

**ECOLOGICAL ASSESSMENT
LAND AT ROUNDSTONE LANE,
ANGMERING**

JULY 2012

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**ECOLOGICAL ASSESSMENT
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1.0 INTRODUCTION

1.1 Background

1.1.1 Aluco Ecology Ltd was commissioned to carry out detailed ecological survey work of land at Roundstone Lane by Barratt David Wilson Homes (Southampton) Ltd.

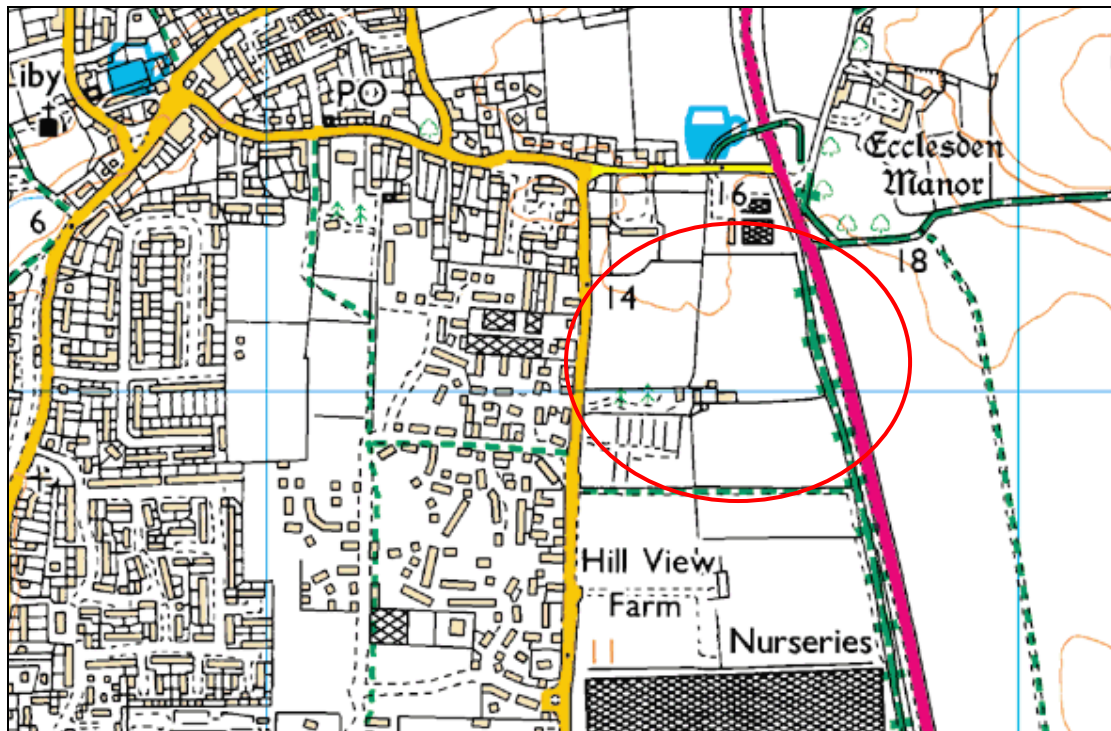
1.1.2 The aim of the Ecological Assessment is to survey and document baseline ecology data on the site, and then evaluate and assess the impacts of the proposals for Outline Planning Permission against this baseline. The assessment therefore:

- highlights any features of particular ecological value;
- identify potential impacts to ecology as a result of the proposed works;
- identify any ecological issues that may have legal or planning implications such as the presence of protected species; and
- recommends potential for mitigation and/or compensation that can be undertaken to avoid, reduce or offset the potential for impacts.

1.1.3 The results of the assessment are provided below to inform the Planning Application for development on the site

1.2 Outline of the Scheme and Site Location

1.2.1 The land consists of three improved grassland grazed horse paddocks adjacent to housing between Roundstone Lane and the A 280. Its location is shown at **Figure 1** below. Grid Reference TQ075040.



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Figure 1: Location of the Site

1.2.2 The Scheme is for a residential development of 200 dwellings.

1.3 Relevant Legislation and Policy

UK Legislation

1.3.1 The Wildlife & Countryside Act 1981 is the principal mechanism for the legislative protection of wildlife in Great Britain. This legislation deals with both protected species and the designation and protection of Sites of Special Scientific Interest (SSSI). The parts of this Act most relevant to the proposed development are outlined in **Technical Appendix 1**.

1.3.2 Environmental Impact Assessment (EIA) is governed by the Environmental Impact Assessment Regulations 'The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended)'. These Regulations implement the European Council Directive 85 / 337 on the assessment of the effects of certain public and private projects on the environment in so far as it applies to town and country planning. Scoping has been completed and it not considered as falling within the Regulations. Due regard to these Regulations has been taken in the ecological assessment undertaken.

European Legislation

1.3.3 The Conservation (Natural Habitats &c) Regulations 1994 now replaced by the Conservation of Habitats & Species Regulations 2010 (known as the Habitats Regulations) makes it an offence to deliberately kill, capture, or disturb a European Protected Species (EPS), or to damage or destroy the breeding site or resting place of such an animal. European Protected. The Habitats Regulations are also concerned with the protection of Special Areas of

Conservation (SAC) and Special Protection Areas (SPA), which are designations applied to sites of European Importance for wildlife. See **Technical Appendix 2** for more details.

National Planning Policy

- 1.3.4 The Government sets out its objectives for conserving and enhancing biodiversity in the new National Planning Policy Framework that also makes reference to the existing ODPM Circular 06/2005. The Government's objectives for planning and biodiversity are that '...the planning system should seek not just to protect, but where possible to enhance biodiversity – making sure we don't just have isolated pockets of wildlife, but rich and connected green spaces for all kinds of species to thrive.'
- 1.3.5 The Framework goes on to state that at the heart of the planning system is a presumption in favour of sustainable development.

Local Planning Policy

- 1.3.6 In addition to the NPPF and the legislation outlined above, the strategic and local planning policies are the principal policies against which the outcomes of this ecological assessment will be tested; the Arun District Council Local Plan is being replaced by the Council's Local Development Framework, until that time certain policies have been retained and these are outlined at **Technical Appendix 3**.

Biodiversity Action Plans

- 1.3.7 The UK Biodiversity Action Plan is the Government's response to the 1992 Convention on Biodiversity (The Rio Convention), with the aim of halting loss of biodiversity in the UK. Biodiversity strategy is implemented at a local level through county and district level Biodiversity Action Plan (BAPs). The site falls within the geographic area covered by the National BAP and the Sussex BAP.

2.0 ASSESSMENT METHODOLOGY

2.1 Introduction

- 2.1.1 The methodology for this assessment is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Institute of Ecology and Environmental Management (IEEM, 2006). This sets out survey, evaluation and assessment guidelines.

2.2 Site Survey Methodology

- 2.2.1 The first stage of the assessment is a desk study of the site and associated Zone of Influence. This provides background information on the site and local environment in order to effectively target field survey and further desk research. The aims of the field survey are to record land-use and broad vegetation types present on the site and in the surrounding areas, and to evaluate the habitats and vegetation communities' potential ecological value along with their potential to support protected species, species of principal importance, and any other notable species. This is then backed up with detailed ecological surveys where necessary. The details of these survey methodologies are described in relevant baseline chapters and Technical Appendices.
- 2.2.2 Following the evaluation of the baseline an impact assessment is made. Further details of the assessment methodology used can be found in **Technical Appendix 4**.
- 2.2.3 Survey work was primarily undertaken by Anthony Blunden MIEEM CEnv and Gareth Knass MIEEM for Aluco Ecology.

3.0 BIOPHYSICAL CHANGES AND THE ZONE OF INFLUENCE

3.1 Introduction

3.1.1 In order to be able to target relevant ecological survey and assess the impacts of a proposed development, it is necessary to identify the activities that may result in biophysical changes from the development and the area these cover (i.e. the zone of influence). There are three stages of this development scheme that include activities that may have an impact on features of ecological value; namely site preparation, construction and operation / use.

3.1.2 The proposed development area is shown at **Figure 2** below.

3.2 Biophysical Changes associated with the Development Scheme – Determination of the Zone of Influence

3.2.1 It is proposed that change of use of the site will result in the physical structure of the present site being altered. The potential zone of influence of the proposal is determined from the predicted biophysical changes brought about by activities associated with construction and post-construction phases. Therefore the zone is predicted to extend across the development footprint and locally along the edge of the site, and immediately adjacent to the site. Consequently, survey has been carried out within this zone.

3.3 Site Preparation / Construction Activities and Biophysical Changes

3.3.1 During the construction phase, it is predicted that site preparation activities will include some earthworks and earth stripping associated with the house building and road footprints. This phase may affect habitat suitable for wildlife. Without appropriate mitigation, site clearance work may result in death or injury to protected species (if they are present), or damage to other features of ecological value. Construction could result in the loss of features of ecological value and/or the loss of habitat of protected species resulting in a net decrease in biodiversity.

3.3.2 The construction of the site has the potential to affect adjacent habitats, where present, through noise, air and run off pollution.

3.4 Predicted Operational Activities during Use Phase and Biophysical Changes

3.4.1 The operational phase will need to consider how protected species and species of conservation concern may use the site and zone of influence, and what effect the proposals may have on their conservation status locally.



4.0 DESIGNATED SITES, HABITATS & VEGETATION ON SITE

4.1 Introduction

- 4.1.1 The ecological baseline describes the site in the context of the characteristic habitats of the area, and includes descriptions of designated sites and ecological features present within the potential zone of influence of the proposed development.

4.2 Designated Sites

Statutory Designated Sites

- 4.2.1 There are no statutory sites such as Sites of Special Scientific Interest (SSSI) designated of regional to national importance; or European and Internationally important sites (Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Ramsar Sites) within 2km of the site. The site just abuts the South Downs National Park (to the east of the Angmering Bypass). Further details are provided in **Technical Appendix 5**.

Non Statutory Sites

- 4.2.2 There are three Sites of Nature Conservation Importance for (SNCI) present within 2km of the site but all over 1km from the site. These are mostly designated for grassland wetland habitats. Further details of the SINCs are provided in **Technical Appendix 5**.

4.3 Local History

- 4.3.1 The site has been open farmland since at least the 1830's and probably for a lot longer. At the beginning of the 19th Century it was probably farmed as part of Eaglesdon Farm, which later became Ecclesden Manor. Roundstone Lane and the village of Angmering to the north east, the Spotted Cow public house and Pound house were all present throughout the 1800's. By the end of the century Pound Cottage is shown at the centre of the site, where ruins still exist today at the east end of Pound Place. The field boundaries are shown on the first inch six inch to the mile Ordnance Survey mapping at this time, more or less as they exist today. No mature trees are illustrated the site area.
- 4.3.2 By the early 1930's the local nursery industry was prevalent to the south and to the west of the site, with various individually owned nurseries. The site remained as open farmland, with Pound Cottage in the centre, and with access through from Roundstone Lane. As the nursery industry grew during the mid twentieth century, it expanded around the local area with land to the immediate west of Roundstone Lane becoming part of the nursery trade in the mid 1970's and by the end of the decade the Manor Nursery at the northern end of the site was constructed. The nursery at the south east of the site followed after this. At this time, Pound Cottage was converted into a private site cutting into the current site, with some of the former outbuildings remaining on site.
- 4.3.3 In the early twenty first century the Angmering by-pass was given the go-ahead and this started construction in 2001/02. A short time later, the Nurseries to the west of Roundstone Lane, which had rapidly become disused, were converted into new housing estates to the

south of the historical village of Angmering. The current site now lies within the Angmering By-pass, on the south-east end of the much larger village.

4.4 Habitats and Vegetation

Introduction

- 4.4.1 The following description is based on a site visits in December 2010- July 2011, July 2012. The site is made up of a series of improved pasture fields currently being used for horse grazing, bordered by hedges with one more notable hedge with mature standard trees. The site boundary does not include the boundary hedges to the east, south and west but does include those within the fields.
- 4.4.2 The site is bound to the south by an area of sports fields, to the east by the Angmering bypass and to the north and west by suburban development. The housing to the west is of recent construction while that to the north is longer standing. The broad habitats on site are shown in **Figure 3** below.

Grassland

- 4.4.3 The horse pasture that dominates the site was ungrazed in 2011 and is dominated by coarser grasses including Rye *lolium perene* indicative of reseeded grassland; with Yorkshire-fog *Holcus lanatus*, Soft-brome *Bromus hordeaceus* and Creeping Bent Grass *Agrostis stolonifera* dominating the poorer quality areas (such as the northern field units, see **Photo 1**), and in slightly less agriculturally improved areas abundant Sweet Vernal Grass *Anthoxanthum odoratum* and a few small patches of Meadow Foxtail *Alopecurus pratensis*, Crested Dog's-tail *Cynosurus cristatus* and the more local Meadow Barley *Hordeum secalinum* locally in the north of the site (**Photos 2-4**). Other species occasional through the sward include Cock's Foot *Dactylis glomerata*, and False Oat Grass *Arrhenatherum elatius*.
- 4.4.4 Herb species are generally poorly represented within the grasslands, but include species able to tolerate agricultural improvement such as Creeping Buttercup *Ranunculus repens*, Meadow Buttercup *Ranunculus acris*, Lesser Stitchwort *Stellaria media*, White Clover *Trifolium repens*, Yarrow *Achillea millefolium* some Common Sorrel *Rumex acetosa*, and in places ruderal species such as Creeping Thistle *Cirsium arvense*, Spear Thistle *Cirsium vulgare*, Nettle *Urtica dioica*, and Docks *Rumex sp.* in areas disturbed by localised high rabbit populations or associated with horse dung accumulation areas. Rarely Common Bird's-foot-trefoil *Lotus corniculatus* is present in the field edges (mostly in the small field along the northern edge of the site around Pound House).

- 4.4.5 Typical examples of the grasslands on site are shown at **Photos 1 -4** below.



Photo 1: North-eastern Field south of Manor Nursery. This field is the most agriculturally improved with coarse grasses and few herbs, the most numerous being Creeping Buttercup, shown in full flower here in May 2011.



Photo 2: The small area of field to the north of the site around the edge of Pound House. This field is less dominated by coarse grasses, with abundant Sweet Vernal Grass (such as at the bottom of the picture). The field is still low in herbs, but with some Birds-foot Trefoil and abundant Yarrow around the northern margin (July 2011).



Photo 3: The north western field. This has abundant Soft Brome and Creeping Bent Grass, with frequent Sweet Vernal Grass. This is one of the fields with some surviving Meadow Barley. Herb diversity is however low, but does include abundant buttercups shown here in full flower (May 2011).



Photo 4: The south eastern field was cut in July 2011.

Boundaries and Hedgerows on and off the site

- 4.4.6 The eastern boundary of the site runs along a strip of secondary woodland dominated by Sycamores *Acer cf. pseudoplatanus*, but with other species including Lime *Tilia cf. x europaea*, Beech *Fagus sylvatica* and Pines *Pinus sp.*, with an understorey of Elm *Ulmus procera*, Field Maple *Acer campestre*, Elder *Sambucus nigra* and Hawthorn *Crataegus monogyna*. The ground flora is species poor and dominated by Ivy *Hedera helix* agg., Nettles, and Ground Ivy. The woodland strip has a public right of way running through it and is off site. The site boundary is marked by a barbwire fence. Beyond the fence is a ditch/watercourse. On the edge of the south western field is an area of edge habitat between the woodland strip and the field. This has areas dominated by Nettle, with Brambles *Rubus fruticosus* agg. developing, and a patch of Bracken *Pteridium aquifolium*. The boundary is shown at **Photo 5**.



Photo 5: Eastern Wooded Boundary. This strip of secondary woodland is off site and dominated by Sycamore (December 2010).

- 4.4.7 The southern boundary is also a fence line (wooden ranch style) to the east. To the immediate south of the fenceline is a line of planted Conifers with planted Poplars interspersed. These form a high boundary feature to the football pitches further south. The ground flora is dominated by bare ground and Nettles. (see **Photo 6**). To the west of the site is the boundary with the dwelling and property 'Pound Place'. This has dense non-native Fur hedges surrounding the property with occasional mixed native and ornamental trees. The site boundary is denoted mostly by wooden fencing in front of these hedges. This property boundary is shown at **Photo 7** below.
- 4.4.8 The western boundary is also fenced and mostly open without a hedgerow, or with occasional Elder, Elm and Hawthorn, and some planted young trees. Roundstone Lane is below a species poor bank, dominated by False Oat Grass and with abundant Cow Parsley *Anthriscus sylvestris* and Nettles. This bank is off site (see **Photo 8**).

