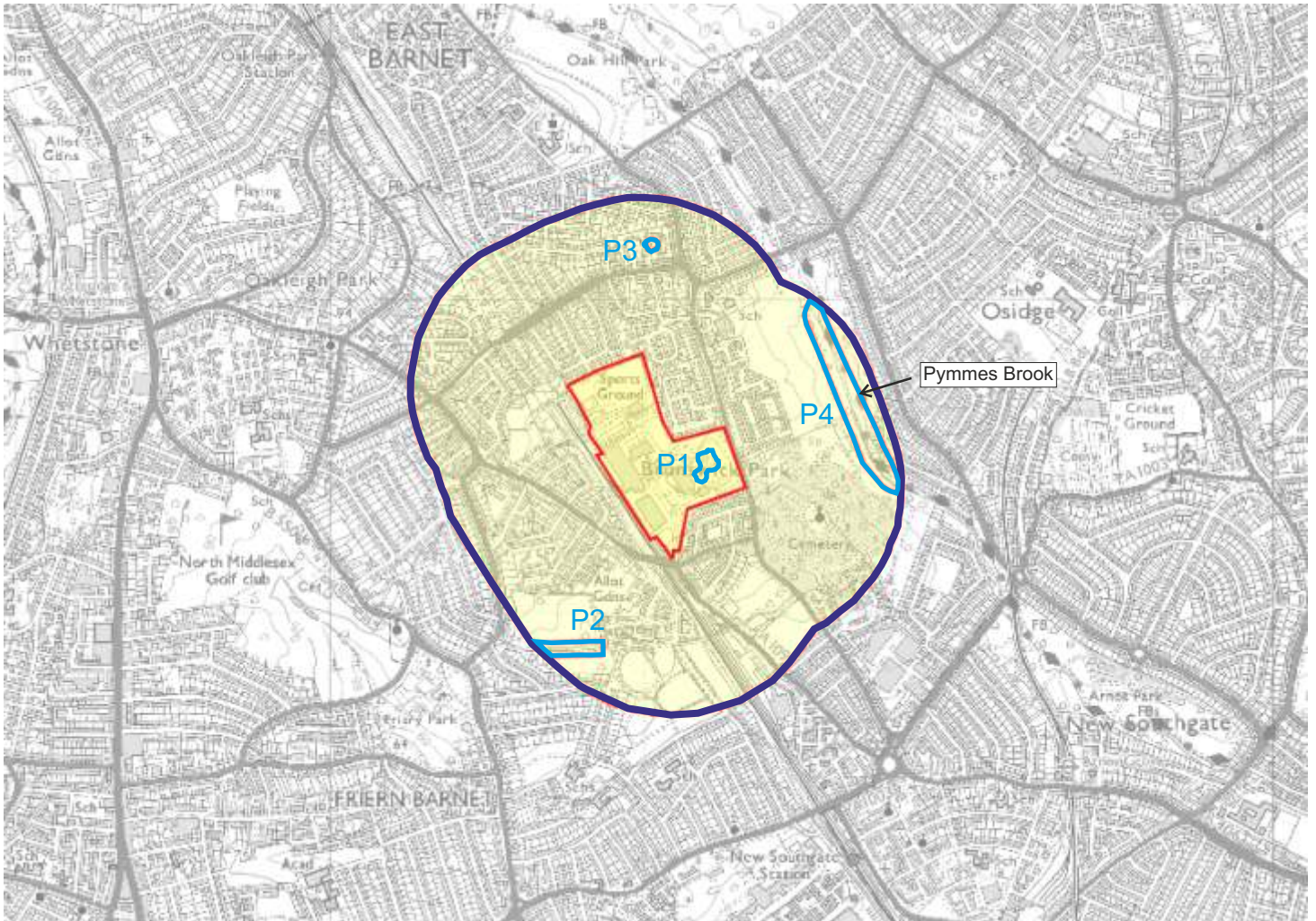
-  Survey Boundary
-  Scattered Scrub
-  Dense Scrub
-  Standard Tree
-  Tree with Bat Potential and Reference
-  Semi-improved Grassland
-  Ruderal
-  Standing Water
-  Hedgerow with Reference
-  Building with Reference
-  Amenity Areas (grassland and ornamental planting)
-  Hardstanding
-  Target Note
-  Static Bat Detector Locations
A: August
B: September
-  Reptile Tin Locations with Number of Refugia
-  Reptile Sightings
-  Badger Evidence
SN - Snuffle Hole
SQ - Squeeze




fpcr Comer Group
 North London Business Park
 London
 PHASE 1 HABITAT PLAN, SURVEY RESULTS &
 STATIC DETECTOR LOCATIONS 2014

NTS @ A3 TJL / HES 01.12.2015
Figure 10.2 6457-E-10.2

Approximate Distance Between Site and Waterbody

- P1: On-site
- P2: 430m South West
- P3: 370m North
- P4: 400m East



-  Site
-  Waterbody
-  500m Buffer



Comer Group
North London Business Park
London

POND LOCATION PLAN

NTS @ A4

DAH

05.12.2014

Figure 3

6457-E-03

This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material is used with the permission of The Controller of HMSO, Crown copyright 100018896.



Comer Group

North London Business Park

Bat Transect: August 28th Dusk

Appendix A & B

December 2014

(6457) North London Business Park – Transect Data – 28/08/2014

August 28th 2014: Weather: Cloud cover: 90%, Rain: 0%, Wind: 01, Temperature: 18°C (End Temperature: 16°C)














Transect

Track/Transect No.	Encounter Number	Time	Species	Activity	No. Passes	Habitat
	Sunset 19:57					
1	Start 19:42 – Finish 19:55					
2	Start 20:06 – Finish 20:14					
3	Start 20:20 – Finish 20:33					
	1	20:29	Common Pipistrelle	Commuting	2	Tree group TG2
4	Start 20:40 – Finish 20:44					
5	Start 20:50 – Finish 20:56					
6	Start 21:02 – Finish 21:07					
	2	21:05	Common Pipistrelle	Commuting	2	Site boundary
7	Start 21:14 – Finish 21:25					
	3	21:19	Common Pipistrelle	Commuting	2	Under and around trees
	4	21:22	Common Pipistrelle		2	Under and around trees
8	Start 21:31 – Finish 21:39					
	5	21:35	Faint Bat possible Common Pipistrelle	Commute	1	Under and around large tree
	6	21:36	Common Pipistrelle	Forage and Feed	6	Around pond
9	Start 21:45 – Finish 21:51					
	7	21:49	2x Common Pipistrelle	Forage	4	Under and around trees on site boundary
	8	21:51	Common Pipistrelle	Commuting	3	Under and around trees on site boundary
10	Start 21:58 – Finish 22:00					
	9	21:58	Common Pipistrelle	Forage and Feed	Continuous	On the southern boundary backing onto gardens
	End 22:15					

Point Counts

Point Count No.	Time	Species	Activity	No. Passes	Habitat
1	Start 19:56 – Finish 20:02				
2	Start 20:14 – Finish 20:20				
3	Start 20:33 – Finish 20:40				
4	Start 20:44 – Finish 20:50				
	20:47	Common Pipistrelle	Commuting with foraging	7	Under and around trees
5	Start 20:56 – Finish 21:02				
	20:58	Common Pipistrelle	Commuting	1	Site boundary over dense scrub
6	Start 21:07 – Finish 21:14				
	21:07	Common Pipistrelle	Commuting	1	Middle of field
7	Start 21:25 – Finish 21:31				
	21:26	Faint bat, Pip. 45?	Commuting	1	Over open grassland
8	Start 21:39 – Finish 21:45				
9	Start 21:51 – Finish 21:58				
	21:51	Common Pipistrelle	Forage	2	Under and around trees
	21:52	Common Pipistrelle	Commuting	2	Under and around trees
	21:54	Common Pipistrelle	Commuting	4	Under and around trees
	21:55	Common Pipistrelle	Forage	4	Under and around trees
	21:57	2x Common Pipistrelle	Commuting	3	Under and around trees



-  Survey Boundary
-  Scattered Scrub
-  Dense Scrub
-  Tree with Bat Potential and Reference
-  Semi-improved Grassland
-  Ruderal
-  Standing Water
-  Hedgerow with Reference
-  Building with Reference
-  Amenity Areas (grassland and ornamental planting)
-  Hardstanding
-  Bat Transect Route with Contact Number
-  Point Count

This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material is used with the permission of The Controller of HMSO, Crown copyright 100018896.



Comer Group

North London Business Park

Bat Transect: August 29th Dawn

Appendix C & D

December 2014

(6457) – North London Business Park – Transect Data – 29/08/2014

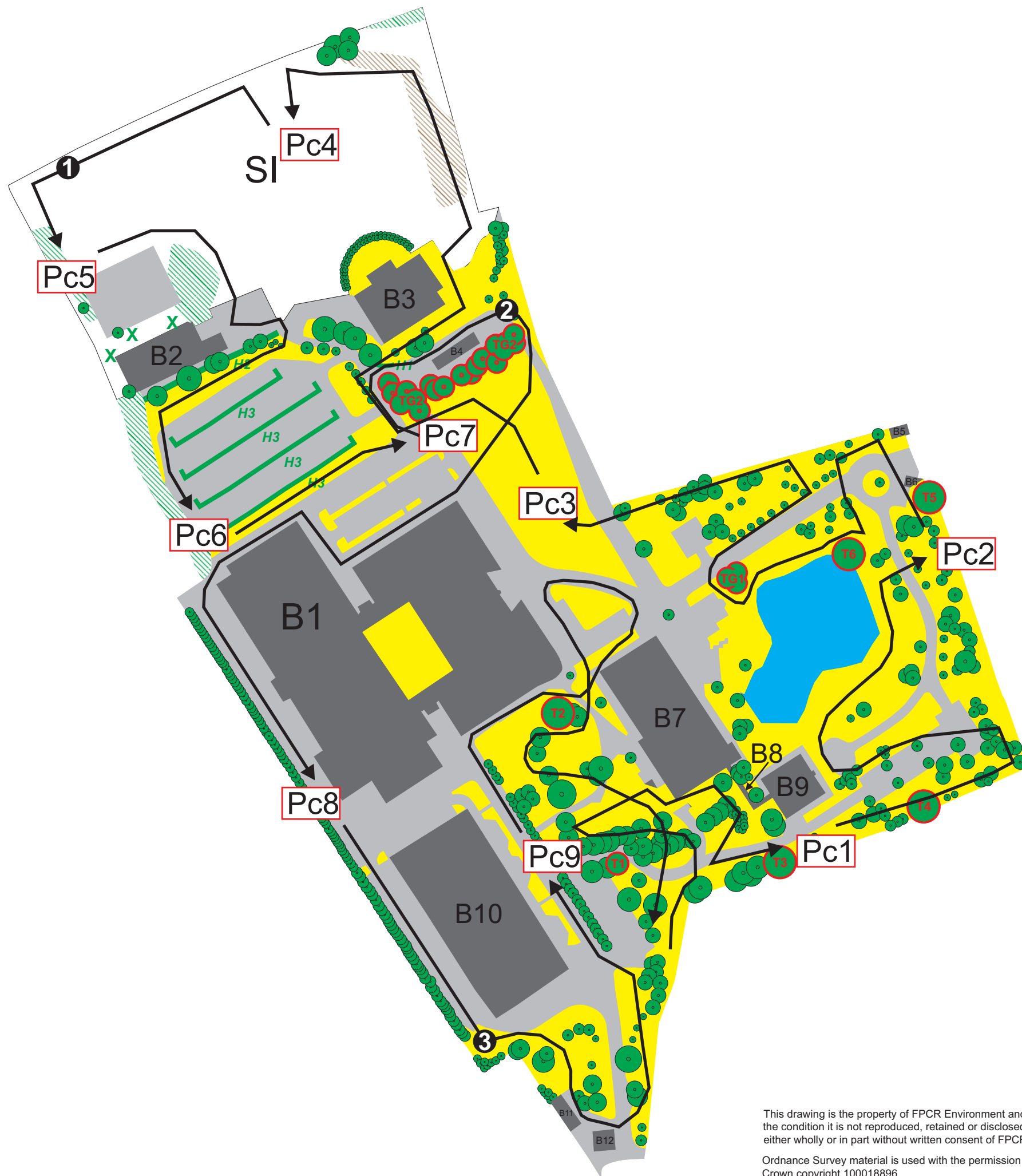
August 29th 2014: Weather: Cloud cover: 0%, Rain: 0%, Wind: 02, Temperature: 13°C (End Temperature: 15°C)














