

ARUN DISTRICT COUNCIL				
No.	BN	9	10	
RECEIVED				

SEAWARD PROPERTIES LIMITED

Land off Goodacres and Halliford Drive,
Barnham, West Sussex
Residential Development Site

Extended Ecology Phase 1 Habitat Survey Report

Approved By: Joe Jackson

Signed:

Position:

Date:

[Signature]
Principal

26 March 2010

March 2010 – Planning Issue

LLD237 HallifordDrive Barnham Extended Ecology Phase 1 Habitat Survey Report Rev01 03 2010



Landscape Architecture



Environmental Design



Landscape Planning

Lizard Landscape Design

Lizard Landscape Design



CONTENTS

	PAGE
SUMMARY	1
1.0 INTRODUCTION	2
2.0 SCOPE OF SURVEY	2
3.0 METHODOLOGY	4
4.0 RESULTS	6
5.0 EVALUATION	19
6.0 CONCLUSIONS AND RECOMMENDATIONS	24
7.0 REFERENCES	26

FIGURES

Figure No. 1 – Ecology Phase 1 Habitat Survey Drawing

Figure No. 2 – Location of Protected Species Records (SXBRC)

TABLES

Table No. 1 – Target Notes for the Phase 1 Habitat Plan – Figure No. 1

APPENDICES

Appendix 1 – Site Photographs

Appendix 2 – Summary of Protected Species Legislation

SUMMARY

Seaward Properties Limited has commissioned Lizard Landscape Design to undertake an ecological appraisal of the Halliford Drive, Barnham residential development site. As part of the proposed development site (*hereafter called the site*), an Extended Ecology Phase 1 Habitat Survey was undertaken to appraise the ecology within the site and its surroundings. This report outlines the results of the Extended Ecology Phase 1 Habitat Plan, undertaken on the 23 February 2010 in wet conditions by Sophie Miller *BSC MSC MIEEM*.

On site habitats of interest included Unimproved Neutral Grassland, Standing and Running Water and Hedgerows. No rare plants were noted but it was not considered the best time of year to survey and it was recommended that a check for botanical species-diversity should be undertaken in Spring; April / May 2010. The southern boundary Hedgerow was suggested to be important due to its good connectivity to other Hedgerows and 'green' habitat and that it was considerable mature. Ditches held water on site and provided interest for Invertebrates and Amphibians. Overall the site had potential to support a variety of wildlife including Bats, Birds, Amphibians, Reptiles and Invertebrates. It was recommended that within the proposed scheme some areas of Grassland and Shrub / Scrub should remain plus the southern boundary Hedgerow feature should be maintained where possible within the development plan, and improved to ensure wildlife such as Birds, Reptiles and Amphibians can be accommodated.

Lizard Landscape Design has undertaken an Ecological and Phase 1 Habitat Survey of the Halliford Drive, Barnham residential development site. The existing ecological habitats and landscape features found within the site have been assessed against the development proposals. Lizard Landscape Design has concluded that the existing ecological habitats and landscape features contained within the site do not represent a significant constraint to the redevelopment of the site.

Protected species surveys and data should be collected to inform detailed mitigation measures prior to submission of the planning application in accordance with PPS9. Phase 2 Habitat Surveys for Bats, Birds, Amphibians and Reptiles are recommended and should be used to ensure mitigation can be included at the earliest stages of the development proposal.

1.0 INTRODUCTION

- 1.1 Seaward Properties Limited has commissioned Lizard Landscape Design to undertake an ecological appraisal of the Halliford Drive, Barnham, West Sussex residential development site. The site area is proposed to be developed as residential development areas to the eastern edge of Barnham, and to the southern edge of Lake Lane (*hereafter referred to as the 'site'*).
- 1.2 As part of the proposed development for the Barn Rise, Barnham development site; an Extended Ecology Phase 1 Habitat Survey was undertaken to appraise the ecology within the site and its surroundings. The survey was specifically targeted to identify the habitats and also to identify potential for protected species within and adjacent to the site. This report sets out the results of the Ecology Phase 1 Habitat Survey. The Ecological Phase 1 Habitat Survey was undertaken on site by Sophie Miller, Ecologist (*IEEM*). This report has been prepared by Sophie Miller (*IEEM*) and Joe Jackson, Landscape Architect, (*BA (Hons) DipLA CLA*) for Lizard Landscape Design, Worthing.
- 1.3 This report establishes the potential ecological resource within the site and outlines where any ecological constraints may occur and makes recommendations for ecological mitigation, and enhancements based upon the proposed development for the site. Ecological mitigation measures and bio-diversity enhancements have been identified at Section 5.0.

2.0 SCOPE OF SURVEY

- 2.1 The site is approximately 2.5 hectares and comprised of Grazed Fields, Scrub and Tree-lined boundaries.
- 2.2 The aim of the survey was;
- *To identify main habitat types and plant communities;*
 - *To identify habitats with potential for protected species; and;*
 - *To provide recommendations for surveys of protected species.*

- 2.3 The above aims are required to inform the Local Planning Authority (LPA) in its regard to fulfilling its obligations to species and habitats under 'The Conservation (Natural Habitat &c.) Regulations' 1994 and the 'Wildlife and Countryside Act' 1981, as amended. The duty of the LPA is outlined in the Government Circular on *Biodiversity and Geological Conservation Planning Policy Statement 9 (PPS9, ODPM, 2006)*. In dealing with cases where an European Protected Species (EPS) such as Great Crested Newts *Triturus cristatus*, Dormouse *Muscardinus avellanarius*, Otter *Lutra lutra* and all Bat species, may be affected the LPA is a competent authority as defined in the Habitat Regulations, and therefore has a *Statutory Duty under Regulation 3 (4)* to have regard to the requirements of the Habitats Directive in the exercise of its functions. Priority species and / or habitats highlighted within Local or the UK Biodiversity Action Plan are also a material consideration within planning applications.
- 2.4 It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. Surveys should only be required when there is reasonable likelihood of the species being present and affected by the development (*Paragraph 99, PPS9*).
- 2.5 In order to achieve the aims, an Extended Survey Area was established and undertaken including the margins of the site to include habitats within and adjacent to the site, shown on *Figure No. 1 – Phase 1 Habitat Survey*. The detailed survey methodology is set out in Section 3.0. Legislation for relevant protected species is outlined in Appendix No. 2.

3.0 METHODOLOGY

- 3.1 A Walkover Survey was undertaken by an experienced Ecologist on the 23rd February 2010 and the site subjected to an Ecology Phase 1 Habitat Survey using the guidelines set out in the '*Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit*' (JNCC, 2003). This has resulted in an Ecology Phase 1 Habitat Plan (*Figure No. 1*) and Target Notes in Table No. 1. Habitats within the site were classified and the presence, or potential presence, of certain protected and/or notable species of flora and fauna were identified. Summary descriptions of habitat classifications following the Ecology Phase 1 Habitat Survey methodology are presented in the results Section No. 4.
- 3.2 Due to the field survey consisting of only one site visit certain species, particularly some of flowering plants, may not have been visible or may have been otherwise inconspicuous at the time of survey, and hence overlooked. These are accepted constraints associated with the standard Ecology Phase 1 Habitat Survey Methodology.
- 3.3 Habitats within, and immediately adjacent to the site were assessed for their potential for supporting populations of uncommon and protected fauna including Mammals, Birds, Reptiles and Amphibians. This involved identifying features which may be used by protected species for breeding, hibernation or basking sites and potential foraging areas and other signs of use. Stones, dead wood and rubble were turned over and any dug holes studied for recent activity by mammals such as Badger. Water bodies were recorded within 500.0 metres of the proposed development and if access was available they were checked for potential for breeding Amphibians. Trees, Woodland and nearby buildings were assessed in general for overall Bat potential. Bats may use any crack or hole (*such as Woodpecker holes*), splits or flaking bark and Ivy thickly on tree trunks (*Mitchell-Jones, 1999*). Bats will also use different roosts at different times of the year and it can therefore often be difficult to definitely locate Bat roosts in trees.

