

**Land East of Street Hill**

**Crawley**

**West Sussex**

**RH10 7NN**

**Extended Phase I Habitat Survey  
and HSI Assessment**

**A Report for “Tony Fullwood Associates”**



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**LAND EAST OF STREET HILL**

**Extended Phase I Habitat Survey**

**and HSI Assessment**

**Controlled Copy**

**01 of 02**

**01 Tony Fullwood Associates**

**02 Greenspace Ecological Solutions Ltd**

This report was compiled by Guy Newman MIEEM

*The content of this report is the responsibility of Greenspace Ecological Solutions Ltd.  
It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can  
ensure complete assessment or prediction of the changeable onsite environment.*

**Report Number J-20119**

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**1. PROJECT OVERVIEW**

Client: Tony Fullwood Associates

Site Address: Street Hill, Crawley, West Sussex, RH10 7NN

Attending Ecologist: Guy Newman (Bat Licence No 20130277 & Great Crested Newt Class One Licence Holder)

Survey Date: 14<sup>th</sup> October 2013

Site Proposals: Residential Development

Associated Planning Reference Number: Unknown

Source of Relevant Documents:

<b>Document:</b>	<b>Source:</b>
Site Plan	Tony Fullwood Associates
Site Location	Street Map
Desk Study	Magic.gov.uk, Sussex Biodiversity Record Centre

## 2. INTRODUCTION

### 2.1 Site Description

2.1.1 Part of the Worth Meadows Site of Nature Conservation Importance (SNCI) is being proposed for residential development. The SNCI is located on the eastern fringe of the town of Crawley, East Sussex (National Grid Reference TQ 300 359). The SNCI is situated in a semi urban setting and is bordered by the M23 to the east, residential properties and associated landscaping to the north and west, and industrial units to the south. The wider landscape is one of urban dwellings, grazing pasture, agricultural land and woodland.

2.1.2 Designated in 1992, the SNCI covers approximately 5.8ha and encompasses grassland, scrub, overgrown ponds, woodland and a stream. The area subject to survey comprises the whole of the site. The area of the proposed development covers approximately 2ha and lies in the south of the SNCI. The location of the survey area and the area to be developed is depicted in Figure 1.

2.1.3 The geographical location of the site is depicted in Plate 1. Photographs of the site and areas of interest are provided in Section 4.

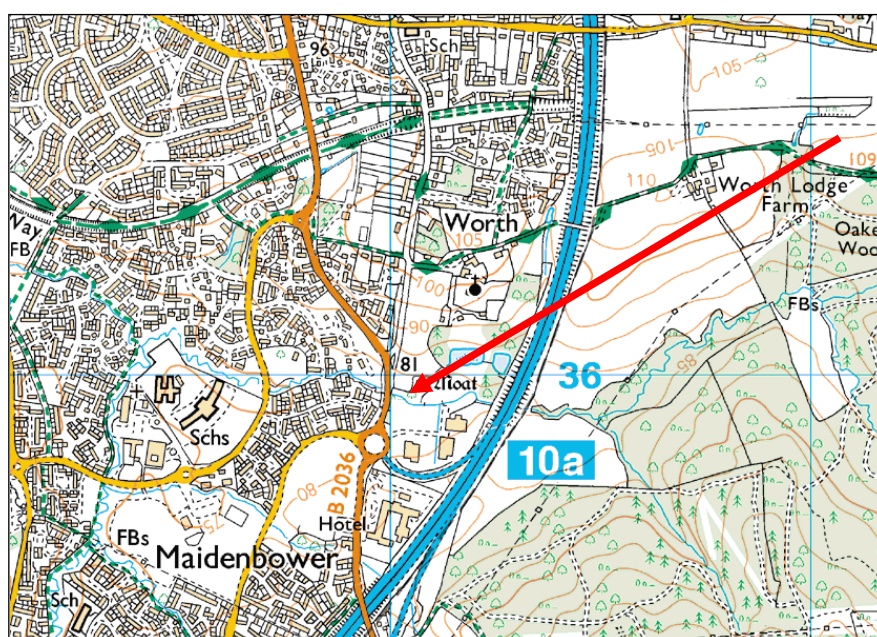


Plate 1 – Site Location

### 2.2 Site Proposals

2.2.1 Part of the SNCI is being proposed for residential development with associated landscaping.

2.2.2 In response, Greenspace Ecological Solutions Ltd was commissioned by Tony Fullwood Associates to conduct an Extended Phase I Habitat Survey and Bat Tree Assessment of the area proposed for

development. To provide a contextual basis for the survey, the wider SNCI has also been reviewed and appropriate recommendations are provided in Section 5.

## **2.3 Objectives of the Survey**

2.3.1 The objectives of the surveys were to:

- Review the designation criteria of the SNCI;
- Evaluate the potential for protected species to occur within the area proposed to be developed;
- Assess the potential for bats to roost within trees to be affected by the proposal;
- Evaluate the ecological importance of habitats within the area proposed to be developed;
- Identify waterbodies within 250m of the site that have potential to support great crested newts;
- Assess the potential for protected species and/or habitats to be affected by the proposals;
- Assess the impact of the proposals on the area and provide appropriate recommendations and mitigation where required.

## **2.4 Survey Constraints**

2.4.1 Desk study data may not be complete. The omission of species from the desk study data should not be considered confirmation of their absence from the search area.

2.4.2 The survey was conducted on a single visit and due to seasonal constraints botanical species present may be omitted from this report.

2.4.3 All measurements and distances in this report are estimates.

### 3 METHODOLOGY

#### 3.1 Desk Study

3.1.1 A desk study to determine designated areas and historical records of protected species within 3km of the site was undertaken. Those consulted for the desk study were:

- Magic.gov.org
- The Sussex Biological Records Centre

#### 3.2 Extended Phase I Habitat Survey

3.2.1 The proposed development site and the wider SNCI were subject to a Phase I Habitat survey on 14<sup>th</sup> October 2013. The survey was conducted by the suitably experienced surveyor Guy Newman of Greenspace Ecological Solutions. The habitats present were mapped in accordance with current best practice guidance (JNCC, 2010) and a map of the habitats and areas of interest is provided in Figure 1.

##### Protected Species

3.2.2 The Phase I Habitat survey was extended to include an assessment of the sites' potential to support protected species. This survey did not include any species specific survey methods that would determine the presence of such species. Planning policies and legislation protecting species of relevance to the site is provided in Appendix A.

#### 3.3 Tree Survey

3.3.1 Trees within and adjacent to the survey area were assessed for their potential to support bats. The survey was conducted in accordance with current best practice guidance (BCT, 2012) and the trees were inspected for features such as splits, fissures, delaminated bark, heavy ivy cover, rot holes and woodpecker holes. Evidence such as droppings and staining from urine were also searched for below suitable roost features.

3.3.2 The scale process used to identify trees with bat roost potential is as follows:

- **Category 1\*** = Trees with multiple, highly suitable features capable of supporting larger roosts.
- **Category 1** = Tree with definite bat potential, supporting fewer suitable features than Cat 1\* trees or with potential for use by single bats.
- **Category 2** = Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks and/or crevices being found; or the tree supports some features which may have limited potential to support bats.
- **Category 3** = Trees with no potential to support bats.



3.3.3 The locations of significant trees within the site are depicted in Figure 1.

### 3.4 Habitat Suitability Assessment (HSI)

3.4.1 From aerial mapping a total of 3 waterbodies were identified within 250m of the site. The location of these waterbodies is depicted in Figure 1. None are located within the proposed development site.

3.4.2 The assessment of the waterbodies' suitability to support great crested newts was undertaken using a simplified version of the HSI methodology as developed by Oldham *et al* (2000). The HSI incorporates ten suitability indices, all of which are factors considered to affect great crested newts. The ten indices assessed are;

- Location (in Britain);
- Pond area;
- Desiccation rate (years out of ten that pond dries);
- Water quality (subjective assessment);
- Percentage of pond shaded;
- Number of waterfowl;
- Fish population (subjective assessment);
- Number of ponds within 1km;
- Terrestrial habitat quality;
- Percentage macrophyte cover.