- 4.4.9 The northern boundary is disjunct with the boundary around Pound House property north west of the site. It comprises a mixture of planted hedges from non-native conifers in the west, to Hawthorn and Elder hedges around the small northern field, and a fenceline separating Manor Nursery. A small amount of woody vegetation including individual mature Elders, Hawthorn and Sycamore is present along the fence line (see **Photo 9**). The native dominated hedgerow around the small northern field has a good edge structure grading into the grasslands with abundant Bramble. There are also extensive stands of Nettle and Thistle. This part of the boundary is shown in **Photo 10** below.



Photo 6: Southern Boundary



Photo 7: Southern Boundary of Property 'Pound Place'



Photo 8: Western Boundary with scattered scrub and rough grassland, mostly off site (May 2011)



Photo 9: Southern boundary of Manor Nursery with occasional woody vegetation.



Photo 10: Part of the Northern Boundary. Here showing abundant Elder, with an understorey of Nettle.

- 4.4.10 There are also a number of internal boundary features on site. The boundary of the north west and north eastern field is a thick outgrown hedgerow with a couple of mature Ash *Fraxinus excelsior* and Oak *Quercus robur* trees as standards, and dominated by Elder and Hawthorn with some Blackthorn *Prunus spinosa*. This hedge is very thick, with about a 10m-15m

width. The ground flora is generally bare inside the hedge, disturbed by Rabbit *Oryctolagus cuniculus* burrows and activity, and dominated by Nettles on the edge. A single large plant of Deadly Nightshade *Atropa belladonna* is present on the eastern edge of the hedge, and a couple of plants of Broad Buckler Fern *Dryopteris dilatata* are also present. This is considered Under the Hedgerows Regulations 1997 'important' given its historical presence, connections to other hedges, low percentage gaps, mature standards and diversity of plant species. The hedge is shown at **Photo 11** below.

- 4.4.11 An east west hedge running from the centre of the site to the eastern boundary is shown at **Photo 12** below. This is becoming outgrown but is dominated by Elder with Hawthorn, with frequent Blackthorn and Elm, and occasional Holly *Ilex aquifolium*. There is also abundant Bramble. The ground flora is dominated by Nettles, with Ivy and Ground Ivy *Glechoma hederacea* also locally dominant.



Photo 11: Hedge running North/South through the centre of the site.



Photo 12: Hedge running from the house to the eastern boundary, dominated by Elder with occasional hawthorn

Flora

- 4.4.12 A single large specimen of Deadly Nightshade was located within the central hedgerow, which may be locally notable, but is not rare. No other notable or locally scarce species were noted within the site boundary during the survey. The only species that shows any affinity to unimproved grasslands noted on site was small patches of Meadow Barley scattered in a couple of fields.

Evaluation of Vegetation and Habitats

- 4.4.13 The grasslands on site are improved grasslands with small areas of semi-improved habitat in peripheral areas around the derelict nursery in the south west. The grasslands are considered to be of **value within the Zone of Influence**. The Hedgerow features on site are generally of **value within the Zone of Influence**, with the hedge running north-south through the centre of the site, this is considered Under the Hedgerows Regulations 1997 a hedge is considered 'important' and is considered to be of **local nature conservation value**. Other areas of the site are of **Negligible Value**.

5.0 PROTECTED SPECIES & SPECIES OF CONSERVATION CONCERN

5.1 Introduction

- 5.1.1 An initial ecological appraisal of the site was undertaken in winter 2010-11. This concluded that detailed survey work was required to be undertaken for Bats and Reptiles, and that some additional data on Birds would also be required, as well as continued monitoring for signs of Badger use of the site. The following chapter details the additional work for the main protected species groups with potential to be present on site, and details on other protected species and species of conservation concern.

5.2 Breeding Birds

Methodology

- 5.2.1 A breeding bird survey was undertaken on a number of dates in May-June 2011. Time is spent on recording species present and identifying territory centres, territory range and size. This is done by noting what activity the birds recorded are undertaking. Sightings are noted on individual survey maps using standard codes for behaviour and species. Over a number of visits these maps can be collated and territories of species determined to a relative degree of accuracy. Further advice is also obtained from the methodology used by the BTO for their Breeding Bird Survey (BBS). More information on survey work is provided at **Technical Appendix 6**.
- 5.2.2 A number of bird surveys were undertaken on various dates following dawn bat surveys or during building assessments (see **Table 1** below for dates).

Table 1: Bird Survey Dates

Date of Survey	Time
04 May	Late am
12 May	am
16 May	am
25 May	am
27 May	am
13 June	am
27 June	am
28 June	am

Results

- 5.2.3 The survey results showed very little farmland bird populations on site, with only woodland edge and scrub species present. The species of conservation concern (Eaton *et al.* 2009) recorded on site are shown in **Table 2** below. Of these species, the only one confirmed to be breeding on site is Dunnock *Prunella modularis*. Song Thrush *Turdus philomelos* is also likely to breed in low numbers.

Table 2: Species of Conservation Concern

Species	Status/Protection	Comments
Green Woodpecker	Amber	Seen once feeding on site on a couple of occasions
Dunnock	Amber BAP	Breeding species in hedges on site
Song Thrush	Red, BAP	Couple of pairs around boundaries, possibly breeding off site along north eastern edge
Mistle Thrush	Amber	Recorded on site feeding with local breeding in association with the Poplars to the south of the site
Linnet	Red, BAP	Recorded on site feeding on a couple of occasions only, with local breeding in expected, but probably not on site
Kestrel	Amber	1 bird regularly feeding and occasional roosting in the central hedgerow standards
Swift	Amber	Occasionally seen feeding over site
House Martin	Amber	Occasionally seen feeding over site
Swallow	Amber	Occasionally seen feeding over site
Common Whitethroat	Amber	Recorded on one date, potential migrant
House Sparrow	Red BAP	Occasionally seen feeding on the site boundaries
Starling	Red BAP	Occasionally seen feeding on the site

Sch 1 = Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)

BAP = UK Biodiversity Action Plan Species (amended 2008) and/or Oxfordshire BAP(2008a)

Red/Amber – Birds of Conservation Concern on either the Red or Amber List (Eaton et al 2009)

Evaluation

- 5.2.4 There is very little habitat on site for nesting birds much of site is improved grassland. The site provides some nesting and foraging opportunities along the larger hedges on site, for a number of commoner rural and garden species. The site is considered to be of **value within the Zone of Influence** for local bird populations.

5.3 Bats

Methodology

- 5.3.1 The methodology involved survey of all building structures for any roosting bats or signs which could indicate use of the buildings on site by bats. A survey of the on-site trees for their potential to provide roosting structures for bats was also undertaken. All roosting features identified have then assessed by detailed emergence survey assessment, Bat detectors were used to listen for bats and observations were made for any bats emerging from potential roost sites. The methodology of these assessments is further detailed in **Technical Appendix 7**.
- 5.3.2 The methodology for the tree survey is outlined in **Technical Appendix 7** and involves categorising trees into three different categories. Category 1 is for trees with confirmed bat roosts. Any tree work on trees marked as Category 1, or that may affect such a tree, usually

require to be licensed via a European Protected Species Licence. Category 2 trees are subdivided into Category 2a, which is a holding category and the tree requires further survey work, and Category 2b which is a tree with some limited bat potential and should be felled using certain safety measures in case bats are present. These safety measures are also outlined in **Technical Appendix 7**.

- 5.3.3 Where a tree has been identified as being a Category 2a tree, further survey work of the relevant features of such a tree will confirm whether the tree should be made either a Category 1 tree (confirmed bat roost), or a Category 2b tree (no confirmed roost but requires a safe felling method if removed). Further survey work involves inspection of any cavities and emergence surveys. A Category 3 tree is considered as having no bat potential and can be felled without any further bat mitigation. The survey was completed in 2011 following 2011 survey guidelines.
- 5.3.4 The survey dates and methods and results can be seen in **Table 3** below.

Results – Roosting Potential

- 5.3.5 The built structures present on site are very low or no potential for roosting bats. These consist of two open fronted horse shelters. Annotated **Photo 13-** provides an example of the horse shelters.
- 5.3.6 No buildings present on site have any evidence of supporting a bat roost and they are very poorly suited for roosting.



Photo 13 Horse Shelter Note open single skin drafty buildings usually unsuitable for bats

- 5.3.7 A few mature trees including mature oaks and Ash trees are present within the hedgerow (**Photo 14-15** show an Ash (ACD Tree Constraints Plan tree no.20, with the highest roost potential) running through the centre of the site from north to south. Most of the trees in the areas are considered to be still relatively young and free from damage and the associated potential access for bat roosts. Three trees were initially marked as Category 2a, (i.e. trees requiring further detailed emergence survey assessment) on account of holes and other features allowing potential for roosting bats; the location of these are shown on **Figure 4** below.



Photo 14: Ash Tree Category 2a to date (high potential)



Photo 15: Ash Tree Category 2a to date (high potential)

Results – Emergence & Foraging

- 5.3.8 The desk top data survey indicates that four species of bat Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus* Natterer's *Myotis nattereri* and Brown Long Eared Bat *Plecotus auritus* have been definitively recorded from within 2km of the site. This includes larger maternity roosts of Soprano Pipistrelle.
- 5.3.9 The habitats on site provide potential foraging and commuting opportunities for local populations of bats, with hedges and trees within the fields. The general landscape also provides bat foraging along the mature hedgerows.
- 5.3.10 **Table 3** below shows the results of emergence and foraging surveys undertaken around the Category 2(a) trees within the central hedgerow and other nearby buildings on and off site, and transect surveys to understand the degree the site is used by commuting and foraging bats as part of the wider local area.

Table 3: Bat Survey Results May – July 2011

Date	Survey Method	Conditions	Results
12/6/11	Dusk Emergence SS21:17 Transect over site around Site	16c Warm after rain, SW2-3, 100%	Nil Tree emergence 22:00 2 Soprano Pipistrelle south onto site
13/6/11	Transect over site around Site Dawn Return SR04:43	12c Cool w/sw 1-2 60%	No dawn activity along eastern hedge Nil Tree return
27/6/11	Dusk Emergence Transect over site around Site SS21:22	20c N0-1 0%cloud Clear , warm	Nil Tree emergence 21:51 Soprano Pipistrelle, 21:55 Common Pipistrelle, Brown Long-eared from northern houses onto site. Foraging by 2 Soprano Pipistrelle, and 2 Common Pipistrelle 21:55- . Serotine 22:02-2210
27- 28/07/11	Activity Monitoring	25c-C16c N0-1 0%cloud Clear , warm	Noctule 21:58 high over Foraging. Also by c2 Soprano Pipistrelle, and c2 Common Pipistrelle and around central hedge with occasional Serotine and Myotis (prob whiskered type) passes. Very low levels of Dawn activity
30/6/11	Dusk Emergence Transect over site around Site SS21:10	18c	21:47 Common Pipistrelle from direction of northern houses onto site c4 Common Pipistrelle foraging 21:50- Soprano Pipistrelle foraging 22:17 Transect c4 Common Pipistrelle dispersed round site boundaries
19/7/2011	Dusk Emergence Transect over site around Site	15-12c 100% sw0-1	21:40 Common Pipistrelle, Brown Long-eared 21:44 from direction of northern houses onto site Transect c4 Common Pipistrelle 1 Soprano Pipistrelle dispersed round site boundaries

Results of Evening Emergence and foraging Survey

- 5.3.11 The surveys included emergence survey of the trees that may be affected by the development proposals, and foraging and activity transect surveys walking down each boundary and hedge feature to build a picture of foraging areas and commuting routes.
- 5.3.12 The majority of bats first observed at the site were recorded not long after the optimum emergence time from the north of the site indicating local roosting in the surrounding houses. The lane to the north has a number of older buildings as it constitutes the older part of the village. Survey indicates that small numbers of bats travelled to the site for feeding rather than commuting over the site to other foraging area. Bat activity survey indicated that foraging and commuting activity was lowest along the east and west boundaries bordering the roads. A total of five species were recorded in low numbers; Common Pipistrelle *Pipistrellus pipistrellus* and Soprano Pipistrelle *Pipistrellus pygmaeus* being the most regularly recorded species, favouring the central hedgerow for foraging, with occasional records of Long Eared Bat *Plecotus cf. auritus*, Noctule *Nyctalus noctula*. Serotine *Eptesicus serotinus* and a Myotis species (considered to be a Whiskered *Myotis mystacinus*).

(a) Commuting Routes

- 5.3.13 All tree lines, woodland edges and hedgerows were used by bats for moving around the landscape. This is especially so where the hedges are more mature with large mature trees within. During the surveys, commuting and foraging bats were recorded at the site using the range of landscape features. No particularly important non-feeding commuting routes were recorded.

(b) Foraging Sites

- 5.3.14 The presence of outgrown hedgerow habitat provides foraging habitat for bats. The evening surveys confirmed that bats utilise the hedgerows on the site, with greater use of the more mature sheltered hedges with favoured feeding areas depending upon wind direction and invertebrate accumulations.
- 5.3.15 The survey results show that given the size of the site, the use by bats is typical for such with any similar-studied large hedgerows in the area expected to have very similar use. As is typical with the surrounding housing, Pipistrelle account for the majority of bat passes, and these are in favoured foraging spots along mature hedges and around maiden trees on site.

(C) Roosts

- 5.3.16 No evidence of bat roosts was noted during the survey work, with bats generally present on site after sunset with a southern movement bias from the direction of a number of older properties to the north. Although no evidence to date the Ash tree classified as a 2a tree is still considered highly likely to support periodic roosting. Two other trees initially classified as 2a trees have been re classified as Category 2b given the lack of emergence noted during surveys.

(Photo 14-15, Figure 4)

Evaluation

- 5.3.17 All native species of bat are afforded legal protection in the UK through the Habitats Regulations. All of the species recorded are BAP species. All the bat species recorded on the site are considered common or local frequent, with a widespread distribution in the UK and therefore this assemblage of bats is considered of **local value**.

5.4 Badger

Methodology

- 5.4.1 The site was searched for signs of the potential presence of Badgers *Meles meles* using the methods outlined in **Technical Appendix 8**.

Results

- 5.4.2 No signs of Badgers were noted during the survey effort on site. A large number of holes are located along the site boundaries which are primarily Rabbit, and no signs of Badgers were noted from them (see **Photo 16**).



Photo 16: Evidence of rabbit activity on site

5.5 Other Protected Mammal Species

- 5.5.1 The potential for the European protected species Dormouse *Muscardinus avellanarius* to be present was also considered (See **Technical Appendix 1 & 2** for legal status).. The data search shows that the closest known site for the species is just under 5km away to the north and north of the A27(T). The habitats on site are of low value for this species and would only have the potential to be used if associated with high quality habitat adjacent to the site. In the immediate wider local area there is very little woody habitat, and the landscape is either enclosed with new build housing, the recently constructed Angmering By-pass or more open farmland. The presence of Dormouse on site is therefore considered unlikely.
- 5.5.2 Watervole *Arvicola terrestris* is known from the wider local area. No watercourses are present on site and the species is therefore not likely to be present. A small watercourse on the eastern boundary of the site is shaded by vegetation and without any aquatic vegetation. During survey periods it was noted to be dry for much of the year.
- 5.5.3 No other protected mammal species are likely to occur. Roe Deer *Capreolus capreolus*, Fox *Vulpes vulpes*, Pigmy Shrew *Sorex minutus* and Wood Mice *Apodemus sylvaticus* have been recorded during other survey work on site.

5.6 Reptiles

Methodology

- 5.6.1 Most of the site has very low potential habitat for reptiles being intensively managed and grazed grassland lacking structure to support populations. The southern facing boundaries of the fields and other boundaries have some limited potential habitat. On this basis a reptile survey was undertaken during May-July 2011. The methodology of the survey is provided in **Technical Appendix 9**, and the dates of the survey in **Table 4** below. A total of 60 refugia were placed on potentially suitable habitat on site. Given the negative results while potential habitat is present on parts of the site, a couple of additional surveys were undertaken.

Results

- 5.6.2 No reptiles were recorded during the survey.

Table 4: Results of Reptile Survey

Date of Survey	Time	Results
04 May 22c no cloud	Am	Set up
12 May 19c no cloud	Am	0
16 May 17c partial cloud	Am	0
25 May 19c partial cloud	Am	0
27 May 23c no cloud	Am	0
13 June 18c partial cloud	Pm	0
27 June 25c little cloud	Pm	0
28 June 24c partial cloud	Pm	0
15 July 15c high cloud sunny	Pm	0
20 July 17c partial cloud	Pm	0

Ad = Adult, Sub = Sub Adult

5.7 Amphibians

- 5.7.1 No water bodies suitable for amphibians exist on site. The nearest pond is a recently constructed pond within Ecclesden Manor, built around the same time as the Angmering By-pass in the last 10 years. Given the lack of other potentially suitable ponds within 500m, and the effective barrier the by-pass is likely to create, it was considered unlikely that Great Crested Newt *Triturus cristatus* would be present in the new pond, and that it is also isolated from the site by the by-pass. The small water course on the eastern boundary of the site was not considered suitable for amphibians. Great Crested Newts are therefore considered unlikely to be present on site.
- 5.7.2 The data search did not return any records of Great Crested Newt within 1km and the nearest known population is about 2km to the east in West Durrington.