- 3.4 The Habitat Suitability Index (*HSI*) (*Oldham et al., 2000*) was used to assess the ponds within 500.0 metres of the site for Great Crested Newt habitat suitability. This uses ten indices for a range of field characteristics such as pond location, percentage of shade and presence of fowl which are given a numerical value between 0.1 and 1.0. The tenth root of this number is then calculated from the multiple of these ten values and the score will be in the range from 0 and 1. Therefore; $HSI\ score = (SI^1 \times SI^2 \times SI^3 \times SI^4 \times SI^5 \times SI^6 \times SI^7 \times SI^8 \times SI^9 \times SI^{10})^{1/10}$ (*Tenth Root*).
- 3.5 Dr Lee Brady (*Kent Amphibian and Reptile Group*) has developed a system where a score of below 0.5 offers 'poor' pond suitability for Great Crested Newts ranging to a score of over 0.8 that has excellent habitat for Great Crested Newts. The HSI is only a limited tool to assess pond habitat.
- 3.6 The Sussex and UK Biodiversity Action Plans (*BAP*), The New Flora of the British Isles and Ireland (*Preston et al., 2002*) and web sites of statutory bodies such as Natural England and DEFRA were all referred to, to enable consideration of the habitat and species interest within the site. Records of protected species and habitats were requested within a 1.0 kilometres radius from the Sussex Biodiversity Record Centre (*SXBRC*) including a 5.0 kilometre radius for Bat records.
- 3.5 The NERC Act of 2006 ensures Local Authorities and other Statutory Authorities and Landowners to promote and enhance biodiversity and to make sure that it is considered in all Local Authority decisions and policies. The UK Government recommends Local Authorities to conserve species that are highlighted in the UK and Local Biodiversity Action Plans, including Amphibian and Reptile species. Therefore mitigation for the scheme on site considers PPS9 in its regard to data collection of the species on site, and maintaining biodiversity within the scheme.

4.0 Results

4.1 Background Information

Designated Sites and Habitats

- 4.1.1 The following section outlines the ecological context of the development site, describing the designated nature conservation sites in the vicinity of the development site. The following designated sites and habitats are not representative of the existing site's ecology, but are indicative of the ecological context of the surrounding area.

Protected Sites

- 4.1.2 The site lies within the Natural Area 'South Coast Plain and Hampshire Lowlands' (*Natural England*) which is highlighted for its low lying and mostly featureless plains, with harbours, estuaries and narrow inlets. Further inland the land is undulating with occasional Woodland set within a dominant arable landscape. Natural habitats include Saline Lagoons, Coastal Marsh, Sand Dunes and adjacent Neutral Grassland and Fen Meadows.
- 4.1.3 The Natural Area Profile highlights biodiversity targets of maintaining and improving Neutral Grasslands and Coastal Habitats. NVC Type MG5 *Cynosurus cristatus* – *Centaurea nigra* Grassland is a nationally important Grassland habitat with associated species including Common Spotted Orchid *dactylorhiza fuchsii*, Meadow Vetchling *lathyrus pratensis*, Rough Hawkbit *leontodon hispidus* and Meadow Buttercup *ranunculus acris*.
- 4.1.4 No statutory or Non-statutory sites were identified by SXBRC within 1.0 kilometres of the site and no statutory sites were identified within 2.0 kilometres from on-line mapping (*magic.gov.uk*). Stemps Wood is the only Ancient Woodland identified within 1.0 kilometres which lies to the north of the site.

Habitats

- 4.1.5 Within the Sussex Biodiversity Action Plan (BAP) relevant Habitat Action Plans (HAPs) include Lowland Meadows, Hedgerows and Standing Water. The Lowland Meadows HAP highlights both Species-Rich and Species-Poor Grassland. Sussex is a relative stronghold for Unimproved Neutral Grassland. The Sussex Wildlife Trust (1996) estimated that Sussex currently possesses around 690 ha, accounting for about 17% of the remaining British Neutral Grassland, of which Meadows are the rarest type. Unimproved Neutral Grasslands in particular are extremely rich wildlife habitats with over a hundred plant species present in the sward of a single field. This is a product of inherently low soil fertility combined with a long history of grazing (*Pastures*) and/or hay making (*Meadows*) which prevents the domination of a few vigorous species or succession back to Scrub and Woodland.
- 4.1.6 The Hedgerows HAP includes both Species-Rich and Species-Poor Hedgerows as both are key wildlife habitats supporting many Invertebrates and providing corridors of protection between larger areas of habitat for Mammals. They are considered Species-Rich if they have five woody species or more within a 30.0 metres length and have added value for biodiversity if they contain mature or veteran trees.
- 4.1.7 The Standing Water HAP includes Water Bodies such as Ponds. In Sussex several Ponds provide important breeding sites for large colonies of Common Frogs *Rana temporaria* and Toad *bufo bufo*. Standing Open Water sites are also important for many Dragonfly and Damselfly species; The Downy Emerald, Brilliant Emerald and Hairy Dragonflies (*Cordulia aenea*, *Somatochlora metallica*, and *Brachytron pratense*) are all found at sites in Sussex. The Great Diving Beetle (*Dytiscus marginalis*) is currently present in Sussex but is becoming increasingly scarce due to habitat loss. The legally protected Great Crested Newt is a high conservation priority in Sussex as the region sustains an Internationally significant population of this species.

Species

- 4.1.8 Species Action Plans (SAP's) that are relevant within Sussex include Bats such as the Pipistrelle Bat *pipistrellus pipistrellus*, Brown-Long-Eared Bat *Plecotus auritus*, Song Thrush *turdos philomelos* and native Reptiles such as Slow Worm *anguis fragilis*. Further species of interest include insects associated with deadwood found in Sussex such as the Stag Beetle *Lucanus cervus* that particularly needs dead wood in its breeding cycle and is a UK and Sussex BAP species. Dead wood also provides valuable nesting sites for Birds. Hedgehog *Erinaceus europaeus* is also a UK BAP species as its numbers have declined in recent years. The most relevant records of protected and rare species provided by SXBRC are shown on Figure No. 2 – Location of Protected Species Records.
- 4.1.9 Relevant records of species on the Sussex Rare Species Register include Broad-Leaved Spurge *Euphorbia platyphyllos*, found near Lake Lane in 2005, Broad-Leaved Osier *Salix x smithiana* found to the east near a nursery and Pale Toad Flax *Linaria repens* found in 2006 near the railway line. Two Moths, the Oak-tip and Dusky Thorn are recorded to the east in Walburton and are UK BAP species. The Horse Chestnut Moth and Star-Wort are both nationally scarce species and on the Sussex Rare Species Register and are recorded south of Walburton Park in Lazy Wood Pond in 2005, to the north of the site.
- 4.1.10 Records for rare and/or protected species provided by SXBRC within 1.0 kilometres of the site include records for Amphibians including Great Crested Newt. Two records are provided, one from 2005 in Walburton to the north-east and one in Yapton, from 2002. Four records of Toad are recorded, three of which are from 2002. Reptile species include seven records of Slow Worm in and around Barnham between 2001 and 2005. Three records of Common Lizard *Lacerta viviparia* were provided since 1998. Grass Snake *natrix natrix* records from 2001 are noted to the north of Barnham. From the Surveyors previous experience Grass Snake are also located in Barnham in 2004 near Nannys Copse. Adder *Vipera berus* was also recorded along the southern edge of Barnham and to the north in Walburton.