Transect

Track/Transect No.	Encounter Number	Time	Species	Activity	No. Passes	Habitat
	Sunrise 06:06					
1	Start 04:06 – Finish 04:09					
2	Start 04:15 – Finish 04:20					
3	Start 04:26 – Finish 04:21					
4	Start 04:38 – Finish 04:46					
5	Start 04:53 – Finish 04:57					
	1	04:55	Very Faint Common Pipistrelle	Commuting	1	Along the northern boundary
6	Start 05:03 – Finish 05:09					
7	Start 05:15 – Finish 05:19					
8	Start 05:26 – Finish 05:37					
	2	05:28	Faint Bat Pip. 45	Commuting	2	Around tree group TG2
9	Start 05:43 – Finish 05:51					
	3	05:45	Very Faint Pip. 45	Commuting	1	South west corner of site
10	Start 05:58 – Finish 06:06					

Point Count

Point Count No.	Time	Species	Activity	No. Passes	Habitat
1	Start 04:09 – Finish 04:15				
2	Start 04:20 – Finish 04:26				
3	Start 04:31 – Finish 04:37				
4	Start 04:46 – Finish 04:52				
5	Start 04:57 – Finish 05:03				
6	Start 05:09 – Finish 05:15				
7	Start 05:19 – Finish 05:26				
8	Start 05:37 – Finish 05:43				
9	Start 05:51 – Finish 05:58				



-  Survey Boundary
-  Scattered Scrub
-  Dense Scrub
-  Tree with Bat Potential and Reference
-  Semi-improved Grassland
-  Ruderal
-  Standing Water
-  Hedgerow with Reference
-  Building with Reference
-  Amenity Areas (grassland and ornamental planting)
-  Hardstanding
-  Bat Transect Route with Contact Number
-  Point Count

This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material is used with the permission of The Controller of HMSO, Crown copyright 100018896.



Comer Group

North London Business Park

Bat Transect: September 29th Dusk

Appendix E & F

December 2014

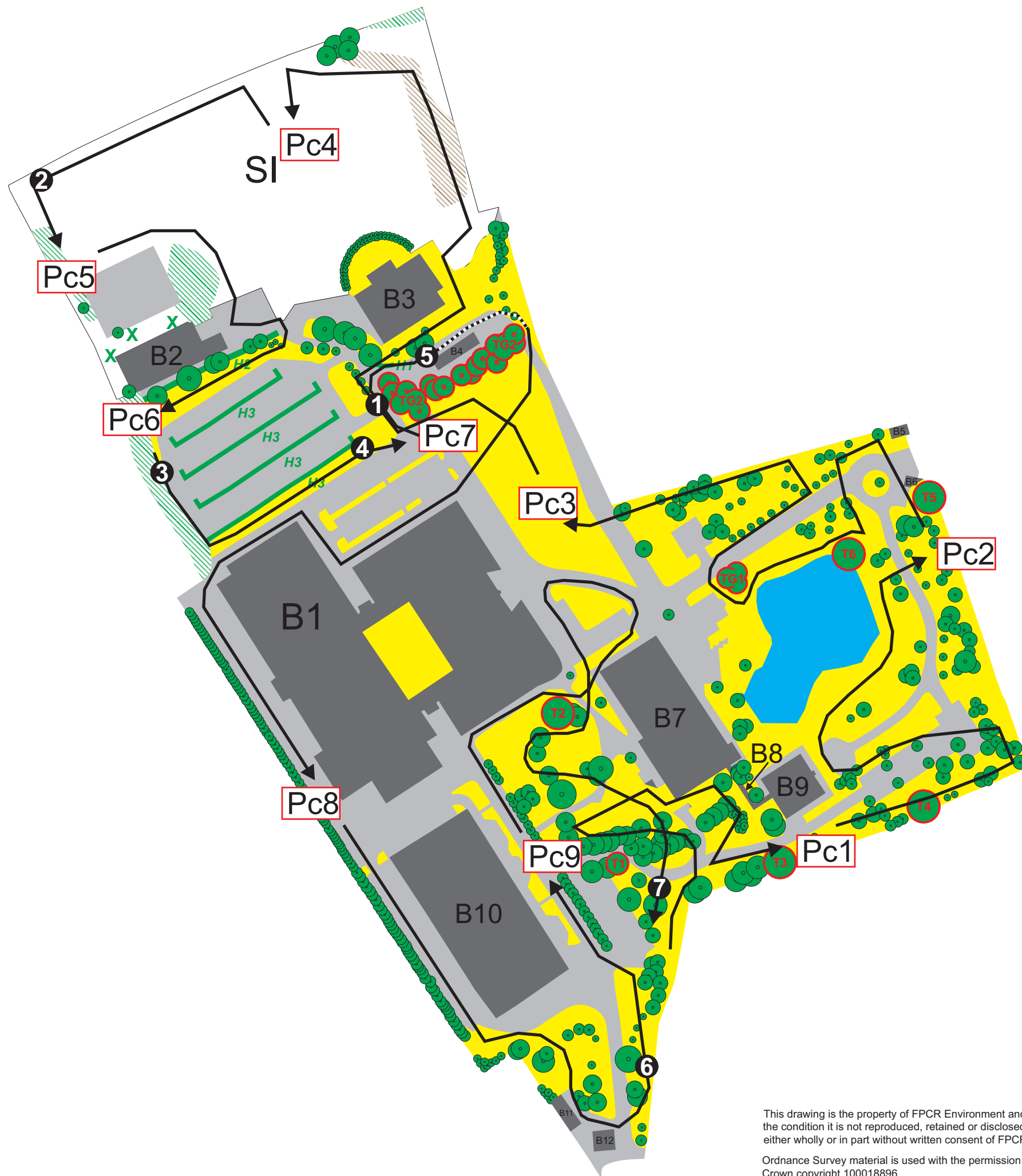
(6457) – North London Business Park – Transect Data – -29/09/2014














September 29th 2014: Weather: Cloud cover: 100%, Rain: 0%, Wind: 01, Temperature: 17°C (End Temperature: 15°C)

Track/Transect No.	Encounter Number	Time	Species	Activity	No. Passes	Habitat
	Sunset 18:53					
1	Start 18:38 – Finish 18:40					
2	Start 18:46 – Finish 18:54					
3	Start 18:59 – Finish 19:07					
4	Start 19:12 – Finish 19:24					
	1	19:13	Common Pipistrelle	Commute & Forage	4	Western edges of tree group TG2
5	Start 19:29 – Finish 19:36					
	2	19:33	Common Pipistrelle	Commute	1	North western corner under tree canopies
6	Start 19:46 – Finish 19:53					
7	Start 19:59 – Finish 20:04					
	3	20:01	Common Pipistrelle	Forage	1	Along scrub in the west of site
8	Start 20:09 – Finish 20:21					
	4	20:10	Common Pipistrelle	Forage	2	Close to tree group TG2
	5	20:12	Common Pipistrelle	Forage	Continuous	Around tree group TG2
9	Start 20:26 – 20:35					
	6	20:32	Common Pipistrelle	Forage and Feed (buzz)	5	In the south western corner near back gardens
10	Start 20:40 – Finish 20:47					
	7	20:46	Common Pipistrelle	Forage	3	Around trees near car park

Point Count

Point Count No.	Time	Species	Activity	No. Passes	Habitat
1	Start 18:40 – Finish 18:46				
2	Start 18:54 – Finish 18:59				
3	Start 19:07 – Finish 19:12				
4	Start 19:24 – Finish 19:29				
5	Start 19:40 – Finish 19:46				
6	Start 19:53 – Finish 19:59				
7	Start 20:04 – Finish 20:09				
	20:07	Common Pipistrelle	Forage (faint)	5	Around tree group TG2
8	Start 20:21 – Finish 20:26				
9	Start 20:35 – Finish 20:40				



-  Survey Boundary
-  Scattered Scrub
-  Dense Scrub
-  Tree with Bat Potential and Reference
-  Semi-improved Grassland
-  Ruderal
-  Standing Water
-  Hedgerow with Reference
-  Building with Reference
-  Amenity Areas (grassland and ornamental planting)
-  Hardstanding
-  Bat Transect Route with Contact Number
-  Point Count

This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material is used with the permission of The Controller of HMSO, Crown copyright 100018896.

fpcr Comer Group
 North London Business Park
 London
 Bat Activity Transect: Dusk 29th September

NTS @ A3 HES 04.12.2014

Appendix F 6457-E-ApF

Commissioned by
FPCR Environment and Design Ltd
Lockington Hall
Lockington
Derby
DE74 2RH

NORTH LONDON BUSINESS PARK, BARNET

INVERTEBRATE SURVEY REPORT

Report number: 18058

July 2018

Prepared by

Colin Plant Associates (UK)
Consultant Entomologists
30a Alexandra Rd
London
N8 0PP

1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

1.1.1 **Colin Plant Associates (UK)** were commissioned by **FPCR Ltd** to update the existing invertebrate survey data for the North London Business Park, Brunswick Park, Barnet in May 2018. The site was previously appraised and surveyed ten years ago by Colin Plant Associates (Environmental Gain, 2008), when it was considered to have a low value for invertebrates.

1.1.2 The site in question contains several areas which are of potential importance to invertebrates, all of which are entirely secondary in nature. These are outlined below:

- a) The grassed banks around the central car park which include several native tree species, including oak, lime, field maple, hawthorn and hazel. The banks themselves support a reasonably diverse herbaceous flora including Black Medick *Medicago lupulina*, Common Bird's-foot Trefoil *Lotus corniculatus*, Yarrow *Achillea millefolium*, Selfheal *Prunella vulgaris* and Ribwort Plantain *Plantago lanceolata*.
- b) The area of semi-improved neutral grassland to the north of the car park. This is rather rank in nature and presents as a uniform sward with little structural variation. Along the northern boundary dense stands of Stinging Nettle *Urtica dioica*, Black Horehound *Ballota nigra* and Common Mallow *Malva sylvestris* are present.
- c) The small lake, associated marginal vegetation and planted trees and shrubs bordering this area, including willows, poplars and alder. The lake is heavily silted, probably due to the presence of large numbers of Canada Geese and no emergent macrophyte zone is present.

1.1.3 The methodology followed that used in 2008, comprising a single visit during the peak invertebrate season. While this level of survey falls short of the minimum number of visits recommended by Natural England guidelines, we consider that it is adequate in the light of the results of the 2008 survey and is sufficient to provide a baseline species inventory to help guide the mitigation process.