5.8 Invertebrates

- 5.8.1 The potential for local or scarce invertebrates to be present on site is considered to be low given the lower quality of the grasslands and hedgerows on site. Whilst survey work for other species groups was undertaken note was made of any invertebrate potential and records.
- 5.8.2 The following species were noted from the site, mostly from the south west corner or along the hedgerows (see **Table 5**):

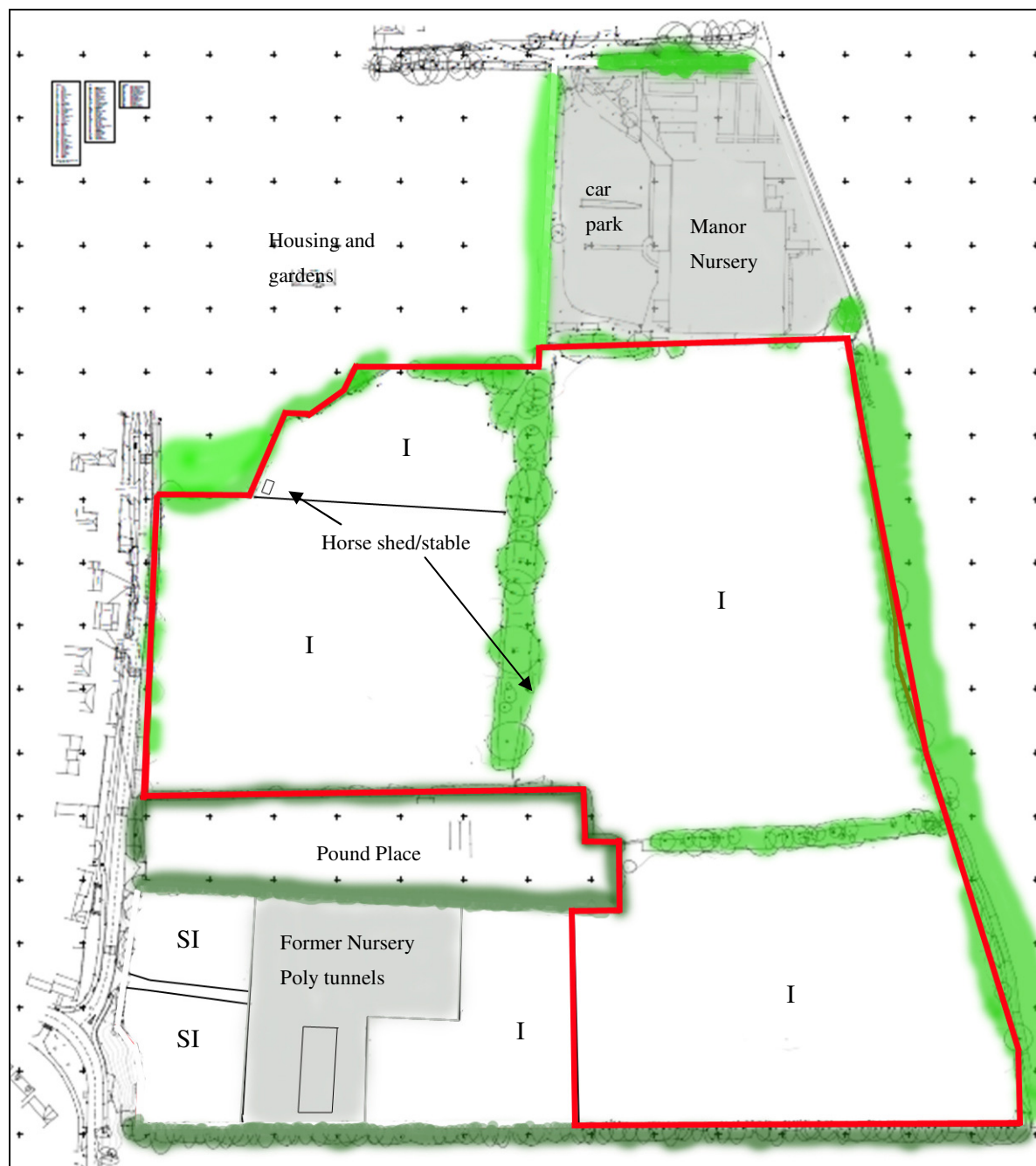
Table 5: Local Invertebrates recorded

Species		Notes
Meadow Brown	<i>Maniola jurtina</i>	
Common Blue	<i>Polyommatus icarus</i>	off site in SW former nursery
Brown Argus	<i>Aricia agestis</i>	off site in SW former nursery
Small Copper	<i>Lycaena phlaeas</i>	off site in SW former nursery
Roesel's Bush Cricket	<i>Metrioptera roeseli</i>	Common around site edge
Long Winged Conehead	<i>Conocephalus discolor</i>	Occasional in rough grassland
Emperor Dragonfly	<i>Anax imperator</i>	
Common Blue Damselfly	<i>Enallagma cyathigerum</i>	
Stag Beetle	<i>Lucanus cervus</i>	

- 5.8.3 The stag beetle is listed on Appendix III of the Bern Convention, on Appendix 2 of the Habitats Directive, on Schedule 5 of Wildlife & Countryside Act 1981 (as amended), and as a Priority Species on the UK Biodiversity Action Plan (1995). This species favours deadwood habitats. The habitats on site are considered to be of **value within the Zone of Influence** for Invertebrate populations.

5.9 Other Protected Species

- 5.9.1 No other protected species are considered present within the zone of influence which would be impacted by the development proposals.



Key

I = Improved Grasslands ■ = Hedges & Woody Vegetation; ■ = Non-native woody vegetation/hedges;

Off site:

= Nursery Areas; SI = Poor Quality Semi-improved grassland

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Figure 3: Site Survey



Key Bat Foraging route	Survey	Trees with bat roosting potential
Regular  Occasional  Minor 	Monitoring Locations  Emergence/Dawn Survey Locations (Note transect route on each Survey followed field boundaries) 	Category 2a Tree  Category 2b Tree 
Brown		
<p>Notes on foraging Regular = Bats recorded on all visits with bats regular throughout survey period; Occasional= Bats recorded regularly but with regular periods of absence; Minor = Occasional records , not on each survey</p>		

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Figure 4: Bat Survey

6.0 BRIEF ASSESSMENT OF LIKELY IMPACTS WITHOUT MITIGATION

6.1 Introduction

- 6.1.1 In view of the predicted activities and the resultant biophysical changes associated with the proposal, as described in Section 3, this section identifies the main potential ecological impacts within the predicted zone of influence, those considered likely to arise in the absence of mitigation. This exercise provides focus for recommendations for further scheme design and mitigation.

6.2 Protected Sites

Potential Impacts on Designated Sites

- 6.2.1 The nearest designated Sites are considered to be of sufficient distance for the development not to have significant adverse impacts on their features.

6.3 Habitats & Species on Site

Potential Impacts on Habitats and Vegetation

- 6.3.1 Hedgerows on site / surrounding the site will be predominantly retained along with other boundaries and trees. The central north south hedgerow will be partially retained within the landscaped area with breaks to facilitate access and views in areas, but the canopy corridor will be retained where possible. The grasslands on site will be developed and therefore lost as a part of the scheme. The grasslands are considered on the whole to be of negligible value, but a small amount of lower quality semi-improved grassland will be lost. Without mitigation there will be a minor adverse impact on habitats and vegetation as a result of this.

Potential Impacts on Birds

- 6.3.2 Woody vegetation with potential bird nesting habitat is to be removed. A small amount of rough grassland with developing bramble and blackthorn scrub may potentially contain a bird nest. If this is removed during the breeding season there is potential to destroy bird nests, which would be contrary to Section 1 of the Wildlife and Countryside Act 1981 (as amended), see **Technical Appendix 2**.

Potential Impacts on Bats

- 6.3.3 One Category 2a tree following 2011 guidelines (the mature Ash in the internal hedgerow) exists on site which has the potential to periodically hold roosting bats. The Ash (ACD Tree Constraints Plan tree no.20, with the highest roost potential) has been designated a R Category Tree, a tree in such a condition that any existing value, would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboriculture management. The removal of this tree without any mitigation may provide an adverse impact.
- 6.3.4 The retention of trees with potential along with boundary features will ensure that commuting routes and foraging areas around these routes are retained (these being as new gardens and open space areas). Light spill and general urbanisation will change the local environmental

conditions of the hedgerows and trees, which in turn may effect use but in general the function of the foraging habitat will be retained.

Potential Impacts on Invertebrates

- 6.3.5 The retention of boundary trees and features will reduce the impact of vegetation removal on invertebrate populations.

7.0 OPPORTUNITIES MITIGATION AND ECOLOGICAL ENHANCEMENT

7.1 Introduction

- 7.1.1 The potential for impacts on an unmitigated scheme was considered in Section 6, and mitigation recommendations are provided to ensure that protected species are also considered in construction and operation of the site.
- 7.1.2 The location of the site and the scheme design provides for potential to provide enhancements to the local ecology. Suggestions and recommendations are outlined below, including broad scheme design recommendations.

7.2 Mitigation for Protected Habitats, Species and Species of Concern

Vegetation

- 7.2.3 Hedges and trees on / off site will be protected according to BS5837:2012 during construction of the buildings and road route to ensure that construction material is not stored around the root systems and they are not compacted by machinery. The loss of small numbers of trees for arboriculture and road alignment will be mitigated by infill native tree planting within the main north-south central and east west hedgerow to retain all existing green corridors through the site. Areas of semi-improved grassland will be retained and created to enhance the retained hedgerow and boundary features and to enhance public open spaces within the scheme (see ACD Landscape drawings BSH 17576, July 2012).

Birds

- 7.2.4 All bird species are protected at the nest. Any development that could affect nesting birds should take place outside the bird nesting season, usually considered March-August. Only a very small amount of potential habitat is present currently. This will be maintained as such or cut outside the bird nesting season with ecology supervision where required.

Bats

- 7.2.5 The Ash (ACD Tree Constraints Plan tree no.20, with potential roost features) has been designated as an R-Category Tree to be removed. To mitigate for the loss of the tree and potential (no confirmed evidence) bat roosting features, a range of bat roost units will be incorporated within the development to include 6 inbuilt roost units and 6 tree roost units 1FF / 1FD (see **Figure 5**). Update tree survey and potential bat roost feature inspection will be undertaken prior to removal. All other trees and hedgerows with Category 2a or b trees are being retained. The scheme has aimed to minimise lighting spill onto retained hedgerow boundary features of the site as these function as foraging areas and local movement corridors. Lighting close to the green corridors to be low level / directional to avoid light spill.

Cavity Box/ inbuilt Roost Unit	 
<p>Schwegler 1FF</p> <p>The 1FF has an opening at the bottom, allowing droppings to fall out, it does not need cleaning and is therefore especially suitable for hanging in inaccessible places such as steep slopes and house walls.</p>	
<p>Schwegler 1 FD with Three Front Panels</p> <p>Selected offering the appropriate conditions for a range of smaller bat species</p>	

Figure 5: Bat Mitigation

Reptiles

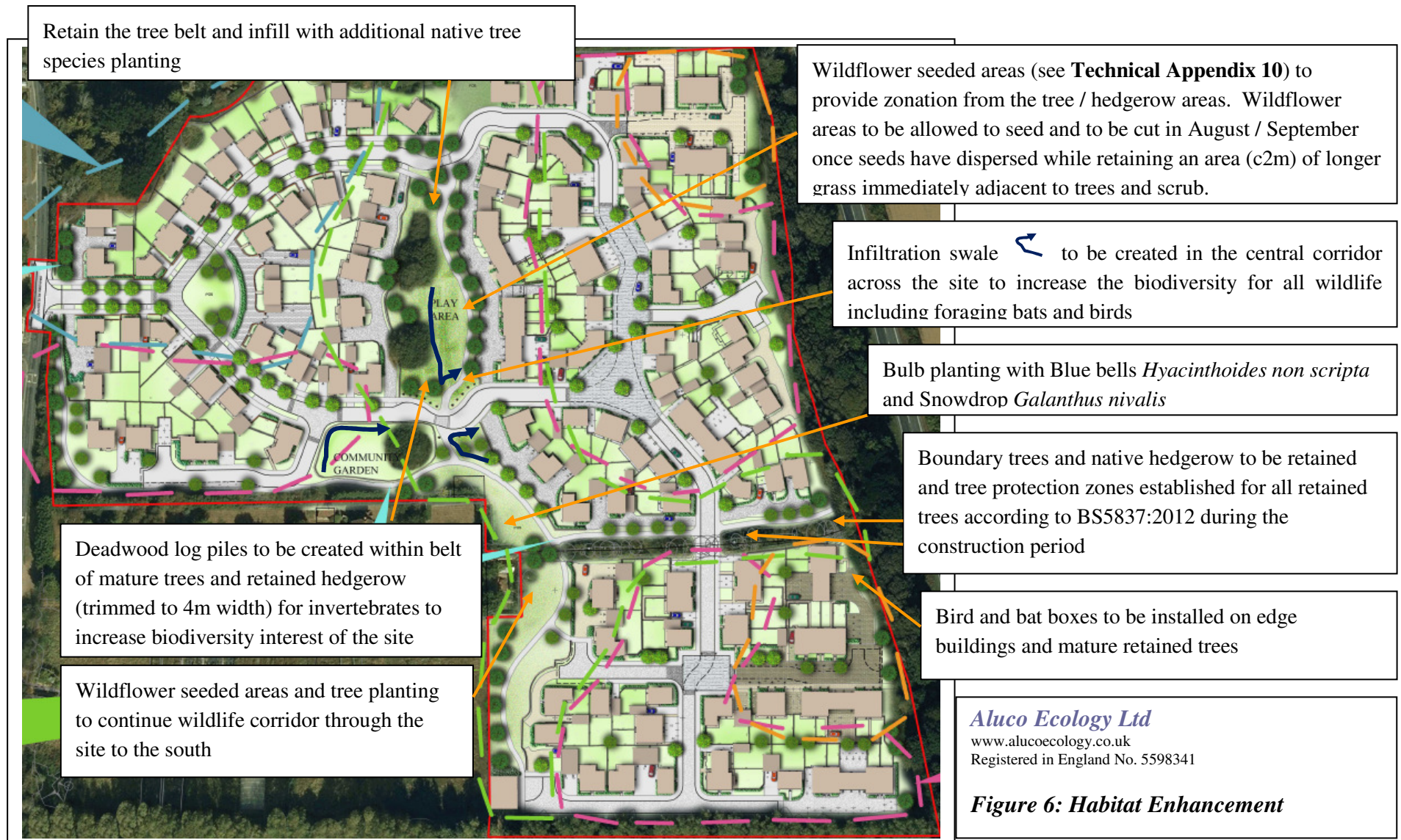
- 7.2.6 A precautionary approach will be taken as, although survey has not resulted in any records of reptiles on site, there are areas of potentially suitable habitat affected by the development. These field edge areas will be modified to reduce their suitability outside the bird breeding season to encourage movement and dispersal following any scrub removal, the grass height will be reduced by careful strimming to manipulate habitat areas. The grass/soft vegetation height will be reduced to no less than 10cm on the first cut and will be phased in bands and habitat areas across the site.

Invertebrates

- 7.2.7 Enhancement measures for invertebrates will include provision of dead wood piles on site (from woody vegetation to be removed). Large timbers that can be made safe on the ground from arboriculture works will be retained on site.