- 4.1.11 One record of Dormouse was provided found in 2004, on the eastern side of Walburton to the north. Records of Water Vole *Arvicola terrestris* were noted in Barnham near the nurseries to the north of Lake Lane (1998) and to the south at Barnham Court (2003). Many records are provided for Hedgehog within and around Barnham and two records of Hare *lepus europeaus* are noted to the south of the railway line.
- 4.1.12 Bat records include eight Bat species (*the UK has a total of 17 species*) found within 5.0 kilometres of the site at Barnham. Bat species (*not identified*) are noted at Bignor, Arundel Castle and Walburton. A record for Serotine Bat *Eptesicus serotinus* is noted at Elm Grove, Barnham in 2004 and at Highground House also in Barnham in 2007 and at both these sites Long-Eared Bat species were also found. Bechstein's Bat *myotis bechsteinni* was noted at Climping in 1994 and in Yapton in 1990. Whiskered Bat *myotis mystacinus* was noted in Felpham in 2004. Natterer's Bat *myotis nattereri* was recorded in Slindon in 2006 to the north, Binsted Wood in 2005 to the east and at Arundel in 1990. Noctule Bat *nyctalus noctula* was also noted in Slindon in 1990 and 2005. Pipistrelle Bat species are noted throughout the area including records at Bognor Regis in 2004, Aldingbourne in 2003, Walburton (*large numbers were counted roosting*) in 1999, 2001 and 2002, and in Tortington in 2001.
- 4.1.13 Records of the Common Pipistrelle Bat are found at Yapton in 2007, Binsted Wood in 2005 and 20006, Arundel in 2005 and two records are noted in Barnham, on at Elm Grove and another near the railway line. The Soprano Pipistrelle Bat *Pipistrellus pygmaeus* is noted at Slindon in 2006. Brown-long Eared Bat species were recorded at Bognor Regis in 2004, Tortington in 2001, Arundel Park in 1984, Slindon in 1999 and at Walburton Church in 1986.
- 4.1.14 Within 1.0 kilometres of the site a total of 11 Birds afforded extra protection (*Listed on Schedule 1*) on *The Wildlife and Countryside Act 1981* as amended, are recorded including Barn Owl, Fieldfare, Redwing, Hobby and Honey Buzzard. Twenty Birds are recorded that are on the RSPBs 'Red' list for globally threatened Birds and include Skylark, Starling, Sparrow, Bullfinch, Yellow Hammer, Reed Bunting, Corn Bunting and Lesser Spotted Woodpecker. These are also UK BAP species. Twenty-eight Birds are noted that are on the RSPB's 'Amber' list of 'Unfavourable Conservation Status' and include Swift, Curlew, and Goldcrest.

4.2 Description of Habitats

4.2.1 The following standard Ecology Phase 1 habitats were recorded within the Extended Survey Area. Each habitat has been described in turn, along with dominant plant species, plants of high nature conservation value and a brief description of the habitat's physical characteristics. These are shown on the detailed Phase 1 Habitat Survey Plan, Figure No. 1 for the site. Target Notes are listed in Table No. 1.

- *Unimproved Neutral Grassland;*
- *Semi-Improved Neutral Grassland;*
- *Improved Grassland;*
- *Dense Scrub;*
- *Scattered Scrub;*
- *Scattered Trees;*
- *Tall Ruderal;*
- *Running Water;*
- *Standing Water;*
- *Hedgerows;*
- *Other Habitat;*
- *Refuse-Tip;*
- *Building; And;*
- *Bare Ground.*

4.2.2 The site is located on the eastern edge of Barnham, north of the railway line and adjacent to large green houses.

Unimproved Neutral Grassland

- 4.2.3 Grassland that appears to be Unimproved is found over much of the site, although it had been closely grazed to a short sward at the time of survey and much of it was water-logged. Grassland in the southern half of the site is shown in Photograph No. 01, Appendix No. 1. The central area of short Grassland at Target Notes TN31, TN38, and TN42 is divided up by barbed wire fencing into small paddocks. Grass species included Dominant Cock's-Foot *Dactylis glomerata*, Creeping Bent *Agrostis stolonifera* and occasional Meadow-Grass species *Poa* and Yorkshire Fog *Holcus lanatus*. Frequent herbs include Common Ragwort *Senecio jacobaea* and Spear Thistle *Cirsium vulgare*. Infrequent herbs visible include Daisy *Bellis perennis*, Creeping Buttercup *Ranunculus repens*, Red Bartsia *Odontites verna* and Selfheal *Prunus vulgaris*. There may be some acidic soil conditions also affected parts of the sward as Bracken *Pteridium aquilinum* is noted growing by the Ditches on the western side of the field. Mosses form a good cover over much of the ground and include *Brachythecium rutabulum* and *Kindbergia praelonga*.
- 4.2.4 The southern fenced part of the field at TN46 had a longer sward and appeared to be dominated by Bent Grass species *Agrostis*, including Creeping Bent. There is a frequent Tall Ruderal 'weeds' visible in the sward, possibly some *Brassica* species. Therefore most of the Grassland appeared to be Species-Poor in this field.
- 4.2.5 In the northern square of the site, adjacent to Lake Lane at TN12 there is a small area of uncut Grassland which also appears to be Unimproved Grassland with herbs such as Common Knapweed *Centaurea nigra*, Creeping Buttercup and Ribwort Plantain *Plantago lanceolata*. Ant hill are also visible here which suggests the Grassland has been undisturbed for some while.

Semi-Improved Neutral Grassland

- 4.2.6 In the southern corner of the site at TN57 the Grassland is mown short and appears to be Semi-Improved Species-Poor Neutral Grassland. Grass species visible include Fescue *Festuca* species, Creeping Bent and Cock's-Foot with occasional Herbs of Daisy, White Clover *Trifolium repens*, Selfheal and Snow Drop *Galanthus* species.

Improved Grassland

- 4.2.7 Bordering the southern boundary of the site at TN53 is an Arable field that appears to have a sparse sward of sown grass species.

Dense Scrub

- 4.2.8 Much of the margins of the site have clumps of Bramble *Rubus fruticosus* Scrub while there are larger blocks of Hawthorn *Crataegus monogyna* in the southern half of the site. In the northern section at TN13 and TN14 Scrub has overgrown most of the Grassland and is comprised of Bramble, Common Nettle *urtica dioica* and clumps of Hemlock Water-Dropwort *oenanthe croccata*. Scrub here is shown in Photograph No. 2, Appendix No. 1. By the Barn there is much Bramble and Elder *Sambucus nigra* at TN24 and nearby at TN27 a block of Bramble Scrub has become impenetrable in part of the field.
- 4.2.9 In the southern half of the site at TN45, TN48 and TN55 Hawthorn has grown tall over much rubble and house debris. Sycamore *Acer pseudoplatanus* is infrequent at TN55 with occasional Butter-Fly Bush *Buddleja davidii* and Elder. Within this Scrub at TN56 Hart's Tongue Fern *Phyllitis scoropendrium* is noted frequently growing on rubble. Stinking Iris *Iris foetidissima* and Lord's-and-Ladies *Arum maculatum* are also noted infrequently here and under adjacent trees. Hart's-Tongue Fern and Stinking Iris are Ancient Woodland Vascular Plants (AWVP) species and are indicative of undisturbed and shaded Woodland conditions. At TN45 there is much Bramble with two small Oak *quercus robur* trees and at TN48 the Scrub is predominantly Bramble and Hawthorn.
- 4.2.10 A clump of Hawthorn at TN59 is impenetrable with few other species visible. On the western boundary there is again much Bramble and Elder scrub in the corner at TN64, and more Bramble lies along the fence at TN67.

Scattered Scrub

- 4.2.11 Throughout the site scattered Bramble is frequent with occasional scattered Elder along the eastern boundary. Elder Scrub with particularly old trees noted is found at TN40 where they are scattered in between larger trees of Poplar *Populus* and Scot's-Pine *Pinus sylvestris*.