3.4.3 The results of the HSI provide a numerical index of between 0 and 1 where 0 indicates unsuitable habitat and 1 represents optimal habitat. A score of  $\geq 0.5$  is considered indicative of a pond that may support a population of great crested newts. The details of the HSI scoring criteria are provided below in Table 1.

Table 1 – Great Crested Newt HSI Scoring Criteria

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

## 4 RESULTS

### 4.1 Desk Study

#### *Statutory and Non-Statutory Designated Sites*

4.1.1 The following designated sites are noted within 3km of the development boundary.

*Table 2 – Designated Sites*

Site Criteria	No Sites within 3km	Location of Closest Site	Notes on Closest Site
LNR	2	1300m, north	Tilgate Forest LNR lies on the southern fringe of Crawley
Notable Road Verge	1	2600m, north east	Beyond the M23 motorway
SNCI	6	0m	The site lies within the Worth Meadows SNCI
SSSI	1	2400m, south	Worth Forest SSSI lies beyond the M23 motorway.

(Note – AONB = Area of Outstanding Natural Beauty, LNR = Local Nature Reserve, SNCI = Site of Nature Conservation Importance, SSSI = Site of Special Scientific Interest)

4.1.2 A map depicting the designated areas within 3km of the site is presented in Figure 2.

#### *Significant Habitats*

4.1.3 The following significant habitats are noted within 3km of the site boundary.

*Table 3 – Significant Habitats*

Habitat Type	Location of Closest Habitat	Notes
Ancient Veteran Tree	20m, north east	Appears to be within the grounds of the adjacent church.
Ancient Woodland	250m, east	Other side of M23 motorway
Ghyll Woodland	250m, east	Other side of M23 motorway
Lowland Heathland	600m, south	Other side of M23 motorway
Lowland Meadow	1500m, east	Small parcel on other side of M23 motorway
Open Water	0m	Adjacent to northern site boundary

4.1.4 A map depicting the significant habitats within 3km of the site is presented in Figure 3.

#### *Bats*

4.1.5 Nine species of bat have been recorded within the search area and bat records of relevance to the site are presented in Table 4. The full data set for bats is presented in Appendix B.

Table 4 – Closest Bat Records

Species	No of Records within 5km	Location of closest record	Year of Closest Record	Direction of closest record	Roost Status
Bechstein's Bat	3	2550m	2008	south	M
Brown Long-eared	11	300m	2005	north	UR
Common Pipistrelle	13	1100m	2009	west	UR
Daubentons	5	1300m	2004	west	VO
Nathusius pipistrelle	1	2900m	2009	north west	M/S
Natterer's	2	2700m	2005	north west	VO
Noctule	5	700m	2006	north west	VO
Soprano pipistrelle	1	3275m	2009	north west	UR
Western barbastelle	1	2800m	2004	north west	VO

(Note – M/S = Mating / Swarming, MR – Maternity Roost, UR = Unidentified Roost, VO = Visual Observation)

#### Birds

- 4.1.6 A total of 35 birds of relevance to the site and of conservation concern have been recorded within 3km of the site. An overview of the species of interest is presented in Table 5. The full data set is presented in Appendix C.

Table 5 – Bird of Relevance and of Conservation Interest

Species	No of Records	Most Recent Record	Status
Mallard	64	2011	A
Osprey	3	2006	A, !
Kestrel	12	2010	A
Merlin	2	2007	A, !
Eurasian Hobby	1	1996	!
Common Snipe	1	1990	A
Woodcock	17	2010	A
Stock Pigeon	25	2008	A
European Turtle Dove	6	2011	BAP, N, R
Common Cuckoo	6	2011	BAP, N, R
Nightjar	8	2004	BAP, N, R
Green Woodpecker	58	2011	A, !
Lesser Spotted Woodpecker	17	2005	BAP,R
Tree Pipit	58	2004	BAP, N, R
Grey Wagtail	86	2011	A
Hedge Accentor	25	2011	A

Nightingale	2	2003	A
Common Redstart	9	2003	A
Fieldfare	9	2010	R, !
Redwing	24	2010	R, !
Mistle Thrush	19	2010	A
Common Whitethroat	8	2010	A
Wood Warbler	11	2000	Bap, N, r
Firecrest	15	2001	A,!
Spotted Flycatcher	15	2005	BAP, R
Willow Tit	18	2005	BAP, R
Marsh Tit	36	2009	BAP, R
Starling	15	2011	BAP, R
House Sparrow	23	2011	BAP, N, R
Brambling	9	2011	!
Common linnet	7	2003	BAP, R
Lesser Redpoll	52	2009	BAP, N, R
Bullfinch	46	2011	BAP, R
Hawfinch	1	2003	Bap, n, r
Yellow Hammer	19	2008	BAP, N, R

(Note – ! = Schedule 1, R = Bocc Red List, A = Bocc Amber list, BAP = Biodiversity Action Plan Species, N = Natural Environment & Rural Communities (NERC) Act Species)

#### *Dormice*

- 4.1.7 A total of six dormouse *Muscardinus avellanus* records were noted within 3km of the site. Details of the closest record are presented in Table 6.

Table 6 – Closest Dormouse Record

Location of closest record	Year of Closest Record	Direction of closest record	Notes
2300m	2009	North west	Beyond the main rail line

#### *Great Crested Newts*

- 4.1.8 A total of five great crested newt *Helvetic cristatus* records were noted within 3km of the site. Details of the closest record are presented in Table 7.

Table 7 – Closest Great Crested Newt Record

Location of closest record	Year of Closest Record	Direction of closest record	Notes
2900m	2006	North west	N/A

### Reptiles

- 4.1.9 A total of seven slow worm *Anguis fragilis*, six common lizard *Zootica vivipara*, 13 grass snake *Natrix natrix* and six adders *Vipera berus* records were noted within 3km of the site. Details of the closest record are presented in Table 8.

Table 8 – Closest of the Reptile Records

Species	Location of closest record	Direction of closest record	Year of Closest Record	Notes
Slow Worm	350m	South west	2007	Within the Maidenbower Area
Common Lizard	350m	South West	2007	Within the Maidenbower Area
Grass Snake	1200m	South West	1996	Within the Maidenbower Area
Adder	575m	South East	2012	On other side of M23

## 4.2 Extended Phase I Habitat Survey

- 4.2.1 The following habitat types were recorded within the proposed development area.

- Broadleaved woodland
- Scrub
- Semi-improved grassland

- 4.2.2 The order in which the habitats are presented is alphabetical and not indicative of their ecological importance. Areas of interest are depicted in Figure 1.

### Broadleaved Woodland

- 4.2.3 Broadleaved woodland is noted around the entirety of the site perimeter, with key areas present along the southern, eastern and western boundaries.

- 4.2.4 Denoted TN1 in Figure 1, the woodland on the eastern boundary is an area of coppiced hazel *Corylus avellana* with silver birch *Betula pendula*, hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, young

sycamore *Acer pseudoplatanus* and willow *Salix* sp, also present. Occasional mature ash *Fraxinus excelsior* and pedunculate oak *Quercus robur* were noted within and the herb layer comprises honeysuckle *Lonicera periclymenum*, bracken *Pteridium aquilinum*, bramble *Rubus fruticosus* sp. agg., common nettle *Urtica dioica* and snowberry *Symphoricarpos* sp.

- 4.2.5 A younger block of broad-leaved woodland is present on the southern site boundary (TN5). Dominated by young pedunculate oak, the herb layer comprises a sward indicative of previous meadow/grassland with creeping buttercup *Ranunculus repens*, meadow buttercup *Ranunculus acris*, ground ivy *Glechoma hederacea*, yarrow *Achillea millefolium*, ribwort plantain *Plantago lanceolata*, common sorrel *Rumex acetosa*, timothy grass *Phleum bertolonii* and selfheal *Prunella vulgaris* noted throughout.
- 4.2.6 An area of open woodland which extends along the western site boundary (TN6) is dominated by hazel coppice, with occasional rowan *Sorbus aucuparia*, cherry *Prunus* sp., yew *Taxus baccata*, sycamore, pedunculate oak, holly *Ilex aquifolium*, rhododendron *Rhododendron* sp. and blackthorn *Prunus spinosa*. The herb layer contains common ivy *Hedera helix*, false wood-brome *Brachypodium sylvaticum*, lords and ladies *Arum maculatum* and ground elder *Aegopodium podagraria*.
- 4.2.7 Mature trees of particular interest to the site are described in Section 4.3. An example of the eastern woodland block (TN1) is presented in Plate 2. An example of the woodland along the western boundary (TN6) is presented in Plate 3.