7.3 Potential for Ecological Enhancement

- 7.3.1 The retention of all boundary features will provide a long term benefit to the ecology of the site and wider area. Additional planting with native hedgerow species to increase the density and diversity of the boundary hedgerows is recommended. The main area for enhancement runs through the centre of the site, where the mature trees will be mostly retained and additional tree / hedgerow native species planting is recommended to be used to increase the density of woody species. Dead wood log piles will be included to enhance the site for invertebrates among the areas of tree and hedgerow. Retained hedgerow through the central north-south wildlife corridor and central east-west corridor to be trimmed to 4m width and maintained as a native hedgerow.
- 7.3.2 The use of wildflower seeding and management in areas adjacent to the tree / hedgerow planting to increase the diversity within the development especially adjacent to the boundaries and retained mature trees and hedgerows is recommended. See **Figure 6** for indicative areas of habitat enhancement. The diversity of grassland species will be enhanced through use of WFG18 Butterfly and Honey Bee and WFG7 Free Draining Soils mixes through the central semi improved corridor. WFG 8 seed mix to be used for shaded areas alongside retained and planted tree and hedgerow edges (see **Technical Appendix 10, Figure 6**).
- 7.3.3 The creation of infiltration swales will allow the opportunity to use wildflower seed mixes for damp and drier swale bank areas. The swale will benefit local wildlife through increased biodiversity and opportunity for foraging in the local area by invertebrates, bat communities and birds.
- 7.3.4 Benefits to the local bat and bird communities will include the provision of new roosting and nesting opportunities. Bat and bird boxes will be located in the mature trees and buildings to be constructed. A total of 12 bat roosting structures will be incorporated into the scheme, six woodcrete bat boxes to be erected on suitable trees on site, and six bat roost features built into buildings within the scheme along with 10 mixed bird boxes.



8.0 CONCLUSIONS

8.1 Compliance with legislation

- 8.1.1 Implementation of the mitigation measures outlined in section 7.0 and to take into account the ecological interests pre-development and during site clearance and construction, will ensure protected species and habitats should not be directly affected and the provisions of the law and local policy outlined in **Technical Appendix 1, 2 and 3** will be adhered to. Such measures could be conditioned to the development and detailed in an ecological mitigation report to ensure that measures are implemented and timings are adhered to.

8.2 Opportunities for Ecological Gain

- 8.2.1 A number of options will be put forward for providing ecological gain to the development proposals. The implementation of these or other ecological gains as part of the development will ensure that the provisions of the National Planning Policy Framework and the saved policies in the Arun District Local Plan (See **Technical Appendix 3**) are complied with.

9.0 REFERENCES

Arun District Council Local Plan

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Technical Appendix 1

Habitats Regulations and Schedule 2 Species

The Conservation (Natural Habitats & c.) Regulations SI 1994/2716 partially implement the Habitats Directive. This has recently been replaced by the Conservation of Habitats and Species Regulations 2010 (the Habitat Regulations). The Regulations contain provisions relating to the protection of European sites and European protected species. European Sites are defined within the Regulations as Special Areas of Conservation (SACs) or Special Protection Areas (SPAs) whether proposed, candidate or classified. European Protected Species are those species listed in Annex IV of the Directive that occur in the UK, and these have been listed in Schedule 2 of the Regulations.

Species listed under Schedule 2 of the Habitat Regulations were formally afforded protection by Regulation 39 (1994), this is now found under Regulation 41/42 (2010). European protected species include the great crested newt, dormice and all species of bats.

(1) The Habitats Regulations makes it an offence;

(a)deliberately to capture or kill a wild animal of a European protected species;

(b)deliberately to disturb any such animal;

(c)deliberately to take or destroy the eggs of such an animal; or

(d)to damage or destroy a breeding site or resting place of such an animal.

(2)It is an offence to keep, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a European protected species, or any part of, or anything derived from, such an animal.

(3)Paragraphs (1) and (2) apply to all stages of the life of the animals to which they apply.

(4)A person shall not be guilty of an offence under paragraph (2) if he shows-

(a)that the animal had not been taken or killed, or had been lawfully taken or killed, or

(b)that the animal or other thing in question had been lawfully sold (whether to him or any other person).

For this purpose "lawfully" means without any contravention of these Regulations or Part I of the Wildlife and Countryside Act 1981.

(5)In any proceedings for an offence under this regulation, the animal in question shall be presumed to have been a wild animal unless the contrary is shown.

(6) A person guilty of an offence under this regulation is liable on summary conviction to a fine not exceeding level 5 on the standard scale.

The Regulations go on to state exemptions and defences that apply to acts that may contravene the Regulation. Such exemptions include those listed in Regulation 40 (1994) now found at Regulation 42 of the 2010 Regulations

The granting of a licence under Regulation 44 (1994 Regulations) now Regulation 53-55 (of 2010 Regulations).

In order to carry out a lawful operation (e.g. development work which has full planning permission) that may result in any of the offences above, it is necessary to obtain a licence from Natural England to allow the operation to proceed.

However, in accordance with the requirements of the Habitats Regulations 2010, a licence can only be issued after the following conditions have been satisfied:

- *that there is no satisfactory alternative, and*
- *that the action authorized will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.*
- *that the action is required in preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;*

Full planning permission is required to apply for a Natural England licence (where such a consent is necessary for the work to be carried out). In addition, a method statement which details the survey results, methodology of work to be undertaken, mitigation and compensation measures, must be submitted to Natural England with the licence application.

For Full details of the 2010 Habitat Regulations see:

<http://www.legislation.gov.uk/ukxi/2010/490/regulation/42/made>

Technical Appendix 2

Wildlife & Countryside Act 1981 & Countryside & Rights of Way Act 2000 (CRoW)

Wildlife & Countryside Act

The Wildlife and Countryside Act 1981 (as amended) (WCA) is the principle legislation in Britain for the protection and conservation of our wildlife and its habitats of national importance. The legislation adopts a habitat and species based approach to nature conservation. Habitats and some species are protected in designated Sites of Special Scientific Interest (SSSI). Other species are afforded some protection from harm or disturbance by way of inclusion in either Article 1 (birds), Schedule 1 (specially protected birds), Schedule 5 (specially protected animals) or Schedule 8 (specially protected plants).

(ii) Protection Afforded to SSSIs

The presence of an SSSI on or near to a development is a material consideration, and this is discussed further in policy (see PPS9)

(iii) Law Relating to Protected Species

The WCA provides protection to such species via Section 1 (birds) and Section 9 (animals). These sections provide protection from intentionally:

- killing, injuring or taking any wild bird or taking, damaging or destroying the nest or eggs of a wild bird
- disturbing any wild bird in Schedule 1 whilst building, on or near a nest, or disturbing dependant young of such birds
- damaging, destroying or obstructing access to any structure or place of shelter or protection of a schedule 5 animal, or disturbs any such animal whilst it is occupying a structure or place it uses for that purpose
- killing, injuring or taking any animal listed in Schedule 5
- Having in possession or control any live or dead wild bird or egg, or any wild animal in Schedule 5, or trading in any animal under Schedule 5.

As with European Protected species, there are exemptions from this legislation, and licences for development can be obtained in certain circumstances. Protected species are also a material consideration in planning applications.

Countryside & Rights of Way Act 2000 (CRoW) and Wildlife and Countryside Act 1981

(i) Protected Species & SSSIs

The Countryside and Rights of Way Act 2000 (CRoW Act 2000) adds to protected species legislation in the WCA. The lesser test of 'Recklessness' is added to the protection from disturbance in three circumstances. These are:

- disturbance to Schedule 1 birds and their nests, eggs and dependant young,
- disturbance to Schedule 5 animals in their place of shelter/protection, and
- disturbance to the places of shelter/protection of Schedule 5 animals.

This addition means that any person who deliberately takes an unacceptable risk or fails to notice an obvious risk is falls under the Section irrespective of intention.

The CRoW Act also provides greater protection to SSSIs from operations (and non operations) of owners, occupiers and third party users of an SSSI.

The CRoW Act also provides a basis for Local Authorities to consider Biodiversity within their functions and decision making.

Arun District Council Retained Ecology Policies

POLICY GEN28 Trees and Woodlands

Development will not be permitted if it would damage or destroy one or more trees protected by a tree preservation order, identified as ancient woodland or in a conservation area unless:

the removal of one or more trees would be in the interests of good arboricultural practice; or
the benefits of the proposed development outweigh the amenity value of the protected trees.

Conditions may be used to ensure that, for any trees which are removed as part of a development, an equivalent number are planted on the site.

POLICY GEN29 Nature Conservation Across the District

Development will only be permitted on sites which contain semi-natural habitats, features of nature conservation interest, or within wildlife corridors, where these can be largely retained and sympathetically incorporated into the scheme. Legal agreements may be used to offset the loss of, or impact on, any nature conservation resource present on the site prior to development

POLICY AREA13 Sites of International Importance for Nature Conservation

Proposals for development in, or likely to affect (directly or indirectly) a site of international importance for nature conservation will be subject to the most rigorous examination. Development not directly connected with or necessary to the management of the site which is likely to have an adverse effect on the site, will not be permitted unless: there is no alternative solution, there are reasons of public health or public safety, or there are benefits of primary importance to the environment.

Where such sites do not host a priority habitat or species, development will not be permitted unless there are imperative reasons of overriding public interest.

Where development is permitted, the use of conditions or planning obligations will be considered in order to avoid and minimise harm to the site, to enhance the site's nature conservation interest, and to secure any compensatory or mitigation measures and appropriate management that may be required.

POLICY AREA14 Sites of National Importance for Nature Conservation

Proposals for development in, or likely to affect (directly or indirectly) Sites of Special Scientific Interest will be subject to special scrutiny. Where such development is likely to have an adverse effect, it will not be permitted unless the reasons for the development clearly outweigh the nature conservation value of the site itself and the national policy to safeguard the national network of such sites.

Where the site concerned is a National Nature Reserve, a site identified by the Nature Conservation Review or Geological Conservation Review, particular regard will be paid to the national importance of that site.

Where development is permitted, harm to the nature conservation interest must be minimised. The use of conditions or planning agreements will be considered to ensure the protection and enhancement of the nature conservation interest, and to provide appropriate compensatory or mitigation measures and site management.

POLICY AREA15 Sites of Local Importance for Nature Conservation

Proposals for development in, or likely to have an adverse effect (directly or indirectly) on a Local Nature Reserve, Site of Nature Conservation Importance (including ancient woodlands or wildlife corridors) or Regionally Important Geological/Geomorphological Site will not be permitted unless it can be demonstrated that reasons for the proposal outweigh the need to safeguard the nature conservation value of the site/feature. Where development is permitted which would damage the nature conservation value of the site/feature, such damage should be kept to a minimum.

Conditions or planning obligations will be used to secure necessary compensatory or mitigation measures, enhancement and site management.

Where appropriate, the Authority will consider the use of legal agreements to provide appropriate compensatory measures, enhancement and site management.

Ecological Appraisal Method

Introduction

The methodology for this appraisal is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Institute of Ecology and Environmental Management (IEEM June 2006). Regardless of whether a statutory Environmental Impact Assessment is required, these guidelines provide a robust framework for ecological assessment at any scale.

Desk Study

The first stage of the appraisal is a desk study of the proposed development site and associated Zone of Influence. This provides background information on the site and local environment so as to more effectively target field survey and further desk research.

The Multi Agency Geographical Information for the Countryside (MAGIC) database and Natural England's 'Nature on the Map' are interrogated for information regarding nationally or internationally designated sites within 1km or 5km of the site respectively. The National Biodiversity Network (NBN) data base is interrogated primarily for any relevant local protected species records within the area. The NBN provides access to a substantial volume of biodiversity data for the UK. Although rarely site specific, it does provide valuable information on the local occurrence of protected species.

Where appropriate, the local environmental Record Centre is approached to provide information regarding locally identified sites and records of protected and/or notable species within and around 1km of the site and European Protected species within 5km of the site.

Site Survey Methodology

The aims of the survey are to record land-use and broad vegetation types present on the site and in the surrounding areas, and to evaluate the habitats and vegetation communities ecological value along with the potential to support protected species, species of principal importance, and any other notable species.

Where relevant, habitat immediately adjacent to the site is also assessed as this can have a bearing on the possible presence of protected species on the site and the ecology of adjacent areas can be affected by development nearby.

Habitats and Vegetation

Habitats and vegetation communities are recorded on a broad scale by visually noting contrasting land uses, vegetation zones and landscape features, such as hedgerows and trees. Dominant plant species are recorded in each of the areas identified, as are any notable plant species, such as protected species and habitats or notifiable weeds.

Protected Species

Many plant and animal species are legally protected in the UK. Some, such as bats, badger, water vole and great crested-newt are commonly encountered on development sites. Protected species law is a serious consideration for developers and land owners, as failure to confirm their presence during initial

project conception can later lead to serious programming delays and their associated costs and to prevent any infringement of the law.

Case law has established (Regina vs. The Cornwall County Council ex parte Hardy 2001) that “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.

For the most regularly encountered protected species, a brief summary of methods follows:

Bats

Bats use buildings and trees for roosting and breeding, and so the potential for any of these features on site to support bats was considered, as was the sites potential for providing bat foraging habitat.

External inspections of the trees and buildings on site were undertaken. The survey looked for the presence of bats as well as signs of their presence such as:

Bat droppings, e.g. within cavities and buildings;

Staining at potential roost access points;

Lack of bat evidence cannot be taken to mean the lack of use by bats and an assessment of potential roost sites was therefore also undertaken:

Signs of bats can be easily washed off by wind or rain;

Droppings are hard to see where rubble and other floor debris may obscure them;

Low numbers of droppings can easily be missed especially where they may become damp and deteriorate;

Evidence of bats may not be apparent where bats roost out of view, such as in tree cavities etc.

Badgers

The site and its boundaries were systematically searched for the presence of Badgers *Meles meles*, in particular badger setts, on or near (30-40m) of the site. The area was also assessed for the presence of badger foraging activity and territorial behaviour. Such signs include foraging trails, foraging scrapes in short grass, which are commonly known as 'snuffle holes' (shallow scrapes in soft ground or even turf rolling created by foraging for ground-dwelling invertebrates such as worms and grubs), footprints, hairs caught under fences, sett entrances, and latrine sites.

Dormice

The presence of Dormouse on or near the site was considered during the survey, principally through habitat suitability, combined with data on occurrence within the area. Where suitable habitat occurs, further survey for feeding signs on hazel nuts and honeysuckle where it occurs along with searches for arboreal nests. If it a site is considered suitable, further survey may be recommended.

Other Mammals

Consideration is also given to the potential for habitats to support other legally protected mammals and those of nature conservation importance. Where any water bodies occur on or near to the site species including Water Vole *Arvicola terrestris* and Otter *Lutra lutra* are considered. Depending upon the geographic location consideration is also given to species such as Red Squirrel .

Breeding Birds

Any notable bird species seen during the survey are recorded. The type and quality of breeding, foraging and roosting habitats available for birds is also considered and interpreted with particular reference to protected or more notable bird species.

Consideration is given to any features which could support nesting birds, (Buildings and other structures, and areas of vegetation) that will be cleared or disturbed as a result of the development.

Reptiles

Any areas of habitat considered suitable for supporting reptiles were noted (for example, areas of rough grassland and scrub, banks, burrows, and rubble piles, compost heaps).

Great Crested Newt

Due to declines in numbers predominantly due to habitat loss and restricted European range, Great Crested Newts *Triturus cristatus* are protected under Section 9 of the Wildlife and Countryside Act, 1981 (as amended) and Regulation 39 of the Conservation (Natural Habitats &c) Regulations 1994, which protects Great Crested Newts from harm, injury and deliberate capture, killing, disturbance, damage and destruction of eggs, breeding site or resting place. This includes deliberate or reckless damage or disturbance.

Survey was by habitat suitability (the occurrence of suitable ponds and terrestrial habitat) combined with knowledge on their distribution from biological records for the area. If a site is considered suitable, further survey is usually required if an impact is considered likely.

Invertebrates

A very small proportion of invertebrates are afforded legal protection under the Wildlife and Countryside Act 1981 (as amended), although a relatively high number of invertebrates are included within the UK and local BAPs, and many more species are identified as being Nationally Scarce. Most invertebrates require specialist knowledge in order to identify them, although some groups, including butterflies and dragonflies, can be readily identified by generalists. Therefore, apart from recording any species of these readily identifiable groups, the survey concentrated on recording the presence of any key habitats of nature conservation importance considered suitable for supporting more scarce and restricted invertebrates, for example bare ground, dead wood and botanically rich habitats.

Survey Constraints and Limitations

Walkover surveys are carried out during a brief window of time. And therefore, the survey will provide only a snapshot of the range of plants and animals that might be present. However, professional judgement is used to interpret the habitat features recorded, and their likely value for supporting protected and notable species, including species of principal importance. Where timing is likely to significantly affect the results of a survey, further survey work is recommended. Survey can also be restricted through land access, especially land adjacent to the site.

Technical Appendix 5

Data from Sussex Biodiversity Records Centre Rare Species, Bats and Designated Sites Data obtained December 2010



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SUSSEX RARE SPECIES INVENTORY REPORT

Land at Roundstone Lane, Angmering + 2km radius

14 December 2010 ESD/10/481 Search Area: TQ0502 to TQ0905
Anthony Blunden (Aluco Ecology)

The contextual information in this report is based on the latest data available to the Record Centre and is regularly updated. If relying on this information for important decisions please check with record centre for the most up to date position of this species in Sussex. Please note that bat, bird and other records are not included in this report.