1.2 Survey Constraints

1.2.1 The scope of the survey was confined to terrestrial invertebrates only.

1.3 Methodology

1.3.1 The invertebrate sampling visit was made on 11th June 2018 in very warm and optimal conditions for surveying terrestrial invertebrates.

1.3.2 The sampling was undertaken by two surveyors, Marcel Ashby and Tristan Bantock, each with a different specialist area of invertebrate knowledge/experience.

1.3.3 Aculeate Hymenoptera (bees and wasps), Coleoptera (beetles) and Hemiptera (true bugs) were specifically targeted as primary ecological indicators, given the nature of the habitats present. These groups were identified systematically and numerous others were included at the discretion of the surveyors.

- 1.3.4 Terrestrial invertebrate sampling was undertaken by direct observation/capture and by the following active sampling methods:

Sweep-netting. A stout hand-held net is moved vigorously through herbaceous vegetation or scrub to dislodge resting insects. This technique is effective for many invertebrates, including bees and wasps, flies, many groups of beetles and true bugs and large number of other insects that live in vegetation of this type.

Beating. A cloth tray, held on a folding frame, is positioned below branches of trees or bushes which are sharply tapped with a stick to dislodge insects. This technique is effective in obtaining arboreal species, including many beetle groups, true bugs, caterpillars of Lepidoptera, spiders and others.

2 INVERTEBRATE SPECIES

2.1 Summary

2.1.1 Appendix 1 details the complete list of terrestrial insect taxa encountered during the survey; a total of 208 species was recorded. The list is annotated with formal conservation status codes which are explained in Appendix 2.

2.1.2 The list is also annotated with the primary ecological associations of each species, where known. This allows species with differing habitat affinities to be immediately discerned.

2.2 Species of conservation interest

2.2.1 Several categories of invertebrates are of raised significance in an ecological assessment. These categories are explained in Appendix 2 and the corresponding species found during the survey are now examined.

UK Biodiversity Action Plan (UK BAP) Priority Species/Section 41 Species

2.2.2 UK BAP priority species were those identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). The original UK BAP list was created between 1995 and 1999 and stood at 577 species. Following a two-year review, a revised list was produced in 2007 which increased the number of BAP priority species to 1149. A total of 123 species no longer met the criteria for selection and were removed.

2.2.3 As a result of devolution, and new country-level and international drivers and requirements, much of the work previously carried out by the UK BAP is now focussed at a country level rather than a UK level, and the UK BAP has recently (July 2012) been succeeded by the *UK Post-2010 Biodiversity Framework*. The full list of priority invertebrate species can be viewed at: <http://jncc.defra.gov.uk/page-5169>.

2.2.4 The UK BAP list remains an important reference source and has been used to help draw up statutory lists of priorities in England, Scotland, Wales and Northern Ireland. For England and Wales these statutory lists are currently presented in *The Natural Environment & Rural Communities Act*,

2006: Section 41. List of Species of Principal Importance for Conservation of Biological Diversity in England and Section 42: List of Species of Principal Importance for Conservation of Biological Diversity in Wales.

- 2.2.5 No Species of Principal Importance for Conservation of Biological Diversity in England were recorded during the present survey.

Former UK Biodiversity Action Plan (UK BAP) “Research only” moth species

- 2.2.6 The original list of UK Biodiversity Action Plan Priority Species of butterflies and moths was divided into two sections. In the first, a total of 81 species are afforded the status of UK BAP Priority Species; none of these are recorded in the surveyed area and none are likely to be present. The second section is a list of 69 species that have declined in population strength by a significant amount in the past 25 years. These were defined as “not yet rare” and were flagged as UK BAP species “**for research only**”.
- 2.2.7 It is unfortunate that this “Research Only” list has been incorporated into the current priority listing process and that these species are now, therefore, of statutory interest. Some bodies now specifically recommend that these species are excluded from an appraisal of Section 41 and Section 42 species and this is a view with which we fully agree. Unfortunately, the species are not listed separately so that non-specialists are unable to discern them.
- 2.2.8 At the site under discussion one such “Research Only” moth species was recorded:

Cinnabar *Tyria jacobaeae* S41 is a moth found in various open and disturbed habitats, the larvae feeding on ragworts *Senecio* species, especially Common Ragwort *S. jacobaea*. It is widespread throughout much of England and Wales, although rather local and mainly coastal in the southern half of Scotland. Larvae were noted on ragwort in the area of semi-improved neutral grassland.

Nationally Rare / Red Data Book species

- 2.2.9 The following species listed in the British Red Data Books (Shirt, 1987; Bratton, 1991) or which have been elevated to the status of Nationally Rare by subsequent formal reviews were recorded by the present survey (see Appendix 2):

***Gymnosoma nitens* RDB1** is a parasitic fly which is associated exclusively with the shieldbug *Sciocoris cursitans*, itself a scarce species confined to southern England and not found north of Essex. The host is a strongly ground-dwelling species found in dry, sparsely-vegetated grasslands and ruderal habitats. It is probably polyphagous but is frequently found in association with Mouse-ear Hawkweed *Hieracium pilosella*. *G. nitens* has a very restricted distribution and is confined to south-east England where the East Thames Corridor forms its national stronghold. However, it is much more widespread than its current status suggests and ought to be considered as Nationally Scarce. A single specimen was swept from the banks around the car park.

***Acinia corniculata* RDB1** is a picture-winged fly found in various open habitats, the larvae developing in the seedheads of Common Knapweed *Centaurea nigra*. Although an exceptionally rare species historically, since 2000 there have been numerous records from south-east England and East Anglia and the species no longer warrants RDB status. A single specimen was swept from knapweed close to the car park.

***Lygus pratensis* RDB3** is a true bug which feeds on various species of Asteraceae. Although formerly extremely local and confined to lowland heathland in southern England, it has recently undergone a significant range expansion and is now widespread throughout much of southern Britain. It no longer warrants any conservation status. This species was swept from the banks around the car park.

Nationally Scarce Species

2.2.10 The following Nationally Scarce species were recorded by the present survey (see Appendix 2):

***Mordellistena parvula* NS** is a tumbling flower beetle associated with *Artemisia* and possibly other plants. Many localities are from areas with calcareous soils and the species probably has a requirement for open well-insolated habitats. It is also widespread on the dry, more base-rich, hard-rock sea-cliffs of Cornwall, Devon and Pembrokeshire. It is widespread but local in southern England and parts of Wales. It was swept from the banks bordering the car park.

***Platynaspis luteorubra* NS(Na)** is a ladybird which is strongly restricted to dry, open habitats on sandy or chalky soils in south-east England, where it associated with ants such as *Lasius niger*. Larvae live underground, feeding on subterranean aphids. A single specimen was swept from the banks bordering the car park.

***Oxystoma cerdo* NS(Nb)** is a weevil found in various open habitats, the larvae developing in the seed pods of vetches *Vicia* species. It is widespread in much of England but very local in Wales and Scotland. There have been recent signs of spread, particularly in southern and central England. A single specimen was swept from the banks bordering the car park.

***Trichosirocalus rufulus* NS(Na)** is a small weevil which is strongly ground-dwelling and found in various warm, open habitats such as sparsely-vegetated grasslands. The larvae feed on plantains, in particular Ribwort Plantain *Plantago lanceolata*. It is a very local species in southern England. A single adult was swept from the banks bordering the car park.

***Bembecia ichneumoniformis* NS** is a day-flying moth which is found in various open habitats on calcareous soils, the larvae feeding on the roots of Common Bird's-foot Trefoil *Lotus corniculatus* and Kidney Vetch *Anthyllis vulneraria*. Widespread in southern Britain, the species has undergone recent range expansion and probably no longer warrants a conservation status. Several adults were swept from areas of *Lotus* on the banks bordering the car park.

3 DISCUSSION AND RECOMMENDATIONS

3.1 Overview

3.1.1 Many sites within the eastern sector of the London area are well known to support a higher than usual invertebrate interest. This nationally important Thames Terrace invertebrate fauna is associated with a unique combination of climatic, geographic, geological and ecological factors, which have only been recognised in recent years.

3.1.2 In contrast, similar sites outside this Thames Gateway area, such as the one under discussion here, tend to have invertebrate faunas which are significantly less rich and may not even be locally important.

- 3.1.3 Despite this, it is clear that the habitats represented at North London Business Park support a reasonable level of intrinsic invertebrate interest and that their loss would contribute to the fragmentation of the wider landscape level habitat mosaic.
- 3.1.4 However, it is equally clear that this invertebrate interest is not uniformly distributed across the site. All but one of the nine species of conservation significance were associated with the banks bordering the car park. These banks not only support a range of host plants for phytophagous invertebrate species, they also present a particularly warm and dry microclimate and are subject to some degree of heat stress, increasing their suitability for heat-loving (thermophilic) ground-dwelling species. They are also flower-rich and act as important foraging areas for solitary bees and wasps.
- 3.1.5 In our opinion these banked areas are the most important feature of the site for invertebrates and we recommend that they are retained and not shaded out by trees.
- 3.1.6 In contrast, the rank and uniform area of semi-neutral grassland to the north of the carpark is of much lower importance to invertebrates, as is the small lake and surrounding habitat.

3.2 Mitigation

- 3.2.1 In the light of any potential losses to invertebrate habitat owing to development, the following mitigation strategies are considered generally appropriate for the site.
- 3.2.2 The creation of banks to provide nesting areas for bees. Bee banks can provide useful habitat for many thermophilic ground-nesting invertebrate species including solitary bees, solitary wasps, beetles and spiders and are best created in south-facing situations. Compacted soil and gravel should be shaped into a mound with various slopes, hollows and angles that may be utilised and favoured by different species. Vertical or very steep banks often take much longer to vegetate due to the greater heat stress they experience and may require less maintenance.
- 3.2.3 Although the Stag Beetle *Lucanus cervus* has not been recorded from the site and no suitable breeding habitat is present, the species is known to be present in the wider environment and has been recorded within a two kilometre radius (Environmental Gain, 2008). The creation of artificial breeding sites (loggeries) for Stag Beetles and other saproxylic invertebrates may therefore be of benefit. Piles of unrotted logs should be constructed using hardwoods, such as oak. The logs should be set upright in a shallow hole approximately 60 cm deep by 3 m square mulched with wood chippings to create a damp microclimate, so that around 1.2 m protrudes above ground level. Log piles should be constructed in semi-shaded locations so the soil does not dry out and periodically topped up with wood chippings.

4 REFERENCES CITED IN THE PREPARATION OF THIS REPORT AND ITS APPENDICES

Ball, S. G. (1986) Terrestrial and freshwater invertebrates with Red Data Book, Notable or habitat indicator status. Invertebrate Site Register internal report number 66. NCC.

Bratton, J.H. (ed) (1991) British Red Data Book: Invertebrates other than insects Book 3. Joint Nature Conservation Committee, Peterborough.

Environmental Gain (2008) Brunswick Park, Barnet: Terrestrial Invertebrate Appraisal Report. Ref: eg0286 Report for WSP Environmental UK.

IUCN (2012a). Guidelines for application of IUCN Red List criteria at regional and national levels: Version 4.0. Gland: IUCN.

IUCN (2012b). IUCN Red List Categories and Criteria: Version 3.1. Second edition. Gland: IUCN. Available at <http://www.iucnredlist.org/technical-documents/categories-and-criteria>

IUCN (2014). Guidelines for Using the Red List Categories and Criteria. Version 11. IUCN Species Survival Commission. IUCN, Gland.

