

Unit D, Capitol Park, Dodworth, Barnsley S75 3TZ

ECOLOGICAL SURVEY AND ASSESSMENT

July 2017

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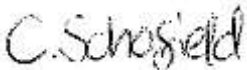
CONTENTS

Summary	3
1.0 Introduction	4
2.0 Method of Survey.....	4
2.1 Desktop Study.....	4
2.2 Vegetation and Habitats.....	5
2.3 Animal Life	5
2.4 Survey Limitations.....	9
2.5 Evaluation Methodology	9
3.0 Survey Results	10
3.1 Desktop Study.....	10
3.2 Vegetation and Habitats.....	11
3.3 Animal Life	13
4.0 Evaluation and Assessment	16
4.1 Introduction and Description of Proposals.....	16
4.2 Designated Sites.....	16
4.3 Vegetation and Habitats.....	16
4.4 Protected Species and Other Wildlife.....	16
4.5 Assessment of Impacts.....	17
5.0 Recommendations and Ecological Enhancement	17
5.1 Introduction	17
5.2 Protection of Existing Vegetation and Recommendations in Relation to Site Layout.....	17
5.3 Invasive Species	17
5.4 Invertebrates	18
5.5 Amphibians and Reptiles.....	18
5.6 Bats	19
5.7 Birds.....	20
5.8 Landscape Planting	20
6.0 Conclusion	21
7.0 References	22
8.0 Appendix 1: Tables and Figures	24

List of Tables

Table 2.1: Consideration of Suitability of Foraging and Commuting Habitat for Bats	6
Table 2.2: Rapid Risk Assessment Result	8
Table 2.3: Important Habitat Characteristics for Reptiles.....	9
Table 3.1: Records of Protected and Notable Species within a One Kilometre Radius of the Site	10
Table 3.2: Records of Bat Species within a Two Kilometre Radius of the Site	11
Table 3.3: Bird species Detected in 2016 and 2017	14
Table 3.4: Notable Invertebrate Species Detected in June 2016.....	15
Table 5.1: Suitable Native Species for Tree and Shrub Planting	20
Table 8.1: Plant Species Composition, Frequency and Abundance for vegetation colonising the site	24
Table 8.2: Plant Species Composition, Frequency and Abundance for Hedgerow 1	26
Table 8.3: Hedgerow Description and Assessment in Accordance with The Hedgerows Regulations 1997	27
Table 8.4: Species List of Invertebrates Detected in June 2016.....	28
Table 8.5: Notable Diptera species	31
Table 8.6: Photographs	32

Document Control

Survey type:	Surveyors¹	Survey date(s)
Phase 1 Habitat Survey	Chris Schofield B.Sc. (Hons) M.Sc. GradCIEEM	28 th April 2016 and 10 th July 2017
Reporting	Personnel	Date
Author	Chris Schofield B.Sc. (Hons). M.Sc. GradCIEEM Graduate Ecologist	10 th July 2017
Signature(s)		
Checked by	Brian Robinson B.Sc. (Hons), MCIEEM Senior Ecologist	10 th July 2017
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SUMMARY

- i. This Ecological Appraisal presents the ecological, biodiversity and nature conservation status of Unit 6 at the proposed Capitol Park, Dodworth, Barnsley. The appraisal was requested in connection with proposals to develop an NHS Blood and Transplant (NHSBT) Establishment at the site.
- ii. The appraisal presents the results of a desktop study, extended Phase 1 Habitat Survey and invertebrate surveys of the site and the wider area carried out in 2016 over the Capitol Park site, and an updated Phase 1 Habitat Survey of the Unit 6 area carried out in July 2017. The scope of survey undertaken is appropriate to enable the identification of any potential ecological constraints, the remit of mitigation required and opportunities for biodiversity associated with the development proposals.
- iii. The Unit 6 area of Capitol Park is located at the north-western area of the wider Capitol Park site and is characterised by cleared and levelled ground bare of vegetation and other areas which have become colonised by poorly draining wet grassland, self-seeded shrubs and ruderal vegetation. Young planted saplings and grassland are present at the northern and western margins of the site, with a hedgerow with occasional mature trees forming the western boundary between the site and Higham Lane.
- iv. The proposals will have no adverse effect on statutory or non-statutory designated sites.
- v. The boundary hedgerow and trees are of local value as they provide habitat connectivity and structural diversity in a landscape dominated by built development and farmland. The western boundary hedgerow also represents Priority Habitat.
- vi. No other habitats within or adjacent to the site are Priority Habitat. All habitats are common and widespread across lowland Britain and are typical of the local area and the conditions present.
- vii. Rhododendron, an invasive species, as listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), is present within the hedgerow at the western site boundary.
- viii. The 2016 invertebrate surveys confirmed the site was of entomological interest, with a wide range and diversity of species present, including species of both local and national notability. Mitigation proposals to provide optimal habitats for a range of invertebrate species in association with the development are presented at **Section 5.4**.
- ix. The boundary hedgerow, trees and planted saplings are suitable habitat for nesting passerine birds. The open undisturbed habitat recorded in 2016 within the centre of the site was suitable for ground-nesting bird species. Guidance on the protection afforded to nesting birds is presented at **Section 5.7**.
- x. The boundary hedgerow, trees and saplings also provide suitable habitat for foraging birds and bats. Recommendations for the retention and protection of these features is described at **Section 5.2**.
- xi. No other protected species have been detected. Any impacts of the proposed redevelopment on badger, roosting bats, water vole, great crested newt, reptiles and barn owl are reasonably discounted.
- xii. The recommendations in **Section 5.0** address all the mandatory measures and ecological recommendations to be applied to ensure compliance with wildlife legislation, the National Planning Policy Framework (NPPF) and best practice.
- xiii. The proposals will secure an opportunity to implement beneficial measures such as habitat creation that will safeguard habitats for wildlife such as birds, bats and invertebrates, with the aim of providing a net gain in biodiversity in accordance with the principles of the NPPF.
- xiv. It is considered that the proposals for a NHS Blood and Transplant Establishment at Unit 6 of Capitol Park is feasible and acceptable in accordance with ecological considerations and relevant planning policy. The proposed development at the site will provide an opportunity to secure ecological enhancement for wildlife.

1.0 INTRODUCTION

Background and Rationale

- 1.1 In 2016, ERAP (Consultant Ecologists) Ltd was commissioned by Commercial Development Projects Limited to carry out an ecological appraisal of land at Capitol Park, Dodworth, Barnsley (hereafter referred to as the 'site'). The Ordnance Survey (OS) grid reference at the centre of the site is SE 3167 0608.
- 1.2 The Report for that survey is presented at *2016-93 Proposed Capitol Park, Dodworth, Barnsley S75 3TZ: Ecological Survey and Assessment* (ERAP Ltd, 2016)¹, hereafter referred to as the "2016 report".
- 1.3 This report presents an updated survey of the current conditions on site, and has been commissioned in order to inform an updated planning application. The updated appraisal was requested in connection with a planning application to develop a NHS Blood and Transplant (NHSBT) Establishment at the site.
- 1.4 Whilst current conditions are presented within this report, data from the 2016 report are presented to provide the baseline conditions at the site and for ease of reference.

Scope of Survey

- 1.5 The scope of ecological surveys undertaken in 2016 and 2017 comprised:
 - a. A desktop study for known ecological information at the site and the local area;
 - b. An Extended Phase 1 Habitat Survey and assessment;
 - c. Invertebrate surveys and assessment;
 - d. An assessment of the ecological value of the habitats within the site with the use of the National Vegetation Classification (NVC) and the Ratcliffe criteria, as presented in *A Nature Conservation Review* (Ratcliffe, 1977);
 - e. Survey and assessment of all habitats for statutorily protected species and other wildlife including badger (*Meles meles*), barn owl (*Tyto alba*), great crested newt (*Triturus cristatus*), water vole (*Arvicola amphibius*), bats, birds and reptiles;
 - f. The identification of any potential ecological constraints on the proposals and the specification of the scope of mitigation and ecological enhancement required in accordance with wildlife legislation, planning policy guidance and other relevant guidance; and
 - g. The identification of any further surveys or precautionary actions that may be required prior to the commencement of any development activities.

2.0 METHOD OF SURVEY

2.1 Desktop Study

- 2.1.1 The following sources of information and ecological records were consulted for information:
 - a. MAgiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;
 - b. Barnsley Biological Records Centre (BBRC);
 - c. South Yorkshire Bat Group, and
 - d. Barnsley Biodiversity Action Plan (BAP).