Scattered Trees

- 4.2.12 Many trees are noted along the boundaries of the site, with infrequent smaller trees scattered in the field. Outside the eastern fence of the site there are mature trees that have been classified as Scattered Trees and includes a densely planted double row of Cypress trees, possibly Leyland cypress x *Cupressocyparis leylandii* at TN10, TN19 and TN32. These trees are shown in Photograph No. 3, Appendix No. 1. Elder is frequent along the inside edge of the eastern fence. Along the northern half of this boundary at TN03 a double row of Poplar and Italian Alder *Alnus cordata* join onto the boundary. By the ditch at TN07 are four large Sweet Chestnut *Castanea sativa* and along the northern ditch at TN04 are also a few large Cypress trees, Goat Willow *Salix caprea* and a Sweet Chestnut. In this northern section at TN09 there is a small Oak tree.
- 4.2.13 Further south there is a row of Poplar trees at TN41 adjacent to Cypress trees. Another row of Poplars lie across the field at TN30 and include nine mature trees. Near here at TN28 is a Willow possibly *Salix fragilis*. An Ash tree *Fraxinus excelsior* and a Poplar are noted at TN32 on the eastern boundary. By the Barns at TN22, in an adjacent garden are a mature Cypress tree and a Willow.
- 4.2.14 In the eastern corner at TN39 there are three mature Scot's-Pine and also four Poplar trees. The Scot's-Pine are shown in Photograph No. 4, Appendix No. 1. At TN65 in the western corner by the garden sheds there is a small clump of Oak trees. Newly planted trees are also noted along the boundary at TN61, where there are young Willows and Swamp Cypress *taxodium distichum*. Along the fenceline at TN63 there are five mature trees. Trees of interest for Bat species are described further in the Bat section.

Tall Ruderal

- 4.2.15 Much of the Tall Ruderal vegetation throughout the site is a mixture of Common Nettle and Bramble. The northern part of the site at TN08 is comprised of Tall Ruderal 'Weeds' and classified as Tall Ruderal habitat. Common Nettle is dominant with occasional Wood Dock *Rumex sanguineus* and Hemlock Water-Dropwort and in parts is covered by the remains of Hedge Bindweed *calystegia sepium*. Adjacent to the site at TN11 there is much rubble, garden waste and other spoil which is covered in Tall Ruderal species such as Docks and Nettle. Tall Ruderal vegetation borders the whole of this eastern area.

- 4.2.16 The banks of the Ditches appeared to have some Tall Ruderal 'Weeds' such as Nettle plus some clumps of Pendulous Sedge *Carex pendula* at TN16 and TN18. In the southern half of the site there are dense stands of Common Ragwort and a *Brassica* species at TN46. Much of the vegetation under the southern Hedgerow is Nettle and classified as Tall Ruderal at TN54.

Running Water

- 4.2.17 Ditches border the western and southern boundaries of the site. Along Lake Lane there is a fast-flowing stream at TN01, which has bare banks and base and appears to have recently been cleared out. Ditches with water on site flow into this at TN05 and at TN16. The banks of the Ditches at TN16, TN21 and TN18 have all been cleared of vegetation and noted as either Bare Ground or Tall Ruderal vegetation (*visible remains*). Pendulous Sedge is infrequent and there are some remnant mounds of Moss such as *Plagiomnium undulatum* which is indicative of shady conditions.

Standing Water

- 4.2.18 In the ditches around the site is Standing Water. Water is found along the western boundary in the ditch by the footpath at TN44 (*Photograph No. 5, Appendix No. 01*), but much of the Ditch is overgrown with grass and the water is shallow. There is also Standing Water in the Ditches at TN05, TN16 and TN18. In the Ditch along the southern boundary there is a large area of Standing Water under the trees at TN60. Water is also noted in the field at TN49 and in holes created by fallen trees at TN34 and TN35 on the eastern boundary.

Hedgerows

- 4.2.19 Along the northern boundary by the houses at TN17 is a mature line of trees that has been classified as a Defunct Species-Poor Hedgerow as it appeared to have been managed as a Hedgerow in the past. Species noted included Sycamore and Willow. There was some Pendulous Sedge and Ivy at the base. Intact Species-Poor Hedgerows are noted in the adjacent properties bordering the footpath to the west of the site. All have been planted inside the properties fences.

- 4.2.20 The Hedgerow features that comprise the southern boundary at TN61 and TN52 appear to have been managed previously as a Hedgerow. The Hedgerow at TN61 has been classified as a Defunct Species-Rich Hedgerow as it does not appear to have been managed for some time, although there are recent tree additions in the south-western corner. Trees at TN61 are predominantly Hawthorn with occasional Goat Willow, Elder, Elm *Ulmus* and Hazel *Corylus avellana*. Further east the Hawthorn becomes more dominant and at TN52 is now classified at a Defunct Species-Poor Hedgerow, shown in Photograph No. 6, Appendix No. 1. There are no Banks or Ditches visible but the Hawthorn and Elder trees do appear to be of considerable age. Of interest is that the Hedgerow continues east at TN51, (classified as an Intact Species-Poor Hedgerow) along the edge of the arable field and although appears Species-Poor at this time of year, more species may be easier to spot in the Spring 2010. This Hedgerow appears to be cut at least every other year.

Other Habitat

- 4.2.21 A small Vegetable Garden is noted at TN58 in the southern half of the site and is mostly Bare Earth but has some vegetables remaining.

Buildings

- 4.2.22 Garden sheds are noted on site at TN66 and are made of wood with flat roofs. Adjacent to the site at TN23 is a barn which at the front has a timber wall and flat prefab roof. To the rear it has concrete block walls and a sloping corrugated iron roof. There is also a garden shed in the adjacent garden near here. Stables at TN29 are comprised of five small wooden sheds.

Refuse-Tip

- 4.2.23 There is much rubble, garden waste and house-hold waste in mounds at TN47 and TN56 and along this scrubby area through the middle and south-east corner of the site. Garden waste is also noted by the barns at TN25 and in the adjacent Tall Ruderal habitat to the east of the site. A large dung heap is noted at TN36 near the stables and an older dung heap noted adjacent to the site at TN62 where there is also much garden waste. Other piles of garden debris are noted throughout the site, by the water at TN49, and along the southern Hedgerow.

Bare Ground

- 4.2.24 The footpath that crosses the site to the north is mostly Bare Ground comprised of stone and gravel with few weeds visible. At TN26 there is a gravel area in front of the Barns, also classified as Bare Ground. The recently cleared banks of the ditches are comprised of earth and have been classified as Bare Ground at TN15.

4.3 Protected and Uncommon Species

Bats

- 4.3.1 Buildings on site include the garden sheds at TN66 and the stables at TN29. These are all wooden with unlined flat roofs and appear to have little potential to support Bat roosts. The adjacent barn at TN23 had some Ivy growing up it and the front walls were made of timber planks. These may offer some Bat roosting opportunities for Bats.
- 4.3.2 Trees on and near the site offer potential for Bat roosts. In the northern part of the site the mature trees at TN04, TN07 and trees in the Hedgerow at TN17 offer potential for Bats with frequent Ivy-clad trunks. The Poplars, Alder and Cypress trees on the eastern boundary at TN10 and TN03 also offer potential for Bats although few actual holes are noted. The Oak tree at TN09 is younger than the trees around the site and has no visible holes and is suggested to have lower Bat potential.
- 4.3.3 The mature Willow and Cypress trees at TN22 to the west of the site are large and wide-spreading and appear to be suitable for Bat roosts. Again the Cypress and Poplar trees along the eastern boundary at TN32, TN33 and TN37 appear to have potential to support Bats as do the nine Willow trees at TN30. The large Willow tree at TN28 does not have many cracks and openings in the bark which may be suitable for Bats to use. The three Scot's-Pine and Poplar trees at TN39 and TN40 also have potential for Bats with all the trees being tall and mature.
- 4.3.4 Along the southern boundary Hedgerow at TN52 and TN61 there are mature trees with Ivy-clad trunks which may offer opportunities for roosting Bats. The five trees along the fence line at TN63 have smooth bark and no visible holes and are suggested to offer nil to limited potential for Bats.