Shirt, D.B. (ed.) (1987). British Red Data Books: 2. Insects. Peterborough: Nature Conservancy Council.

APPENDIX 1: TERRESTRIAL INVERTEBRATE SPECIES RECORDED

National status codes are explained in Appendix 2.

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
ARANEAE	SPIDERS			
Araneidae				
<i>Araniella cucurbitina</i>		LC		spins an orb web in trees and bushes at around 1.5m. Widespread and common.
Pisauridae				
<i>Pisaura mirabilis</i>	Nursery Web Spider	LC		various open habitats. Very common and widespread.
Salticidae				
<i>Heliophanus cupreus</i>		LC		on low vegetation. Common in southern England, very local in the north
Thomisidae				
<i>Xysticus cristatus</i>		LC		on the ground or in low vegetation. Common and widespread throughout much of Britain
COLEOPTERA	BEETLES			
Anobiidae				
<i>Ochina ptinoides</i>		LC		in woody stems of ivy <i>Hedera helix</i> . Common in the southeast, local elsewhere.
Apionidae	Weevils (part)			
<i>Aspidapion aeneum</i>		NE		on <i>Malva sylvestris</i> , the larvae living in the stems. Widespread in Britain
<i>Aspidapion radiolus</i>		NE		on <i>Malva sylvestris</i> , the larvae living in the stems. Widespread in Britain
<i>Ischnoptera pion virens</i>		NE		on various vetches. Fairly common.
<i>Malvapion malvae</i>		NE		in the fruits of Malvaceae, widespread and not uncommon in England and Wales
<i>Oxystoma cerdo</i>		NE	NS(Nb)	associated with vetches. Widespread but local throughout England
<i>Protapion apricans</i>		NE		in seed heads of red clovers - various <i>Trifolium</i> spp. Very common
<i>Protapion trifolii</i>		NE		in flowerheads of <i>Trifolium</i> spp., especially <i>T. pratense</i> . Widespread in England and Wales
<i>Pseudapion rufirostre</i>		NE		in the fruits of <i>Malva</i> spp., widespread and common in England and Wales
Cantharidae	Soldier beetles			
<i>Cantharis rustica</i>		LC		various lowland grasslands. Predatory. Widespread throughout Britain
Cerambycidae	Longhorn beetles			
<i>Pseudovadonia livida</i>		NE		larvae feed in dead wood of deciduous and coniferous trees
<i>Rutpela maculata</i>		NE		larvae feed in decaying tree stumps; adults wander and are found at flowers
Chrysomelidae	Leaf beetles			
<i>Bruchidius varius</i>		NA		Various habitats; adults feed mainly on pollen of clovers, larvae probably within clover seeds
<i>Bruchus loti</i>		LC		Various habitats; adults feed mainly on pollen of legumes, larvae probably within legume seeds
<i>Crepidodera aurea</i>		LC		Various habitats; adults feed on leaves <i>Populus</i> , larvae develop at the roots

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
<i>Longitarsus pellucidus</i>		LC		Various habitats; adults feed on the leaves of Convolvulaceae bindweeds, larvae develop in the roots
<i>Longitarsus suturellus</i>		LC		Wide range of habitats; adults feed on leaves of many Asteraceae, larvae found at the roots of groundsel <i>Senecio vulgaris</i> and possibly also colt-s-foot <i>Tussilago farfara</i>
<i>Sphaeroderma rubidum</i>		LC		Wide range of habitats; adults feed on leaves of Asteraceae, larvae mine leaves
Coccinellidae	Ladybirds			
<i>Adalia bipunctata</i>	2-spot ladybird	NE		a ubiquitous species associated with a wide variety of deciduous trees
<i>Adalia decempunctata</i>	10-spot ladybird	NE		a ubiquitous species associated with a wide variety of deciduous trees
<i>Calvia quattuordecimguttata</i>	Cream-spot ladybird	NE		associated with deciduous trees and most commonly found in woodland
<i>Coccinella septempunctata</i>	7-spot ladybird	NE		a ubiquitous species
<i>Harmonia axyridis</i>	Harlequin ladybird	NE		a recent arrival (2003) that has rapidly spread - a ubiquitous generalist species
<i>Platynaspis luteorubra</i>		NE	NS(Na)	amongst low-growing vegetation on dry chalky and sandy habitats occupied by ants
<i>Psyllobora 22-punctata</i>	22-spot ladybird	NE		on low vegetation in grassland habitats - feeds on mildews on leaves
<i>Scymnus frontalis</i>		NE		on low plants in heathland and other dry habitats on chalky or sandy soils
Curculionidae	Weevils (part)			
<i>Curculio venosus</i>		NE		on oak, larvae in acorns. Widespread in southern and central England.
<i>Hypera nigrirostris</i>		NE		on <i>Trifolium</i> , usually <i>T. pratense</i> . Common throughout Britain.
<i>Hypera postica</i>		NE		favours black meddick <i>Medicago lupulina</i> in open habitats. Widespread in England and Wales
<i>Mecinus pascuorum</i>		NE		on <i>Plantago lanceolata</i> . Widespread and often common.
<i>Mecinus pyraeter</i>		NE		feeds on common species of plantain in grassy places. Widespread and common.
<i>Orchestes signifer</i>		NE		usually on oak species. Fairly common and widely distributed in southern England and Wales.
<i>Pachyrhinus lethierryi</i>		NE		arboreal introduction on <i>Cupressus</i> , widespread in southern Britain
<i>Sitona humeralis</i>		NE		various open habitats, primarily associated with <i>Medicago</i> species. Local in England and Wales
<i>Sitona lineatus</i>		NE		on most species of leguminosae mainly in grassland. Very common and widespread
<i>Trichosirocalus rufulus</i>		NE	NS(Na)	on plantains in sparsely-vegetated grasslands. Very local in southern England
<i>Trichosirocalus troglodytes</i>		NE		on ribwort plantain <i>Plantago lanceolata</i> . Widespread and common throughout much of Britain
<i>Tychius picirostris</i>		NE		in grassy places on white clover <i>Trifolium repens</i> . Widespread in England and Wales, local further north
Dermestidae				
<i>Anthrenus verbasci</i>		NA		larvae feed on the dry remains of insects and are a notorious pest in museum collections. Adults often on flowers. Widespread and common.
Elateridae	Click beetles			
<i>Kibunea minuta</i>		NE		Black click beetle. Dry grassland. Larvae are wireworms at grass roots. Widespread but local.

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Latridiidae				
<i>Enicmus histrio</i>		NE		in plant debris. Widespread but local.
Malachiidae	Malachite beetles			
<i>Malachius bipustulatus</i>		LC		Adults feed on pollen and nectar; larvae are active predators on tree trunks. Widespread in England and Wales
Mordellidae				
<i>Mordellistena parvula</i>		LC	NS	associated with Artemisia and possibly other plants. Widespread but local in southern England and parts of Wales
Nitidulidae				
<i>Meligethes aeneus</i>		NE		A small pollen beetle. Very common species, feeding in a very wide variety of Brassicaceae
<i>Meligethes carinulatus</i>		NE		in the flowers of Lotus corniculatus. Widespread and common.
Oedemeridae				
<i>Oedemera lurida</i>		LC		The larvae develop in the old stems of various plants. Widespread and common throughout England and Wales
<i>Oedemera nobilis</i>		LC		The larvae develop in the old stems of various plants. Widespread and common throughout England and Wales
Phalacridae				
<i>Olibrus affinis</i>		NE		larvae develop on various composites, particularly Tragopogon and Hypochaeris, adults feeding on pollen. Primarily southern
Scaptiidae				
<i>Anaspis maculata</i>		LC		larvae in dead wood, adults frequently on hawthorn blossom. Widespread in England and Wales
<i>Anaspis pulicaria</i>		LC		Larvae may develop in stems of herbaceous or semi-woody plants; found in more open situations, including herb-rich coastal grasslands & road verges; adults attracted to umbellifer blossom. Widespread
DERMAPTERA	EARWIGS			
Forficulidae				
<i>Forficula auricularia</i>	Common Earwig	LC		Ubiquitous
DIPTERA	FLIES			
Asilidae	Robber flies			
<i>Dioctria baumhaueri</i>		LC		predatory; woodland edge and scrub, widespread in southern Britain but rare in Wales
<i>Dioctria rufipes</i>		LC		predatory; scrubby grassland and woodland margins, widespread throughout Britain
<i>Leptogaster cylindrica</i>		LC		predatory; dry grassland, larvae in sandy soil. Widespread in southern Britain
Empididae				
<i>Empis livida</i>		NE		Large, predatory fly typically seen visiting flowers in mid-summer. Common and widespread.
Ptychopteridae	Crane flies			
<i>Ptychoptera contaminata</i>		NE		water margins, ditches, ponds, lakes, and sluggish rivers, larvae aquatic. Local in England (mainly southern) and Wales.
Stratiomyidae	Soldier flies			
<i>Chloromyia formosa</i>		LC		woods, hedges, parks and gardens, larvae in rotting vegetable matter in damp soil, rotting bark and leaf litter. Widespread throughout much of Britain
<i>Pachygaster atra</i>		LC		hedgerows and woodland margins, larvae in rotting organic matter. Widely distributed and common.
Syrphidae	Hoverflies			
<i>Cheilosia latifrons</i>		LC		Dry grasslands, larval host plant unknown. Widespread but local throughout Britain

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
<i>Cheilosia pagana</i>		LC		various habitats, larvae develop in the root bases of <i>Anthriscus sylvestris</i> . Widespread throughout Britain
<i>Episyrphus balteatus</i>		LC		various habitats, larvae predatory on aphids. Very common and widespread
<i>Eristalis arbustorum</i>		LC		various habitats, larvae aquatic. Widespread throughout Britain
<i>Eupeodes corollae</i>		LC		gardens, grassland, hedgerows and woodland edge. Larvae predatory on aphids. Widespread throughout Britain
<i>Eupeodes luniger</i>		LC		gardens, grassland, hedgerows and woodland edge. Larvae predatory on aphids. Widespread throughout Britain
<i>Paragus haemorrhous</i>		LC		short grassland and sparsely vegetated, dry situations, larvae are predatory on aphids. Widespread throughout southern Britain
<i>Pipizella viduata</i>		LC		various dry habitats, associated with various root aphids. Widespread throughout Britain
<i>Sphaerophoria scripta</i>		LC		various grasslands, larvae feeding on aphids on herbaceous plants. Widespread in southern Britain
<i>Syrritta pipiens</i>		LC		various habitats including urban areas, larvae develop in rotting organic matter. Widespread throughout Britain
<i>Xanthogramma pedissequum</i>		LC		grassland and woodland rides, larvae in nests of <i>Lasius flavus</i> and <i>L. niger</i> , feeding on aphids. Widespread in southern Britain
Tachinidae				
<i>Gymnosoma nitens</i>		NE	RDB1	a larval parasitoid of the ground-dwelling pentatomid shieldbug <i>Sciocoris cursitans</i> , itself a nationally scarce species found in southern England.
Tephritidae	Picture-winged flies			
<i>Acinia corniculata</i>		NE	RDB1	larvae develop in the seedheads of <i>Centaurea nigra</i> . Local in southern and central England
<i>Anomoia purmunda</i>		NE		various open habitats, larvae develop in the fruits of <i>Crataegus</i> . Widespread in southern Britain
<i>Chaetostomella cylindrica</i>		NE		various grasslands, larvae in the flowerheads of <i>Centaurea nigra</i> and various thistles. Widespread throughout Britain
<i>Tephritis vespertina</i>		NE		various open habitats, larvae form a gall in the flower head of <i>Hypochoeris radicata</i> . Throughout Britain
<i>Urophora quadrifasciata</i>		NE		various grasslands, larvae develop in the flower head of <i>Centaurea nigra</i> and probably <i>C. debeauxii</i> . Southern Britain
<i>Urophora stylata</i>		NE		various grasslands, larvae in a gall formed in the flower head of thistles. Widespread in southern Britain
<i>Xyphosia miliaria</i>		NE		grasslands, larvae in flower heads of various thistles. Throughout Britain
HEMIPTERA	TRUE BUGS			
Aphrophoridae	Froghoppers			
<i>Aphrophora alni</i>		NE		adults are found on a wide range of trees and shrubs and low vegetation; nymphs feed in froth-lumps on a wide range of plants.
<i>Neophilaenus campestris</i>		NE		on grasses in dry open habitats.
<i>Philaenus spumarius</i>	Common Froghopper	NE		Ubiquitous on a very wide range of herbaceous plants
Cicadellidae	Leafhoppers			
<i>Alebra albostrigata</i>		NE		on oak
<i>Aphrodes makarovi</i>		NE		on herbs in moist eutrophic habitats, particularly <i>Urtica dioica</i>
<i>Arthaldeus pascuellus</i>		NE		in moist grasslands on a range of grasses
<i>Cicadula persimilis</i>		NE		in various dry grasslands
<i>Deltocephalus pulicaris</i>		NE		on grasses in various grassland types
<i>Eupelix cuspidata</i>		NE		strongly terrestrial. In dry grasslands