¹ Barnsley Metropolitan Borough Council application reference number 2016/0713

2.2 Vegetation and Habitats

- 2.2.1 An initial Extended Phase 1 Habitat Survey of the wider Capitol Park site was carried out by Chris Schofield B.Sc. (Hons) M.Sc. GradCIEEM on 28th April 2016. The weather was partly cloudy, with a light breeze (Beaufort Scale 2) and 1°C at 8am rising to 7°C at midday. The conditions and time of year were suitable for the ecological survey.
- 2.2.2 An updated Extended Phase 1 Habitat Survey of the area within Unit 6 of the site was carried out by Chris Schofield B.Sc. (Hons) M.Sc. GradCIEEM on 10th July 2017. The weather on this date was overcast with a gentle breeze (Beaufort Scale 3) and 17°C. The conditions and the time of year were favourable for the ecological survey.
- 2.2.3 A vegetation and habitat map was produced for the site and the immediate surrounding area at a scale of 1:2000 (refer to **Figure 1**). The mapping is based on the Joint Nature Conservation Committee Phase 1 Habitat Survey methodology (JNCC, 2010) with minor adjustments to illustrate and examine the habitats with greater precision.
- 2.2.4 The plant species within the site boundary were determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors. The terms L = Locally and V = Very were additionally used to describe the plant species distributions with greater accuracy.
- 2.2.5 All stands of vegetation and habitats were described and evaluated using the National Vegetation Classification (NVC). The NVC provides a systematic and comprehensive analysis of British vegetation and provides a reliable framework for nature conservation and land-use planning.
- 2.2.6 Hedgerows were assessed in accordance with *The Hedgerows Regulations 1997* Wildlife and Landscape Criteria (H.M.S.O., 1997).
- 2.2.7 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and uncommon plant communities. Plant nomenclature follows *New Flora of the British Isles 3rd Edition* (Stace, 2010).
- 2.2.8 Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*).

2.3 Animal Life

Badger

- 2.3.1 A thorough search for badger activity was carried out. The survey area covered the site (as annotated on **Figure 1**) and extended to the accessible land within a radius of 50 metres from the site boundary. Private land was excluded from the survey.
- 2.3.2 Surveys were conducted in accordance with guidance presented with *Badgers and Development* (Natural England, 2007) and *Badgers: surveys and mitigation for development projects* (Natural England, 2015).
- 2.3.3 The following signs of badger activity were searched for:
 - a. Setts entrances, e.g. entrances that are normally 25 to 35cm in diameter and shaped like a 'D' on its side;
 - b. Large spoil heaps outside sett entrances;
 - c. Bedding outside sett entrances;
 - d. Badger footprints;

- e. Badger paths;
- f. Latrines;
- g. Badger hairs on fences or bushes;
- h. Scratching posts; and
- i. Signs of digging for food.

2.3.4 All habitats within and surrounding the site were assessed in terms of their suitability for use by foraging and sheltering badger in accordance with their known habitat preferences as detailed in current guidance and *Badger* (Roper, 2010).

Bat species

Roosting Bats

2.3.5 A preliminary assessment trees within the site was conducted to assess their suitability for use by roosting bats, and to inform whether further surveys or precautionary measures were required at the site in respect of roosting bats. Trees were assessed for their suitability for use by roosting bats from the ground using binoculars and a high-powered torch. Each tree was searched for the presence of any of the following features:

woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed platey bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy (Hedera helix) with stem diameters in excess of 50mm and bat, bird or dormouse (Muscardinus avellanarius) boxes.

2.3.6 Terms used to describe any features present follow (where possible) those outlined and described in *Bat Tree Habitat Key, 2nd Edition* (Andrews, H (ed), 2013).

Habitat Assessment for Commuting / Foraging Bats

2.3.7 Habitats within and adjacent to the site were assessed for their value and suitability for commuting and foraging bats in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, 2016). Reference has been made using the following categories and descriptions / examples, presented at **Table 2.1**, below

Table 2.1: Consideration of Suitability of Foraging and Commuting Habitat for Bats

Suitability	Commuting Habitat	Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.	
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.	Habitat that is linked to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Habitats close to and connected to known roosts.	High-quality habitat that is well-connected to the wider landscape and is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Habitats close to and connected to known roosts.

Bird species

- 2.3.8 Bird species observed and heard during the survey were recorded.
- 2.3.9 Habitats throughout the site and immediate surrounding area were assessed for their value for roosting, feeding and nesting birds, as indicated by the amount of shelter, feeding value, woody vegetation structure and species diversity of tree and shrub species in the site.

Invertebrates

Initial Desktop Study

- 2.3.10 John Coldwell, a locally respected entomologist who has surveyed the site and the local area for at least six years for *Diptera* (true flies) was contacted. Mr Coldwell provided a complete site list of *Diptera* species which he has gathered over the years and proposals for enhancement and mitigation of the site for invertebrates was discussed.

Site Surveys

- 2.3.11 Invertebrate surveys were undertaken by Peter Flint FRES and Sharon Flint B.Sc., two highly experienced entomologists with extensive knowledge of invertebrate survey methods and the local area. The site was visited on 21st and 30th June 2016 when suitable weather permitted sweep net sampling to be carried out.
- 2.3.12 Surveys were carried out in accordance with the methods described in *Surveying Terrestrial and Freshwater Invertebrates for Conservation Evaluation* (Drake, et al., 2007). A pond net was used to sample all aquatic habitats (where water was deep enough to use a net), and a sweep net was used to sample terrestrial vegetation, including shrubs and trees, and to catch flying insects.
- 2.3.13 Stone turning and hand-searching, with use of a pooter, was used to collect invertebrates from the ground surface, and visual observation of flying insects which could not be captured in the sweep net was undertaken.
- 2.3.14 Invertebrates were identified in the field where possible, with specimens collected and identified in the laboratory where necessary.
- 2.3.15 *Diptera* (true flies) were not recorded as the six year data provided by Mr John Coldwell is comprehensive and provides far more complete data than could be gathered during the two site visits conducted here.
- 2.3.16 An assessment of the suitability of the habitats within the site for different invertebrate taxa was undertaken, with areas of particular interest highlighted.

Great Crested Newt

Initial Desktop Search for Ponds

- 2.3.17 In accordance with current Natural England guidance (English Nature, 2001) the potential of the proposed development to impact upon any great crested newt population(s) whose breeding ponds are within 500 metres must be considered.
- 2.3.18 The search of the wider area revealed the presence of one pond, located approximately 495 metres to the north-west of the site (OS grid reference SE 313 065).

Consideration of Requirements for Further Survey

2.3.19 The requirement for further survey at the pond was then assessed using the following criteria:

- Presence of dispersal barriers to great crested newt movements between the pond and the site, as detected during the walkover survey;
- Distance of the pond from the site;
- Potential influence of the proposed development of the site on any populations of great crested newt (if present at the pond), using the Natural England rapid risk assessment tool; and
- Presence of other ponds which may form metapopulations and/or alter the influence of the site on ponds at greater distances.

Presence of Dispersal Barriers

2.3.20 Higham Lane to the immediate west of the site forms a partial barrier to the dispersal of great crested newt and other amphibians. The road has a 90° kerb along its west side and there is a steady flow of traffic.

Consideration of Distance of Ponds from Site and Relative Size of Site

2.3.21 No pond is within 250 metres of the site. One pond, is between 250 and 500 metres from the site (495 to the north-west). **Table 2.2**, below provides the results of the Natural England Rapid Risk Assessment tool from *Template for Method Statement to support application for licence under Regulation 53(2)(e) in respect of great crested newts Triturus cristatus. Form WML-A14-2* (Natural England, 2015).

2.3.22 The tool has been completed based on the single pond at this distance, and the size of the development site (approximately 1.8 hectare, or 'Ha'). The rapid risk assessment tool assumes that great crested newt are present.

Table 2.2: Rapid Risk Assessment Result

Component	Likely effect	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	No effect	0
Land >250m from any breeding pond(s)	1 – 5 ha lost or damaged	0.04
Individual great crested newts	No effect	0
Maximum:		0.04
Rapid risk assessment result:	GREEN: OFFENCE HIGHLY UNLIKELY	

2.3.23 The result of the Natural England Rapid Risk Assessment indicates that the site is sufficiently small and distant from the pond that any proposed development is *highly unlikely* to impact upon great crested newt populations (if present).

Presence of other ponds

2.3.24 Aerial imagery and OS maps indicate, there are no ponds in the wider area to the south and east of the site to which great crested newts would be attracted to cross the proposed development site to reach.

2.3.25 In July 2017 it was confirmed the areas of marshy grassland within the site and within the wider Capitol Park site do not support any ponds, ephemeral pools or any other area of open water suitable for breeding great crested newt.

Reptile species

- 2.3.26 The site and its surroundings were assessed in terms of their suitability for use by reptile species using the important characteristics for reptiles outlined in the draft document '*Reptile Mitigation Guidelines*' (Natural England, 2011), and the *Reptile Habitat Management Handbook* (Edgar, et al., 2010). These habitat characteristics are outlined in **Table 2.3**, below.

Table 2.3: Important Habitat Characteristics for Reptiles

1. Location (in relation to species range)	7. Connectivity to nearby good quality habitat
2. Vegetation Structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime
6. Surface geology	12. Egg-laying site potential

Water Vole and other Riparian Fauna

- 2.3.27 The site and the immediate surroundings do not contain any suitable habitat for water vole and other riparian fauna, such as otter (*Lutra lutra*). No further assessment for these species is required.

Other Wildlife

- 2.3.28 The habitats within and adjacent to the site were assessed for further Priority Species as informed by the site conditions and the data search, notably common toad (*Bufo bufo*) and hedgehog (*Erinaceus europaeus*), through identification of foraging, refuge and corridor habitat.

2.4 Survey Limitations

- 2.4.1 All areas of the site were fully accessible, and the surveys were conducted under suitable conditions and favourable times of year. No survey limitations were experienced.