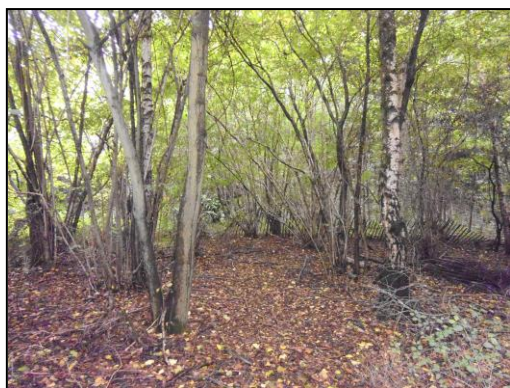


Plate 2 – Eastern Woodland (TN1)



Plate 3 – Western Woodland (TN6)

### Scrub

- 4.2.8 The dominant habitat type within the site is bramble *Rubus fruticosus* scrub. Noted to be encroaching into the site from the broadleaved woodland, the bramble scrub is denoted TN2 in Figure 1 and examples are depicted in Plates 4 and 5.



Plate 4 – Bramble Scrub



Plate 5 – Bramble Scrub

#### *Semi-improved Grassland*

4.2.9 Semi-improved tussock grassland is noted throughout the central parts of the site. Denoted TN4 in Figure 1, the habitat is considered a relic of previous grazing pasture/ meadow which is in the throes of succession into bramble scrub. The semi-improved grassland forms distinct glades between the encroaching scrub and contains grass species of rough meadow-grass *Poa trivialis*, annual meadow-grass *P. annua*, red fescue *Festuca rubra*, cock's-foot grass *Dactylis glomerata* and false oat-grass *Arrhenanthrum elatius*. Herb species present include lesser stitchwort *Stellaria graminea*, white clover *Trifolium repens*, tormentil *Potentilla erecta*, spear thistle *Cirsium vulgare*, hedge bedstraw *Galium mollugo*, sedge *Carex* sp., knapweed *Centaurea nigra* and bush vetch *Vicia sepium*.

4.2.10 Examples of the tussocky semi-improved grassland TN4 is presented in Plates 6 and 7.



Plate 6 – Semi-improved Tussock Grassland (TN4)



Plate 7 – Semi-improved Grassland (TN4)

### 4.3 Tree Survey

4.3.1 A total of 7 mature trees were noted within the area proposed for development. The location of the trees is depicted in Figure 1 by the letter 'T'. A description of the trees and their levels of potential are provided below in Table 9.

Table 9 – Tree Table

Tree Number	Species	DBH (cm)	Description	Potential
T1	Ash	90	East-facing cavity in the main trunk at a height of 1m is c. 30cm long x 2cm wide. Feature extends into the trunk c. 40cm. No other feature visible.	Category 1
T2	Pedunculate oak	100+	Veteran tree with multiple features. Dead wood at tips, west-facing snags at c. 8m. No wounds visible.	Category 1
T3	Willow	90	No visible features.	Category 3
T4	<i>Pinus</i> sp	60	Next to the stream. No visible features.	Category 3
T5	<i>Pinus</i> sp	60	Next to the stream, no visible features.	Category 3
T6	Pedunculate oak	100	Veteran tree with multiple features. Split limbs and toothy snags throughout. Potential north-facing hole leading to a cavity at c. 3m high. Dead wood at tips.	Category 1*
T7	Pedunculate oak	80	Tall healthy tree. Restricted access results in one side subject to survey. No suitable features noted.  To be re-assessed if to be felled.	Category 2

#### 4.4 Habitat Suitability Index Assessment (HSI)

4.4.1 Of the three waterbodies mapped within 250m of the site, only a single water body contained water at the time of survey. Both of the remaining waterbodies are heavily overgrown with *Rhododendron Rhododendron* sp. and the feature denoted P3 appears to have failed and is considered unlikely to contain water at any time of year. The feature denoted P2, may, however, contain water during the winter or spring months.

4.4.2 Pond 1 (P1) lies on the north-east corner of the site, has a surface area of approximately 2000m<sup>2</sup> and dries 'Rarely'. Water quality is 'Moderate' and shade is 90%. Fowl or fish were 'Absent' and the terrestrial habitat is 'Good'. Macrophyte cover was 20%. P1 scores **0.78** which is considered 'Good' for its suitability to support great crested newts.

4.4.3 Table 10 depicts the results of the HSI survey.



Table 10 - Results of the HSI Survey (P1)

SI1 - Location	1	
SI2 - Pond area	0.8	
SI3 - Pond drying	1	
SI4 - Water quality	0.67	
SI5 - Shade	0.4	
SI6 - Fowl	1	
SI7 - Fish	1	
SI8 - Ponds	0.8	
SI9 - Terr'l habitat	1	
SI10 - Macrophytes	0.5	
<b>HSI</b>	<b>0.78</b>	<b>Good</b>

#### 4.5 Protected Species within the Development Site

##### *Badgers*

- 4.5.1 No evidence or field signs were identified to suggest that the area proposed for development is used by badger *Meles meles*.

##### *Bats*

- 4.5.2 Trees with potential to support roosting bats have been identified and the habitats to be affected are considered suitable to support foraging and commuting bats and historical records suggest nine species of bat reside within 5km of the site. Given the number of suitable features within the site and that bats are known to frequent the area, the potential for roosting bats to reside within trees along the margins of the area to be developed is considered '**High**'.

##### *Breeding Birds*

- 4.5.3 The broadleaved woodland, scrub and tussock grassland have potential to support both arboreal and ground nesting birds. Furthermore, the historical records suggest 35 species of relevance to the site are known to frequent the surrounding area and with this in mind it is suggested that, at the appropriate time of year, the potential for breeding birds to reside within the site is considered '**High**'.

##### *Dormice*

- 4.5.4 The semi-natural broadleaved woodland and bramble scrub have potential to support dormice. Although historical records have identified dormice within 3km of the site, it should be noted that the closest of these lies beyond the main railway line which lies north-west of the site and the significant barrier of the M23 motorway separate the site from many of the other records. With this in mind the potential for dormice to reside within the site is considered '**Moderate**'.

*Great Crested Newts*

- 4.5.5 Habitats within the site are suitable to support great crested newts and waterbodies around the development area have potential to support the species. Historical records for great crested newts have, however, highlighted no records within the identified search radius for great crested newts of 500m and in response the potential for great crested newts to reside within the site is considered '**Moderate**'.

*Reptiles*

- 4.5.6 The grassland habitats have potential to support the more common reptile species; and historical records highlight the presence of slow worm, common lizard and adder in within 600m of the site. Although grass snake is the most distant record (1200m), the habitats are considered highly suitable and this species is considered likely to reside within the site. Therefore the potential for reptiles to reside within the site is considered '**High**'.

## 5 ECOLOGICAL EVALUATION AND RECOMMENDATIONS

### 5.1 Principles of Ecological Evaluation

5.1.1 The evaluation of ecological features and resources should be based on sound professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this chapter is based on that described in 'Guidelines for Ecological Impact Assessment in the United Kingdom' (IEEM, 2006).

5.1.2 In evaluating ecological features and resources it should be noted that key factors are taken into account, including "Geographic Frame of Reference", "Habitats", "Species" and the "Secondary Supporting Value".

### 5.2 Designated Sites

5.2.1 The site is not designated as of European Importance and is not classified as a Site of Scientific Interest (SSSI).

5.2.2 It should be noted that although the site is considered a Site of Nature Conservation Importance (SNCI), the official designation text was compiled in 1992 and describes the site as "*relatively species rich meadows, two overgrown ponds, some woodland and a stream*". A more complete version of the SNCI text is provided in Figure 4.