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
<i>Eupteryx aurata</i>		NE		on a wide range of low-growing plants, including <i>Urtica dioica</i>
<i>Eupteryx melissae</i>		NE		polyphagous on low-growing plants but associated chiefly with Lamiaceae
<i>Iassus lanio</i>		NE		usually on oaks
<i>Oncopsis alni</i>		NE		on alder
<i>Oncopsis carpini</i>		NE		on hornbeam
<i>Oncopsis flavicollis</i>		NE		on birches
<i>Oncopsis subangulata</i>		NE		on birches
<i>Oncopsis tristis</i>		NE		on birches
<i>Populicerus albicans</i>		NE		On <i>Populus alba</i>
<i>Rhopalopyx elongata</i>		NE		on grasses
<i>Streptanus sordidus</i>		NE		at the base of various grasses
Cixiidae				
<i>Tachycixius pilosus</i>		NE		nymphs develop at the base of grasses in dry places, adults on low vegetation, bushes and trees
Delphacidae				
<i>Dicranotropis hamata</i>		NE		on various grasses in a wide range of situations
Psyllidae	Psyllids			
<i>Psylla alni</i>		NE		on alder; common throughout Britain.
<i>Psyllopsis fraxini</i>		NE		on ash. It is common and widely distributed throughout Britain.
Acanthosomatidae	Shieldbugs (part)			
<i>Elasmucha grisea</i>	Parent Bug	LC		Deciduous woodland and scrub, feeding on catkins of <i>Betula</i> and <i>Alnus</i>
Anthocoridae				
<i>Anthocoris confusus</i>		NE		Predatory species, on a range of deciduous trees, particularly <i>Quercus</i>
<i>Anthocoris nemoralis</i>		NE		Predatory species, on a range of deciduous trees
<i>Orius niger</i>		NE		Predatory species, on various trees and herbaceous species
Coreidae				
<i>Coriomeris denticulatus</i>	Denticulate Leatherbug	LC		Mainly ground-dwelling. Sparsely-vegetated dry grasslands and ruderal habitats, principally on <i>Medicago</i> and other legumes
Lygaeidae	Ground bugs			
<i>Kleidocerys resedae</i>		NE		On <i>Betula</i> , <i>Alnus</i> and occasionally <i>Rhododendron</i>
<i>Nysius huttoni</i>		NE		Strongly ground-dwelling. Dry grasslands and sparsely vegetated habitats. Polyphagous on a range of plant species. Known as the 'Wheat Bug' in New Zealand but unlikely to become a crop pest in Britain
<i>Peritrechus geniculatus</i>		NE		Strongly ground-dwelling. Dry grasslands and sparsely vegetated habitats. Probably polyphagous on various plant species.
Miridae	Plant bugs			
<i>Amblytylus nasutus</i>		NE		Dry grasslands; polyphagous on a range of grasses.
<i>Atractotomus mali</i>		NE		On <i>Malus</i> and <i>Crataegus</i>
<i>Capsus ater</i>		NE		Dry grassland, polyphagous on a range of grasses
<i>Chlamydatus saltitans</i>		NE		Strongly ground-dwelling. Warm, dry sparsely-vegetated habitats on various legumes
<i>Closterotomus norwegicus</i>		NE		Polyphagous on various herbaceous plants in various open habitats
<i>Closterotomus trivialis</i>		NE		Polyphagous on various herbaceous plants, mostly in synanthropic habitats
<i>Deraeocoris flavilinea</i>		NE		Predatory species. On various deciduous trees
<i>Deraeocoris lutescens</i>		NE		Predatory species. On various deciduous trees

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
<i>Leptopterna dolabrata</i>		NE		Ubiquitous in various grassland habitats and polyphagous on a range of grass species
<i>Leptopterna ferrugata</i>		NE		Dry grasslands; polyphagous on a range of grass species
<i>Liocoris tripustulatus</i>		NE		Ubiquitous on <i>Urtica dioica</i>
<i>Lygus pratensis</i>		NE	RDB3	In dry open habitats on a range of Asteraceae
<i>Neolygus populi</i>		NE		On <i>Populus</i> species
<i>Notostira elongata</i>		NE		Polyphagous on various grasses
<i>Orthotylus viridinervis</i>		NE		On <i>Ulmus glabra</i>
<i>Phylus coryli</i>		NE		On <i>Corylus avellana</i>
<i>Phylus melanocephalus</i>		NE		On <i>Quercus</i> species
<i>Pinalitus cervinus</i>		NE		On a variety of deciduous trees and <i>Hedera helix</i>
<i>Plagiognathus arbustorum</i>		NE		Ubiquitous on <i>Urtica dioica</i>
<i>Psallus ambiguus</i>		NE		On a variety of deciduous trees, including <i>Malus</i> , <i>Crataegus</i> and <i>Alnus</i>
<i>Psallus assimilis</i>		NE		On <i>Acer campestre</i>
<i>Psallus perrisi</i>		NE		On <i>Quercus</i> species
<i>Psallus salicis</i>		NE		On <i>Alnus</i>
<i>Psallus varians</i>		NE		On <i>Quercus</i> species
<i>Rhabdomiris striatellus</i>		NE		On <i>Quercus</i> species
<i>Stenodema laevigata</i>		NE		Polyphagous on various grasses
<i>Sthenarus rotermundi</i>		NE		On <i>Populus alba</i>
Nabidae	Damsel bugs			
<i>Himacerus mirmicoides</i>		NE		Strongly ground-dwelling. Predatory species in a range of dry, open habitats, often with sparse vegetation
<i>Nabis rugosus</i>		NE		Predatory species in a range of grasslands
Pentatomidae	Shieldbugs (part)			
<i>Aelia acuminata</i>	Bishop's Mitre Shieldbug	LC		Dry grasslands, polyphagous on a range of grass species
<i>Dolycoris baccarum</i>	Hairy Shieldbug	LC		Ruderal habitats; polyphagous on a wide range of herbaceous plants
<i>Eurydema oleracea</i>	Brassica Shieldbug	LC		Grasslands and ruderal habitats on a range of Brassicaceae
<i>Palomena prasina</i>	Common Green Shieldbug	LC		Grasslands and scrub, polyphagous on a very wide range of plants
<i>Pentatoma rufipes</i>	Red-Legged Shieldbug	LC		Deciduous woodland and scrub; polyphagous but particularly associated with <i>Quercus</i>
Rhopalidae				
<i>Corizus hyoscyami</i>		LC		Ruderal habitats, polyphagous on a range of composites
<i>Rhopalus subrufus</i>		LC		Grasslands and ruderal habitats on a variety of herbs, including <i>Hypericum</i> , <i>Geranium</i> and <i>Marjorum</i>
Scutelleridae				
<i>Eurygaster testudinaria</i>	Tortoise Shieldbug	LC		Grasslands and ruderal habitats; polyphagous on a range of grasses and composites.
Tingidae				
<i>Kalama tricornis</i>		NE		Strongly ground-dwelling. A variety of grasslands and sparsely vegetated habitats. Presumably polyphagous.
HYMENOPTERA				
Andrenidae	Bees (part)			
<i>Andrena flavipes</i>		NE		various habitats on light soils; nesting in large but very compact aggregations in the ground. Double brooded. Locally common in southern Britain.
<i>Andrena labialis</i>		NE		collects pollen entirely from legumes, including clovers and trefoils. Widespread but local in southern Britain.

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
<i>Andrena minutula</i>		NE		nests in the ground in a range of open, particularly disturbed, sites. Double brooded. Widespread and common.
<i>Andrena semilaevis</i>		NE		nests in the ground in a range of open, particularly disturbed, sites. Double brooded. Widespread and common in southern Britain.
<i>Andrena wilkella</i>		NE		nests in sandy grassland and heathland, collecting pollen mainly from legumes. Locally common in England and Wales
Apidae	Bees (part)			
<i>Apis mellifera</i>		NE		a domesticated species, although colonies may persist in the wild for a few years in hollow trees and other structures.
<i>Bombus hypnorum</i>		NE		A bumblebee which colonised southern England in the late 1990s and is now well established. Often found in gardens. Nests in holes in trees and bird boxes.
<i>Bombus lapidarius</i>		NE		Various habitats, nesting underground. Very widespread and common throughout Britain.
<i>Bombus pascuorum</i>		NE		Various habitats, nesting under dense vegetation. Very common and widespread throughout Britain.
<i>Bombus pratorum</i>		NE		Widely distributed and common.
<i>Bombus terrestris</i>		NE		Various habitats, nesting underground. Very widespread and common in lowland Britain.
<i>Nomada fabriciana</i>		NE		cuckoo bee of various <i>Andrena</i> species, especially <i>A. bicolor</i> . Widespread and locally common.
<i>Nomada flavoguttata</i>		NE		cuckoo bee of smaller <i>Andrena</i> species (eg. <i>A. minutula</i>). Widespread and locally common.
Halictidae	Bees (part)			
<i>Halictus tumulorum</i>		NE		a ground-nesting species, exploiting various habitats on light soils. Widespread and common.
<i>Lasioglossum calceatum</i>		NE		various habitats, nesting in the ground on light soils. Widespread and common.
Colletidae	Bees (part)			
<i>Hylaeus communis</i>		NE		a wide range of lowland habitats, nesting in holes and dead stems. Widespread in southern Britain
<i>Hylaeus dilatatus</i>		NE		principally in calcareous habitats, nesting in dead stems. Locally common in southern England.
Megachilidae				
<i>Megachile willughbiella</i>		NE		Leafcutter. Various habitats, including gardens, nesting in holes. Common in southern Britain.
<i>Osmia caerulescens</i>		NE		various habitats including urban areas, nesting in holes. Widespread but local in southern Britain.
Crabronidae	Solitary wasps (part)			
<i>Crossocerus podagricus</i>		NE		various open habitats, nests in holes in dead wood and stocks burrow with small Diptera. Widespread in England and Wales
Chrysididae	Jewel wasps			
<i>Pseudomalus auratus</i>		NE		cleptoparasite of solitary wasps such as <i>Pemphredon</i> and <i>Trypoxylon</i> spp. which nest in stems or holes. Widespread throughout much of Britain
Eumenidae	Solitary wasps (part)			
<i>Ancistrocerus gazella</i>		NE		various habitats, nests in stems, prey are Lepidopteran larvae. Widespread and common in southern Britain north to Yorks,
Formicidae	Ants			