2.5 Evaluation Methodology

- 2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described in *A Nature Conservation Review* (Ratcliffe, 1977) and *Guidelines for the Selection of Biological SSSIs* (Bainbridge, et al., 2013). These are size (extent), diversity, naturalness, rarity, fragility, typicality, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.
- 2.5.2 Habitats have been assessed to determine whether they meet those described in *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, A (ed), 2008); these lists are used to help draw up the statutory lists of Priority Habitats, as required under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006*. Where suitable, the ecological value of the habitats present have been assessed using the terms outlined in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition* (CIEEM, 2016).
- 2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Great Britain Department for Communities and Local Government, 2012) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedule 1 and Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2010* (as amended), is referenced where applicable, and any impacts to protected species are evaluated in accordance with current guidance.
- 2.5.4 The presence of any Priority Species, as listed under Section 41 of the *NERC Act 2006* is noted, and habitats are assessed in terms of their suitability and value for these species. The presence of habitats

and/or species listed by the Barnsley Biodiversity Action Plan has been taken into account in the evaluation of the site.

3.0 SURVEY RESULTS

3.1 Desktop Study

Site Designations

- 3.1.1 The proposed development site has no statutory or non-statutory designation for nature conservation. There are no statutory designated sites within a one kilometre radius of the proposed development.
- 3.1.2 The site lies within the Site of Special Scientific Interest (SSSI) Impact Risk Zone of Pye Flatts Meadows SSSI which lies approximately four kilometres west of the site. The Impact Risk Zone at this distance indicates local planning authorities should consult with Natural England for development types including aviation proposals and pig and poultry units. The proposed development of an NHSBT Establishment does not fall into the above categories; no further consultation with Natural England is required in respect of the proposals and impacts upon the SSSI. It is considered that the site is sufficiently distant from the SSSI that any impact from the proposals can be reasonably discounted.
- 3.1.3 There are no non-statutory Local Wildlife Sites (LWS) within a one kilometre radius of the proposed development site.

Protected and Notable species

- 3.1.4 There are no records of protected or notable species for the site.
- 3.1.5 The local records centre has records of protected and notable species for the one kilometre radius surrounding the site. These records are summarised in **Table 3.1**.

Table 3.1: Records of Protected and Notable Species within a One Kilometre Radius of the Site

Group	Species	Notes
Amphibian	Great crested newt (EPS, WCAs5, S41 & LBAP)	1 record from 1995, within the one kilometre OS grid square of the site.
	Common toad (S41)	1 record from 2012, approximately 90 metres south-west of the site.
Terrestrial Mammal	Brown long-eared bat (EPS, WCAs5, S41 & LBAP)	2 records, both from 2001 and approximately 330 metres north-east of the site.
	Noctule (EPS, WCAs5 & LBAP)	1 record from 1981, within the OS one kilometre grid square of the site.
	Hedgehog (S41 & LBAP)	1 record from 1983, within the one kilometre OS grid square of the site.
Insect	White letter hairstreak (S41), small heath (S41), dingy skipper (S41 & LBAP).	
Bird	House sparrow (S41), kestrel (LBAP), starling (S41), song thrush (S41), dunnock (S41), bullfinch (S41) and marsh tit (S41).	
EPS = European Protected Species under <i>The Conservation of Habitats and Species Regulations 2010</i> (as amended).		
WCAs5 = Listed on Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended).		
S41 = Priority Species listed under Section 41 of the NERC Act (2006).		
LBAP = Barnsley Biodiversity Action Plan Priority Species.		

- 3.1.6 The South Yorkshire bat group has provided records of bat species recorded within a two kilometre radius of the site. These records are summarised in **Table 3.2** below.

Table 3.2: Records of Bat Species within a Two Kilometre Radius of the Site

Scientific name	Common Name & Designation	Notes
<i>Pipistrellus pipistrellus</i>	Common pipistrelle EPS & WCAs5	19 records, the closest record approximately 990 metres south of the site from 2013.
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle EPS, WCAs5 & S41	Six records, the closest record approximately 1.5km north of the site from 2012.
<i>Pipistrellus</i> sp.	<i>Pipistrelle</i> sp. EPS & WCAs5	39 records, the closest record approximately 350 metres north-east of the site from 1998.
<i>Nyctalus noctula</i>	Noctule EPS, WCAs5 & S41	Seven records, the closest record approximately 1.5km north of the site from 2012.
<i>Nyctalus leisleri</i>	Leisler's bat EPS & WCAs5	Seven records, the closest record approximately 1.4km north-east of the site from 2003.
<i>Plecotus auritus</i>	Brown long-eared bat EPS, WCAs5 & S41	14 records, the closest record approximately 300 metres north-east of the site from 2001.
<i>Myotis daubentonii</i>	Daubenton's bat EPS & WCAs5	One record from 2015 approximately 2.5km south of the site.
<i>Myotis nattereri</i>	Natterer's bat EPS & WCAs5	Three records, the closest approximately 2.5km south of the site from 1987.
<i>Myotis</i> sp.	<i>Myotis</i> species EPS & WCAs5	11 records, the closest approximately 2.5km west of the site from 2011.
EPS = European Protected Species under <i>The Conservation of Habitats and Species Regulations 2010</i> (as amended). WCAs5 = Listed on Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended). S41 = Priority Species listed under Section 41 of the NERC Act (2006).		

- 3.1.7 The presence of protected species, Priority Species and Barnsley BAP species in the local area is recognised in this report and the site has been evaluated for its habitat suitability in respect of these species.

3.2 Vegetation and Habitats

General Description

- 3.2.1 The approximately 1.8 hectare Unit 6 site is located within a wider 4.5 hectare development site at Capitol Park at the northern extent of the village of Dodworth, approximately 2.5 kilometres west of the town of Barnsley.
- 3.2.2 Construction is ongoing for development of an industrial unit on the eastern side of the wider Capitol Park site (**Photo 1**). The site compound for the development area, including site cabins, car parking and material storage is present within Unit 6 of the site (refer to **Figure 1**).
- 3.2.3 Unit 6 comprises a rectangular shaped area at the north-western end of the wider Capitol Park site (**Photo 2**). The northern part of the site has been cleared within the last 12 months and is devoid of vegetation. Other areas at the southern end of the site have been cleared and levelled in the last 10 years and are in the process of colonising to poorly drained unmanaged grassland and marshy grassland with scattered self-seeded shrubs. Young planted saplings are present on slopes at the northern and western margins of the area, and a hedgerow with occasional mature trees is present at the western boundary (refer **Figure 1**).
- 3.2.4 The northern boundary is demarcated by a knee rail timber fence adjacent to Capitol Close, beyond which are industrial units. The western boundary is defined by the hedgerow separating the site from Higham Lane, beyond which is woodland. The southern and eastern boundaries are undefined but lie across cleared ground associated within the adjacent ongoing construction site.
- 3.2.5 A Phase 1 Habitat Survey map is appended at **Figure 1**. Photographs from July 2017 are appended at **Table 8.6**.

Cleared Ground

- 3.2.6 Approximately 0.85 hectares at the northern and eastern areas of the site have recently (within the last 12 months) been cleared and currently comprise bare earth devoid of vegetation (**Photos 2 and 3**). An approximately 0.2 hectare area adjacent to the eastern boundary of Unit 6 is currently being used as the site compound for the ongoing active construction to the east.

Colonising Vegetation and Planted Saplings

- 3.2.7 The southern area of the site and habitats on the northern and western margins have previously been cleared and undergone earthworks. This area is in the process of colonisation to unmanaged grassland with marshy areas (**Photos 4 and 5**) on the level ground with planted and self-seeded shrubs present on the sloped land at the northern and western margins (**Photos 6 and 7**).
- 3.2.8 Herb species within the cleared area of the site are representative of the poorly drained conditions and comprise abundant Red Fescue (*Festuca rubra*) and mosses, frequent and locally abundant Yorkshire-fog (*Holcus lanatus*), Creeping Buttercup (*Ranunculus repens*), Soft Rush (*Juncus effusus*), with occasional and locally abundant Glaucous Sedge (*Carex flacca*), Cock's-foot (*Dactylis glomerata*), Compact Rush (*Juncus conglomeratus*), Hard Rush (*Juncus inflexus*), Perennial Rye-grass (*Lolium perenne*) and Common Bird's-foot Trefoil (*Lotus corniculatus*).
- 3.2.9 The self-seeded shrubs within the site comprise occasional and locally abundant Silver Birch (*Betula pendula*) and Common Gorse (*Ulex europaeus*), with occasional and locally frequent Alder (*Alnus glutinosa*) and Goat Willow (*Salix caprea*). Young planted saplings at the site boundaries comprise occasional and locally frequent Dogwood (*Cornus sanguinea*) and Hazel (*Corylus avellana*), with occasional Field Maple (*Acer campestre*), Sycamore (*Acer pseudoplatanus*), Ash (*Fraxinus excelsior*), Flowering Currant (*Ribes sanguineum*), Grey Willow (*Salix cinerea*) and Rowan (*Sorbus aucuparia*).
- 3.2.10 These areas hold affinities with the *MG1a Red Fescue* sub-community of the *MG1 False Oat-grass grassland* and also hold characteristics of the *MG10 Yorkshire-fog – Soft Rush* rush pasture community of the NVC (Rodwell, 1992).
- 3.2.11 Ornamentally planted species at the north-eastern boundary (**Photo 5**) include *Hebe*, *Euonymus*, Box-leaf Honeysuckle (*Lonicera nitida*) and Creeping Bramble (*Rubus tricolor*). These areas do not conform to any community of the NVC.
- 3.2.12 A plant species list is appended at **Table 8.1**.