5.2.3 Although the grassland habitat noted in the central areas of the site contain species indicative of relic pasture, the finer grass species of interest to the SNCI designation are currently being out-competed by the courser grass species inclusive of cock's-foot grass and false oat-grass. With this in mind, it is suggested that without intervention, the habitats identified previously as 'of importance' are likely to be replaced with bramble scrub and broadleaved woodland. Although in its current state the grassland habitat reflects the former meadow it once was, it is now less diverse and is becoming dominated by species typical of rank semi-improved grassland. The two overgrown ponds and the stream lie beyond the area proposed for development and although consideration to their integrity should be implemented throughout the development, they are not to be directly affected by the proposed.

5.2.4 No other statutory or non-statutory designated sites fall within or adjacent to the site. No other statutory or non-statutory designated sites fall within or adjacent to the site and no deleterious effect will result on these sites.

### 5.3 Habitats and Botanical Species

- 5.3.1 No rare or endangered plant species were noted within the site and the habitats present are considered typical of those expected. In response, no further botanically specific surveys are required in this instance.
- 5.3.2 Native broadleaved trees noted around the perimeter of the development site are to be retained, and in response measures to avoid damage and root compaction should be implemented. Protection measures should be implemented in accordance with the British Standard BS 5837 Trees in Relation to Design, Demolition and Construction, the design of which is presented in Figure 5.
- 5.3.3 Of three waterbodies within 250m of the site, only one contained water at the time of survey. The two dry ponds are noted to lack management and have also become heavily overgrown with rhododendron. It is suggested that without management the ecological value of these waterbodies will continue to deteriorate with time and if available measures to increase their ecological value should be incorporated within the design.

### 5.4 Protected Species

#### *Bats –*

- 5.4.1 The survey identified, a single tree as having Category 1\* (T6), two trees as having Category 1 (T1 and T2), one tree as having Category 2 (T7) and three trees as having Category 3 (T3, T4, and T5) potential to support roosting bats.
- 5.4.2 All UK bats and their roosts are protected by law and should the proposed result in any loss/impact to trees identified as suitable to support bats, then evening emergence and/or pre-dawn re-entry surveys, to determine the presence/likely absence of roosting bats, should be conducted prior to the start of works. An overview of the emergence / re-entry survey methodology is provided in Appendix B.
- 5.4.3 The habitats within and around the site are considered optimal for foraging/feeding and commuting bats and in accordance with the Bat Conservation Trust 'Bat Surveys Good Practice Guidelines (2012)' the site be subject to bat activity surveys prior to the start of works.
- 5.4.4 Bat activity surveys serve to determine the assemblage of bat species present, determine the frequency with which the site is used by different bat species, establish the spatial and temporal distribution of activity for different bat species and, if present, identify whether the site is important for foraging, commuting and/or roosting bats.

- 5.4.5 If required, the activity surveys would provide the level of information required to ensure proportionate mitigation is applied and would serve to establish the need or not to apply to Natural England for a EPS Licence prior to the start of works. An overview of the activity surveys are provided in Appendix A.
- 5.4.6 Should bats be identified as present, measures to retain and manage the habitats within the site should be implemented. If removal is required, trees/habitats to be lost should be replaced in suitable locations and with similar species and roosting opportunities for bats should be increased through the application of bat boxes in/on the buildings and mature trees within the site. It is suggested that through appropriate habitat management and sympathetic lighting designs, foraging opportunities for bats could be improved post development.
- 5.4.7 Through the application of such mitigation and enhancement measures, there is scope for the proposed development to maintain the Favourable Conservation Status (FCS) of bats within the site, should they be present.

#### *Birds*

- 5.4.8 Habitats within the site are considered optimal for a range of both arboreal and ground nesting birds and in response the sites potential to support breeding birds is considered '**High**'. As all breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended) and the historical records have identified a number of priority and BAP species within the area, it is recommended that the site be subject to breeding bird survey prior to the start of works.
- 5.4.9 Through the application of appropriate habitat management, timings of works and the installation of alternative nesting opportunities, it is suggested that the potential for breeding birds to reside within the site will be maintained/increased post development.

#### *Dormice –*

- 5.4.10 '**Moderate**' potential for dormice has been identified within the broadleaved woodland and scrub habitats within the site and as dormice and their habitats are protected under both European and UK legislation, further surveys to determine the presence of dormice will be required prior to the start of works. Details of the further surveys are provided in Appendix B.
- 5.4.11 If the surveys identify dormice as present, the layout of the proposed development should be considerate to retention of suitable habitats and the application of wildlife corridors within/through the site. Where practical, the site layout should maintain the woodland edges and provide a mosaic of hedges / tree corridors of native species selected to provide a broad calendar of flowering / fruiting habitats. Furthermore, works to suitable habitats would need to be conducted in an appropriate manner and under the guidance of an EPSL from Natural England.

*Great Crested Newts –*

- 5.4.12 The site has '**Moderate**' potential to support great crested newts and the water body adjacent to the north eastern site boundary has '**Good**' breeding potential for the species. Great crested newts and their habitats are protected under both European and UK legislation and as suitable habitats are to be affected by the proposed development then further surveys to determine the presence/ likely absence of great crested newts should be conducted prior to the start of works. Details of the presence / likely absence surveys are provided in Appendix A.
- 5.4.13 No waterbodies lie within the proposed development boundary and non are to be affected / lost as a result of the proposed. Should the further surveys identify great crested newts as present, it should be noted that the habitats to be retained post development will provide suitable places for great crested newts to forage, rest and shelter. If present, works that will affect habitats suitable for great crested newts will need to be conducted under the guidance of a EPSL from Natural England. To fulfil the requirements of the EPSL, the layout of the proposed development should be considerate to retention of habitat connectivity between waterbodies, the installation of improved / enhanced foraging areas, the installation of wildlife ponds and the construction of log piles and hibernacula.
- 5.4.14 Through the application of such mitigation and enhancement measures, it is suggested that there is scope for the proposed development to maintain the Favourable Conservation Status (FCS) of great crested newts, should they be present.

*Reptiles –*

- 5.4.15 Potential for reptiles to reside within the areas of semi-improved grassland is considered 'High' and as all British reptiles are protected under the Wildlife and Countryside Act 1981 (as amended) further presence / likely absence survey for reptiles should be conducted prior to the start of works. Details of the presence / likely absence surveys are provided in Appendix B.
- 5.4.16 Through the application of the mitigation measures suggested for great crested newts, should they be present, the sites' suitability to support reptiles will be maintained post development.

*Other Protected Species*

- 5.4.17 No field signs indicative of the sites use by badgers were recorded during this survey. In response no further consideration to the presence of badgers is required in this instance.
- 5.4.18 Outside of those noted above, the survey identified no further constraints regarding protected species and no further consideration to protected species is required in this instance.

## 6 ECOLOGICAL ENHANCEMENTS

6.1 Although the detail of any on-site ecological enhancements would be best completed following the further surveys, in an effort to promote an accessible range of ecological enhancements post development, the following recommendations are provided:

- The installation of open fronted and close fronted (with a hole) nesting boxes on suitable trees within the site ownership would increase the sites' potential to support nesting birds.
- The installation of swallow and/or swift boxes in suitable locations within the development would increase the site potential to support the species.
- The provision of bat boxes on the external elevations of buildings and/or mature trees within the land ownership would increase the potential for roosting bats.
- The installation of log piles and hibernacula in suitable locations within the site would increase the sites potential to support reptiles and amphibians.
- To promote features of benefit to wildlife, proposed tree and/or hedge planting within the site should include native species such as common hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, beech *Fagus sylvatica*, ash, *Fraxinus excelsior*, spindle *Euonymus europaeus*, guelder rose *Viburnum opulus*, hazel *Corylus avellana* and honeysuckle *Lonicera* sp .
- Any trees to be lost to the development should be replaced with newly planted specimens of the same or similar species.
- If deemed appropriate, control of the existing bramble scrub on the retained areas of the site would ensure retention and enhancement of the grassland habitats.
- The application of grass and wildflower seed mixes, such as those available from Emorsgate, within proposed landscaping plans would increase botanical diversity throughout the site.