- 4.3.5 The eastern boundary forms a connective green habitat which may be used by Bats as a navigational corridor between Bat roosting and foraging sites, as does the southern Hedgerow. The grazed field within the site itself offers some foraging habitat for Bats with Invertebrates such as Moths and such like possibly attracted to the Dung, Barns, Vegetable Plot and Scrub habitat.

Badgers

- 4.3.6 No evidence of Badger is noted on site or within 30.0 metres of its boundary. Fox and Rabbit holes and foraging evidence is noted along the eastern boundary and in the spoil mounds in the Scrub at TN55.

Water Vole

- 4.3.7 The Ditch at TN01 has flowing water and banks suitable to support Water Vole, but these had been recently cleared. There is potential for Water Vole in the future once vegetation has re-colonised. Ditches on site at TN16, TN21 and TN18 were also cleared and had little water visible in them offering limited to nil potential for Water Vole. The western Ditch at TN44 also has limited Standing Water and the southern Ditch at TN60 also had only Standing Water visible.

Dormouse

- 4.3.8 The Dense Scrub in the southern half of the site at TN45, TN48, TN55 and TN59 appears thick and impenetrable with little light entering the centre of the Scrub. It is mostly comprised of Hawthorn and Bramble, both fodder species for Dormouse but does not appear to have other suitable fodder species. The Hedgerow along the southern boundary at TN52 is predominantly comprised of 'gappy' mature Hawthorn and Elder trees. This boundary feature may be of use to Dormouse for navigation between nesting and foraging sites. It does not however offer good habitat for Dormouse to nest, being rather sparsely branched giving little protection and is open to the elements.
- 4.3.9 The eastern boundary comprised of closely planted Cypress and Poplar trees does not appear suitable for Dormouse having a closed canopy with little light filtering through and few fodder species were visible. In the north of the site the Bramble scrub and Tall Ruderal habitat provides suitable foraging habitat for Dormouse, but much of it has been bashed down by the rain and does not offer prime nesting habitat. This scrub is linked to Hedgerows along Lake Lane but otherwise is isolated and small in area.

Reptiles

- 4.3.10 The Garden Waste, Spoil and Rubble found in the southern half of the site at TN47 and TN55 provides good hibernation habitat for Reptiles. Further north the Dung Heap at TN36 may attract Reptiles such as Slow-Worm. Garden Waste and Rubble is also noted at TN25 which provides suitable hibernation habitat for Reptiles. Scrub and Tall Ruderal habitats in the northern section of the site also provide protective and hibernation habitat for Reptiles. The Ditches holding water may attract species such as Grass Snake. The grass field on site provides some Reptile basking habitat, although parts are heavily shaded near the eastern boundary.

Amphibians

- 4.3.11 The site has small water bodies of which the largest is in the ditch at TN60. The water is heavily shaded by the Hedgerow and has no marginal or aquatic vegetation visible. It is isolated with no other natural ponds noted from OS mapping within 500.0 metres. It appears possible that it would dry out each year. More ephemeral stands of water are found at TN50 along the ditch at TN44, at TN34 and TN35 on the western boundary and in the ditches in the northern part of the site. These small water bodies again probably dry out in summer and may only be present now due to the previous wet weather over the last few months. The site does have Scrub and Tall Ruderal habitat which provide good terrestrial habitat for Amphibians in winter and after the breeding season. The water bodies have potential for breeding Amphibians including Great Crested Newt. The water body at TN60 has a HSI score of 0.55 which using the system developed by Dr Lee Brady suggests that this water body has below average habitat suitability to support Great Crested Newt.

Invertebrates

- 4.3.12 The site itself supports good habitat for Invertebrates such as Butterflies and Moths with Dense Scrub, Tall Ruderal and trees offering fodder sources. The closely grazed Grassland however in the southern half of the site provides minimal habitat for Invertebrates. Little dead wood is noted on site although the Willow tree at TN28 may offer habitat for Invertebrates such as the Stag Beetle *lucanus cervus*.

Birds

- 4.3.13 Common Songbirds were noted during the survey and appeared to be most prevalent in the Hawthorn Scrub in the southern half of the site at TN45, TN48, TN55 and TN59 and the Hedgerows. Species noted include Blue-Tit, Black-Cap, Blackbird, Robin, Dunnock, Wood Pigeon, Greenfinch and Goldfinch.

5.0 EVALUATION

5.1 Habitats

- 5.1.1 On site habitats of interest included Unimproved Neutral Grassland, Standing and Running Water and Hedgerows. The Grassland on site, although it appeared to be Unimproved was small in area and much overgrown with Bramble and Weeds in the northern section. In the southern section grazed fields the Grassland appeared to be Species-Poor Grassland. Lowland Meadows were highlighted in the Sussex and UK BAPs and although this Grassland area was small, there is good potential for it to support a variety of Grassland and shade-tolerant plants. Therefore it is recommended that a check for botanical interest within the Grassland is made in the Spring – April / May 2010.
- 5.1.2 The southern Hedgerow at TN52 was of most interest with a variety of species present in the western half at TN61 which linked to a more species-poor Hedgerow that extended the length of the adjacent field. Hedgerows were highlighted in both the Sussex and UK BAPs for not only being connective habitat but providing good habitat in their own right for wildlife. Shown on OS mapping, from 1877 (*old-maps.co.uk*) no Hedgerows were noted on site and only the railway and village of Barnham were distinct features. It is suggested that the Cypress and Poplars on the eastern boundary were planted in the 1920s (*pers comm.*) when the green house industry was developing in the area and these would have formed a shelter belt to the eastern site boundary. It is recommended that the boundary Hedgerow feature and trees to the eastern boundary are maintained within the scheme development scheme, enhanced and managed appropriately for wildlife.

5.1.3 The Standing Water on site was found in ditches that formed a network around the site and in pools created by fallen trees at TN34 and TN35, and as flooded areas within the Grassland such as at TN49. After the heavy rainfall and wet winter water bodies may have been more frequent and fuller than usual and it is suggested that most would dry out in the summer. The Ditch at TN01 had fast-flowing water and possibly flows for most of the year. These Small Streams and Ditches provided good potential for a variety of wildlife such as Amphibians, Reptiles and Invertebrates.

5.1.4 Overall the site provided semi-natural habitats of Scrub, Tall Ruderal, Grassland and Hedgerows within a rural setting which are suggested to have value for local wildlife such as Bats, Birds, Amphibians, Reptiles and Invertebrates.

5.2 Protected And Uncommon Species

Plants

5.2.1 No uncommon or rare plants were noted. Common Knapweed was noted in the Unimproved Grassland and is an indicator species typical of Neutral Grassland conditions. Plants typical of Woodland and shaded conditions included Stinking Iris and Lord's-and-Ladies. Pendulous Sedge was also recorded near the ditches.

Bats

5.2.2 Trees along the eastern boundary including Poplar, Alder and Cypress trees had moderate potential to support Bat roosts. Trees such as Sweet Chestnut on the western border at TN07 also had potential with some having Ivy growing up their trunks. Trees within the site with Bat potential were noted at TN28, a Willow, the nine Poplars at TN30, the Scot's-Pine at TN39 and Poplars at TN40. The trees in the Hedgerow along the southern boundary appeared to be mature and also offered potential for Bat roosts.

5.2.3 The eastern and southern tree-lined boundaries offer good navigational corridors for Bats, providing routes near the railway and to Lake Lane to the north. The railway to the east heads into the surrounding Arable Farmland, Woodland and the River Arun which may provide foraging habitat for Bats. The site itself also provided Grassland and Scrub habitats which may be suitable for some foraging Bat species. Records provided by SXBRC highlighted at least eight species of Bat which were recorded within 5.0 kilometres of the site. Pipistrelle Bat activity and Long-Eared and Serotine Bat species were noted in Barnham itself with the surrounding villages also having many Bat records.