Hedgerow

- 3.2.13 The hedgerow forming the western boundary (**Photo 8**) is approximately 240 metres long and on average four metres high and two metres wide. It is unmanaged and has no associated bank, wall or ditch.
- 3.2.14 Woody species comprise constant abundant and locally dominant Hawthorn (*Crataegus monogyna*), occasional and locally frequent Sycamore, Dog Rose (*Rosa canina*) and Elder (*Sambucus nigra*), and occasional Ash, Rowan and Field Maple. A single mature Horse Chestnut (*Aesculus hippocastanum*) tree and a mature Ash are present within the hedgerow.
- 3.2.15 The ground flora associated with the hedgerow is species-poor and comprises constant and abundant Ivy (*Hedera helix*), constant, frequent and locally abundant Common Nettle (*Urtica dioica*), frequent Yorkshire-fog and Cow Parsley (*Anthriscus sylvestris*), with occasional and locally abundant Cock's-foot and Bramble (*Rubus fruticosus* agg.) and occasional Hogweed (*Heracleum sphondylium*), Broad-leaved Dock (*Rumex obtusifolius*), Common Ragwort (*Senecio jacobaea*) and Dandelion (*Taraxacum officinale* agg.)
- 3.2.16 The hedgerow is characteristic of a *W21 Hawthorn – Ivy* scrub community of the NVC (Rodwell, 1991).
- 3.2.17 A plant species list is appended at **Table 8.2**.

- 3.2.18 The hedgerow does not meet the criteria to be assessed as 'important' in accordance with *The Hedgerows Regulations 1997* wildlife and landscape criteria. The full assessment is appended at **Table 8.3**.

Invasive Species

- 3.2.19 As illustrated on **Figure 1** a single stand of *Rhododendron* was detected within the hedgerow at the western site boundary. This species is listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) and it is therefore an offence to spread or cause the spread of these species in the wild. Further guidance is described in **Section 5.3**.
- 3.2.20 No further invasive species were detected within the site.

3.3 Animal Life

Amphibians

- 3.3.1 There are no ponds or ephemeral pools within Unit 6 or within the wider Capitol Park site.
- 3.3.2 All areas of marshy grassland and poorly draining soils were found to be completely dry in July 2017.
- 3.3.3 It is considered there are no suitable habitats within the site to support breeding great crested newt or common toad, with no ponds or pools which support sufficient depth of open water. Additionally, as the entire site was cleared and levelled within the last decade, and as the closest pond which has the potential to support great crested newt is approximately 500 metres from the site boundary, it is considered great crested newt are significantly unlikely to have colonised the site.
- 3.3.4 As a result of the combination of the factors discussed at **Section 2.3**, namely the relative large distance between the site and the pond, the relatively small size of the site, the barrier of Higham Lane to the west of the site, the recent site clearance and the lack of ponds in the wider area, it is considered any impact of the proposed development on great crested newt is highly unlikely (as confirmed by the risk assessment at **Table 2.2**).
- 3.3.5 Any impact of the proposed development on great crested newt is reasonably discounted; no further survey in respect of great crested newt is necessary.
- 3.3.6 Common toad has been recorded approximately 90 metres to the south-west of the site. Precautionary measures to be observed during site clearance, and enhancement proposals for wildlife such as common toad are described at **Section 5.0**.

Badger

- 3.3.7 No evidence of badger was detected within the site or within the accessible 50 metres of the site boundary.
- 3.3.8 The bare ground and unmanaged wet grassland areas within the footprint of the proposed development may provide some sub-optimal foraging habitat for badger, however the site does not support any favourable habitats for badger such as woodland or extensive scrubland. Further, there are no records of badger in the wider area.
- 3.3.9 The presence of badger is reasonably discounted.

Bat species

Roosting Bats

- 3.3.10 No trees at the site support any features suitable for roosting bats. The presence of roosting bats at the boundary trees is reasonably discounted.

Foraging and Commuting Bats

- 3.3.11 The trees, shrubs and hedgerow along the site margins are suitable for use by foraging bats, particularly edge-feeding species, such as common pipistrelle (*Pipistrelle pipistrellus*) which have been recorded in the wider area. There are no habitats at the site which are likely to attract an abundance or diversity of foraging or commuting bats. In addition, the South Yorkshire bat group does not hold any records of notable species within or in close proximity to the site.

Bird species

- 3.3.12 Birds detected in the site during the 2016 and 2017 surveys are presented below.

Table 3.3: Bird species Detected in 2016 and 2017

Scientific name	Common Name	BOCC Status ¹	Priority Species?
<i>Columba palumbus</i>	Wood pigeon	Green	No
<i>Corvus corone</i>	Carion crow	Green	No
<i>Cyanistes caeruleus</i>	Blue tit	Green	No
<i>Erithacus rubecula</i>	Robin	Green	No
<i>Parus major</i>	Great tit	Green	No
<i>Phylloscopus collybita</i>	Chiffchaff	Green	No
<i>Pica pica</i>	Magpie	Green	No
<i>Streptopelia decaocto</i>	Collared dove	Green	No
<i>Troglodytes troglodytes</i>	Wren	Green	No
<i>Turdus merula</i>	Blackbird	Green	No

¹BOCC: Birds of Conservation Concern (Eaton, et al., 2015)

- 3.3.13 The boundary trees, hedgerow and saplings are suitable habitat for nesting and foraging passerine birds.
- 3.3.14 No ground-nesting bird species, such as lapwing (*Vanellus vanellus*) or curlew (*Numenius arquata*) were detected at the site. The open, undisturbed habitats within the site are suitable habitat for ground-nesting bird species such as skylark (*Alauda arvensis*).
- 3.3.15 There are no habitats within the site suitable for nesting or roosting barn owl (*Tyto alba*). Further, the colonising grassland and marshy grassland do not represent favourable foraging habitat for barn owl as it is unlikely to support an abundance of small mammal prey species.

Invertebrates

- 3.3.16 A complete species list of all invertebrates detected at the site is presented at **Table 8.4**.
- 3.3.17 A total of 95 invertebrate species were identified at the site during the surveys.
- 3.3.18 Six species of butterfly (*Lepidoptera*) have been detected at the site, including Small Heath (*Coenonympha pamphilus*) a Priority Species listed under Section 41 (S41) of the *Natural Environment and Rural Communities* (NERC) Act 2006. Nine species of bumblebee (*Bombus*) were detected, including the Hill Cuckoo-bee (*Bombus rupestris*) which is noted as being nationally notable.
- 3.3.19 41 species of beetle (*Coleoptera*) were detected with the nationally notable *Stenus ater*, *Rhionocyllus conicus* and *Polydrosus formosus* recorded. Of particular note is the Alder Leaf Beetle (*Agelastica alni*), which was once thought to be extinct in Britain, but has recently re-established in northern England (particularly in South Lancashire and North Cheshire) and the Red Book Data (RBD) status has been changed to *Insufficiently Known*.
- 3.3.20 Notable species of local and county significance are detailed in **Table 3.4** below.

Table 3.4: Notable Invertebrate Species Detected in June 2016

Order or Higher Taxa	Family	Genus and Species	English Name (where one exists)	British Mainland Distribution	RDB or other Conservation Status?
Lepidoptera		<i>Coenonympha pamphilus</i>	Small Heath	Widespread in Decline	NERC S41 Priority Species
Coleoptera	Staphylinidae	<i>Stenus ater</i>		Scattered	Nationally Notable
Coleoptera	Chrysomelidae	<i>Agelastica alni</i>	Alder Leaf Beetle	Southern	RDB Insufficiently Known
Coleoptera	Curculionidae	<i>Rhinocyllus conicus</i>		Southern	Nationally Notable
Coleoptera	Curculionidae	<i>Polydrosus formosus</i>		Southern	Nationally Notable
Hymenoptera	Apidae	<i>Bombus rupestris</i>	Hill Cuckoo-bee	Southern	Nationally Notable
RDB - Red Data Book Species					

- 3.3.21 A total of 308 species of *Diptera* (true flies) have been recorded at the site and surrounding area over a six year period from 2010 to 2016. 32 of these species have been identified by Mr John Coldwell as noteworthy, as listed on official reviews, new to Yorkshire, have few records locally or based on personal knowledge of the area. These notable *Diptera* species are appended at **Table 8.5**.
- 3.3.22 One *Diptera* species, the Grey Least Blowfly (*Angioneura acerba*), is listed as Red Book Data *Endangered*, and was recorded in the local area in 2014. This species is very rare in Britain with localised populations restricted to Yorkshire, Oxfordshire and the New Forest. The life-history and ecological requirements of the species are largely unknown as the species is unstudied.
- 3.3.23 Additionally, *Sciophila nigronitida* and *Cephalops pannonicus* are listed as *Nationally Scarce* and *Cheilosia mutabilis* and *Brachicheta strigata* are listed as *Nationally Notable*.
- 3.3.24 The wet grassland which covers large parts of the site provides suitable habitat for nectaring and pollen gathering species, as well as species which feed on grasses and herbaceous plants. Habitats which were noted as supporting a significant range and diversity of invertebrates included the shallow ephemeral pools and their margins, and areas of more species rich meadow grassland in southern areas of the site.
- 3.3.25 Recommendations for mitigation and enhancement proposals in respect of the invertebrates at the site are presented at **Section 5.0** of this report.