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
<i>Formica fusca</i>		NE		various open habitats. Common throughout southern Britain, but rare in Scotland.
<i>Lasius niger</i>		NE		numerous habitats including gardens. Widely distributed, but absent from some parts of Scotland.
<i>Myrmica scabrinodis</i>		NE		various open habitats which are not too dry. Widespread in Britain
Cephalidae	Sawflies (part)			
<i>Calameuta pallipes</i>		NE		Widely distributed in England and Wales and occurring as far north as central Scotland. Adults can be found from May to July. Larvae have not been recorded so the foodplant is not known.
<i>Cephus spinipes</i>		NE		Common in southern England but much more scarce in the north. The larvae are stem borers of various common grasses.
Tenthredinidae	Sawflies (part)			
<i>Tenthredopsis coqueberti</i>		NE		
ISOPODA				
Armadillidiidae				
<i>Armadillidium vulgare</i>		LC		In most habitats in south-eastern England but more restricted further north.
LEPIDOPTERA	BUTTERFLIES & MOTHS			
Crambidae				
<i>Chrysoteuchia culmella</i>		NE		dry grassland, larvae feed on various grasses. Widespread throughout Britain
Erebidae				
<i>Euclidia glyphica</i>	Burnet Companion	NE		Downland, woodland rides and clearings, the larva feeding on <i>Trifolium</i> spp. and <i>Lotus</i> spp. Local throughout Britain
<i>Tyria jacobaeae</i>	Cinnabar	NE	S41	various open habitats; larvae on ragworts. Widespread throughout much of Britain
Gracillariidae				
<i>Cameraria ohridella</i>	Horse Chestnut Leaf Miner	NE		larvae mine the leaves of horse chestnut. First found in Britain in 2002 and now widespread in England and Wales
Lycaenidae				
<i>Polyommatus icarus</i>	Common Blue	LC		various open habitats. larvae feed on various herbaceous legumes. Widespread throughout Britain
Nymphalidae				
<i>Maniola jurtina</i>	Meadow Brown	LC		various grasslands, very common throughout Britain
Pieridae				
<i>Pieris brassicae</i>	Large White	LC		various habitats, larvae feed on Brassicaceae. Widespread throughout Britain
Pyralidae				
<i>Aphomia sociella</i>		NE		The caterpillars of this moth feed on the comb of bumble-bees and wasps.
<i>Euzophera pinguis</i>		NE		woodlands and hedgerows, larvae in the wood of ash. Local in England and Wales
<i>Homoeosoma sinuella</i>		NE		various dry open habitats, larvae feeding in the roots of plantains. Southern and central England and south Wales
Sesiidae				
<i>Bembecia ichneumoniformis</i>	Six-belted Clearwing	NE	NS(Nb)	calcareous habitats mainly on <i>Lotus corniculatus</i> . Local in southern Britain
Tischeriidae				
<i>Coptotriche marginata</i>		NE		larvae mine the leaves of bramble; widespread throughout Britain
Tortricidae				

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
<i>Aleimma loeflingiana</i>		NE		woodland and scrub, larvae feed primarily on oak. Widespread throughout Britain
<i>Dichrorampha petiverella</i>		NE		grasslands, larvae feed on Yarrow. Widespread in Britain
<i>Dichrorampha plumbana</i>		NE		0
<i>Epinotia nisella</i>		NE		various open habitats, larvae feed on sallows and poplars. Widespread throughout Britain
<i>Hedya nubiferana</i>		NE		0
<i>Pammene aurita</i>		NE		woodland and parkland, larvae feed on sycamore. Widespread in southern Britain
Peleopodidae				
<i>Carcina quercana</i>		NE		woodlands, larvae feeding on the leaves of various trees, particularly oaks. Widespread throughout Britain
Yponomeutidae				
<i>Argyresthia cupressella</i>		NE		gardens, larvae feed on Cypresses and Juniper. A recent arrival (1997). Local in parts of England and Wales
ODONATA	DRAGONFLIES & DAMSELFLIES			
Aeshnidae				
<i>Aeshna mixta</i>	Migrant Hawker	LC		ponds and lakes with well vegetated margins, avoiding acidic water bodies. Widespread in England and Wales
Coenagrionidae				
<i>Ischnura elegans</i>	Blue-tailed Damselfly	LC		generalist; all types of still and slow moving water. Widespread and very common in England and Wales, rather more restricted in Scotland
Libellulidae				
<i>Libellula depressa</i>	Broad-bodied Chaser	LC		well-vegetated water bodies including garden ponds. It can tolerate mildly polluted conditions. Widespread throughout England and Wales
ORTHOPTERA	GRASSHOPPERS & BUSH CRICKETS			
Acrididae				
<i>Chorthippus brunneus</i>	Field Grasshopper	LC		various dry grasslands. Generally common over the whole of Britain.
<i>Chorthippus parallelus</i>	Meadow Grasshopper	LC		all types of moderately long grassland, particularly in moister areas. Very widely distributed and common.
Meconematidae				
<i>Meconema thalassinum</i>	Oak Bush Cricket	LC		deciduous woodland, in the north mainly on limestone. Widespread and common in southern Britain.
Tettigoniidae				
<i>Metriopectera roeselii</i>	Roesel's Bush Cricket	LC		usually found in long grassland. Historically scarce but now widespread in southern and central England.
PSOCOPTERA				
Stenopodidae				
<i>Graphopsocus cruciatus</i>		NE		Frequent on deciduous trees

APPENDIX 2: INVERTEBRATE STATUS CODES

The new IUCN status codes

Many British invertebrate species have been assigned a formal status code. These codes are paramount in the definition of noteworthy species and accordingly, it is necessary to explain them here.

Natural England has recently instigated a new programme of invertebrate status reviews, in which species are assessed according to universally accepted criteria set by the International Union for the Conservation of Nature (IUCN) (IUCN 2012a, 2012b, 2014). In contrast to previous status assessments, which focussed largely on absolute rarity, the IUCN approach places each species into a threat category that also takes historic population trends into account. Species qualifying for a threat status (Critically Endangered, Endangered or Vulnerable) are those that are not only rare, but also have a history of decline or extreme population fluctuations. Species not assigned to a threat category are categorised as Near Threatened, Least Concern, Data Deficient or Not Applicable.

As of 2016, a total of almost 4000 species have been reviewed in accordance with IUCN guidelines. All of these belong to groups that have readily available identification keys, active recorders and a history of recording. Progress with the IUCN invertebrate status review programme has recently been afforded a very useful summary (Webb & Brown, 2016).

A key to the IUCN status codes is given below and summarised in Fig. 1.

REGIONALLY EXTINCT (RE)

A taxon is Extinct when there is no reasonable doubt that the last individual has died.

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Table 1). Critically Endangered species that are likely to be Extinct, but for which confirmation is still required are reported as Critically Endangered (Possibly Extinct), abbreviated as CR(PE).

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Table 1).

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Table 1).

NEAR THREATENED (NT)

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate.

NOT EVALUATED (NE)

A taxon is Not Evaluated when it has not yet been evaluated against the criteria.

NOT APPLICABLE (NA)

This category is typically used for introduced non-native species whether this results from accidental or deliberate importation. It may also be used for recent colonists (or attempted colonists) responding to the changing conditions available in Britain as a result of human activity and/or climate change. The IUCN regard 1500 as the cut-off date after which a species is classed as 'non-native'.

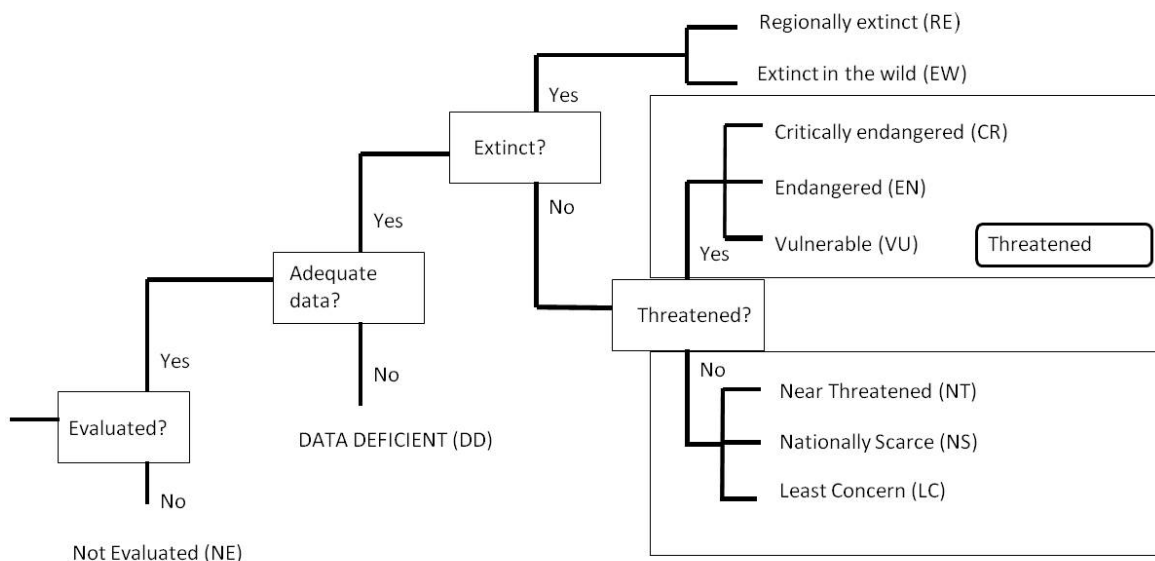


Fig. 1. Hierarchical relationships of the categories

Taxa listed as Critically Endangered, Endangered or Vulnerable are defined as Threatened (Red List) species. For each of these threat categories there is a set of five main criteria A-E, with a number of sub-criteria within A, B and C (and an additional sub-criterion in D for the Vulnerable category), and one of which qualifies a taxon for listing at that level of threat. The qualifying thresholds within the criteria A-E differ between threat categories and are summarised in Table 1.

Table 1. Summary of the thresholds for the IUCN Criteria

Criterion	Main thresholds		
	<i>Critically Endangered</i>	<i>Endangered</i>	<i>Vulnerable</i>
A. Rapid decline	>80% over 10 years or 3 generations in past or future	>50% over 10 years or 3 generations in past or future	>30% over 10 years or 3 generations in past or future
B. Small range + fragmented, declining or fluctuating	Extent of occurrence <100 km ² or area of occupancy <10 km ² + two of the following: - severely fragmented or only a single location - continuing decline - extreme fluctuations	Extent of occurrence <5,000 km ² or area of occupancy <500 km ² + two of the following: - severely fragmented or no more than 5 locations - continuing decline - extreme fluctuations	Extent of occurrence <20,000 km ² or area of occupancy <2,000 km ² + two of the following: - severely fragmented or no more than 10 locations - continuing decline - extreme fluctuations
C. Small population and declining	<250 mature individuals, population declining	<2,500 mature individuals, population declining	<10,000 mature individuals, population declining
D. Very small population	<50 mature individuals	<250 mature individuals	D1. <1,000 mature individuals
D2. Very small area of occupancy			D2. <20 km ² or 5 or fewer locations
E. Quantifiable probability of extinction	>50% within 10 years or three generations	>20% within 20 years or five generations	>10% within 100 years

Curent GB rarity codes (IUCN assessed species)

The IUCN reviews also provide an assessment of rarity, based purely on the number of hectads (10km x 10km squares) in which any given species occurs. Two categories are defined:

Nationally Rare (NR)

Species recorded from between 1 and 15 hectads within a given date class when there is reasonable confidence that exhaustive recording would not find them in more hectads.