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## 7 CONCLUSION

- 7.1 In response to a proposed residential development, Greenspace Ecological Solution Ltd were commissioned to complete an Extended Phase I Habitat Survey and HSI Assessment of waterbodies within 250m of the site.
- 7.2 The site lies within the Worth Meadows SNCI which was designated in 1992. The site was designated for its meadow grassland habitats, but due to the encroachment of bramble only a small percentage of this habitat type now remains. Without intervention, the on-site grassland will likely disappear in the not too distant future.
- 7.3 The survey concludes that no rare or endangered plant species or habitats are present within the proposed development site, and outside the Worth Meadows SNCI noted above, the current proposals are considered unlikely to affect designated sites.
- 7.4 Potential for the site to support roosting bats, breeding birds, dormice, reptiles and great crested newts has been identified and further surveys are required to determine the presence of protected species within the area to be developed.
- 7.5 Although best set out upon completion of the further surveys, in accordance with the requirements of the NPPF, recommendations for biodiversity gain have been provided and should be implemented appropriately.
- 7.6 Nevertheless, through the mitigation and enhancement measures suggested in this report, it would be possible to adequately mitigate and not cause significant harm to the SNCI as a whole or to protected species should they be present. The measures to ensure a significant enhancement to the nature conservation interest of the largest part of the SNCI, which lies outside the area proposed for development, should be included with a legally binding Management Plan attached to development proposals. These would ensure that the spread of scrub is arrested, broadleaf woodland and specimen trees are protected / managed, wetlands are protected and meadow grasslands are reinstated. Overall, the proposed residential development could be designed and implemented to provide enhancements to the SNCI as a whole.



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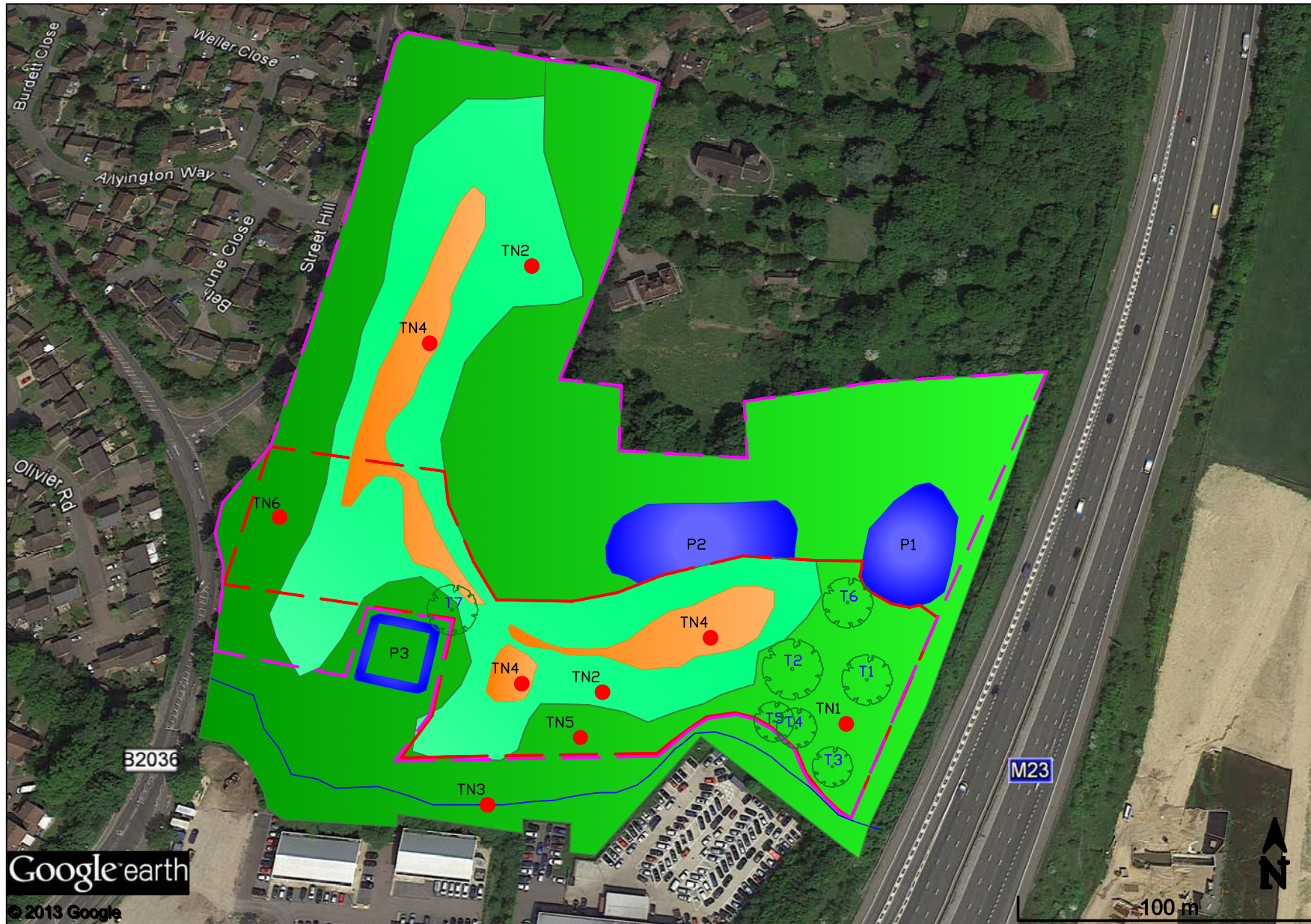
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# Figures



### Legend

- Site Boundary
- SNCI Boundary
- Broad Leaved Woodland
- Tree
- Scrub
- Semi-Improved Grass
- Waterbody
- Target Note
- T1 Tree Number
- P1 Pond Number

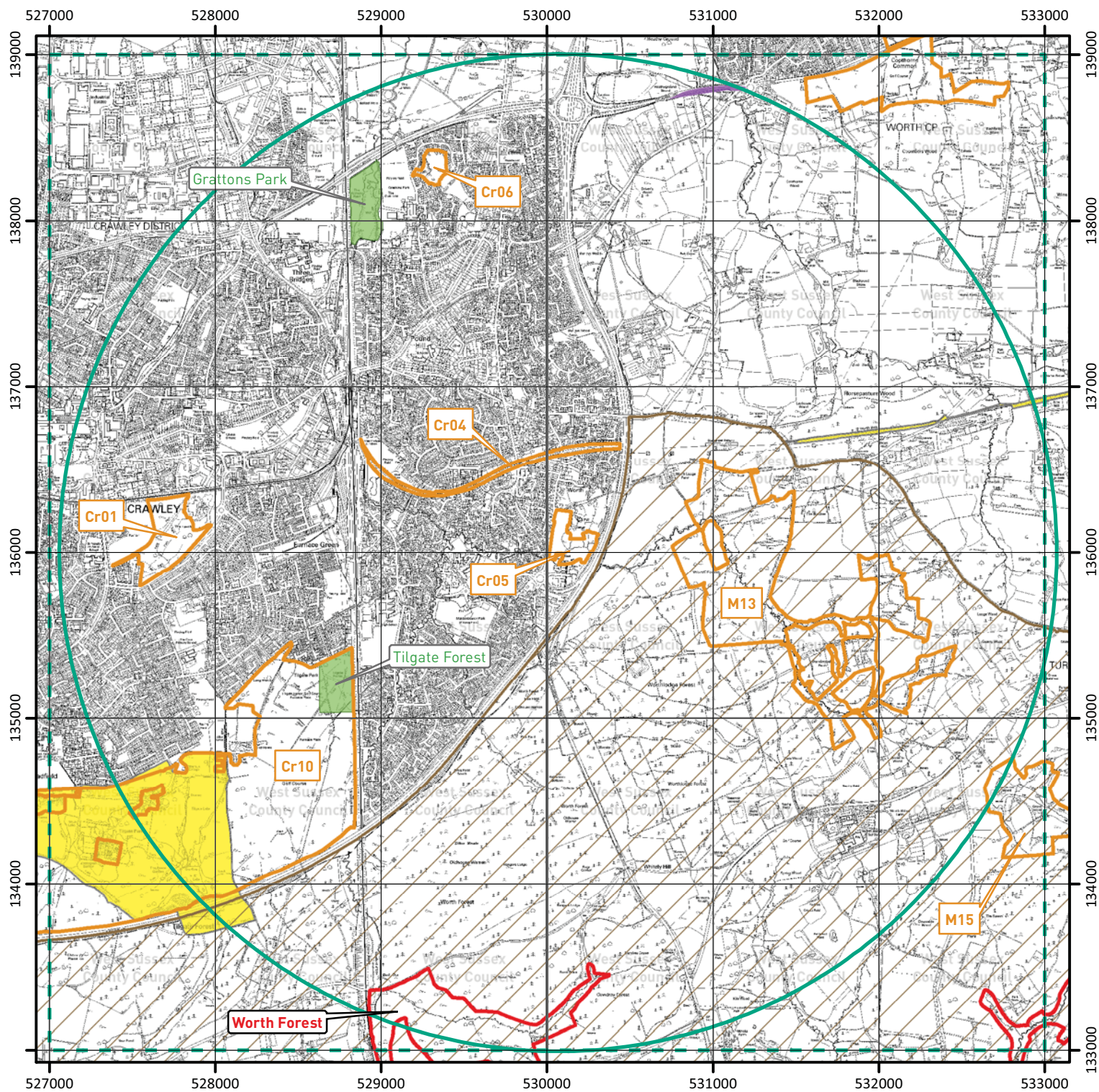
Figure 1	Phase I Plan
Site Name	Street Hill
Author	GN
Checked	VFH
Date	23-12-2013
Scale : NTS	Greenspace Ecological Solutions