Reptiles

- 3.3.26 No records of reptile are reported for the site or the wider area, and no reptiles were observed during the site visits in April 2016 or July 2017, or during the ground-searching or stone-turning conducted during the invertebrate surveys in June 2016.
- 3.3.27 The site is largely homogenous in terms of its surface geology and vegetation structure, being largely open and dominated by colonising wet grassland, with few refuge and shelter opportunities.
- 3.3.28 Furthermore, significant site clearance and earthworks was conducted at the site within the last decade; it is considered unlikely the site will have become colonised by reptile species since this time, as there are no favourable habitats within or adjacent to the site, such as heathland or moorland, which are likely to attract reptiles.
- 3.3.29 The presence of reptiles within the site is reasonably discounted.

4.0 EVALUATION AND ASSESSMENT

4.1 Introduction and Description of Proposals

- 4.1.1 In accordance with the *Proposed Site Plan* drawing number 14120-110 (Harris Partnership Architects, 2017), it is proposed to develop Unit 6 to a NHS Blood and Transplant Establishment with associated car parking and service yard.
- 4.1.2 In accordance with the plans it is proposed to retain the hedgerow and trees associated with the northern and western boundaries of the site.
- 4.1.3 Impacts of these proposals are considered on the designated sites in the wider area are considered at **Section 4.2**. The ecological value of habitats within the site are evaluated at **Section 4.3**, and the presence of protected and notable species is considered at **Section 4.4**.
- 4.1.4 Impacts upon the habitats within the site, and upon the protected and notable species associated with the site, are quantified and assessed at **Section 4.5**.

4.2 Designated Sites

- 4.2.1 The site is sufficiently distant to avoid any direct or indirect impact on designated site for nature conservation in the wider area and their features of interest.

4.3 Vegetation and Habitats

- 4.3.1 None of the habitats within the site are of significant interest in terms of their plant species composition or are representative of semi-natural habitat. The site supports only common and widespread plant species. The NVC communities present are typical of the geographical area and conditions present.
- 4.3.2 The hedgerow at the western boundary qualifies as Priority Habitat, as it consists of at least 80% native woody species and is greater than 20 metres long. The hedgerow, however, is considered a poor example of the habitat as it is dominated by Hawthorn and has a very limited assemblage of woodland ground flora species. The hedgerow does not meet the criteria to be considered as 'important' in accordance with *The Hedgerows Regulations 1997*.
- 4.3.3 The boundary hedgerow, trees and saplings are of local value as they provide structural diversity and habitat connectivity across a landscape with significant industrial and residential development. Recommendations to protect the hedgerow and trees are presented at **Section 5.2**, below.
- 4.3.4 Rhododendron, an invasive species as listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), is present within the hedgerow at the western boundary. Guidance for the removal of this species is described at **Section 5.3**.

4.4 Protected Species and Other Wildlife

- 4.4.1 The presence of badger, roosting bats, water vole, barn owl, great crested newt and reptiles is reasonably discounted.
- 4.4.2 The remaining marshy grassland within the levelled areas at the centre of the site are assessed as of considerable entomological value, with a wide range and diversity of species detected, including species of both local and national notability. Recommendations to incorporate mitigation measures and enhancement proposals in respect of invertebrates are presented at **Section 5.4**.
- 4.4.3 The boundary trees, hedgerow and saplings are suitable habitat for use by nesting passerine bird species, and the open undisturbed habitats within the centre of the site are suitable for ground-nesting bird species. Guidance on the protection afforded to nesting birds is described at **Section 5.7**.

4.5 Assessment of Impacts

- 4.5.1 In the absence of suitable precautionary measures and mitigation, the proposed development at the site may negatively impact the ecological value of the site, through harm to nesting birds and damage to habitats used by invertebrates, foraging birds and foraging bats.
- 4.5.2 Recommendations for the protection of habitats and species are presented at **Section 5.0**.
- 4.5.3 The proposals present the opportunity to enhance the ecological value of the site for wildlife such as feeding and sheltering invertebrates, nesting birds and foraging bats through pond creation, appropriate landscape planting, provision of refuge piles and provision of nest/roost boxes; these recommendations are presented within **Section 5.0**, below.

5.0 RECOMMENDATIONS AND ECOLOGICAL ENHANCEMENT

5.1 Introduction

- 5.1.1 The recommendations in this section aim to ensure that the development is implemented in accordance with all wildlife legislation, Natural England guidance, the principles of the National Planning Policy Framework (NPPF), local planning policy and best practice.
- 5.1.2 Where possible, opportunities to enhance the ecological interest and habitat connectivity and seek biodiversity gain through appropriate landscape planting and habitat creation have been identified and recommended below, as required by the NPPF and other relevant planning documents.
- 5.1.3 All recommendations are appropriate to the geographical area, the habitats in the wider area, the wildlife present in the local area (and likely to use the site post-construction) and take into consideration the end use of the site as industrial units.
- 5.1.4 The recommendations presented within the 2016 report for the wider Capitol Park site remain appropriate and should be read in conjunction with this report.

5.2 Protection of Existing Vegetation and Recommendations in Relation to Site Layout

Trees, Shrubs and Hedgerow

- 5.2.1 The site layout has been designed to ensure the new building and hard standing areas lie within the central areas of the site, minimising any requirement for tree, hedgerow or sapling clearance at the boundaries.
- 5.2.2 During the construction phase, temporary protective demarcation fencing will be used to protect the trees and shrubs that are to be retained. The fencing must extend outside the canopy of the retained trees and must remain in position until all plots have been developed to ensure protection is provided throughout the construction phase.
- 5.2.3 The fencing will be in accordance with BS5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations* (BSI, 2012).

5.3 Invasive Species

- 5.3.1 It is an offence under the *Wildlife and Countryside Act 1981* (as amended) to cause the spread of *Rhododendron* in the wild. It is recommended that the stands of *Rhododendron* within the western boundary hedgerow should be grubbed out by the roots and either buried on-site or otherwise disposed of responsibly. It is considered that the preparation of an Invasive Species Management Plan is not necessary.

5.4 Invertebrates

Protection

- 5.4.1 The recommendations detailed above for the protection of the boundary trees, hedgerow and shrubs will ensure habitats suitable for invertebrates are retained and protected.

Enhancement

Species-rich wildflower grassland

- 5.4.2 It is recommended that species-rich wildflower grassland is promoted at the site, as at the northern and western margins which are to remain undeveloped. This should be achieved through seeding an appropriate seed mix, such as the *EM8 – Meadow Mixture for Wetlands* and *EM3 – Special General Purpose Meadow Mixture* available from www.wildseed.co.uk. These mixtures should be established through the ground preparation, sowing and aftercare instructions provided by the manufacturer.
- 5.4.3 The aim should be to maintain a species-rich wildflower meadow in the long-term providing optimal habitat for a range of feeding invertebrate species.

Refuge Creation

- 5.4.4 As stated at **Section 5.8** below, it is recommended that at least three refuge piles are created within the undeveloped habitats at the northern and western margins. This will provide enhanced opportunities for invertebrates which are within the area and that are likely to be attracted to the site post-completion.
- 5.4.5 It is recommended deadwood is used for their creation, including any deadwood from any necessary tree or shrub removal required to prepare the site. Different sizes of both hard and softwood logs should be used, and ideally should be located in shaded locations within the retained trees and shrubs.
- 5.4.6 Further advice on the creation of deadwood piles is available at <http://www.rspb.org.uk/makeahomeforwildlife/advice/gardening/deadwood.aspx>.

Tree and Shrub Planting

- 5.4.7 In addition to the native landscape planting recommended at **Section 5.8**, it is recommended that additional Alder and Hazel is planted at the retained habitats at the site boundaries. These species are the food-plant of the Alder Leaf Beetle which has been recorded at the site and is very rare and localised in Britain. If stakes and ties are used to plant whips, these should be checked annually to ensure they are not restricting the growth of the tree, and should be removed once the tree has established.

5.5 Amphibians and Reptiles

- 5.5.1 As described in **Section 4.4**, the impact of development on great crested newt and reptiles at the site is assessed as negligible. However, in accordance with best practice the following Reasonable Avoidance Measures (RAMs) should be observed during the construction period;
- All site personnel must be made aware of this RAMs Method Statement, and the possible presence of amphibians (such as common toad and common frog) and the possible (but very unlikely) presence of reptiles;
 - A copy of this report must be held on site and available for consultation as required;
 - During construction, bricks and other materials similar materials must be stored on hard-standing or stored on pallets to avoid the creation of suitable habitat for amphibians and reptiles;
 - During construction, any holes, trenches or other pits which amphibians and other wildlife could fall into must be covered overnight, or have sloped banks or ramps suitable for their escape;

- e. The use of chemicals (such as fertilisers and herbicides) harmful to amphibians and other wildlife should be avoided wherever possible;
- f. If a great crested newt or reptile is found while any site clearance or building operations are in progress then all works in the area must cease and ERAP Ltd (01772 750502) must be contacted immediately for further guidance; and
- g. If any other amphibian species (such as smooth newt, common toad or common frog) is detected on site, it must be carefully picked up, placed in a clean bucket and moved to an area of suitable habitat beyond the construction working area.