Agaricus sylvaticus

fungus

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ095045	Recorder @ CPM	01/11/1999- 31/10/2000	West Durrington

Leucoagaricus leucothites

White Dapperling

fungus

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ095045	Recorder @ CPM	01/11/1999- 31/10/2000	West Durrington

Solenopsora candicans

A lichen of sunny, exposed hard rocks, especially limestones and churchyard monuments. Common in central southern and north west England, rather scattered elsewhere. Recorded in our area from Rustington, West Grinstead and Shipley, all in West Sussex though according to Dobson (2000) there are a number of East Sussex records as well.

lichen

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ050023	Howard Matcham; Peter James; Francis Rose	02/07/1992	Rustington Churchyard
TQ057026	SAMLL	1992	West Sussex (VC13)

Usnea flammea

A tree-bears lichen of mossy trees, de-barked wood, rocks, soil and heather stems, especially in exposed coastal places. Mainly western and northern in the British Isles, but recorded in Sussex from Slindon Park Bottom, East Preston churchyard and East Dean Park Wood, all in West Sussex. 1988-1992.

Lichen

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ064024	SAMLL	1992	West Sussex (VC13)

Amandinea lecideina

A lichen of hard rocks noted only from Co. Kerry in the British Isles by Smith (1992) and in RECORDER. However, it has been recorded in our area from East Preston churchyard in West Sussex and cliffs west of Newhaven in East Sussex. 1987-1992.

Lichen

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ064025	Howard Matcham	1992	West Sussex (VC13)
TQ065025	Howard Matcham; Peter James; Francis Rose	02/07/1992	West Preston Churchyard

Porpidia cinereoatra

A lichen of n exposed, acid rocks and stonework. Mainly an upland species in the British Isles but also coastal. Scattered across our area and recorded in from three sites in East Sussex and five in West Sussex. 1967-1993.

Lichen

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ064025	Howard Matcham	1992	West Sussex (VC13)

Protoblastenia incrustans

A lichen of hard limestones. Scattered throughout the British Isles and common in some places. Recorded in our area from East Clayton, Bury and Heyshott Down in West Sussex and Clayton Holt in East Sussex. 1948-1995.

Lichen

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ064025	SAMLL	1992	West Sussex (VC13)

Ramalina siliquosa

A lichen that is usually found on rocky coasts and sea cliffs, but in our area an inland species of stonework. Common in many coastal districts in the British Isles. Recorded in our area from Pagham, Sutton and East Preston in West Sussex and Pevensay, Bodiam Castle and Rye Harbour in East Sussex.

Lichen

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ064025	SAMLL	1992	West Sussex (VC13)
TQ065025	Howard Matcham; Peter James; Francis Rose	02/07/1992	West Preston Churchyard

Pertusaria flavicans

A lichen of hard coastal, rocks though sometimes found inland. Frequent in the north and west of the British Isles. In our area recorded from Fittleworth and Ashurst churches in West Sussex and Battle Abbey and an unspecified location in East Sussex. 1989-1993.

Lichen

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ050023	Howard Matcham;Peter James;Francis Rose	02/07/1992	Rustington Churchyard
TQ065025	Howard Matcham;Peter James;Francis Rose	02/07/1992	West Preston Churchyard
TQ094026	Howard Matcham;Peter James;Francis Rose	02/07/1992	Ferring Churchyard

Adiantum capillus-veneris**Maidenhair Fern**

This fern is at the northern extent of its range in Britain, and must be considered an introduction in Sussex. It favours warm damp masonry. The largest colony occurs at Ashburnham Place, near Battle in East Sussex. In West Sussex it is still to be found in the grotto of Highdown Gardens.

fern

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ096042	SPASU;Paul Harmes	1987	West Sussex (VC13)
TQ09660412	M Hollings;D.M. Hollings	08/08/2005	West Sussex (VC13)
TQ098042	Anon @ Sussex Bot. Rec. Soc.;D Donovan	1987	West Sussex (VC13)

Osmunda regalis**Royal Fern**

A large fern found of fen-carr woodland, ditches, and riverbanks. Thought to be native in Sussex only in Ashdown Forest and elsewhere likely to be of garden origin.

fern

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ065025	Patrick Roper	26/05/2007	East Preston parish

Arum italicum subsp. neglectum**flowering plant**

IUCN (2001) - Lower risk - near threatened
Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ00R	Anon @ Sussex Bot. Rec. Soc.	1997	West Sussex (VC13)
TQ00W	Anon @ Sussex Bot. Rec. Soc.	1997	West Sussex (VC13)
TQ00X	SPASU	1725 - 1978	West Sussex (VC13)
TQ05720256	M Hollings; D.M. Hollings	07/11/2005	Rustington
TQ05730258	M Hollings; D.M. Hollings	07/11/2005	West Sussex (VC13)
TQ06240237	M Hollings; D.M. Hollings	18/10/2005	West Sussex (VC13)
TQ063049	Nick Sturt; Elizabeth Sturt	09/01/2005	Angmering CP
TQ07150241	M Hollings; D.M. Hollings	18/10/2005	East Preston
TQ07160242	M Hollings; D.M. Hollings	18/10/2005	East Preston
TQ09150599	M Hollings; D.M. Hollings	14/01/2006	Clapham
TQ09780246	M Hollings; D.M. Hollings	19/10/2005	Ferring
TQ09830220	M Hollings; D.M. Hollings	19/10/2005	West Sussex (VC13)

Dactylorhiza incarnata subsp. incarnata**flowering plant**

EC CITES Annex B
Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ00W	Paul Harmes	1996	West Sussex (VC13)
TQ089022	David Lang	31/05/2008	Ferring Rife
TQ08940225	M Hollings; D.M. Hollings	13/06/2003	Ferring
TQ08950222	M M Shaw	02/09/2006	Ferring Rife
TQ08960209	M Hollings; D.M. Hollings	12/06/2004	Ferring

Dactylorhiza incarnata subsp. pulchella**flowering plant**

EC CITES Annex B
Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ00W	Paul Harmes	1996	West Sussex (VC13)
TQ089022	David Lang	31/05/2008	Ferring Rife
TQ08940225	M Hollings; D.M. Hollings	13/06/2003	Ferring
TQ08950223	M M Shaw	02/09/2006	Ferring Rife
TQ08960227	M Hollings; D.M. Hollings	12/06/2004	Ferring

Groenlandia densa**Opposite-leaved Pondweed**

A perennial which may grow in lakes and rivers, but is more frequent in smaller water bodies such as streams, canals, ditches and ponds. There are widespread records from West Sussex but only three in East Sussex, where it is significantly less common than it was in the past.

flowering plant

IUCN (2001) - Vulnerable

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ089020	Anon @ Sussex Bot. Rec. Soc.; Alan Knapp	20/05/1998	West Sussex (VC13)
TQ090021	Frances Abraham	19/08/2001	Ferring area, Worthing, West Sussex
TQ090022	WNHS Worthing Natural History Soc.	05/08/1998	Ferring Rife
TQ0901602086	Alan Knapp	12/06/2006	Ferring Rife
TQ09030206	M Hollings; O.M. Hollings	June 2005	Ferring Rife

Potamogeton trichoides**Hairlike Pondweed****flowering plant**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ095033	Anon @ Reading Ag. Consultants	14/09/2000	West Sussex (VC13)

Scandix pecten-veneris**Shepherd's-needle**

A long-established annual of arable fields and rarely on waste ground, coastal cliffs and in gardens. Has declined dramatically since the advent of modern agriculture, but still has five recent records in West Sussex and three in East Sussex.

flowering plant

IUCN (2001) - Critically endangered

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)

Sussex Biodiversity Action Plan Species

Sussex Rare Species Inventory Species

UK Biodiversity Action Plan priority species

Grid Reference	Recorder	Date	Locality
TQ00X	SPASU	1725 - 1979	West Sussex (VC13)

Lithospermum arvense**Field Gromwell**

A long-established weed of arable fields, occasionally found on waste ground and in other disturbed habitats usually on light, dry, calcareous soils. A declining species with only scattered recent records from both East and West Sussex.

flowering plant

Farm Environment Plan Guidance 007: Table 3

IUCN (2001) - Endangered

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ0804	Anon @ Sussex Bot. Rec. Soc.; Rene Folkard	1996	Highdown Hill
TQ08850422	Christopher Pennells	04/09/1996	Highdown Survey Compartment J
TQ09050438	Henry Smail	1958 - 1960	Highdown Survey Compartment B
TQ09150416	Rene Folkard	1982 - 1983	Highdown Survey Compartment K

Isatis tinctoria**Woad****flowering plant**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ00X	SPASU	1987	West Sussex (VC13)

Lepidium heterophyllum**Smith's Pepperwort**

A perennial, or rarely biennial, of acid soils in dry heathy and gravelly places. Also occurs on shingle, railway ballast and embankments, and, less commonly, in arable fields. It has declined significantly in both E. and West Sussex and has recently been confirmed from only seven sites.

flowering plant

Farm Environment Plan Guidance 007: Table 3
Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ09450415	Bety Bishop	14/05/1997	Highdown Survey Compartment M

Phyteuma orbiculare**Round-headed Rampion**

A perennial of species-rich chalk grassland, open scrub, earthworks and verges in southern England. The vernacular name 'Pride of Sussex' signals the county as the headquarters of this gem of the chalk turf. Widespread in suitable downland habitats in East and West Sussex.

flowering plant

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ0880443	Rene Folkard	1982 - 1983	Highdown Survey Compartment A
TQ08920420	Christopher Pennells	04/09/1996	Highdown Survey Compartment I
TQ09050438	Rene Folkard	1982 - 1983	Highdown Survey Compartment B
TQ09150416	Rene Folkard	1982 - 1983	Highdown Survey Compartment K
TQ092042	K N A Alexander; P K Jackson	July 1997	Highdown Hill
TQ09250424	Henry Smail	1958 - 1960	Highdown Survey Compartment L
TQ09450415	Christopher Pennells	03/09/1997	Highdown Survey Compartment M
TQ09550420	Christopher Pennells	03/09/1997	Highdown Survey Compartment N
TQ09580415	Christopher Pennells	04/09/1996	Highdown Survey Compartment O

Salicornia dolichostachya**Long-spiked Glasswort****flowering plant**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ0602	Anon; Anon @ Sussex Bot. Rec. Soc.	1989	West Sussex (VC13)

Hippophae rhamnoides

Sea-buckthorn

flowering plant

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ089020	Kate Rytand	May 1996 - July 1996	Storage Lagoons (Ferring Meadows), Ferring.
TQ08950214	M Hollings;O.M. Hollings	June 2005	Ferring
TQ08980201	M Hollings;O.M. Hollings	June 2005	Ferring

Lathyrus sylvestris

Narrow-leaved Everlasting-pea

flowering plant

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ09580415	Henry Smail	1958 - 1960	Highdown Survey Compartment O

Erodium moschatum

Musk Stork's-bill

An introduced plant of grassy places, usually near the sea, at one time considered to be very rare. It has been found in recent years in several urban locations in West Sussex. Long extinct in East Sussex.

flowering plant

Farm Environment Plan Guidance 007: Table 3
Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ05140413	M Hollings;O.M. Hollings	12/07/2005	Rustington
TQ0697702485	M Hollings;O.M. Hollings	2006	West Sussex (VC13)

Althaea officinalis

Marsh-mallow

A tall perennial of estuaries and brackish marshes. Still widespread in suitable localities in East and West Sussex but it has declined considerably in the last seventy five years.

flowering plant

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ090022	WNHS Worthing Natural History Soc.	05/08/1998	Ferring Rife

Polygonum rurivagum

Cornfield Knotgrass

A long-established annual of arable fields and more rarely of ruderal habitats, especially on light chalky soils and calcareous clays. Recorded recently from a few sites in West Sussex and one in East. The true distribution is difficult to ascertain as it is easily confused with the ubiquitous *Polygonum aviculare*.

flowering plant

Farm Environment Plan Guidance 007: Table 3
Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ0539405065	M Hollings;O.M. Hollings	17/09/2006	West Sussex (VC13)

Rumex maritimus**Golden Dock**

A plant of marshy places, usually near the coast. Very rare in West Sussex with only one recent sighting. Scattered records in East Sussex from the Cuckmere valley, Pevensey Levels and elsewhere.

flowering plant

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ08860582	M Hollings; O.M. Hollings	26/09/2005	Patching Pond
TQ0888505772	M Hollings; O.M. Hollings	2006	Patching Pond
TQ089059	Anon @ Monks Wood	1985	West Sussex (VC13)

Rumex palustris**Marsh Dock**

A dock of wet, nutrient-rich mud exposed in summer and autumn, most often in marshes and beside ponds and ditches. Still occurs in the Chichester area but apparently now gone from East Sussex where the majority of reports were from the Lewes area.

flowering plant

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ088057	Anon @ Sussex Bot. Rec. Soc.	1990	West Sussex (VC13)

Helleborus foetidus**Stinking Hellebore**

A short-lived perennial of shallow calcareous soils often in woodland glades or open scrub. Always rare in East Sussex, where it is doubtfully native; the only recent records are of garden escapes. In West Sussex most recent records are also of garden origin, but it still occurs as a presumed native in a few chalky woodland areas especially around Arundel and Houghton.

flowering plant

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ058032	Sarah Patton	01/03/2008 - 31/03/2008	West Sussex (VC13)
TQ0585603194	M Hollings; O.M. Hollings	2006	Rustington
TQ065025	Patrick Roper	26/05/2007	East Preston parish

Thalictrum flavum**Common Meadow-rue**

A perennial of fens, ditches and streamsides, and tall vegetation in wet meadows. Always rare in Sussex, and lost from some sites due to the agricultural improvement of damp grassland and the drainage of wetlands. Currently recorded from six sites in West Sussex and one in East Sussex.

flowering plant

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ088028	Bruce Middleton	June 1994	Ferring Rife

Euphrasia pseudokernerii**Eyebright**

An annual of herb-rich downland turf on chalk and soft limestones. Recent records from our area are from a few chalk grassland sites in both East and West Sussex. Thought to be in decline.

flowering plant

IUCN (2001) - Endangered

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)

Sussex Biodiversity Action Plan Species

Sussex Rare Species Inventory Species

UK Biodiversity Action Plan priority species

Grid Reference	Recorder	Date	Locality
TQ00X	SPASU	1725 - 1979	West Sussex (VC13)

Helicella itala**mollusc**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ0904	K N A Alexander	August 1983	Highdown Hill
TQ092042	Anon @ National Trust	1983	Highdown Hill

Limax cinereoniger**Ash-Grey Slug****mollusc**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ090022	WNHS Worthing Natural History Soc.	1998	Ferring Rife

Monacha (Monacha) cartusiana**mollusc**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ090022	Graham Roberts	May 1994	Ferring Rife
TQ092042	K N A Alexander; P K Jackson	July 1997	Highdown Hill
TQ096042	K N A Alexander	August 1983	Highdown Hill

Conocephalus discolor**Long-winged Cone-head****insect - orthopteran**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ089021	Simon Curson	14/08/2002	Ferring Rife
TQ092042	K N A Alexander; P K Jackson	July 1997	Highdown Hill
TQ093042	K N A Alexander	August 1983	Highdown Hill

Forficula lesnei**Lesne's Earwig****insect - earwig (Dermaptera)**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ0804	John Paul	August 2002	Angmering CP

Silpha laevigata**insect - beetle (Coleoptera)**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ092042	K N A Alexander; P K Jackson	July 1997	Highdown Hill

Lucanus cervus**Stag Beetle**

A beetle of broadleaved woodland, parks, other pasture woodland and gardens. The larvae live in the decaying wood of deciduous trees, often in roots and stumps. Widely recorded from West Sussex but rare in East Sussex and apparently absent from much of the vice-county.

insect - beetle (Coleoptera)

Habitats and species directive Annex 2 - non-priority species

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)

Sussex Biodiversity Action Plan Species

Sussex Rare Species Inventory Species

UK Biodiversity Action Plan priority species

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)

Grid Reference	Recorder	Date	Locality
TQ067022	Anne Landon	January 2003	Kingston Manor Meadows, East Preston
TQ067027	Julie Barrass	01/06/2007	West Sussex (VC13)
TQ0702	Anon	16/07/2001	West Sussex (VC13)
TQ0902	Anon	05/05/2001	West Sussex (VC13)
TQ093044	Anon	21/06/2001	Highdown Hill
TQ097029	Mr Miles	2000	West Sussex (VC13)