Google earth  
© 2013 Google









100 m



Figure 2 - Designated Sites within 3km



Key to Map:

-  Enquiry area
-  Species search area
-  AONB
-  Country Park
-  LNR
-  Notable road verge
-  SNCI
-  SSSI

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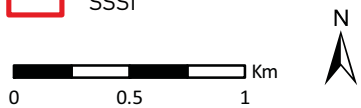
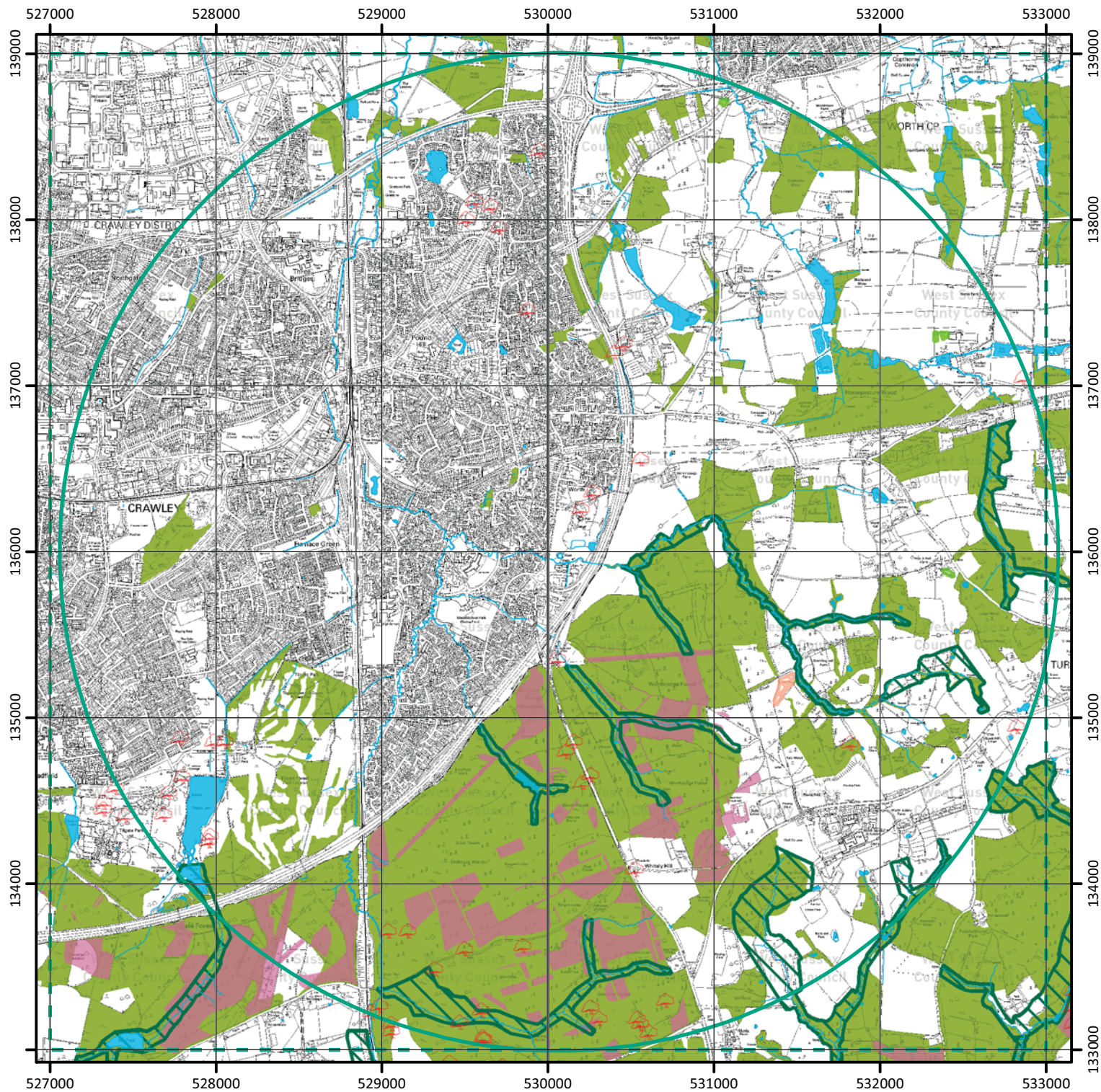




Figure 3 - Significant Habitats within 3km



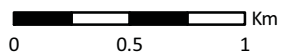
Key to Map:

-  Enquiry area
-  Species search area
-  Ancient/veteran tree
-  Ancient woodland
-  Ghyll woodland
-  Lowland heathland
-  Lowland meadow
-  Open Water
-  Traditional orchard

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Ancient woodland, traditional orchards, vegetated shingle and saline lagoon data reproduced with permission of Natural England. Revised coastal and floodplain grazing marsh data remains provisional and is also reproduced with permission of Natural England. Chalk grassland data supplied by Natural England and South Downs Conservation Board. Black Poplar data supplied by Sussex Wetland Landscapes Project. Ghyll woodland data supplied by Dr Francis Rose. Reedbed data funded by Environment Agency and West Sussex County Council is provided by Sussex Biodiversity Record Centre and maintained by RSPB. Heathland data funded by West Sussex County Council, RSPB and High Weald AONB Unit. Ancient/veteran tree data derived from results of the Ancient Tree Hunt Project and the Tree Register of the British Isles (TROBI). South East Coastal Habitat Mapping data reproduced with permission of Environment Agency. © Crown Copyright. All rights reserved 2013.

This map contains ancient woodland data revised under the Weald and Downs Ancient Woodland Program (2010) on behalf of Natural England. Whilst every effort has been made to make this revision as accurate as possible, the inventories contain limitations and remain provisional. Further revisions are also pending within East Sussex. Habitat data held by Sussex Biodiversity Record Centre (SxBRC) are created in-house or obtained from a variety of dataset providers. SxBRC continually strive to further improve and update these data wherever possible. However, this map should be treated as indicative rather than definitive: data may be generated from a range of field survey and/or predictive methods, each of which may have its own inherent limitations. In some situations a recent ground survey may be required to establish definitively the current status of a particular habitat at a specific location.



## SITE OF NATURE CONSERVATION IMPORTANCE (SNCI)

### West Sussex

<b>Site Name:</b>	<b>Worth Meadows</b>		
<b>Site Ref:</b>	Cr05	<b>Owner:</b>	Private
<b>District:</b>	Crawley	<b>Size (ha):</b>	5.8
<b>Parish:</b>	N/A	<b>Date:</b>	Identified May 1992
<b>National Grid Ref:</b>	TQ302362	<b>Author:</b>	Marion Finch
<b>Habitat:</b>	Neutral grassland, pond, scrub, semi-natural woodland		

#### Summary

The site is located just south of Worth Church and borders the M23. It encompasses several habitats in a relatively small area, including relatively species-rich meadows, two overgrown ponds, some woodland and a stream.