5.6 Bats

Protection

- 5.6.1 The recommendations detailed above for the protection of the boundary trees, hedgerow and shrubs will ensure habitats suitable for use by foraging bats are protected.
- 5.6.2 In addition, the lighting scheme to be implemented at the developed site must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over the boundary vegetation, as lighting overspill may deter use by wildlife such as foraging bats.
- 5.6.3 The lighting scheme will be designed with reference to current guidance, namely:
 - a. *Artificial lighting and wildlife. Interim Guidance: Recommendations to help minimise the impact of artificial lighting.* (Bat Conservation Trust, 2014); and
 - b. *Bats and lighting: Overview of current evidence and mitigation guidance* (Stone, 2014).

Enhancing Habitats for Roosting Bats

- 5.6.4 It is recommended that the development incorporates the installation of **one** commercially available bat box at a retained mature tree at the western boundary.
- 5.6.5 The bat box should be sited at least four metres above ground level against the main stem of the tree and positioned so that it is not cluttered by branches, allowing bats clear access. Once the development layout has been finalised, an Ecologist should advise on appropriate positions for the bat box. Suitable bat boxes are available from NHBS Ecology (www.nhbs.com) or Wild Care Shop (www.wildcareshop.com) and are presented at **Insert 2**:



Insert 2: Schwegler 1FF Bat Box and 2F Schwegler Bat Box (from left to right).

5.7 Birds

Protection

- 5.7.1 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are breeding. It is advised that any site clearance within central areas of the site, or any necessary removal of trees, shrubs or saplings is only conducted outside of the bird breeding season. The bird breeding season typically extends between March to August inclusive.
- 5.7.2 If any site clearance or vegetation removal is scheduled in the bird breeding season it is necessary that advice from an Ecologist is sought. It may be necessary to carry out a walkover survey to demonstrate satisfactorily that no breeding birds, active nests, eggs or fledglings are present in the area to be cleared.
- 5.7.3 If breeding birds are detected the Ecologist will issue guidance in relation to the protection of the nesting birds in conjunction with the scheduled works. This may involve cordoning off an area of the site until the young birds have fledged.

Enhancing Habitats for Nesting Birds

- 5.7.4 It is recommended that the development incorporates provision of bird nest boxes to provide additional habitat for nesting birds.
- 5.7.5 The installation of **two** bird nest boxes at trees and larger saplings at the western boundary of the site is recommended. RSPB advice states that boxes should face north to east, avoiding exposure to direct sunlight and overheating or chicks in the nest which can occur with south and south-west facing boxes. It is recommended that the boxes are positioned ensuring that they are not cluttered by branches or leaves, allowing birds clear access. Examples of suitable commercially available boxes are given at **Insert 3**, below.



Insert 3: 1B Schwegler Nest Box, 2H Schwegler Robin Box and 3H Schwegler Starling Box (from left to right)

- 5.7.6 Such bird boxes are available from the NHBS (www.nhbs.com) or Wild Care Shop (www.wildcareshop.com). ERAP Ltd will advise on the siting of bird boxes.

5.8 Landscape Planting

- 5.8.1 It is recommended that the landscape planting within the site is composed from native species and species known to be of value for the attraction of wildlife.
- 5.8.2 It is recommended that trees which support blossom and fruit which will attract insects are incorporated into the landscape planting. Suitable species are presented at **Table 5.1**.

Table 5.1: Suitable Native Species for Tree and Shrub Planting

Scientific Name	Common Name	Scientific Name	Common Name
<i>Alnus glutinosa</i>	Alder	<i>Prunus spinosa</i>	Blackthorn
<i>Corylus avellana</i>	Hazel	<i>Rosa arvensis</i>	Field Rose
<i>Crataegus monogyna</i>	Hawthorn	<i>Rosa canina</i>	Dog-rose
<i>Ilex aquifolium</i>	Holly	<i>Sambucus nigra</i>	Elder
<i>Malus sylvestris</i>	Crab Apple	<i>Sorbus aucuparia</i>	Rowan
<i>Prunus avium</i>	Wild Cherry	<i>Ulmus glabra</i>	Wych Elm
<i>Prunus padus</i>	Bird Cherry	<i>Viburnum opulus</i>	Guelder Rose

- 5.8.3 The understorey and ground cover planting design should be prepared to optimise the attraction of invertebrates such as feeding bumblebees and butterflies. Where possible the use of native species should be maximised but where necessary non-native species known to be attractive to invertebrates should be used.
- 5.8.4 Planting schemes that include flowering species such as *Calluna*, *Ceanothus*, *Hebe*, *Lavendula*, *Lonicera*, *Potentilla*, *Rosemarinus* and *Vinca* can maximise opportunities for feeding invertebrates and for the attraction of foraging bats and birds.
- 5.8.5 For further plants suitable for the attraction of pollinators please refer to the *Perfect for Pollinators Plant List* (Royal Horticultural Society, 2012). It is recommended that the selection of plant species at the site ensures that a variety of flowering species are available throughout the year.
- 5.8.6 It is recommended that suitable wildflower grassland is seeded and appropriately managed at the site. Seed mixes such as the *EM2 Standard General Purpose Meadow Mixture* and the *EM3 Special General Purpose Meadow Mixture* available from www.wildseed.co.uk are suitable.

6.0 CONCLUSION

- 6.1 This ecological appraisal has demonstrated that the development at Unit 6 of Capitol Park is feasible and acceptable in accordance with ecological considerations and the National Planning Policy Framework.
- 6.2 It is possible to implement reasonable actions for the protection of habitats suitable for use by nesting birds and foraging bats associated with the site, and ensure all works are conducted in accordance with relevant wildlife legislation.
- 6.3 Development at the site will provide an opportunity to secure ecological enhancement for fauna in local area such as breeding birds and roosting bats.

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8.0 APPENDIX 1: TABLES AND FIGURES

Table 8.1: Plant Species Composition, Frequency and Abundance for vegetation colonising the site

Scientific Name	Common Name	DAFOR ¹	% Cover
Woody species			
<i>Acer campestre</i>	Field Maple	O	<1%
<i>Acer pseudoplatanus</i>	Sycamore	O	<1%
<i>Aesculus hippocastanum</i>	Horse Chestnut	R	<1%
<i>Alnus glutinosa</i>	Alder	O/LF	2%
<i>Betula pendula</i>	Silver Birch	O/LA	2%
<i>Cornus sanguinea</i>	Dogwood	O/LF	<1%
<i>Corylus avellana</i>	Hazel	O/LF	<1%
<i>Crataegus monogyna</i>	Hawthorn	VLF	<1%
<i>Fagus sylvatica</i>	Beech	R	<1%
<i>Fraxinus excelsior</i>	Ash	O	<1%
<i>Larix</i> sp.	Larch	VLF	<1%
<i>Pinus sylvestris</i>	Scots Pine	VLF	<1%
<i>Prunus avium</i>	Wild Cherry	R	<1%
<i>Prunus spinose</i>	Blackthorn	VLF	<1%
<i>Ribes sanguineum</i>	Flowering Currant	O	<1%
<i>Rosa canina</i>	Dog Rose	VLF	<1%
<i>Salix caprea</i>	Goat Willow	O/LF	2%
<i>Salix cinerea</i>	Grey Willow	O	<1%
<i>Salix fragilis</i>	Crack Willow	VLF	<1%
<i>Sorbus aucuparia</i>	Rowan	O	<1%
<i>Ulex europaeus</i>	Common Gorse	O/LA	2%
Herb Species			
	Mosses	A	25%
<i>Agrostis stolonifera</i>	Creeping Bent	LA	<1%
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	O/VLA	<1%
<i>Arrhenatherum elatius</i>	False Oat-grass	O/VLA	<1%
<i>Bellis perennis</i>	Daisy	LF	<1%
<i>Cardamine flexuosa</i>	Wavy Bittercress	VLF	<1%
<i>Carex flacca</i>	Glaucous Sedge	O/LA	1%
<i>Carex pendula</i>	Pendulous Sedge	O/VLA	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	VLF	<1%
<i>Cirsium arvense</i>	Creeping Thistle	O/LF	<1%
<i>Cirsium vulgare</i>	Spear Thistle	O/LF	<1%
<i>Dactylis glomerata</i>	Cock's-foot	O/LA	2%
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	O/LF	<1%
<i>Epilobium hirsutum</i>	Great Willowherb	VLA	<1%
<i>Epilobium montanum</i>	Broad-leaved Willowherb	O	<1%
<i>Festuca rubra</i>	Red Fescue	A	25%
<i>Galium aparine</i>	Cleavers	VLF	<1%
<i>Geranium molle</i>	Dove's-foot Crane's-bill	O/LF	<1%
<i>Hedera helix</i>	Ivy	VLA	<1%
<i>Heracleum sphondylium</i>	Hogweed	VLF	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	F/LA	10%
<i>Hypochaeris radicata</i>	Cat's-ear	VLF	<1%
<i>Juncus conglomeratus</i>	Compact Rush	O/LA	<1%
<i>Juncus bulbosus</i>	Bulbous Rush	VLA	<1%
<i>Juncus effusus</i>	Soft-rush	F/LA	10%
<i>Juncus inflexus</i>	Hard-rush	O/LA	2%
<i>Lolium perenne</i>	Perennial Rye-grass	O/LA	<1%
<i>Lotus corniculatus</i>	Common Bird's-foot Trefoil	O/LA	2%
Continued overleaf			