Lysandra bellargus**Adonis Blue**

A downland species, widespread, but declining, mainly in East Sussex and the east of West Sussex.

insect - butterfly

IUCN (2001) - Lower risk - near threatened

Sussex Rare Species Inventory Species

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)

Grid Reference	Recorder	Date	Locality
TQ00R	BBCS British Butterfly Con. Soc.	1996 - 2000	West Sussex (VC13)

Apatura iris**Purple Emperor**

Much rarer today than in the past, this fallow-feeding woodland butterfly has shown some signs of recovery in recent years. Currently widespread nationally, but rare in West Sussex.

insect - butterfly

IUCN (2001) - Lower risk - near threatened
 Sussex Rare Species Inventory Species
 Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)
 Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)

Grid Reference	Recorder	Date	Locality
TQ071053	Brian Leete	2008	Angmering CP

Dahlica lichenella**Lichen Case-bearer****insect - moth**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ005	Mark Parsons	1725 - 1970	West Sussex (VC13)

Metriotes lutarea**Stitchwort Case-bearer****insect - moth**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ09D4	Anon	1725 - 1970	Highdown Hill

Cosmiotes stabilella**Southern Dwarf****insect - moth**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ09D4	Anon	1725 - 1970	Highdown Hill

Luquetia lobella**Sloe Flat-body****insect - moth**

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ09D4	Mark Parsons	1725 - 1970	Highdown Hill

Cyclophora annularia**Mocha**

This pretty nationally scarce (b) species occurs in woodlands in parts of southern England. In Sussex it is widespread in West Sussex, but in East Sussex only occurs regularly in the Brede Valley and the Hastings area. Caterpillars feed on Field Maple.

insect - moth

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ071054	John Knight	05/09/2001	Poling Furze-fields

Scotopteryx bipunctaria subsp. cretata

Chalk Carpet

This naturally scarce (b) species occurs on calcareous grassland in southern England and parts of Wales and Yorkshire. In Sussex it is decreasing and is now only regularly seen on the downs between Eastbourne and Shoreham. Caterpillars feed on Clovers and Vetches. Record both as *Scotopteryx bipunctaria* and *S. bipunctaria cretata*.

insect - moth

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)
Sussex Biodiversity Action Plan Species
Sussex Rare Species Inventory Species
UK Biodiversity Action Plan priority species

Grid Reference	Recorder	Date	Locality
TQ090022	M P Hall	1980 - 1986	Ferring Rife

Ptilodon cucullina

Maple Prominent

A nationally local species of woods, mostly on the chalk. It is found mostly in southern and eastern England, but is expanding its range. In Sussex it is found in woods on the Downs west of Arundel and in woods between Battle and Rye in the east of East Sussex. Caterpillars feed on Field Maple.

insect - moth

Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ071054	John Knight	09/08/2001	Poling Furze fields

Bombylius minor

Heath bee-fly

In the UK this species is mainly confined to southern heathland, where it has suffered a contraction in range. It favours open heathland where it is a parasitoid of solitary bees of the genus *Colletes*. The only record from our area is from Highdown Hill, West Sussex in 1997. This should be treated with caution.

insect - true fly (Diptera)

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)
Sussex Biodiversity Action Plan Species
Sussex Rare Species Inventory Species
UK Biodiversity Action Plan priority species

Grid Reference	Recorder	Date	Locality
TQ093044	Christopher Pennells; Betty Bishop	02/04/1997	Highdown Hill

Volucella zonaria

insect - true fly (Diptera)

Nationally Notable
Sussex Rare Species Inventory Species

Grid Reference	Recorder	Date	Locality
TQ093044	Christopher Pennells	07/08/1996	Highdown Hill

Arvicola terrestris**European Water Vole**

The fastest declining native British mammal, the water vole was 'Ratty' in Wind in the Willows. Water voles prefer slow flowing streams, rivers and dykes with steep earth banks and luxuriant emergent vegetation. They have been in decline for over a century mainly due to loss of habitat while the presence of American mink has greatly hastened this decline. In many areas of mainland Britain water voles are already extinct but there are still some strong populations in Sussex.

A legally protected species, listed on the Sussex Rare Species Inventory and the subject of a Sussex Species Action Programme.

terrestrial mammal

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)
Sussex Biodiversity Action Plan Species
Sussex Protected Species Register Species
Sussex Rare Species Inventory Species
UK Biodiversity Action Plan priority species
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1 (killing/injuring))
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1 (taking))
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.2)
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.4a)
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.4b)
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)
Wildlife and Countryside Act 1981 (Schedule 5)

Grid Reference	Recorder	Date	Locality
TQ066042	Richard Cowser	22/03/2009- 01/11/2009	Angmering CP
TQ066043	Richard Cowser	31/03/2009	West Sussex (VC13)
TQ090020	C Keeling	25/08/1998	West Sussex (VC13)
TQ099035	C Keeling	18/08/1998	West Sussex (VC13)

0 Confidential records exist for this enquiry area. Please contact the record centre if you require further information.

Triturus cristatus**Great Crested Newt**

The largest British newt. It is black or dark brown and the males have a crest along the back and an orange underside spotted with black. Frequently confused with male smooth newts, which also have a crest. The great crested newt prefers larger, open ponds that are free of fish and waterfowl and has declined substantially in Britain and across Europe, mainly due to habitat loss. The species is fully legally protected and Britain has special responsibility for its conservation as some of the best European populations occur here. Scattered across East and Central Sussex but scarce in the west.

amphibian

Berne Convention Appendix 2
European Protected Species
Habitats and species directive Annex 2 - non-priority species
Habitats and species directive Annex 4
IUCN (1994) - Lower risk - conservation dependent
Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)
Sussex Biodiversity Action Plan Species
Sussex Protected Species Register Species
UK Biodiversity Action Plan priority species
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1 (killing/injuring))
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1 (taking))
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.2)
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.4a)
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.4b)
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)
Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)
Wildlife and Countryside Act 1981 (Schedule 5)

Grid Reference	Recorder	Date	Locality
TQ095045	Recorder @ CPM	18/05/2000- 19/05/2000	Land at West Durrington, West Durrington

Anguis fragilis**Slow-worm**

A legally protected legless lizard resembling a small snake. Slow-worms are widespread in southern England and found in open habitats such as rough grassland, heath and on road and railway embankments. They are often common in urban and suburban areas. Like most reptiles and amphibians they have declined considerably and need protection wherever they occur.

reptile

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)

Sussex Biodiversity Action Plan Species

Sussex Protected Species Register Species

UK Biodiversity Action Plan priority species

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1 (killing/injuring))

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)

Grid Reference	Recorder	Date	Locality
TQ0502	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	01/01/1993	56b Ash Lane, Rustington, West Sussex (VC13)
TQ075021	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	30/08/1995	East Preston, West Sussex (VC13)
TQ0802	SARG Sussex Amphibian & Reptile Grp	09/09/1996	Ferring, West Sussex (VC13)
TQ0903	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	01/01/1991	3 Cissbury Road, Ferring, West Sussex (VC13)
TQ0904	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	03/05/1995	Highdown Hill, Ferring, West Sussex (VC13)

Zootoca vivipara**Common Lizard**

The most abundant British lizard and widespread in Sussex in the Weald and along the coast. Probably under-recorded and increasingly confined to small areas of open sunny habitat. A legally protected species due to concern about its overall decline.

reptile

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)

Sussex Biodiversity Action Plan Species

Sussex Protected Species Register Species

UK Biodiversity Action Plan priority species

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1 (killing/injuring))

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)

Grid Reference	Recorder	Date	Locality
TQ0802	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	09/09/1996	Ferring, West Sussex (VC13)
TQ093044	George Bishop; Betty Bishop	1982 - 1983	Highdown Hill
TQ096043	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	05/07/1995	Highdown Hill, West Sussex (VC13)

Natrix natrix**Grass Snake**

A widespread, but legally protected, snake with a normally olive body flecked with black and a distinctive yellow collar. Frequent in Sussex near places where its food, largely frogs, is readily available. Like most reptiles and amphibians, grass snakes have declined considerably and need protection wherever they occur.

reptile

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)

Sussex Biodiversity Action Plan Species

Sussex Protected Species Register Species

UK Biodiversity Action Plan priority species

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1 (killing/injuring))

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)

Grid Reference	Recorder	Date	Locality
TQ0605	SARG Sussex Amphibian & Reptile Grp	01/01/1991	Northpark Wood, Parham Estate, West Sussex (VC13)
TQ065043	Mrs Wood	01/06/2001	Richmond House, Angmering, West Sussex (VC13)
TQ0704	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	19/08/1994	Pigeon House, High Street, Angmering, West Sussex (VC13)
TQ072058	SARG 2002 Leaflet	2002	West Sussex, West Sussex (VC13)
TQ0904	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	01/03/1993	Highdown Gardens, Worthing, West Sussex (VC13)
TQ093044	George Bishop; Betty Bishop	1982 - 1983	Highdown Hill
TQ096037	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	24/04/1993	Littlehampton Road, Ferring, West Sussex (VC13)
TQ097040	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	24/04/1994	Highdown Gardens, West Sussex (VC13)

Vipera berus**Adder**

Britain's only venomous snake, though incidences of snakebite involving man or domestic animals are relatively uncommon. Adders have a distinctive zig zag pattern of black or brown and white. They occur in open areas on downs, heaths and in heathy woods. Grass snakes and slow-worms are often misidentified as adders. Though widespread in Britain and found in suitable areas across Sussex, the adder, like all our native reptiles has declined substantially through habitat loss and other factors. The adder is a protected species and it is illegal to intentionally kill or injure them.

reptile

Natural Environment & Rural Communities Act 2006 - Species of Principal Importance in England (s41)

Sussex Biodiversity Action Plan Species

Sussex Protected Species Register Species

UK Biodiversity Action Plan priority species

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1 (killing/injuring))

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5a)

Wildlife and Countryside Act 1981 (Schedule 5 Section 9.5b)

Grid Reference	Recorder	Date	Locality
TQ0605	SARG Sussex Amphibian & Reptile Grp	01/01/1991	Northpark Wood, Parham Estate, West Sussex (VC13)
TQ0904	SARG Sussex Amphibian & Reptile Grp; Dennis Dey	01/08/1995	Highdown Hill, Ferring, West Sussex (VC13)

SUSSEX BAT INVENTORY REPORT

Please note that all species of bat and their roosts are protected by UK and European law, under the Wildlife and Countryside Act 1981 (WCA) in the UK and the Habitats Directive in the EU. Bats and their roosts may also be protected by site designations, for example if their roost site or feeding grounds are notified as Special Area of Conservation (SAC) or a Site of Special Scientific Interest (SSSI).

You could be committing a criminal offence if you :

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

Key to Indicators

M/S	Mating/Swarming
H	Hibernaculum
FR	Feeding Roost
MR	Maternity Roost
UR	Unspecified Roost
D	Droppings

Land at Roundstone Lane, Angmering + 2km radius

14 December 2010 ESD/10/481 Search Area: TQ0502 to TQ0905

Anthony Blunden (Aluco Ecology)

The contextual information in this report is based on the latest data available to the Record Centre and is regularly updated.

Chiroptera

Bat sp.

Chiroptera (from the ancient Greek for 'wing hand') is the natural group, or order, that covers all the bats. In Britain we have 14 bat species and all have the highest level of legal protection. Many people simply record bats in general when they are not able to assign them to a particular species and these are then included under Chiroptera in our reports.

Date	Location	Grid Reference	Recorder	Sampling Method	M/S	H	FR	MR	UR	D	Abundance	Notes
31/10/1996	St Andrew's Church, Ferring, West Sussex (VC13)	TQ094026	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒		
22/04/1994	Bay Tree Barn, The Street, East Preston, West Sussex (VC13)	TQ063027	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☐		
27/10/1993	Lyndon House, Loxwood, West Sussex (VC13)	TQ078032	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒		Evidence of bats - proposed insecticide treatment.
01/09/1992	24 Cumberland Road, Angmering, West Sussex (VC13)	TQ071045	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☐		
10/09/1991	France Barn, France Lane, Patching, West Sussex (VC13)	TQ085059	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☐		Owner wants to exclude during work.

Myotis nattereri

Natterer's Bat

A medium-sized bat with long ears inhabiting woodland and mixed farmland, often flying near water. In summer it roosts in old buildings, barns and hollow trees and it hibernates in caves, mines and other underground places. Found throughout much of the British Isles, but generally scarce. The UK population of Natterer's bats may be of international importance and it is widespread in Sussex.

Date	Location	Grid Reference	Recorder	Sampling Method	M/S	H	FR	MR	UR	D	Abundance	Notes
10/09/2003	Highdown Hill, West Sussex (VC13)	TQ077042	M. Tanner, Martin Love	Unspecified	☐	☐	☐	☐	☐	☐	present Breeding probable	

*Pipistrellus***Pipistrelle sp.**

There are three species of Pipistrelle bat found in the UK; common (*Pipistrellus pipistrellus*), soprano (*P. pygmaeus*) and Nathusius (*P. Nathusii*). Common and soprano pipistrelles were previously recorded as one species, but they are now recognised as separate species, with a peak frequency echolocation at 45 kHz and 55 kHz respectively. The following records refer to an aggregate of the two species, where the audio frequency or specific species is undetermined. Little is known about the Nathusius pipistrelle, but the other two species are found in all types of countryside (except very exposed areas) as well as in towns and suburbs. Summer roosts are usually in buildings, though tree holes and bat boxes are also used. Hibernation sites are in buildings and tree holes. Both common and soprano pipistrelles are widespread in Sussex, while Nathusius' is much rarer.

Date	Location	Grid Reference	Recorder	Sampling Method	M/S	H	FR	MR	UR	D	Abundance	Notes
15/07/2005	37 Merryfield Crescent, Angmering, BN16 4DA, West Sussex (VC13)	TQ071047	NE Bat Worker	Building Inspection	☐	☐	☐	☒	☐	☐		Pips flying into living room through window. Advised net curtains.

*Pipistrellus pipistrellus***Pipistrelle Bat (species aggregate)**

The commonest bat in the British Isles, this small species is found in all types of countryside, except very exposed areas, as well as in towns and suburbs. Summer roosts are usually in buildings, though tree holes and bat boxes are also used. Winter roosts are in buildings, tree holes and caves.

Pipistrelles were often recorded as either 45 kHz or 55 kHz depending on the pitch of the echolocation calls picked up by bat detectors. These are now separate species; *Pipistrellus pipistrellus* being the 45 kHz animal and *P. pygmaeus* the 55 kHz.

This is the aggregate version of the Pipistrelle where the audio frequency or specific species is undetermined.

Both *Pipistrellus pipistrellus* (45 kHz) and *P. pygmaeus* (55 kHz) are widespread in Sussex and, like all bats are a legally protected species.

Date	Location	Grid Reference	Recorder	Sampling Method	M/S	H	FR	MR	UR	D	Abundance	Notes
20/07/2004	44 Mill Road Avenue, Littlehampton, West Sussex (VC13)	TQ067042	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☐	15 Present	
10/09/2003	Highdown Hill, West Sussex (VC13)	TQ077042	M. Tanner, Martin Love	Unspecified	☐	☐	☐	☐	☐	☐	present Breeding probable	
24/05/1998	12 Wallace Road, Rustington, West Sussex (VC13)	TQ054031	Recorder (a Sussex Bat Group	Grounded Bat	☐	☐	☐	☐	☐	☐	1 Present	Caught by cat. Released after injuries healed.
24/07/1996	22 Merryfields Crescent, Angmering, West Sussex (VC13)	TQ072048	NE Bat Worker	Roost Exit Count	☐	☐	☐	☐	☒	☐	148 Emergent	148 counted flying out, with more heard inside
30/08/1995	West Barn, Wepham, Arundel, West Sussex (VC13)	TQ086042	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒		Droppings found. Site visited in summer 1992.
21/07/1993	63 Greenacre Ring, Angmering, West Sussex (VC13)	TQ071046	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒	157 Present	Droppings found, half metre deep.
01/06/1992	Sea Lane/Ilex Avenue, Ferring, West Sussex (VC13)	TQ098025	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒		Site contains evidence of bats.

*Pipistrellus pygmaeus***Soprano Pipstrelle (55 kHz)****BAP**

For a while considered as a variant of the common pipistrelle, the soprano pipistrelle is now recognised as a separate species. Pipistrelles are the most common bat in the British Isles and are found in all types of countryside (except very exposed areas) as well as in towns and suburbs. This species has a stronger association with water than common pipistrelle. Summer roosts are usually in buildings, though tree holes and bat boxes are also used. Winter roosts are in buildings and tree holes.