5.2.4 Therefore it is recommended that a Bat roost and Bat activity surveys are undertaken on site of the adjacent barn at TN23, and mature trees with Bat roost potential. These surveys should inform mitigation for Bats if they are found to be on or using habitat adjacent to the site. If any mature trees are to have limbs removed for safety reasons prior to works then these should also be checked for Bat roosts. The Scot's-Pine at TN39 in particular may need some attention as two had fallen limbs.

Badgers

5.2.5 No evidence of Badgers or Badger setts were noted on site or within 30.0 metres of the boundary.

Water Vole

5.2.6 There were two records of Water Vole found in Barnham but these were noted in the existing larger rife to the north and the south of the site. The ditches on or adjacent to site at the present time, did not have suitable vegetation or depth of water to provide suitable habitat for Water Vole. The Ditch at TN01 along Lake Lane was suggested to have future potential for Water Vole once the banks have become covered in vegetation again. It is recommended that the Ditches where possible remain within the scheme development plan and that access routes across TN01 should not interfere with the Ditch and a wide margin should be left on its eastern bank.

Dormouse

- 5.2.7 Much of the habitat with possible potential for Dormouse was very dense with few fodder species visible for Dormouse. The Bramble Scrub and Tall Ruderal vegetation in the north of the site had most fodder species but was very small and isolated. Although the southern Hedgerow at TN52 offered some continuity to other Hedgerows the Hedge itself was of an open structure with little opportunities for nesting Dormice. The only record provided by SXBRC was located to the north, and in a Hedgerow linked other green habitat. Therefore it is suggested that the site had limited potential to support Dormouse. It is recommended that the southern boundary Hedgerow should remain within the proposed scheme development plan where possible, but should be boosted by planting native species along it. This would then provide a more diverse planting structure with more benefit to small Mammals, Birds and Invertebrates and ensure the future of the Hedgerow.

Reptiles

- 5.2.8 Scrub, Hedgerows, Tall Ruderal and Refuse-Tip (*Garden Waste, Rubble and Dung Heaps*) throughout the site provided suitable hibernation habitat for Reptiles. The Grassland on site provided some potential Reptile basking habitat. Records of native Reptile species were noted in Barnham including Slow Worm, Common Lizard and Grass Snake. Slow Worms were highlighted in the UK BAP as a Priority Species. Therefore it is recommended that a Reptile survey should be undertaken in Spring; April 2010 to find out if they are present and if so an estimate of Reptile population numbers. It is recommended that some 'Rough' Grassland / Scrub habitat on site should remain within the scheme for any Reptiles. The results of the Reptile survey should be able to suggest an appropriate amount of land and possible location within the site which has connectivity to adjacent 'Green' habitat.

Amphibians

- 5.2.9 No ponds were noted within 500.0 metres of the site from OS mapping but at least one reservoir used by nursery was noted to the east of the site. Small water bodies on site in ditches had potential to support Breeding Amphibians. The largest one at TN61 had a low HIS score suggesting '*below average*' habitat suitability for Great Crested Newt. However records of this Great Crested Newt were found in the nearby villages of Yapton and Warburton within the last six years. They may be able to use the Ditches when migrating in Spring. Terrestrial habitat along the boundaries and in the northern part of the site was good for Amphibians with log piles and rubble creating good Reptile hibernation sites. The Toad is also a Priority Species within the UK and Sussex BAP and returns to the same pond each year to breed. Therefore although there is a low possibility that Great Crested Newt are present on site, to ensure that they are not there; a Reptile presence / absence survey of all Amphibian species is recommended in Spring; April 2010. This would be able to inform any mitigation required for any Amphibians present.

Invertebrates

- 5.2.10 The Tall Ruderal 'Weeds', Grassland and Scrub in the northern half of the site and Tree, Scrub and Hedgerows in the southern half provided some nectar sources for Invertebrates such as Butterflies, Moths and Bees. The Grassland appeared to be Species-Poor over most of the site but may also offer some potential for Terrestrial Invertebrates. Standing Water in ditches also offered a limited area of habitat suitable for Aquatic Invertebrates. Boosting the southern Hedgerow with extra tree and shrub planting would benefit Invertebrates and it would also be recommended that the proposed scheme should include some native understorey shrub planting to the site boundaries.

Birds

- 5.2.11 Common Songbirds on site were plentiful and the site had much Scrub, Trees and Tall Ruderal 'Weeds' which offered good nesting and foraging habitat for Birds. The dense Hawthorn in the southern half of the site, the southern Hedgerow and Trees along the eastern boundary appeared to be particularly good for Birds. Records of Songbirds and Raptors were provided by SxBRC. This included Goldfinch, a species listed on the RSPB 'Amber' list of conservation concern which was noted during the site visit. It is suggested that the site provided an important habitat for Birds within all the Scrub and boundary features, and that a Bird survey should be undertaken in Spring; April 2010 to ensure adequate mitigation is provided for the local farmland and Songbird population.

6.0 CONCLUSIONS

- 6.1 On site habitats of interest included Unimproved Neutral Grassland, Standing and Running Water and Hedgerows. No rare plants were noted but it was not the best time of year to survey and it was recommended a check for botanical diversity should be undertaken in Spring 2010. The southern boundary Hedgerow was suggested to be important due to its good connectivity to other Hedgerows and 'green' habitat and that it was considerable mature. Ditches held standing water on site and provided interest for Invertebrates and Amphibians. Overall the site had potential to support a variety of wildlife including Bats, Birds, Amphibians, Reptiles and Invertebrates. It was recommended that within the proposed scheme some areas of Grassland and Scrub should remain plus the southern boundary Hedgerow feature should be maintained and improved to ensure wildlife such as Birds, Reptiles, and Amphibians can be accommodated.
- 6.2 Trees adjacent to and within the site had good potential for Bats and it was recommended a survey of the adjacent barn and mature trees should be undertaken and / or further Bat activity surveys should these be required. Protected species surveys and data should be collected to inform detailed mitigation in accordance with PPS9. The following surveys are recommended and should be used to ensure mitigation can be included at the earliest stages of the development proposal.

Survey

Bat Roost Assessment of Buildings / Trees

Bat Activity Surveys

Amphibians

Reptiles

Birds

Timing

Survey - All Year

May To September

April to Middle of June

April, May & September

Spring

- 6.4 It is suggested that protected species of Reptile, Bats, and Birds may be using the site and therefore before any vegetation clearance, limb or tree felling or other major activity on the site advice should be sought on the appropriate methods or timing of any activity to ensure no illegal operations are undertaken.

7.0 REFERENCES

HMSO. 1994. *Biodiversity – The UK Action Plan (Revised 2008)*. HMSO, London.
www.ukbap.org.uk

HMSO. 1995. *Biodiversity: The UK Steering Group Report – Volume II: Action Plans*. HMSO, London.

Joint Nature Conservancy Council. (2003). *Handbook for Phase 1 Habitat Survey - A Technique for Environmental Audit*. JNCC, Peterborough.

Mitchell-Jones A.J & Mcleish A.P. (1999). *Bat Worker's Manual*. JNCC, Peterborough.

Stace, C. (1997). *New Flora of The British Isles*. Cambridge University Press, Cambridge.