Scientific Name	Common Name	DAFOR ¹	% Cover
Table 8.2 continued			
<i>Plantago lanceolata</i>	Ribwort Plantain	LA	<1%
<i>Plantago major</i>	Greater Plantain	VLF	<1%
<i>Poa trivialis</i>	Rough Meadow-grass	VLA	<1%
<i>Ranunculus acris</i>	Meadow Buttercup	LF	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	F/LA	5%
<i>Rubus fruticosus</i> agg.	Bramble	VLA	<1%
<i>Rumex crispus</i>	Curled Dock	VLF	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O	<1%
<i>Senecio jacobaea</i>	Common Ragwort	O/LF	<1%
<i>Senecio vulgaris</i>	Groundsel	VLF	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	LF	<1%
<i>Trifolium pratense</i>	Red Clover	O/VLA	1%
<i>Trifolium repens</i>	White Clover	LA	<1%
<i>Tussilago farfara</i>	Colt's-foot	LF	<1%
<i>Typha latifolia</i>	Bulrush	VLA	<1%
<i>Urtica dioica</i>	Common Nettle	VLA	<1%
¹ Key to DAFOR: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, V = Very, L = Local and * denotes a constant species			

Table 8.2: Plant Species Composition, Frequency and Abundance for Hedgerow 1

Scientific Name	Common Name	DAFOR ¹	Cover
Woody species			
<i>Acer campestre</i>	Field Maple	O	<1%
<i>Acer pseudoplatanus</i>	Sycamore	O/LF	2%
<i>Aesculus hippocastanum</i>	Horse Chestnut	R	<1%
<i>Alnus glutinosa</i>	Alder	VLA	<1%
<i>Crataegus monogyna</i>	Hawthorn	A/LD*	90%
<i>Fraxinus excelsior</i>	Ash	O	<1%
<i>Ilex aquifolium</i>	Holly	VLF	<1%
<i>Ligustrum ovalifolium</i>	Garden Privet	VLA	<1%
<i>Rhododendron ponticum</i>	Rhododendron	VLF	<1%
<i>Ribes sanguineum</i>	Flowering Currant	VLF	<1%
<i>Rosa canina</i>	Dog Rose	O/LF	2%
<i>Sambucus nigra</i>	Elder	O/LF	5%
<i>Sorbus aucuparia</i>	Rowan	O	<1%
<i>Ulex europaeus</i>	Common Gorse	VLF	<1%
Herb Species			
<i>Agrostis capillaris</i>	Common Bent	LF	<1%
<i>Alliaria petiolate</i>	Garlic Mustard	VLF	<1%
<i>Anthriscus sylvestris</i>	Cow Parsley	F	1%
<i>Cirsium arvense</i>	Creeping Thistle	VLF	<1%
<i>Dactylis glomerata</i>	Cock's-foot	O/LA	5%
<i>Digitalis purpurea</i>	Foxglove	R	<1%
<i>Galium aparine</i>	Cleavers	VLF	<1%
<i>Hedera helix</i>	Ivy	A*	30%
<i>Heracleum sphondylium</i>	Hogweed	O	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	F	5%
<i>Mercurialis perennis</i>	Dog's Mercury	VLA	<1%
<i>Narcissus</i> sp.	Daffodil	VLF	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	LF	<1%
<i>Rubus fruticosus</i> agg.	Bramble	O/LA	2%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O	<1%
<i>Senecio jacobaea</i>	Common Ragwort	O	<1%
<i>Silene dioica</i>	Red Campion	R	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	O	<1%
<i>Urtica dioica</i>	Common Nettle	F/LA*	25%
¹ Key to DAFOR: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, V = Very, L = Local and * denotes a constant species Species shaded grey are listed as woody or woodland species in <i>The Hedgerows Regulations 1997</i> (refer to Table 8.3 below).			

Table 8.3: Hedgerow Description and Assessment in Accordance with *The Hedgerows Regulations 1997*

Hedgerow name	Hedgerow		
Height x width x length (metres)	4 x 2 x 240		
Continuity	100%		
Management	Unmanaged		
Average Number of Qualifying Woody Species:			
Section number	1	2	3
Qualifying woody species	5	4	2
Average number	4		
Number of Features Present:			
(a) Bank or wall along at least ½ length	No		
(b) Gaps which in agg. do not exceed 10%	Yes		
(c)-(e) 1 standard tree per 50m	No		
(f) At least 3 woodland species within 1m	No		
(g) Ditch along at least ½ its length	No		
(h) Connections scoring 4 points or more	No		
(i) Parallel hedge within 15m	No		
Total Features	1		
Criteria for Hedgerow Importance 1: Hedgerow contains species listed as:			
(1) Part 1 of Schedule 1, Schedule 5 or Schedule 8 of WCA 1981	No		
(2) Declining breeders in 'Red Data Birds of Britain'	No		
(3) Categorised as 'endangered', 'extinct' or 'vulnerable'	No		
Criteria for Hedgerow Importance 2: Hedgerow includes:			
(i) At least 7 woody species	No		
(ii) At least 6 woody species and at least 3 features	No		
(iii) At least 6 woody species, inc. one of: Black Poplar, L-leaved Lime, S-leaved Lime or Wild Service Tree	No		
(iv) At least 5 woody species, and has 4 features	No		
Criteria for Hedgerow Importance 3: Is adjacent to is adjacent to a bridleway, footpath or byway and includes at least 4 woody species on average and 2 features from (a) to (g):			
Qualifies:	No		
Hedgerow Classed as Important?	No		

Table 8.4: Species List of Invertebrates Detected in June 2016

Order or Higher Taxa	Family	Genus and species	English Name (where one exists)	British Mainland Distribution	RDB or other Conservation Status
Ephemeroptera	Baetidae	Cloeon dipterum		Widespread and Common	
Odonata	Coenagrionidae	Coenagrion puella	Azure Damselfly	Widespread and Common	
Odonata	Coenagrionidae	Pyrrhosoma nymphula	Large Red Damselfly	Widespread and Common	
Odonata	Libellulidae	Sympetrum striolatum	Common Darter	Widespread and Common	
Orthoptera	Tetrigidae	Tetrix subulata	Slender Ground-hopper	Southern	
Orthoptera	Acrididae	Unidentifiable Juveniles	Grasshoppers		
Hemiptera Heteroptera	Pentatomidae	Aelia acuminata	Bishop's Mitre	Southern	
Hemiptera Heteroptera	Pentatomidae	Palomena prasina	Green Shieldbug	Southern	
Hemiptera Heteroptera	Pentatomidae	Dolycoris baccarum	Sloe Shieldbug	Southern	
Hemiptera Heteroptera	Rhopalidae	Rhopalus subrufus		Southern	
Hemiptera Heteroptera	Lygaeidae	Cymus glandicolor		Widespread and Common	
Hemiptera Heteroptera	Miridae	Capsus ater		Widespread and Common	
Hemiptera Heteroptera	Miridae	Stenodema laevigata		Widespread and Common	
Hemiptera Heteroptera	Miridae	Leptopterna ferrugata		Widespread and Common	
Hemiptera Heteroptera	Nabidae	Nabis rugosus	Common Damselbug	Widespread and Common	
Hemiptera Heteroptera	Saldidae	Saldula sp. (juvenile)			
Hemiptera Heteroptera	Gerridae	Gerris sp. (juvenile)			
Hemiptera Heteroptera	Notonectidae	Notonecta sp. (juvenile)			
Hemiptera Heteroptera	Corixidae	Corixa sp. (female)			
Hemiptera Heteroptera	Corixidae	Hesperocorixa sahlbergi		Widespread and Common	
Hemiptera Homoptera	Cercopidae	Philaenus spumarius		Widespread and Common	
Hemiptera Homoptera	Cercopidae	Neophilaenus lineatus		Widespread and Common	
Neuroptera	Chrysopidae	Chrysopa perla		Widespread and Common	
Neuroptera	Chrysopidae	Dichochrysa ventralis		Widespread and Common	
Trichoptera	Limnephilidae	Limnephilus lunatus		Widespread and Common	
Lepidoptera		Polyommatus icarus	Common Blue	Widespread and Common	
Lepidoptera		Maniola jurtina	Meadow Brown	Widespread and Common	
Lepidoptera		Coenonympha pamphilus	Small Heath	Widespread in Decline	NERC S41 Priority BAP
Lepidoptera		Ochlodes sylvanus	Large Skipper	Widespread and Common	
Lepidoptera		Camptogramma bilineata	Yellow Shell	Widespread and Common	
Lepidoptera		Zygaena lonicerae	Narrow-bordered Five-spot Burnet	Widespread and Common	
Coleoptera	Carabidae	Bembidion properans		Widespread and Common	
Coleoptera	Carabidae	Pterostichus madidus	Black Clock	Widespread and Common	
Coleoptera	Carabidae	Pterostichus niger		Widespread and Common	
Coleoptera	Carabidae	Pterostichus strenuus		Widespread and Common	
Coleoptera	Carabidae	Harpalus affinis		Widespread and Common	
Coleoptera	Carabidae	Curtonotus aulicus		Widespread and Common	
Continued overleaf					