Date	Location	Grid Reference	Recorder	Sampling Method	M/S	H	FR	MR	UR	D	Abundance	Notes
10/09/2003	Highdown Hill, West Sussex (VC13)	TQ077042	M. Tanner, Martin Love	Unspecified	☐	☐	☐	☐	☐	☐	present Breeding probable	
09/06/2001	Poling Furze fields, West Sussex (VC13)	TQ071054	John Knight	Unspecified	☐	☐	☐	☐	☐	☐	Bat(s) Present	

*Plecotus auritus***Brown Long-eared Bat****BAP**

One of the more common British bat species, but difficult to distinguish from the much rarer grey long-eared bat (*Plecotus austriacus*), unless in the hand. It frequents woodland and orchards and has summer roosts in older buildings and trees. It often hibernates in caves, tunnels and mines. The brown long-eared has declined in the British Isles though it remains widespread.

Date	Location	Grid Reference	Recorder	Sampling Method	M/S	H	FR	MR	UR	D	Abundance	Notes
04/02/2006	Chaplins, High Street, Angmering, BN16 4AG, West Sussex (VC13)	TQ071043	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒		Only 2 droppings found. Occasional roost only. Owner disappointed it wasn't used by more bats!
14/09/2005	Keepers Cottage, Tinnore Lane, Patching, BN13 3UG, West Sussex (VC13)	TQ093051	NE Bat Worker	Building Inspection	☐	☐	☐	☒	☐	☒		Information only - no work planned.
22/11/2000	The Keepers Cott, Highdown Tower, Littlehampton Road, Worthing, West Sussex (VC13)	TQ098041	Martin Love	Building Inspection	☐	☐	☐	☐	☒	☐	1 Present	Daytime observation.
22/05/1992	St. Nicholas, Church Road, Angmering, West Sussex (VC13)	TQ067044	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒	3 Present	Droppings found. Unofficial sighting of 3.

SUSSEX BIRD INVENTORY REPORT SUMMARY

Please note that this is a summary page. Full details of these records are on the following pages.

N.B. The breeding season records of 15 Schedule 1 birds and three other species which are classed as sensitive in Sussex are not included in our biodiversity reports (see www.sxbrc.org.uk/enquiries/SOS-excluded-data.pdf for the list of excluded species). 42 such records have been flagged up in this search. It is critical that the Sussex Ornithological Society (SOS) is contacted directly for more information on these records if potentially damaging operations are to occur in the enquiry area. Email: conservation@sos.org.uk

Land at Roundstone Lane, Angmering + 2km radius

14 December 2010 ESD/10/481

Search Area: TQ0502 to TQ0905

Anthony Blunden (Aluco Ecology)

Common Name	Latin Name	First Date	Last Date	No. of Rec's
Mute Swan	<i>Cygnus olor</i>	31/12/1986	02/06/2008	57
Tundra Swan	<i>Cygnus columbianus</i>	17/02/1995	-	1
Budgerigar	<i>Melopsittacus undulatus</i>	09/05/1992	-	1
Cockatiel	<i>Nymphicus hollandicus</i>	28/09/1995	10/09/2000	2
Greater Canada Goose	<i>Branta canadensis</i>	31/12/1986	31/10/2000	15
Brent Goose	<i>Branta bernicla</i>	31/12/1986	-	1
Eurasian Wigeon	<i>Anas penelope</i>	31/12/1986	-	1
Gadwall	<i>Anas strepera</i>	14/02/2006	15/02/2008	2
Eurasian Teal	<i>Anas crecca</i>	31/12/1986	14/02/2006	4
Mallard	<i>Anas platyrhynchos</i>	31/12/1986	17/06/2008	136
Northern Shoveler	<i>Anas clypeata</i>	12/10/1991	15/02/2008	3
Red-crested Pochard	<i>Netta rufina</i>	03/04/1991	16/05/1992	2
Common Pochard	<i>Aythya ferina</i>	12/01/1992	12/12/1996	12
Tufted Duck	<i>Aythya fuligula</i>	31/12/1986	12/11/2008	23
Common Scoter	<i>Melanitta nigra</i>	19/06/2007	-	1
Red-breasted Merganser	<i>Mergamus serrator</i>	08/02/1996	-	1
Red-legged Partridge	<i>Alectoris rufa</i>	31/12/1986	-	1
Grey Partridge	<i>Perdix perdix</i>	31/12/1986	01/05/2009	12
Common Pheasant	<i>Phasianus colchicus</i>	31/12/1986	24/12/2007	36
Little Grebe	<i>Tachybaptus ruficollis</i>	05/02/1992	19/12/2008	11
Great Crested Grebe	<i>Podiceps cristatus</i>	12/01/1991	04/09/2008	10
Red-necked Grebe	<i>Podiceps grisegena</i>	16/01/1992	18/01/1992	2
Slavonian Grebe	<i>Podiceps auritus</i>	10/04/1994	13/11/1996	3
Northern Fulmar	<i>Fulmarus glacialis</i>	28/02/2004	-	1
Great Cormorant	<i>Phalacrocorax carbo</i>	31/12/1986	01/05/2009	23
Little Egret	<i>Egretta garzetta</i>	02/02/1997	24/12/2008	26
Grey Heron	<i>Ardea cinerea</i>	31/12/1986	01/05/2009	22
Eurasian Marsh Harrier	<i>Circus aeruginosus</i>	28/03/2000	-	1
Hen Harrier	<i>Circus cyaneus</i>	31/12/1986	-	1
Eurasian Sparrowhawk	<i>Accipiter nisus</i>	31/12/1986	01/05/2009	51
Common Buzzard	<i>Buteo buteo</i>	21/01/1991	01/05/2009	35
Common Kestrel	<i>Falco tinnunculus</i>	31/12/1983	01/05/2009	89
Merlin	<i>Falco columbarius</i>	03/05/2002	30/10/2008	3
Eurasian Hobby	<i>Falco subbuteo</i>	13/09/1992	04/09/2001	3
Peregrine Falcon	<i>Falco peregrinus</i>	08/10/1993	06/10/2004	4
Water Rail	<i>Rallus aquaticus</i>	31/12/1986	27/02/2008	9
Common Moorhen	<i>Gallinula chloropus</i>	31/12/1986	01/05/2009	123
Common Coot	<i>Fulica atra</i>	31/12/1986	17/06/2008	85

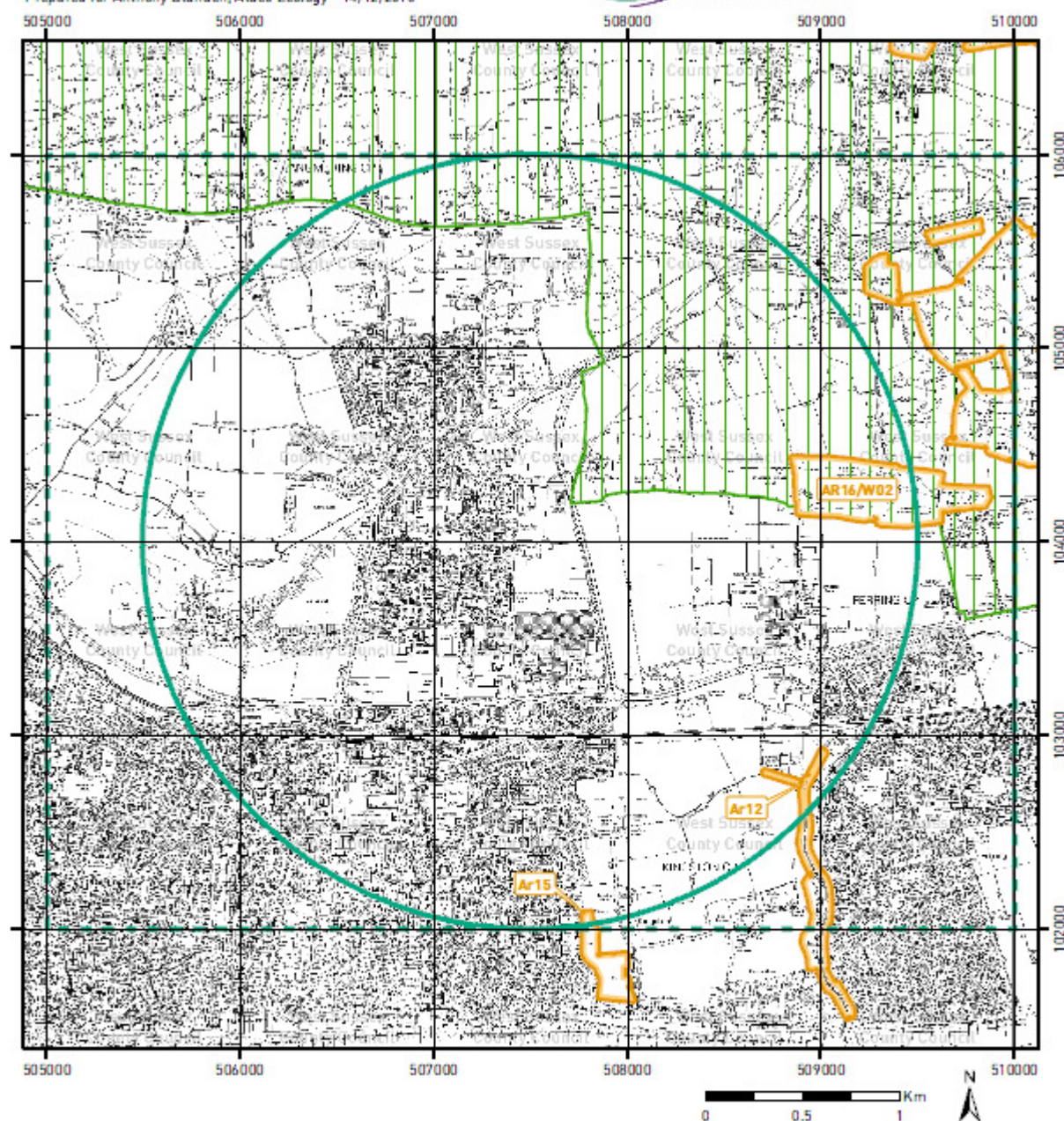
Common Crane	<i>Grus grus</i>	24/10/1993	04/06/2008	2
Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	31/12/1986	19/08/2004	3
Ringed Plover	<i>Charadrius hiaticula</i>	31/12/1986	07/09/1996	2
European Golden Plover	<i>Pluvialis apricaria</i>	31/12/1986	06/10/2004	2
Grey Plover	<i>Pluvialis squatarola</i>	31/12/1986	13/11/1996	3
Northern Lapwing	<i>Vanellus vanellus</i>	31/12/1986	19/12/2008	30
Sanderling	<i>Calidris alba</i>	31/12/1986	12/04/2004	5
Dunlin	<i>Calidris alpina</i>	31/12/1986	07/09/1996	2
Ruff	<i>Philomachus pugnax</i>	31/12/1986	-	1
Jack Snipe	<i>Lymnocyptes minimus</i>	31/12/1986	19/01/2005	15
Common Snipe	<i>Gallinago gallinago</i>	31/12/1986	30/03/2008	5
Eurasian Woodcock	<i>Scolopax rusticola</i>	31/12/1986	01/05/2009	2
Bar-tailed Godwit	<i>Limosa lapponica</i>	31/12/1986	14/04/2004	3
Eurasian Curlew	<i>Numenius arquata</i>	31/12/1986	17/06/2007	4
Common Redshank	<i>Tringa totanus</i>	31/12/1986	-	1
Common Greenshank	<i>Tringa nebularia</i>	31/12/1986	24/04/2008	2
Green Sandpiper	<i>Tringa ochropus</i>	31/12/1986	03/01/1997	2
Common Sandpiper	<i>Actitis hypoleucos</i>	31/12/1986	09/05/2008	6
Ruddy Turnstone	<i>Arenaria interpres</i>	31/12/1986	12/04/2004	2
Red-necked Phalarope	<i>Phalaropus lobatus</i>	22/09/1995	-	1
Arctic Skua	<i>Stercorarius parasiticus</i>	12/06/2007	-	1
Long-tailed Skua	<i>Stercorarius longicaudus</i>	23/05/2007	-	1
Mediterranean Gull	<i>Larus melanocephalus</i>	19/01/1992	14/06/2007	28
Black-headed Gull	<i>Larus ridibundus</i>	31/12/1986	01/05/2009	16
Mew Gull	<i>Larus canus</i>	31/12/1986	17/01/2004	2
Lesser Black-backed Gull	<i>Larus fuscus</i>	31/12/1986	27/08/2007	7
Herring Gull	<i>Larus argentatus</i>	31/12/1986	01/05/2009	36
Glaucous Gull	<i>Larus hyperboreus</i>	21/01/1995	-	2
Great Black-backed Gull	<i>Larus marinus</i>	31/12/1986	26/01/2004	3
Black-legged Kittiwake	<i>Rissa tridactyla</i>	31/12/1986	-	1
Sandwich Tern	<i>Sterna sandvicensis</i>	31/12/1986	23/05/2007	2
Common Tern	<i>Sterna hirundo</i>	31/12/1986	17/05/2008	2
Common Guillemot	<i>Uria aalge</i>	08/02/1996	-	1
Rock Pigeon	<i>Columba livia</i>	31/10/2000	-	1
Stock Pigeon	<i>Columba oenas</i>	31/12/1986	22/07/2007	15
Common Wood Pigeon	<i>Columba palumbus</i>	31/12/1986	01/05/2009	31
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	31/12/1986	01/05/2009	22
European Turtle Dove	<i>Streptopelia turtur</i>	31/12/1986	16/09/2005	2
Rose-ringed Parakeet	<i>Psittacula krameri</i>	13/03/1993	-	1
Common Cuckoo	<i>Cuculus canorus</i>	31/12/1986	05/05/2004	6
Barn Owl	<i>Tyto alba</i>	31/12/1986	01/11/2004	2
Little Owl	<i>Athene noctua</i>	31/12/1986	30/11/2000	6
Tawny Owl	<i>Strix aluco</i>	31/12/1986	01/05/2009	52
Short-eared Owl	<i>Asio flammeus</i>	31/12/1986	-	1
European Nightjar	<i>Caprimulgus europaeus</i>	26/06/2000	-	1
Common Swift	<i>Apus apus</i>	31/12/1986	01/05/2009	13
Common Kingfisher	<i>Alcedo atthis</i>	31/12/1986	11/12/2008	20
Green Woodpecker	<i>Picus viridis</i>	31/12/1986	01/05/2009	88
Great Spotted Woodpecker	<i>Dendrocopos major</i>	31/12/1986	01/05/2009	57
Lesser Spotted Woodpecker	<i>Dendrocopos minor</i>	31/12/1986	24/03/2002	2
Sky Lark	<i>Alauda arvensis</i>	31/12/1983	01/05/2009	52
Sand Martin	<i>Riparia riparia</i>	31/12/1986	17/09/1998	3
Barn Swallow	<i>Hirundo rustica</i>	31/12/1986	09/05/2008	32
House Martin	<i>Delichon urbicum</i>	31/12/1983	24/09/2007	25
Tree Pipit	<i>Anthus trivialis</i>	31/12/1986	-	1
Meadow Pipit	<i>Anthus pratensis</i>	31/12/1986	01/11/2006	12
Yellow Wagtail	<i>Motacilla flava</i>	31/12/1986	10/09/2007	6
Grey Wagtail	<i>Motacilla cinerea</i>	31/12/1986	31/12/2008	12
Pied Wagtail	<i>Motacilla alba</i>	02/06/1996	09/05/2008	19
Winter Wren	<i>Troglodytes troglodytes</i>	31/12/1983	01/05/2009	27
Hedge Accentor	<i>Prunella modularis</i>	31/12/1980	01/05/2009	27
European Robin	<i>Erithacus rubecula</i>	31/12/1986	01/05/2009	28