#### Site description

The meadows have abundant Sweet Vernal-grass (*Anthoxanthum odoratum*) and are relatively herb-rich, with much Common Knapweed (*Centaurea nigra*), Oxeye Daisy (*Leucanthemum vulgare*), Bird's-foot-trefoil (*Lotus corniculatus*), Yarrow (*Achillea millefolium*), Sorrel (*Rumex acetosa*), Lesser Stitchwort (*Stellaria graminea*), and Meadow Buttercup (*Ranunculus acris*). Pignut (*Conopodium majus*), and other species more typical of woodland occur, including Wood Anemone (*Anemone nemorosa*), Bugle (*Ajuga reptans*) and Bluebell (*Hyacinthoides non-scripta*). Ant-hills indicate that at least part of the grassland is undisturbed.

The larger pond is virtually Willow carr, with shallow water and marshy margins. Bittersweet (*Solanum dulcamara*), Water Plantain (*Alisma plantago-aquatica*), Greater Spearwort (*Ranunculus lingua*), Gipsywort (*Lycopus europaeus*), Common Spike-rush (*Eleocharis palustris*), Remote Sedge (*Carex remota*), and Lesser Reedmace (*Typha angustifolia*) occur. The smaller pond has open water with abundant dead wood but little vegetation.

Both ponds are surrounded by trees, but two areas of woodland occur. One is dominated by Ash, Sycamore and Birch with Oak, Yew and pine over dense Hazel, Laurel and Rhododendron. The other, north of the small pond, is predominantly Pine and Horse Chestnut over Hawthorn, Hazel and Elder.

The stream is lined by Alder with Ramsons (*Allium ursinum*) on its banks.

#### Management recommendations

The grazing regime needs to be adjusted as the northern meadow is overgrazed by horses and the southern fields need heavier grazing. Alternating between grazing and cutting for hay could help. The ponds need to be restored, although some carr could be retained. Rhododendron and Laurel should ideally be removed from the wood.

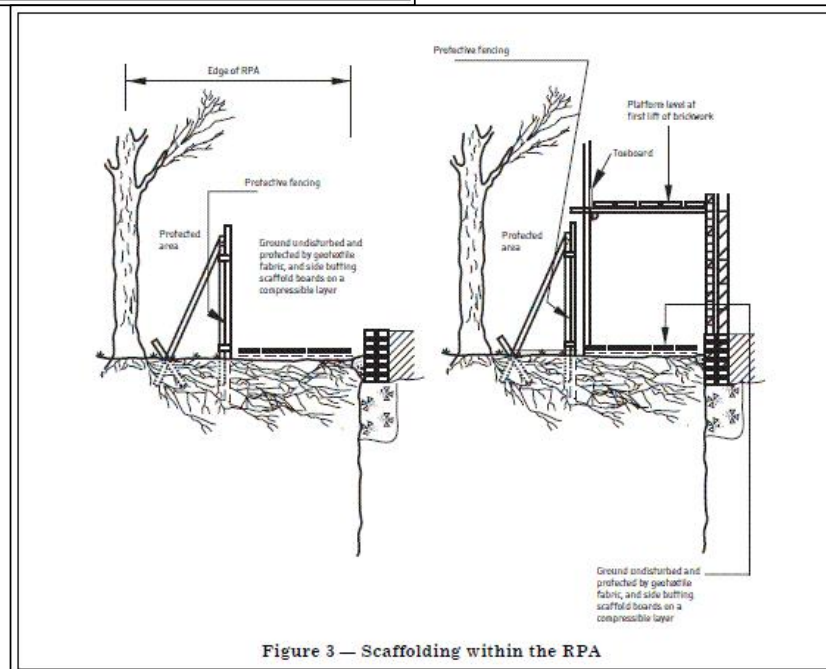
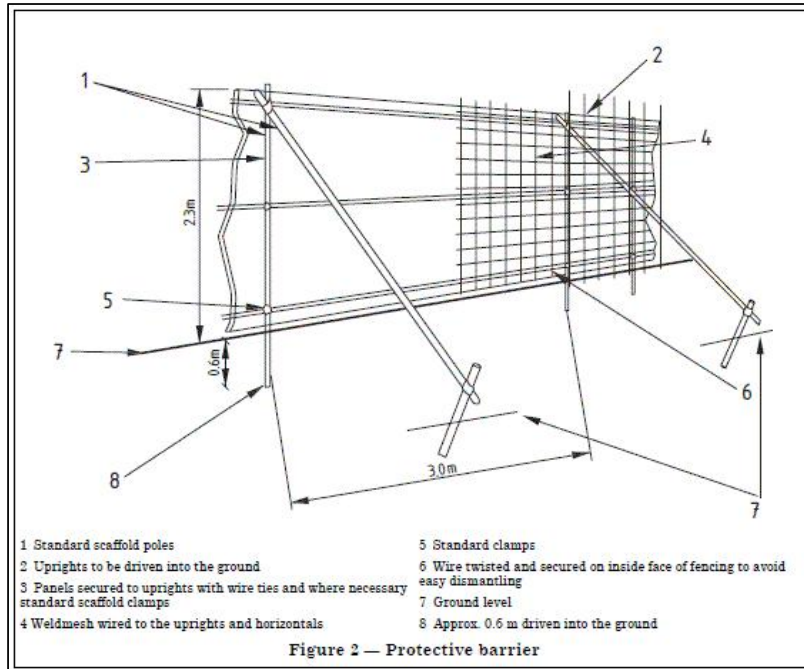



Figure 5	Tree Root Protection
Site Name	Street Hill
Author	GN
Checked	VFH
Date	23-12-13
Scale : NTS	 Greenspace Ecological Solutions



# Appendices

## Appendix A – Planning Policies and Legislation

### *National Planning Policy Framework (NPPF) –*

The National Planning Policy Framework (NPPF) focuses on protecting species and habitats of principle importance to conservation in England, as listed in national and local Biodiversity Action Plans (BAP's). Local planning authorities have an obligation to protect such species and habitats through the planning system and to seek opportunities to promote and enhance biodiversity through Section 41 of the Natural Environment and Rural Communities Act (NERC) (2006).

The NPPF states the following:

- to minimise impacts on biodiversity, planning policies should promote the preservation, restoration and recreation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets,
- When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:
  - If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
  - Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted.
  - Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
  - Opportunities to incorporate biodiversity in and around developments should be encouraged
  - Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss;
  - The following wildlife sites should be given the same protection as European sites: potential Special Protection Areas and possible Special Areas of Conservation; listed or proposed Ramsar sites and sites

identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

#### *Bats –*

All British bat species and their roosts receive European protection under the Conservation of Habitats and Species Regulation 2010 (Habitats Regulations 2010) and the Wildlife and Countryside Act (WCA) 1981 (as amended). This protection means that bats and their roosts are a material consideration in the planning process.

Taken together, these make it an offence to:

- Deliberately capture or intentionally take a bat;
- Deliberately or intentionally kill or injure a bat;
- To be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
- Damage or destroy a breeding site or resting place of a bat;
- Intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection;
- Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection;
- Deliberately disturb any bat, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.

A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to re-use the same roost sites, current legal opinion is that a bat roost is protected whether or not the bats are present at the time.

Certain species of bat are also listed on Annex II of the Conservation of Habitats and Species Regulation 2010 (Habitats Regulations 2010). Annex II species include greater and lesser horseshoe bats, barbastelle and Bechstein's bat. Should these species be recorded as present, consideration should be given to the requirements of a Special Areas of Conservation (SACs).

### *Great Crested Newts –*

Great crested newts and their places of rest and shelter receive European protection under the Habitats Directive (2010) and the Wildlife and Countryside Act (WCA) 1981 (as amended). This protection means that great crested newts and their places of rest and shelter are a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2010 states that a person commits an offence if they;

- Deliberately capture, injure or kill a GCN
- Deliberately disturb GCN
- Deliberately take or destroy eggs of a GCN
- Damage or destroy a GCN breeding site or resting place

Disturbance of animals includes any activity which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young. In the case of hibernating animals, disturbance includes any activity which will likely impair their ability to hibernate or that will **significantly** affect the local distribution or abundance of the species.