Nationally Scarce (NS)

Species recorded from between 16 and 100 hectads within a given date class when there is reasonable confidence that exhaustive recording would not find them in more hectads.

Broadly speaking, the Nationally Rare category is equivalent to the Red Data Book categories used by Shirt (1987) and Bratton (1991), namely: Endangered (RDB1), Vulnerable (RDB2), Rare (RDB3) and Insufficiently Known (RDBK). The Nationally Scarce category is directly equivalent to the combined Nationally Notable A (Na) and Nationally Notable B (Nb) categories introduced by the Nature Conservancy Council (Ball, 1986).

Curent GB rarity codes (Non-IUCN assessed species)

For species not yet evaluated against the IUCN criteria, the most recent conservation status assessment is given, as specified by the Red Data Book categories (Shirt, 1987; Bratton, 1991) and Nationally Notable categories (Ball, 1986):

RDB1 (Endangered)

Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. These include:

- Species known from only a single locality since 1970.
- Species restricted to habitats that are especially vulnerable.
- Species which have shown a rapid and continuous decline in the last 20 years and are now estimated to exist in 5 or fewer localities.
- Species believed extinct but which would need protection if re-discovered.

RDB2 (Vulnerable)

Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. These include:

- Species declining throughout their range.
- Species in vulnerable habitats.
- Species whose populations are low.

RDB3 (Rare)

Taxa with small populations that are not at present endangered or vulnerable but which are at risk. These include:

- Species that are estimated to occur in 15 or fewer localities.

RDBK (Insufficiently known)

Taxa suspected to fall within the RDB categories but which are insufficiently known to enable placement.

RDBi (Indeterminate)

Taxa believed to qualify as either RDB1, RDB2 or RDB3 but which cannot be reliably placed into any category.

pRDB (Provisional)

The prefix 'p' before any Red Data Book category implies that the grading is provisional., pending the publication of a future edition of the Red Data Book.

Nationally Scarce species are those falling within the Nationally Notable categories introduced by Ball (1986). They are species that are estimated to occur within the range of 16 to 100 ten-kilometre squares of the British National Grid system since 1970. Notable species are subdivided as follows:

NS (Na)

Species estimated to occur within the range of 16 to 30 10-kilometre squares of the National Grid System, or for less well-recorded groups, within seven or fewer vice counties.

NS (Nb)

Species estimated to occur within the range 31 to 100 10-kilometre squares of the National Grid System, or for less well-recorded groups, between eight and 20 vice counties.

NS (N)

Species estimated to occur in 16 to 100 10 km squares in Great Britain. The subdividing of this category into Nationally Scarce A and Nationally Scarce B has not been attempted for some species because of either the degree of recording that has been carried out in the group to which the species belongs, or because there is some other reason why it is not possible to be so exact.

Recent provisional status assessments

Certain poorly-recorded Dipteran groups have been subject to recent status assessment which is not based on comparisons of hectad data over two time periods (Falk et. al, 2016). This review uses IUCN status terminology with the added prefix 'p' (e.g. pVulnerable and pNationally Scarce) to indicate that these are provisional assessments based on data which would be insufficient for a formal IUCN status review. The category 'Data Deficient' (DD) is included.

APPENDIX 2 RELEVANT LEGISLATION AND POLICY

LEGISLATION

Current key legislation relating to ecology includes the Wildlife and Countryside Act 1981 (as amended)⁹; The Conservation of Habitats and Species Regulations 2019 ('Habitats & Species Regulations')¹⁰, The Countryside and Rights of Way Act 2000 (CRoW Act)¹¹, and The Natural Environment and Rural Communities Act, 2006¹².

The Conservation of Habitats and Species Regulations 2019

The Conservation of Habitats & Species Regulations replace The Conservation (Natural Habitats, etc.) Regulations 1994 (as amended)¹³, and transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora ('EU Habitats Directive')¹⁴, and Council Directive 79/409/EEC on the Conservation of Wild Birds ('Birds Directive')¹⁵ into UK law (in conjunction with the Wildlife and Countryside Act).

Regulation 43 and 47 respectively of the Conservation of Habitats & Species Regulations makes it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2 (European protected species of animals), or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 5 (European protected species of plant). Development that would contravene the protection afforded to European protected species requires a derogation (in the form of a licence) from the provisions of the Habitats Directive.

Regulation 63 (1) states: 'A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which —

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects); and

(b) is not directly connected with or necessary to the management of that site;

must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.'

Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in Great Britain. This legislation is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats¹⁶ (the 'Bern Convention') and the Birds Directive and EU Habitats Directive are implemented in Great Britain.

The Countryside and Rights of Way Act 2000

The Wildlife and Countryside Act has been updated by the CRoW Act. The CRoW Act amends the law relating to nature conservation and protection of wildlife. In relation to

threatened species it strengthens the legal protection and adds the word 'reckless' to the offences of damaging, disturbing, or obstructing access to any structure or place a protected species uses for shelter or protection, and disturbing any protected species whilst it is occupying a structure or place it uses for shelter or protection.

The Natural Environment and Rural Communities Act 2006

The Natural Environment and Rural Communities Act 2006 states that every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. Biodiversity Action Plans provide a framework for prioritising conservation actions for biodiversity.

Section 41 of the Natural Environment and Rural Communities Act requires the Secretary of State to publish a list of species of flora and fauna and habitats considered to be of principal importance for the purpose of conserving biodiversity. The list, a result of the most comprehensive analysis ever undertaken in the UK, currently contains 1,149 species, including for example, hedgehog (*Erinaceus europaeus*), and 65 habitats that were listed as priorities for conservation action under the now defunct UK Biodiversity Action Plan¹⁷ (UK BAP). Despite the devolution of the UK BAP and succession of the UK Post-2010 Biodiversity Framework¹⁸ (and Biodiversity 2020 strategy¹⁹ in England), as a response to the Convention on Biological Diversity's (CBD's) Strategic Plan for Biodiversity 2011-2020²⁰ and EU Biodiversity Strategy (EUBS)²¹, this list (now referred to as the list of Species and Habitats of Principal Importance in England) will be used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 41 of the Natural Environment and Rural Communities Act 2006 'to have regard' to the conservation of biodiversity in England, when carrying out their normal functions.

Biodiversity Action Plans

Non-statutory Biodiversity Action Plans (BAPs) have been prepared on a local and regional scale throughout the UK over the past 15 years. Such plans provide a mechanism for implementing the government's broad strategy for conserving and enhancing the most endangered ('priority') habitats and species in the UK for the next 20 years. As described above the UK BAP was succeeded in England by Biodiversity 2020 although the list of priority habitats and species remains valid as the list of *Species of Principal Importance for Nature Conservation*.

Regional and local BAPs are still valid however and continue to be updated and produced.

Detail on the relevant BAPs for this site are provided in the main text of this report.

Legislation Relating to Nesting Birds

Nesting birds, with certain exceptions, are protected from intentional killing, destruction of nests and destruction/taking of eggs under the Wildlife and Countryside Act 1981 (as amended) and the CRow Act. Any clearance of dense vegetation should therefore be undertaken outside of the nesting bird season, taken to run conservatively from March

to August (inclusive), unless an ecologist confirms the absence of active nests prior to clearance.

Legislation Relating to Bats

All UK bats and their roosts are protected by law. Since the first legislation was introduced in 1981, which gave strong legal protection to all bat species and their roosts in England, Scotland and Wales, additional legislation and amendments have been implemented throughout the UK.

Six of the 18 British species of bat have Biodiversity Action Plans (BAPs) assigned to them, which highlights the importance of specific habitats to species, details of the threats they face and proposes measures to aid in the reduction of population declines.

Although habitats that are important for bats are not legally protected, care should be taken when dealing with the modification or development of an area if aspects of it are deemed important to bats such as flight corridors and foraging areas.

The Wildlife & Countryside Act 1981 (WCA) was the first legislation to provide protection for all bats and their roosts in England, Scotland and Wales (earlier legislation gave protection to horseshoe bats only.)

All eighteen British bat species are listed in Schedule 5 of the Wildlife and Countryside Act, 1981 and under Annex IV of the Habitats Directive, 1992 as a European protected species. They are therefore fully protected under Section 9 of the 1981 Act and under Regulation 43 of the Conservation of Habitats and Species Regulations 2017, which transposes the Habitats Directive into UK law. Consequently, it is an offence to:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat; and
- Intentionally or recklessly obstruct access to a bat roost.

This legislation applies to all bat life stages.

The implications of the above in relation to the proposals are that where it is necessary during construction to remove trees, buildings or structures in which bats roost, it must first be determined that work is compulsory and if so, appropriate licenses must be obtained from Natural England.

Legislation Relating to Reptiles

All species of reptile native to the UK are protected to some degree under national and/or international legislation, which provides mechanisms to protect the species, their habitats and sites occupied by the species.

Sand lizards and smooth snakes are European protected species and are afforded full protection under Section 9 of the Wildlife and Countryside Act 1981 and Regulation 43 of the Conservation of Habitats and Species Regulations 2017. However, these species are rare and highly localised. Their occurrence is not considered as relevant in this instance, as the ranges and specialist habitats of these species do not occur at this site.

The remaining widespread species of native reptiles (adder, grass snake, slow worm and viviparous lizard) are protected under part of Section 9(1) and all of Section 9(5) of the Wildlife and Countryside Act 1981. They are protected against intentional killing and injury and against sale, transporting for sale etc. The habitat of these species is not protected. However, in terms of development, disturbing or destroying reptile habitat during the course of development activities while reptiles are present is likely to lead to an offence under the Wildlife and Countryside Act 1981. It is therefore important to identify the presence of these species within a potential development site. If any of these species are confirmed, all reasonable measures must then be taken to ensure the species are removed to avoid the threat of injury or death associated with development activities.

Each species of native reptile has specific habitat requirements but general shared features include a structurally diverse habitat that provides for shelter, basking, foraging and hibernating.

All reptiles are BAP species and as such are also of material consideration in the planning process due to the NPPF.

Legislation Relating to Natura 2000 Sites and Habitats Directive Annex I/II Species

European Commission Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora ('EU Habitats Directive'), and Council Directive 79/409/EEC on the Conservation of Wild Birds ('Birds Directive') form the cornerstones of nature conservation legislation across EU member states. Priority species requiring protection across Europe are listed in the Annexes of these Directives. Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017 and Offshore Marine Conservation Regulations, 2007 (as amended) transpose these directives into UK law and set the basis for the designations of protected sites (known as Natura 2000 sites; Special Areas of Conservation under the Habitat Directive and Special Areas of Protection under the Birds Directive) that are of importance for habitats, species or assemblages listed on the directive Annexes. In the UK Ramsar sites are also offered the same level of protection as SPAs and SACs however the qualifying species for the designation may differ; Ramsar sites being designated specifically as important wetland habitats.