Atherton, I Et Al., (2010). *Mosses and Liverworts of Britain and Ireland. A Field Guide*. BBS.

www.biodiversitysussex.org – biodiversity action plan

www.old-maps.co.uk

www.magic.gov.uk

www.naturalengland.org.uk

Table No. 1 - Target Notes for Ecology Phase 1 Habitat Plan

Target Note Number	Phase 1 Description	Description	Species	Protected Species Potential
01	Running Water.	Ditch With Fast Flowing Water, Recently Cleared Banks.	Hemlock Water-Dropwort, Common Nettle.	Invertebrates.
02	Unimproved Neutral Grassland.	Adjacent Grazed Fields.	-	Invertebrates, Reptiles.
03	Scattered Trees.	Row Of Trees Adjacent.	Poplar, Italian Alder.	Bats, Birds.
04	Scattered Trees.	Mature Trees On Boundary.	Cypress, Sweet Chestnut, Willow.	Bats, Birds.
05	Running Water.	Ditch, Slow Moving Water.	Nettle, Bramble.	Invertebrates.
06	Scattered Trees.	Mature Trees.	Ash, Elder, Sweet Chestnut.	Bats, Birds.
07	Scattered Trees.	Mature Trees, on Grass Verge.	Sweet Chestnut.	Bats, Birds.
08	Tall Ruderal.	Tall Weeds.	Nettle, Ivy, Docks, Lord's-And-Ladies, Dove's-Foot Crane's-Bill, <i>Brachythecium Rutabulum</i> .	Reptiles, Amphibian (Terrestrial), Invertebrates.
09	Scattered Trees.	Mature Trees.	Oak – Some Ivy On Trunk No Visible Holes, Sycamore Sapling.	Low Bats.
10	Scattered Trees.	Adjacent Eastern Double Line Of Trees.	Cypress Species, Poplar, Alder.	Bats, Birds.
11	Tall Ruderal/ Rubble.	Adjacent Land To East.	Nettle, Bramble, Docks.	Reptiles, Invertebrates.
12	Unimproved Neutral Grassland.	Grassland Encroached By Bramble Scrub, Ant Hills.	Common Knapweed, Ivy, Cock's-Foot, Creeping Buttercup, Hemlock Water-Dropwort, Ribwort Plantain.	Reptiles, Invertebrates.
13	Dense Scrub.	Scrub.	Bramble, Hogweed, Nettle, Oak Saplings.	Reptiles, Invertebrates.
14	Dense Scrub.	Scrub.	Bramble, Hogweed, Nettle, Oak Saplings.	Invertebrates, Reptiles.
15	Bare Ground.	Bare Earth, Recently Cleared.	-	Reptiles.
16	Running Water.	Slow Moving Water.	-	Invertebrates.
17	Defunct Hedgerow Species-Poor.	Boundary.	Sycamore, Willow, Pendulous Sedge, Ivy.	Birds.
18	Dry-Ditch.	Recently Cleared.	Pendulous Sedge, Hemlock-Water Dropwort, Bracken.	Reptiles, Invertebrates.
19	Scattered Trees.	Adjacent Double Row Of Trees.	Cypress Trees With Some Ivy.	Bat, Birds.
20	Existing Building.	Adjacent House.	Tiled Roof, Few Visible Gaps.	Bats.
21	Dry-Ditch.	Recently Cleared, Bare Earth And Standing Water.	-	Amphibian, Reptiles.
22	Scattered Trees.	Adjacent Mature Trees.	Cypress and Willow.	Bats.
23	Existing Building.	Adjacent Barn.	Timber Wall, Ivy Growing Over.	Bats.
24	Dense Scrub.	Scrub.	Elder, Bramble.	Birds.
25	Refuse-Tip.	Garden Waste.	-	Reptiles.
26	Bare Ground.	Gravel And Earth.	-	-
27	Dense Scrub.	Scrub.	Bramble, Butterfly-Bush.	Birds, Reptile, Invertebrates.

Target Note Number	Phase 1 Description	Description	Species	Protected Species Potential
28	Scattered Trees.	Mature Tree, Fallen Limbs.	Willows.	Bats.
29	Existing Buildings.	5 no. Stable Sheds.	Wooden, Flat Prefab Roofs.	-
30	Scattered Trees.	9 no. Trees.	Mature Poplar.	Bats, Birds.
31	Unimproved Neutral Grassland.	Grazed Grassland, Water-Logged.	Cock's-Foot, Selfheal, Daisy, Creeping Bent Grass, Ragwort, <i>Kindbergia Praelonga</i> .	Invertebrates.
32	Scattered Trees.	Trees On Eastern Boundary.	Cypress, Poplar.	Bats
33	Scattered Trees.	Trees.	Ash (No Obvious Holes), Poplar (Tall And Mature).	Low Bats.
34	Standing Water.	Water In Hole Made By Fallen Tree.	-	Amphibians.
35	Standing Water.	Water In Hole Made By Fallen Trees.	-	Amphibians.
36	Refuse-Tip.	Dung Heap.	Nettles.	Reptiles.
37	Scattered Trees.	Mature Trees.	Poplar.	Bats.
38	Unimproved Neutral Grassland.	Grazed Field.	Creeping Bent, Common Mouse-Ear, Meadow-Grass, Cock's-Foot.	Invertebrates.
39	Scattered Trees.	3 no. Mature Trees.	Scot's-Pine, Some Visible Cracks, Broken Branches.	Bats.
40	Scattered Scrub And Trees.	Mature Scrub And Trees.	Elder, Poplar.	Bats, Birds.
41	Scattered Trees.	Row of Mature Trees Inside Fence Boundary.	Poplar.	Bats, Birds
42	Unimproved Neutral Grassland.	Grazed Field.	Creeping Bent, Common Mouse-Ear, Meadow-Grass, Cock's-Foot.	Invertebrates.
43	Dense Scrub.	Western Boundary by Footpath.	Bramble, Goat Willow, Elder, Soft Rush, Stinking Iris, Greater Periwinkle, <i>Lonicera</i> Species.	Birds, Invertebrates.
44	Dry Ditch.	Some Standing Water, Along Eastern Edge.	Soft Rush, Cock's-Foot.	Amphibians, Reptiles, Invertebrates.
45	Dense Scrub.	Scrub and Rubble.	Bramble, Oak Saplings.	Birds, Reptile, Invertebrates.
46	Tall Ruderal.	Tall Weeds.	<i>Brassica</i> Species, Ragwort, Sorrel, Common Nettle, Teasel.	Reptile, Invertebrates.
47	Refuse-Tip.	Rubble and Household Rubbish.	Hawthorn, Bramble.	Birds, Reptile, Invertebrates.
48	Dense Scrub / Refuse-Tip.	Scrub On Mounds.	Hawthorn, Bramble, Ivy.	Birds, Reptile, Invertebrates.
49	Standing Water.	Flooded Grassland.	Grass Species.	Amphibians.
50	Dense Scrub.	Scrub.	Bramble, Stinking Iris, Willow And Hawthorn.	Reptile, Birds, Invertebrates.
51	Intact Hedgerow Species-Poor.	Adjacent Hedge.	Hawthorn, Elder.	Birds, Reptile, Invertebrates.
52	Intact Hedgerow Species-Poor.	Southern Boundary.	Hawthorn, Elder, Sycamore, Ivy.	Birds, Reptile, Invertebrates.
53	Improved Grassland.	Adjacent Field.	Grass Species.	-
54	Tall Ruderal.	Tall Weeds.	Nettle, Teasel, Docks.	Reptile, Invertebrates.