It is an offence under the Habitats Regulation 2010, for any person to have in their possession or control, to transport, to sell or exchange or to offer for sale, any live or dead great crested newt, part of any great crested newt or anything derived from a great crested newt which has been unlawfully taken from the wild. This legislation accounts for all life stages of the species.

The Wildlife and Countryside Act 1981(as amended) differs from the Habitat Regulations in that;

- Section 9(1) makes it an offence to *intentionally* (rather than deliberately) kill, injure or take any protected species.
- Section 9(4)(a) makes it an offence to *intentionally* or *recklessly* damage or destroy, or obstruct access to any structure or place which a protected species uses for shelter or protection.
- Section 9(4) (b) makes it an offence to *intentionally* or *recklessly* damage or disturb any structure or place which a protected species uses for shelter or protection.

### *Dormice –*

Dormice are covered by the same legislation as great crested newts and bats (see above).

### *Reptiles/ Amphibians –*

All six native reptile species; inclusive of the more common species of adder *Vipera berus*; grass snake *Natrix natrix*; slow worm *Anguis fragilis*; common lizard *Lacerta vivipara*, smooth snake *Coronella austriaca* and sand

lizard *Lacerta agilis* are protected under Schedule 5 of the Wildlife and Countryside Act (1981) (as amended). This legislation makes it an offence to intentionally kill, injure or sell native reptile species, and also protects amphibious species such as smooth newt *Lissotriton vulgaris*, palmate newt *Lissotriton helveticus*, common toad *Bufo bufo* and common frog *Rana temporaria* against sale.

The less frequently found reptile species of smooth snake and sand are protected under the European Legislation noted above.

*Birds –*

All British birds, their nests and eggs are protected by law. It is an offence to deliberately take, kill or injure a wild bird or take, damage, or destroy any nest or egg of any wild bird under Part 1 of the Wildlife and Countryside Act (1981) (as amended). Schedule 1 provides an additional level of protection so that rare species are further protected against intentional and/or reckless disturbance whilst nesting.

## Appendix B – Further Surveys

### *Bat Emergence and or Pre-Dawn Re-Entry Surveys –*

If trees with potential to support roosting bats are to be removed or impacted by the proposed they should be subject to evening emergence and/or pre-dawn re-entry surveys prior to the start of works. Although left to the discretion of the appointed ecologist, the minimum number of recommended surveys to be conducted in most instances is presented below in Table 1. It is recommended that unless exceptional circumstances are applicable, this level of effort should be adhered to.

*Table 1 – Minimum Number of Surveys Required in Most Instances*

<b>High potential* (Cat 1*)</b>	<b>Moderate potential (Cat 1)</b>	<b>Low potential (Cat 2)</b>	<b>Negligible (Cat 3)</b>
3 dusk emergence and /or pre-dawn re-entry surveys during May – September. (Optimum period May – August)	2 dusk emergence and/or pre-dawn re-entry surveys during May – September. (Optimum period May – August)	1 dusk emergence and/or pre-dawn re-entry survey during May – September. (Optimum period May – August)	Dusk emergence and/or pre-dawn re-entry surveys unlikely to be required.
<p>If bats are discovered emerging during surveys, the survey schedule should be appropriately adjusted to increase survey effort so that sufficient information can be collected.</p> <p><b>Note: When determining confidence in negative preliminary roost assessments, two emergence surveys conducted in the same 24 hour period constitute 1 survey. For the purpose of this survey a confirmed roost is considered under the criteria of “high roost potential”</b></p>			

*Ref: BCT. Bat Surveys, Good Practice Guidelines (2012)*

To adequately cover all aspects of a tree, it is recommended that the emergence surveys be conducted using ≥2 surveyors on each occasion. To aid identification the surveyor should be equipped with automated bat detectors and where possible should identify the species, number of bats and also the entrance/exit points into the roost.

To accommodate the varying times which differing bat species emerge, the dusk emergence surveys should commence ≥15 minutes before sunset and are completed ≥1.25hrs after sunset. If required, the pre-dawn survey/s should commence 1.5 – 2 hours before sunrise and continue until at least sunrise.

### *Bat Activity Surveys –*

Given the suitability of the on-site habitats, the sites’ potential to support foraging and commuting bats and the extent of the proposed, bat activity surveys should be conducted in accordance with Bat Conservation Trust

Guidelines (BCT, 2012) for 'Medium Sized Sites (1 – 15ha)'. The details of the required survey effort are provided in Table 2.

Table 2 – Minimum Number of Activity Surveys Required in Most Instances

<b>Medium-sized sites</b> • Site area 1-15 ha • Project value £1M - £20M	<b>Transect surveys</b>		
	One visit per transect each season (spring, summer and autumn)	One visit per transect each month (Apr-Sep or Apr-Oct)  At least one of the surveys should comprise dusk and pre-dawn surveys (or a dusk-to-dawn survey) within one 24-hour period.	Up to two visits per transect each month may be requested (Apr-Sep or Apr-Oct)  At least one of the surveys should comprise dusk and pre-dawn surveys (or a dusk-to-dawn survey) within one 24-hour period.
	<b>Automated surveys</b>		
	1 location per transect. Data to be collected on 3 consecutive nights each season (spring, summer and autumn)	1 location per transect. Data to be collected on 3 consecutive nights each month (Apr-Sep or Apr to Oct)	2 locations per transect. Data to be collected on 4 consecutive nights each month (Apr-Sep or Apr to Oct)

Ref: BCT. *Bat Surveys, Good Practice Guidelines (2012)*

**Breeding Bird Surveys –**

As habitats with potential to support breeding birds are to be affected by the proposed, it is recommended that a breeding bird survey be carried out in accordance with the Common Bird Census (CBC) techniques set out by Bibby *et al.* 2000, Gilbert *et. al.* 1998 and Marchant, 1983, as well as the British Trust for Ornithology (BTO) survey methodology for 'Territory Mapping'.

This methodology would require the survey of breeding birds at an appropriate time of year (March – August with the core period being mid-March – mid-July) and would indicate the breeding territories through identification of adult males singing (proclaiming territories), adult males fighting (defending territories), adult birds carrying food or nesting material, juveniles calling for food or being fed, or adult birds displaying alarm calls.

**Dormice Surveys –**

In accordance with Natural England's dormouse survey guidelines, dormouse tubes and boxes should be installed in areas of suitable habitat within the site and checked on a monthly basis throughout the active period for dormice of April to November. Survey effort should be conducted until a minimum of 20 points are scored using the "Index of Probability" provided in Table 3.

Table 3 – Dormouse Index of Probability Score's

Month	Index of Probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

Upon obtaining a 20 point Index of Probability score, reasonable effort to establish the presence of dormice will have been applied, and appropriate recommendations regarding methods of works and the need or not to apply for a European Protected Species Licence (EPSL) prior to the start of works may be provided.

#### *Great Crested Newt Surveys –*

To establish the presence of great crested newts it is recommended that the pond P1, and if water is present at the time of survey the ponds P2 and P3, should be subject to further survey. The survey method should follow that given by Natural England in the “Great Crested Newt Mitigation Guidelines” 2001 which states “a minimum of four surveys should be completed at an appropriate time of year (March – June), with at least two conducted during mid-April and mid-May”. To establish a population size class estimate, should great crested newts be recorded in any pond a further two surveys of that pond should be completed during the same survey season.

The results of the surveys will establish the presence / likely absence of great crested newts within the area to be developed. If required, the further surveys will also enable proportionate mitigation measures to be applied and the need or not to apply for a European Protected Specie's Licence to be established.

#### *Reptile Surveys –*

To determine the species and number of reptiles, a seven visit presence survey should be conducted within the site. The reptile survey would involve setting out artificial refugia in suitable habitats at a minimum density of  $\geq 10$  mats per hectare. The heat traps should be checked in suitable weather conditions during the optimal survey period of April – June and/or September to October inclusive. Records of any reptiles observed would be taken and a population size class estimate established. Should reptiles be recorded, the results of the survey will allow for a proportionate mitigation strategy to be implemented.