Under article 6(3) of the Habitats Directive, where projects stand to have likely significant effect (in accordance with the European Court of Justice ruling of C-127/02 Waddenzee cockle fishing) upon the integrity of conservation objectives (i.e. conservation status of the qualifying species or habitats) within the designated sites then the Competent Authority must undertake an Appropriate Assessment.

PLANNING POLICY

National

National Planning Policy Framework

The National Planning Policy Framework (NPPF) 2021²² sets out the Government's planning policies for England, including how plans and decisions are expected to apply a presumption in favour of sustainable development. Chapter 15 of the NPPF focuses on conservation and enhancement of the natural environment, stating plans should 'identify and pursue opportunities for securing measurable net gains for biodiversity'.

It goes on to state: 'if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused'. Alongside this, it acknowledges that planning should be refused where irreplaceable habitats such as ancient woodland are lost.

Regional

The London Plan: Spatial Development Strategy for Greater London²³

The London Plan is comprised of separate chapters relating to a number of areas, including London's Places, People, Economy and Transport. The following policies have been identified within the London Plan, which relate specifically to ecology and this development.

Policy 2.18 Green Infrastructure

Policy 2.18 aims to protect, promote, expand and manage the extent and quality of, and access to, London's network of open and green spaces.

Policy 5.10 Urban Greening

This policy encourages the 'greening of London's buildings and spaces and specifically those in central London by including a target for increasing the area of green space (including green roofs etc) within the Central Activities Zone'.

Policy 5.11 Green Roofs and Development Site Environs

Policy 5.11 specifically supports the inclusion of planting within developments and encourages boroughs to support the inclusion of green roofs.

Policy 5.13 Sustainable Drainage

Policy 5.13 promotes the inclusion of sustainable urban drainage systems in developments and sets out a drainage hierarchy that developers should follow when designing their schemes.

Policy 7.19 Biodiversity and Access to Nature

'The Mayor will work with all the relevant partners to ensure a proactive approach to the protection, enhancement, creation, promotion and management of biodiversity in support of the Mayors Biodiversity Strategy.'

The Draft New London Plan (emerging)

Policy G1 Green infrastructure

- A. London's network of green and open spaces, and green features in the built environment such as green roofs and street trees, should be protected, planned, designed and managed as integrated features of green infrastructure.
- B. Boroughs should prepare green infrastructure strategies that integrate objectives relating to open space provision, biodiversity conservation, flood management, health and wellbeing, sport and recreation.
- C. Development Plans and Opportunity Area Planning Frameworks should:
 1. identify key green infrastructure assets, their function and their potential function
 2. identify opportunities for addressing environmental and social challenges through strategic green infrastructure interventions.

Policy G2 London's Green Belt

- A. The Green Belt should be protected from inappropriate development:
 1. development proposals that would harm the Green Belt should be refused
 2. the enhancement of the Green Belt to provide appropriate multi-functional uses for Londoners should be supported.

Policy G5 Urban greening

- A. Major development proposals should contribute to the greening of London by including urban greening as a fundamental element of site and building design, and by incorporating measures such as high-quality landscaping (including trees), green roofs, green walls and nature-based sustainable drainage.
- B. Boroughs should develop an Urban Greening Factor (UGF) to identify the appropriate amount of urban greening required in new developments. The UGF should be based on the factors set out in Table 8.2, but tailored to local circumstances. In the interim, the Mayor recommends a target score of 0.4 for developments that are predominately residential, and a target score of 0.3 for predominately commercial development.

Policy G6 Biodiversity and access to nature

- C. Where harm to a SINC (other than a European (International) designated site) is unavoidable, the following approach should be applied to minimise development impacts:
 - 1. avoid adverse impact to the special biodiversity interest of the site
 - 2. minimise the spatial impact and mitigate it by improving the quality or management of the rest of the site
 - 3. seek appropriate off-site compensation only in exceptional cases where the benefits of the development proposal clearly outweigh the biodiversity impacts.
- D. Biodiversity enhancement should be considered from the start of the development process.
- E. Proposals which create new or improved habitats that result in positive gains for biodiversity should be considered positively, as should measures to reduce deficiencies in access to wildlife sites.

Policy G7 Trees and woodlands

- C. Development proposals should ensure that, wherever possible, existing trees of quality are retained [Category A and B]. If it is imperative that trees have to be removed, there should be adequate replacement based on the existing value of the benefits of the trees removed, determined by, for example, i-tree or CAVAT. The planting of additional trees should generally be included in new developments – particularly large-canopied species which provide a wider range of benefits because of the larger surface area of their canopy.

Supplementary Planning Guidance (SPG): Sustainable Design and Construction 2014

As part of the London Plan 2011 implementation framework, the SPG, relating to sustainable design and construction, was adopted in April 2014 and includes the following sections detailing Mayoral priorities in relation to biodiversity of relevance to The Site.

Nature conservation and biodiversity

The Mayor's priorities include ensuring 'developers make a contribution to biodiversity on their development Site'.

Overheating

Where priorities include the inclusions of 'measures, in the design of schemes, in line with the cooling hierarchy set out in London Plan policy 5.9 to prevent overheating over the scheme's lifetime'

Urban greening

A Priority is for developers to 'integrate green infrastructure into development schemes, including by creating links with wider green infrastructure network'.

Use less energy

'The design of developments should prioritise passive measures' which can include 'green roofs, green walls and other green infrastructure which can keep buildings warm or cool and improve biodiversity and contribute to sustainable urban drainage'.

London Environment Strategy 2018²⁴

The Mayor's Environment Strategy was published in May 2018. This document sets out the strategic vision for the environment throughout London. Although not primarily a planning guidance document, it does set strategic objectives, policies and proposals that are of relevance to the delivery of new development in a planning context, including:

Objective 5.1 Make more than half of London green by 2050

Policy 5.1.1 Protect, enhance and increase green areas in the city, to provide green infrastructure services and benefits that London needs now.

This policy states:

"New development proposals should avoid reducing the overall amount of green cover and, where possible, seek to enhance the wider green infrastructure network to increase the benefits this provides. [...] New developments should aim to avoid fragmentation of

existing green space, reduce storm water run-off rates by using sustainable drainage, and include new tree planting, wildlife-friendly landscaping, or features such as green roofs to mitigate any unavoidable loss”.

This supports the ‘environmental net gain’ approach promoted by government in the 25 Year Environment Plan.

Proposal 5.1.1.d The London Plan includes policies to green streets and buildings, including increasing the extent of green roofs, green walls and sustainable drainage.

Objective 5.2 conserving and enhancement wildlife and natural habitats

Policy 5.2.1 Protect a core network of nature conservation sites and ensure a net gain in biodiversity

This policy requires new development to include new wildlife habitat, nesting and roosting sites, and ecologically appropriate landscaping will provide more resources for wildlife and help to strengthen ecological corridors. It states:

“Opportunities should be sought to create or restore priority habitats (previously known as UK Biodiversity Action Plan habitats) that have been identified as conservation priorities in London [and] all land managers and landowners should take BAP priority species into account”.

Local

Barnet’s Local Plan

Barnet’s Local Plan

- Core Strategy Policy CS5: Protecting and Enhancing Barnet’s Character to Create High Quality Places – *‘Highlights that development in Barnet should respect the local context and distinctive local character, creating places and buildings of high quality design. As part of this, development should enhance all areas that make Barnet such an interesting, diverse and attractive place to live. This policy applies to all development in the borough... High quality landscape design can help to create spaces that provide attractive settings for both new and existing buildings, contributing to the integration of a development into the established character of an area’*
- Core Strategy Policy CS9: Ensuring the Efficient Use of Natural Resources – *‘Highlights that reducing carbon dioxide (CO2) emissions, adapting to future climate change, ensuring resource use is kept within acceptable levels, promoting biodiversity and improving quality of life are all key objectives for Barnet.’*

- Core Strategy Policy CS5: Protecting and Enhancing Barnet's character to create high quality spaces - Policy aims to protect and enhance Barnet's heritage and highlights Barnet's rich historic environment.
- Core Strategy Policy CS7: Protecting and Enhancing Barnet's Open Spaces - Policy aims to protect and improve open spaces and protect and enhance biodiversity. Policy also aims to improve public access to these green. The Policy aims to increase connectivity through Green Infrastructure.

REFERENCES

- ¹ Joint Nature Conservation Committee (2010); Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit. JNCC, Peterborough.
- ² CIEEM (2017); Guidelines for Preliminary Ecological Appraisal, 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester.
- ³ BSI (2013); British Standard 42020:2013: Biodiversity — Code of practice for planning and development, BSI Standards Publication
- ⁴ MAGIC (2019); Interactive Map. (Partnership project involving six government organisations: Defra (Department for Environment, Food and Rural Affairs); English Heritage; Natural England; Environment Agency; Forestry Commission; Department for Communities and Local Government). Available at: www.magic.gov.uk.
- ⁵ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London
- ⁶ English Nature, (2004); Bat Mitigation Guidelines. English Nature.
- ⁷ JNCC (2016) UK Biodiversity Action Plan Priority Habitat Descriptions – Ponds
- ⁸ JNCC (2016) UK Biodiversity Action Plan Priority Habitat Descriptions – Hedgerows
- ⁹ HM Government, (1981); Part I and Part II of Wildlife and Countryside Act (as amended). HMSO
- ¹⁰ HM Government, (2017); The Conservation of Habitats and Species Regulations 2017. Statutory Instrument 2017 no. 490 Wildlife Countryside. OPSI
- ¹¹ HM Government, (2000); The Countryside and Rights of Way Act. HMSO
- ¹² HM Government, (2006); Natural Environment and Rural Communities Act 2006. HMSO
- ¹³ HM Government, (1994); The Conservation (Natural Habitats, &c.) Regulations. HMSO
- ¹⁴ CEC (Council of the European Communities), (1992); Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
- ¹⁵ The European Parliament And Of The Council, (30 November 2009); Directive 2009/147/EC On The Conservation Of Wild Birds (Codified Version)

-
- ¹⁶ CEC (Council of the European Communities), (1979); Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 19.IX.1979). EC
- ¹⁷ UK Biodiversity Action Plan (2007). UKBAP Priority Species and Habitats. <http://www.ukbap.org.uk/newprioritylist.aspx>
- ¹⁸ JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012). UK Post-2010 Biodiversity Framework. July 2012. Available from: <http://jncc.defra.gov.uk/page-6189>
- ¹⁹ Defra (2011). Biodiversity 2020: A strategy for England's wildlife and ecosystem services
- ²⁰ Convention on Biological Diversity (CBD) (2010). Decision X/2 Strategic Plan for Biodiversity 2011-2020, including Aichi Biodiversity Targets. Available at <https://www.cbd.int/decision/cop/?id=12268>
- ²¹ European Commission (2012). Our life insurance, our natural capital: an EU biodiversity strategy to 2020 European Parliament resolution of 20 April 2012 on our life insurance, our natural capital: an EU biodiversity strategy to 2020 (2011/2307(INI))
- ²² GOV.UK. (2021). *National Planning Policy Framework*. [online] Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework> [Accessed 13 June 2021].
- ²³ Greater London Authority (2016). *The London Plan: The Spatial Development Strategy for London Consolidated with Alterations Since 2011*. London: Greater London Authority.
- ²⁴ Greater London Authority (2018). *London Environment Strategy 2018*. London: Greater London Authority.