Target Note Number	Phase 1 Description	Description	Species	Protected Species Potential
55	Dense Scrub.	Dense Scrub With Occasional Mature Trees, Mounds Of Flint, Rabbits.	Hawthorn, Silver Birch, Sycamore, Ivy, Bramble, Butterfly-Bush.	<i>Birds, Reptile, Invertebrates.</i>
56	Refuse-Tip / Scrub.	Rubble, Remains of Building.	Hart's-Tongue Fern, Bramble, Hawthorn.	<i>Birds, Reptile, Invertebrates.</i>
57	Semi-Improved Neutral Grassland.	Mown Sward.	Fescue Species, Creeping Bent, White Clover, Creeping Buttercup, Selfheal, Snowdrops.	<i>Reptile, Invertebrates.</i>
58	Other Habitat.	Vegetable Garden.	Remains Of Vegetables Such As Beetroot.	<i>Reptile, Invertebrates.</i>
59	Dense Scrub.	Scrub.	Hawthorn, Bramble.	<i>Birds, Reptile, Invertebrates.</i>
60	Standing Water.	Wide Ditch.	SU 96282 04451, No Vegetation, Fully Shaded.	<i>Amphibian, Invertebrates.</i>
61	Defunct Hedgerow Species-Rich.	Hedgerow Grown Out Trees With Additional Newly Planted Trees.	Hazel, Hawthorn, Elm, Cherry Laurel, Willow, Swamp Cypress.	<i>Birds, Invertebrates.</i>
62	Refuse-Tip.	Garden Waste Adjacent to Site.	-	<i>Reptiles.</i>
63	Scattered Scrub And Trees	5 no. Mature Trees	Bramble	<i>Birds.</i>
64	Dense Scrub.	Scrub.	Bramble.	<i>Birds.</i>
65	Scattered Trees.	Young Trees.	Oak.	<i>Birds.</i>
66	Building.	Garden Shed 2 no.	Wooden, Flat Roofs	-
67	Dense Scrub.	Scrub Along Eastern Boundary.	Bramble, Nettle.	<i>Birds, Reptile, Invertebrates.</i>

Appendix 1 – Site Photographs

APPENDIX NO. 1 - SITE PHOTOGRAPHS



Photograph No. 1 - Grassland in Southern Half of the Site.



Photograph No. 2 - Scrub in Northern Part of the Site.

APPENDIX NO. 1 - SITE PHOTOGRAPHS



Photograph No. 3 - Cypress Trees on Eastern boundary .



Photograph No. 4 - Scot's Pine in Southern Half of Site.

APPENDIX NO. 1 - SITE PHOTOGRAPHS



Photograph No. 5 - Ditch on Western Boundary-



Photograph No. 6 - Southern Hedgerow Boundary Feature.

Appendix 2 – Summary of Protected Species Legislation

APPENDIX NO. 2 – SUMMARY OF PROTECTED SPECIES LEGISLATION

Bats

- A1 All Bat species and their roosts in Britain are protected under the Wildlife and Countryside Act 1981, through inclusion on Schedule No. 5. They are also included on Annex iv Of Council Directive 92/43/Eec of 21 May 1992 on '*The Conservation of Natural Habitats and of Wild Fauna and Flora*' (known as *The Habitats Directive*). As a result of the UK ratifying this directive, all British Bats are protected under the *Conservation Regulations 1994 (The Habitat Regulations)*. The new amendments made by the *Conservation Regulations 2007 (The Conservation (Natural Habitats & c. (Amendment) Regulations 2007)* are also taken into account for assessing the risks to those involved with any activity that may have an impact on bat species. These EU Regulations make it an offence to damage or destroy a breeding site or resting place even if it is unintentional. It is also an offence to deliberately or intentionally disturb the animal affecting its ability to survive, breed or rear young, to impair ability to migrate or hibernate and/or to affect significantly the local distribution of the species to which they belong. Any works should safeguard the 'continued ecological functionality' of the site/place and in nearly all cases will involve licensable activities (from Natural England).

Water Vole

- A2 The Water Vole (*arvicola terrestris*), dramatically declined in the 1980's due to habitat loss and Mink predation. Only now in particular areas where Mink can be eradicated are numbers increasing. They are listed on *Schedule No. 5 of the Wildlife & Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000)* and this was recently updated on the 6th April 2008 in relation to Section 9 (1-5). This makes it an offence to deliberately kill or injure a Water Vole or to intentionally or recklessly damage, disturb or destroy its place of shelter (typically burrows).

Dormouse

- A3 The Dormouse (*muscardinus avellanarius*), is one of the rarest members of the British rodent fauna. This is because much of its habitat has been lost. They are covered by the same legislation as that described above for Bats being listed on *Schedule 5 of the Wildlife & Countryside Act 1981 (as Amended) and within Annex iv of the Habitats Directive*. These UK and EU Regulations make it an offence to damage or destroy a breeding site or resting place even if it is unintentional. It is also an offence to deliberately or intentionally disturb the animal affecting its ability to survive, breed or rear young, to impair ability to migrate or hibernate and/or to affect significantly the local distribution of the species to which they belong. Any works should safeguard the 'continued ecological functionality' of the site/place and in nearly all cases will involve licensable activities (*from Natural England*).

Birds

- A4 All Wild Birds are protected primarily through the Wildlife and Countryside Act 1981, as Amended. This makes it an offence to intentionally kill, injure or take any Wild Bird; take, damage or destroy a Bird Nest (*whilst in use or under construction*); take, damage or destroy its eggs and possess Wild Birds (*dead or alive*) or their eggs. Further restrictions are placed on any Schedule 1 Species (*listed in the WCA 1981*) whereby 'the intentional or reckless disturbance of... whilst nest building, at a nest containing eggs or young, or disturbing dependent juveniles' is an offence and carries more serious penalties. The IUCN guidelines also highlight species through 'Red' and 'Amber' lists of Birds of conservation concern. This includes a total of 246 species, 52 on the 'Red' list, 126 on the 'Amber' list and 68 on the 'Green' list. 'Red' list species are globally threatened or whose population or range has rapidly declined over recent years and includes. 'Amber' list species are less threatened, possibly with declining populations although still of conservation concern. 'Green' list species include all regularly occurring species and also includes species that are recovering from historical decline in the last review (*RSPB, Birds of Conservation Concern, 2009*).

Amphibians

- A5 The Great Crested Newts *triturus cristatus* is covered by the same level of protection as Bats and Dormice discussed above being listed on *Schedule 5 of the Wildlife & Countryside Act 1981 (as amended)* and within *Annex iv of the Habitats Directive*. These UK and EU regulations make it an offence to damage or destroy a breeding site or resting place even if it is unintentional. It is also an offence to deliberately or intentionally disturb the animal affecting its ability to survive, breed or rear young, to impair ability to migrate or hibernate and/or to affect significantly the local distribution of the species to which they belong. Any works should safeguard the 'continued ecological functionality' of the site / place and in nearly all cases will involve licensable activities (*from Natural England*).

Smooth Newts *lissotriton vulgaris* Palmate Newts *I. helveticus*, Common Frogs *rana temporaria* and Common Toads *bufo bufo* are protected only against sale under the WCA Act (1981 as Amended). The Natterjack Toad *bufo calamita* is fully protected but is very restricted in its distribution and would not occur in this study area (*Gent, 1998*).

Reptiles

- A6 Adders *vipera berus*, Grass Snakes *natrix natrix*, Common Lizards *lacerta vivipara* and Slow Worms *anguis fragilis* are protected against intentional killing, injury or sale under the Wildlife and Countryside Act 1981 (*following Statutory Instruments 1991 no. 367*). Smooth Snakes (*coronella austriaca*) and Sand Lizards (*lacerta agilis*) are within Annex iv of the Habitats Directive and accorded full protection against reckless or intentional damage, destruction or obstruction of access to their place of shelter or protection, and against deliberate killing or injuring of the Reptiles themselves, under the Wildlife and Countryside Act 1981, as amended and the Habitat Regulations 1994 and the Conservation Regulations 2007.

Arnold, H. R. (1993) *Atlas of Mammals In Britain*. HMSO, London;

Harris S, Morris P, Wray S & Yalden D. 1995 *A Review of British Mammals* JNCC Peterborough;

Gent, A.H., & Gibson, S.D., Eds.; 1998 *Herpetofauna Workers' Manual*; Peterborough, JNCC;

English Nature (2002) *Badgers and Development*, Peterborough, EN;

Waite A (Ed) 2000. *Kent Red Data Book*, Kent County Council, Maidstone.