Order or Higher Taxa	Family	Genus and species	English Name one (where exists)	British Mainland Distribution	RDB or other Conservation Status
Coleoptera	Carabidae	Agonum muelleri		Widespread and Common	
Coleoptera	Noteridae	Noterus clavicornis	Larger Noterus	Widespread and Common	
Coleoptera	Dytiscidae	Agabus bipustulatus		Widespread and Common	
Coleoptera	Dytiscidae	Agabus nebulosus		Widespread and Common	
Coleoptera	Dytiscidae	Hygrotus impressopunctatus		Widespread and Common	
Coleoptera	Hydrophilidae	Helophorus spp.			
Coleoptera	Hydrophilidae	Berosus signaticollis		Southern	
Coleoptera	Hydrophilidae	Anacaena sp.			
Coleoptera	Hydrophilidae	Hydrotus fuscipes		Widespread and Common	
Coleoptera	Hydrophilidae	Coelostoma orbiculare		Widespread and Common	
Coleoptera	Staphylinidae	Stenus ater		Scattered	Nationally Notable
Coleoptera	Staphylinidae	Stenus boops		Widespread and Common	
Coleoptera	Staphylinidae	Stenus clavicornis		Widespread and Common	
Coleoptera	Staphylinidae	Stenus similis		Widespread and Common	
Coleoptera	Coccinellidae	Coccinella septempunctata	Seven Spot Ladybird	Widespread and Common	
Coleoptera	Coccinellidae	Psyllobora vigintiduopunctata	Twenty Two Spot Ladybird	Widespread and Common	
Coleoptera	Coccinellidae	Harmonia axyridis	Harlequin Ladybird	Widespread and Common	
Coleoptera	Coccinellidae	Tytthaspis sedecimpunctata	Sixteen Spot Ladybird	Southern	
Coleoptera	Coccinellidae	Coccidula rufa		Widespread and Common	
Coleoptera	Oedemeridae	Oedemera lurida		Widespread and Common	
Coleoptera	Lagriidae	Lagria hirta		Widespread and Common	
Coleoptera	Cerambycidae	Clytus arietis	Wasp Beetle	Widespread and Common	
Coleoptera	Chrysomelidae	Donacia semicupraea		Widespread and Common	
Coleoptera	Chrysomelidae	Agelastica alni	Alder Leaf Beetle	Southern	RDB Known Insuf.
Coleoptera	Chrysomelidae	Haltica spp.			
Coleoptera	Chrysomelidae	Phyllodecta vulgatissima	Blue Willow Beetle	Widespread and Common	
Coleoptera	Cantharidae	Cantharis nigra		Widespread and Common	
Coleoptera	Cantharidae	Cantharis palida		Widespread and Common	
Coleoptera	Cantharidae	Cantharis rustica		Widespread and Common	
Coleoptera	Cantharidae	Rhagonycha fulva	Common Red Soldier Beetle	Widespread and Common	
Coleoptera	Elateridae	Agriotes obscurus		Widespread and Common	
Coleoptera	Curculionidae	Rhinocyllus conicus		Southern	Nationally Notable
Coleoptera	Curculionidae	Polydrosus formosus		Southern	Nationally Notable
Coleoptera	Curculionidae	Sitona spp.			
Coleoptera	Curculionidae	Ceuthorrhynchus spp.			
Hymenoptera	Tenthredinidae	Dolerus spp.			
Hymenoptera	Tenthredinidae	Rhogogaster sp.			
Hymenoptera	Tenthredinidae	Tenthredo sp.			
Hymenoptera	Apidae	Bombus campestris	Field Cuckoo Bee	Widespread and Common	
Hymenoptera	Apidae	Bombus hortorum	Garden Bumblebee	Widespread and Common	
Hymenoptera	Apidae	Bombus hypnorum	Tree Bumblebee	Widespread and Common	
Hymenoptera	Apidae	Bombus lapidarius	Red-tailed Bumblebee	Widespread and Common	
Hymenoptera	Apidae	Bombus pascuorum	Common Carder Bee	Widespread and Common	
Hymenoptera	Apidae	Bombus pratorum	Early Bumblebee	Widespread and Common	
Continued overleaf					

Order or Higher Taxa	Family	Genus and species	English Name (where one exists)	British Mainland Distribution	RDB or other Conservation Status
Hymenoptera	Apidae	Bombus rupestris	Hill Cuckoo-bee	Southern	Nationally Notable
Hymenoptera	Apidae	Bombus terrestris	Buff-tailed Bumblebee	Widespread and Common	
Hymenoptera	Apidae	Bombus vestalis	Vestal Cuckoo-bee	Widespread and Common	
Hymenoptera	Formicidae	Formica lemani		Widespread and Common	
Hymenoptera	Formicidae	Lasius niger / L. platythorax		Widespread and Common	
Hymenoptera	Formicidae	Myrmica ruginodis		Widespread and Common	
Hymenoptera	Formicidae	Myrmica scabrinodis		Widespread and Common	
Isopoda	Oniscidae	Oniscus asellus	Common Shiny Woodlouse	Widespread and Common	
Isopoda	Philosciidae	Philoscia muscorum	Common Striped Woodlouse	Widespread and Common	
Isopoda	Porcellionidae	Porcellio scaber	Common Rough Woodlouse	Widespread and Common	
Gastropoda	Limnaeidae	Limnaea palustris	Marsh Pond Snail	Widespread and Common	
Gastropoda	Succineidae	Succinea putris	Large Amber Snail	Widespread and Common	

Table 8.5: Notable *Diptera* species

Family	Genus and species	British Mainland Distribution	RDB or other Conservation Status
Agromyzidae	<i>Agromyza erythrocephala</i>	Very Few Records	
Agromyzidae	<i>Agromyza felleri</i>	Very Few Records	
Agromyzidae	<i>Creodontha crassiseta</i>	Very Few Records	
Agromyzidae	<i>Melanagromyza eupatorii</i>	Very Few Records	
Agromyzidae	<i>Ophiomyia ranunculicaulis</i>	Very Few Records	
Agromyzidae	<i>Phytomyza albipennis</i>	Southern	
Agromyzidae	<i>Phytomyza cineracea</i>	Very Few Records	
Agromyzidae	<i>Phytomyza fuscula</i>	Very Few Records	
Agromyzidae	<i>Phytomyza ranunculicola</i>	Very Few Records	
Anthomyiidae	<i>Egle lynborgi</i>	Very Few Records	
Caliphoridae	<i>Angioneura acerba</i>	Very Few Records	RDB 1 Endangered
Chamaemyiidae	<i>Chamaemyia nigripalpis</i>	Very Few Records	
Chironomidae	<i>Metriocnemus atriclavus</i>	Very Few Records	
Chloropidae	<i>Lasiambia palposa</i>	Very Few Records Scattered	
Ephydriidae	<i>Lamproseatella sibilans</i>	Very Few Records Scattered	
Ephydriidae	<i>Philygria picta</i>	Southern	
Fanniidae	<i>Fannia genualis</i>	Southern	
Heleomyzidae	<i>Heleomyza borealis</i>	Very Few Records Scattered	
Lauxaniidae	<i>Homoneura patelliformis</i>	Very Few Records Southern	
Mycetophilidae	<i>Sciophila nigrinitida</i>	Very Few Records	Nationally Scarce
Piophilidae	<i>Stearibia nigriceps</i>	Very Few Records	
Pipunculidae	<i>Cephalops pannonicus</i>		Nationally scarce
Pipunculidae	<i>Chalarus indistinctus</i>	Very Few Records	
Rhinophoridae	<i>Phyto melanocephala</i>	Southern	
Syrphidae	<i>Cheilosia mutabilis</i>	Mainly Southern	Nationally Notable
Sciomyzidae	<i>Pherbellia ventralis</i>	Widespread	
Tachinidae	<i>Brachicheta strigata</i>		Nationally Notable
Tachinidae	<i>Cinochira atra</i>	Mainly Southern	
Tachinidae	<i>Pelatachina tibialis</i>	Southern	
Tachinidae	<i>Phania funesta</i>	Southern	
Tachinidae	<i>Ramonda latifrons</i>	Southern Very Few Records	

Table 8.6: Photographs



Photo 1: Active Construction to the east of Unit 6



Photo 2: Unit 6, facing southwards from northern boundary



Photo 3: Cleared ground at the north of the site



Photo 4: Areas colonising to marshy grassland



Photo 5: Areas colonising to marshy grassland



Photo 6: Self-seeded and planted shrubs at the northern and western boundaries



Photo 7: Shrubs on the western boundary



Photo 8: Western boundary hedgerow