Common Nightingale	<i>Luscinia megarhynchos</i>	31/12/1960	20/05/1999	4
Black Redstart	<i>Phoenicurus ochruros</i>	31/10/1993	14/12/2007	8
Common Redstart	<i>Phoenicurus phoenicurus</i>	31/12/1986	02/09/2008	6
Whinchat	<i>Saxicola rubetra</i>	31/12/1986	03/09/2007	9
Stonechat	<i>Saxicola torquata</i>	31/12/1986	19/12/2008	19
Northern Wheatear	<i>Oenanthe oenanthe</i>	31/12/1986	28/09/2008	8
Ring Ouzel	<i>Turdus torquatus</i>	27/10/2006	-	1
Common Blackbird	<i>Turdus merula</i>	31/12/1986	24/12/2008	31
Fieldfare	<i>Turdus pilaris</i>	31/12/1986	19/03/2008	11
Song Thrush	<i>Turdus philomelos</i>	31/12/1986	01/05/2009	47
Redwing	<i>Turdus iliacus</i>	31/12/1986	27/02/2008	11
Mistle Thrush	<i>Turdus viscivorus</i>	31/12/1986	01/05/2009	20
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	31/12/1986	30/04/2008	7
Eurasian Reed Warbler	<i>Acrocephalus scirpaceus</i>	31/12/1986	07/09/2008	15
Blackcap	<i>Sylvia atricapilla</i>	31/12/1986	01/05/2009	49
Garden Warbler	<i>Sylvia borin</i>	31/12/1986	17/04/1999	3
Lesser Whitethroat	<i>Sylvia curruca</i>	31/12/1986	02/09/2008	5
Common Whitethroat	<i>Sylvia communis</i>	31/12/1960	09/05/2008	28
Common Chiffchaff	<i>Phylloscopus collybita</i>	31/12/1960	01/05/2009	53
Willow Warbler	<i>Phylloscopus trochilus</i>	31/12/1983	06/05/2008	23
Goldcrest	<i>Regulus regulus</i>	31/12/1986	01/05/2009	28
Firecrest	<i>Regulus ignicapilla</i>	10/11/1992	09/11/1997	4
Spotted Flycatcher	<i>Muscicapa striata</i>	31/12/1986	07/09/2008	19
Pied Flycatcher	<i>Ficedula hypoleuca</i>	31/12/1986	20/09/2005	4
Long-tailed Tit	<i>Aegithalos caudatus</i>	31/12/1960	01/05/2009	28
Blue Tit	<i>Cyanistes caeruleus</i>	31/12/1960	01/05/2009	27
Great Tit	<i>Parus major</i>	31/12/1986	01/05/2009	30
Coal Tit	<i>Parus ater</i>	31/12/1986	01/05/2009	20
Marsh Tit	<i>Poecetes palustris</i>	31/12/1986	16/04/2007	12
Wood Nuthatch	<i>Sitta europaea</i>	17/03/1999	01/05/2009	5
Eurasian Treecreeper	<i>Certhia familiaris</i>	31/12/1986	01/05/2009	21
Eurasian Jay	<i>Garrulus glandarius</i>	31/12/1986	01/05/2009	20
Black-billed Magpie	<i>Pica pica</i>	31/03/1995	01/05/2009	28
Eurasian Jackdaw	<i>Corvus monedula</i>	31/12/1986	01/05/2009	15
Rook	<i>Corvus frugilegus</i>	31/12/1986	01/05/2009	62
Carriac Crow	<i>Corvus corone</i>	31/10/2000	01/05/2009	23
	<i>Corvus corone subsp. corone</i>	31/03/1995	01/05/1996	2
Common Starling	<i>Sturnus vulgaris</i>	31/12/1986	31/12/2010	20
House Sparrow	<i>Passer domesticus</i>	31/12/1986	24/12/2008	20
Eurasian Tree Sparrow	<i>Passer montanus</i>	31/12/1986	30/07/2006	4
Chaffinch	<i>Fringilla coelebs</i>	31/12/1983	01/05/2009	26
Brambling	<i>Fringilla montifringilla</i>	31/12/1986	23/12/2007	4
European Greenfinch	<i>Carduelis chloris</i>	31/12/1986	01/05/2009	26
European Goldfinch	<i>Carduelis carduelis</i>	31/12/1960	01/05/2009	42
Eurasian Siskin	<i>Carduelis spinus</i>	31/12/1986	01/05/2009	6
Common Linnet	<i>Carduelis cannabina</i>	31/12/1960	30/04/2008	23
Lesser Redpoll	<i>Carduelis cabaret</i>	20/01/1991	12/11/1999	3
Common Redpoll	<i>Carduelis flammea</i>	31/12/1986	-	1
Common Bullfinch	<i>Pyrrhula pyrrhula</i>	31/12/1960	12/01/2008	17
Snow Bunting	<i>Plectrophenax nivalis</i>	16/11/2007	22/11/2007	2
Yellowhammer	<i>Emberiza citrinella</i>	31/12/1960	01/05/2009	37
Reed Bunting	<i>Emberiza schoeniclus</i>	31/12/1986	24/12/2008	10
Corn Bunting	<i>Emberiza calandra</i>	31/12/1986	21/11/2006	3
Carriac Crow	<i>Corvus corone agg.</i>	31/12/1986	14/05/1997	2

Designated Site Map (ESD/10/481):
Land at Roundstone Lane, Angmering + 2km radius
 Prepared for Anthony Blunden, Aluco Ecology - 14/12/2010



Wood's Mill, Henfield, W Sussex BN5 9SD
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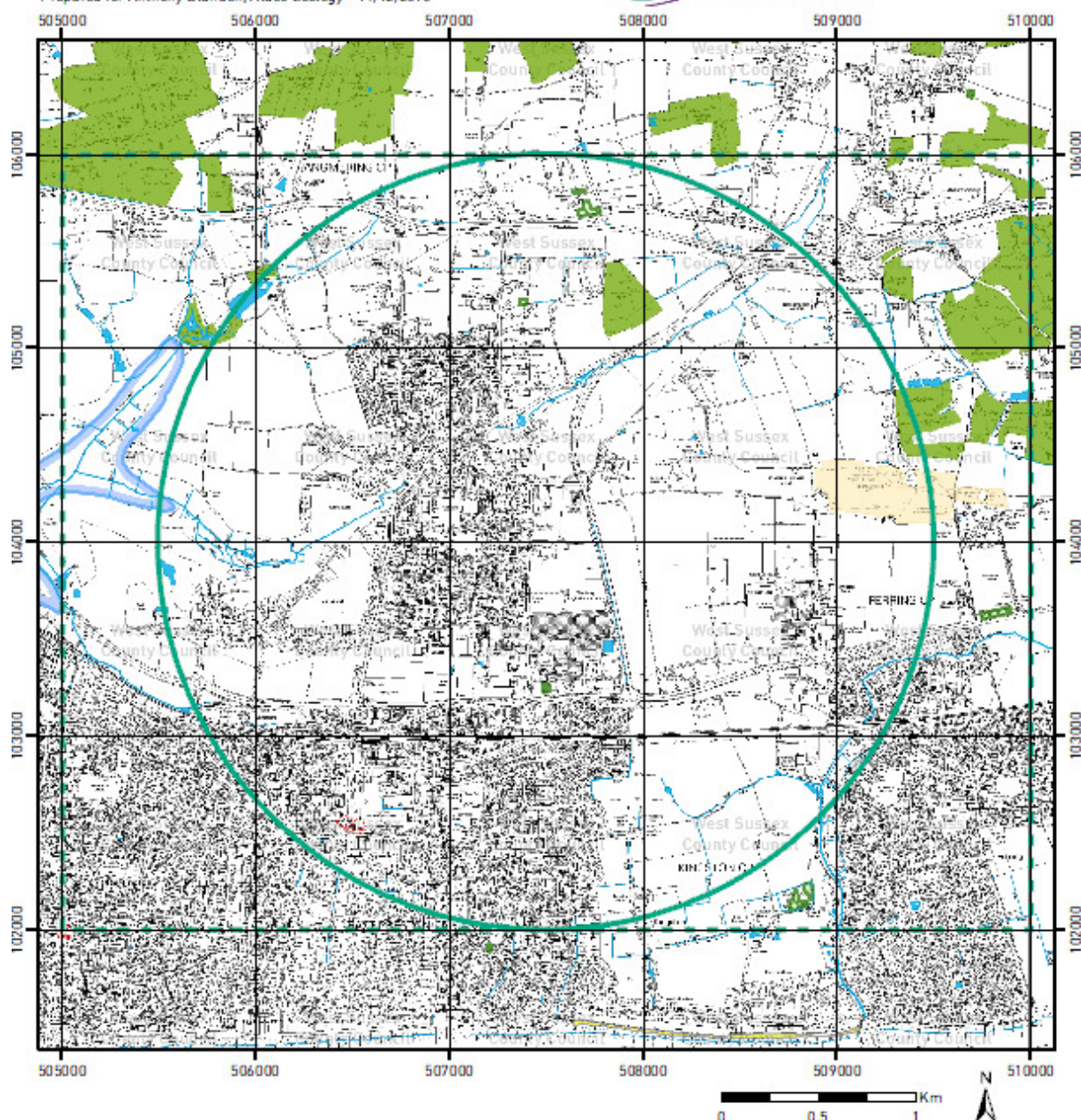
Key to Map:

- Enquiry Area
- Species Search Area
- National Park
- SNCI

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RAMSAR, Special Area of Conservation (SAC), Special Protection Area (SPA), National Park, Area of Outstanding Natural Beauty (AONB), National Nature Reserve (NNR), Site of Special Scientific Interest (SSSI), Local Nature Reserve (LNR) and Country Park data reproduced with permission of Natural England. Site of Nature Conservation Importance (SNCI) data provided by East and West Sussex County

Habitat Map (ESD/10/481):
Land at Roundstone Lane, Angmering + 2km radius
 Prepared for Anthony Blunden, Aluco Ecology - 14/12/2010



Key to Map:

- Enquiry Area
- - - Species Search Area
- ▲ Ancient/Veteran Tree
- Open Water
- Ancient Woodland

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Bird Survey Background & Methodology

Breeding Bird Survey Methodology

Legislation Relating to Birds

Part 1 of the Wildlife & Countryside Act, 1981 (as amended) protects any wild bird from intentional killing, injuring or taking whilst on the nest. In addition, it is an offence to take, damage or destroy the nest or eggs, whilst being built or in use. Furthermore 79 species listed on Schedule 1 of the Act have been afforded special protection from disturbance at the nest by way of their rarity, endangered, declining or vulnerable status.

At an international level a number of Conventions and European Union Directives have aimed to provide legal protection for wild bird species. These include the European Union Directive on the Conservation of Wild Birds, Directive 79/409/EEC, and the Berne Convention on the conservation of European wildlife and natural habitats.

The Wild Birds Directive provides across the EU a general protection for all birds occurring in a wild state, and additional protection for further species listed under Annex I of the Directive. The Directive requires the designation of Special Protection Areas (SPAs) in the most suitable habitats for Annex 1 species, and outside these areas Member States should also strive to avoid pollution or deterioration of habitats of birds.

Under the Berne Convention contracting parties are also required to take requisite measures to maintain the population of wild flora and fauna at, or adapt it to, a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements and the needs of sub-species, varieties or forms at risk locally.

Under Article 6 Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II (including certain listed bird species). The following will in particular be prohibited for these species:

- (a) all forms of deliberate capture and keeping and deliberate killing;
- (b) the deliberate damage to or destruction of breeding or resting sites;
- (c) the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention.

Field Survey

Breeding bird survey work is undertaken in the spring time when birds are holding territories and are relatively easy to detect and monitor. A standard methodology involves visiting each part of a site on a minimum of two occasions at least 7-10 days apart (for large sites), or up to 10 visits for complex sites.

The breeding bird survey methods used were similar to the standard Common Bird Census (CBC) techniques adopted by the British Trust for Ornithology (BTO) and set out in Marchant (1983), Marchant *et al.* (1990), Bibby *et al.* (2000).

Time is spent on recording species present and identifying territory centres, territory range and size. This is done by noting what activity the birds recorded are undertaking. Sightings are noted on individual survey maps using standard codes for behaviour and species. Over a number of visits these maps can be collated and territories of species determined to a relative degree of accuracy. Further advice is also obtained from the methodology used by the BTO for their Breeding Bird Survey (BBS).

Visits are usually carried out one to two hours after dawn, as this is when the majority of species are most active and holding territory. A number of visits are usually also made at dusk in order to record species that are more visible at this time of day.

References

Bibby, C, Burgess N, Hill D, Mustoe S (2000) “Bird Census Techniques”

BTO (2005) “Breeding Birds in the Wider Countryside: Latest Trends” bto.org.uk, published 16 February 2005

Marchant J H (1980) “Common Bird Census Instructions” BTO

Criteria for Birds of Conservation Concern (Eaton et al 2009)

Birds of Conservation Concern:

The criteria used in assessments are intended to ensure that Birds of Conservation Concern (BoCC) listings reflect each species' global and European status as well as that within the UK, and additionally measure the importance of the UK population in international terms.

Red Listed Species that meet any of the following criteria are red listed:

IUCN Global Conservation Status. Species listed by BirdLife International as being Globally Threatened using IUCN criteria.

HD Historical Decline. A severe decline in the UK between 1800 and 1995, without substantial recent recovery.

BDp Breeding Population Decline. Severe decline in the UK breeding population size, of more than 50%, over 25 years (BDp₁) or the entire period used for assessments since the first BoCC review, starting in 1969 (“longer-term”) (BDp₂).

WDp Non-breeding Population Decline. Severe decline in the UK non-breeding population size, of more than 50%, over 25 years (WDp₁) or the longer-term (WDp₂).

BDr Breeding Range Decline. Severe decline in the UK range, of more than 50%, as measured by number of 10 km squares occupied by breeding birds, over 25 years (BDr₁) or the longer-term (BDr₂).

Amber Listed Species that meet any of the following criteria, but none of the red list criteria, are amber listed:

SPEC European Conservation status. Categorised as a Species of European Conservation Concern (SPEC 1, 2 or 3).

HDrec Historical Decline – Recovery. Red listed for Historical Decline in a previous review but with substantial recent recovery (more than doubled in the last 25 years).

BDMp Breeding Population Decline. As for red list criteria BDp₁ and BDp₂, but with moderate decline (by more than 25% but less than 50%).

WDMp Non-breeding Population Decline. As for red list criteria WDp₁ and WDp₂, but with moderate decline (by more than 25% but less than 50%).

BDMr Breeding Range Decline. As for red list criteria BDr₁ and BDr₂, but with moderate decline (by more than 25% but less than 50%).

BR and **WR** Rarity. UK breeding population of less than 300 pairs (BR), or non-breeding population of less than 900 individuals (WR).

BL and **WL** Localisation. At least 50% of the UK breeding (BL) or non-breeding (WL) population found in 10 or fewer sites.

BI and **WI** International Importance. At least 20% of the European breeding (BI) or non-breeding_a (WI) population found in the UK.

Bat Survey Methodologies

Introduction

All bat species and their roosts are fully protected in Britain under the Wildlife and Countryside Act 1981(as amended) and the Conservation (Natural Habitats &c.) Regulations 1994 (as amended). Guidance from the Bat Conservation Trust (2007, 2001), English Nature (2004), Mitchell-Jones and McLeish (2004) and the Vincent Wildlife Trust (2008) was referred to when developing the methodology for bat survey and subsequent bat mitigation strategies:

The methodologies below are split into four distinct survey techniques:

- (1) Assessment of Potential Bat Roosts in Buildings
- (2) Assessment of Potential Bat Roosts in Trees
- (3) Emergence Survey Work Methodology (Buildings)
- (4) Transect Survey Methodology
- (5) Automated Recording Methodology

(1) Assessment of Potential Bat Roosts in Buildings

Guidance from the Bat Conservation Trust (2007, 2001), English Nature (2004), Mitchell-Jones and McLeish (2004) and the Vincent Wildlife Trust (2008) was referred to when developing the methodology for bat survey and subsequent bat mitigation strategies:

- (a) *Signs of residency by bat species.* This consisted of a slow methodical search both internally and externally for actual roosting bats and their signs using binoculars, torch, endoscope and ladders as required. The following can indicate the presence of bats:
 - Bat droppings – e.g. on floors, stored articles, walls, beams, tiles, windowsills entry / exit points etc. These can be used to aid species identification.
 - Dark staining at well-used roost sites (e.g. ridge boards & timber joints, etc) or entry / exit points.
 - Wear marks at bat roost sites and entry / exit points.(This can be a polishing and smoothing of rough wood surfaces and masonry or slight scuffing of very smooth wooden surfaces)
 - Urine spots or streaking in the vicinity of bat roosts and entry / exit points.
 - Similarly the presence of spider webs at a potential roost can often indicate their absence at that time, but requires careful interpretation combined with other evidence

This survey focused particularly on areas providing appropriate environmental conditions for bats. This included warm darker areas, joints and crevices in wood, ridge beams and hips. Observation included listening for bats, noting the presence of the characteristic smell of some bat roosts.

- (b) *An assessment of the potential of the building to provide a roost either in the summer (nursery) or winter (hibernation) periods.* This consisted of a methodological inspection of the buildings internally and externally for potential roost sites. In particular, the potential for roost sites which are hidden from view is noted. A thorough survey was undertaken of construction features of the buildings which can be attractive to bats as potential roosting sites, these include gaps at the roof timber frame joints, hanging tiles, timber beams and joists and timber cladding where a bat can potentially gain access to the internal structure of the building.

Equipment used for Parts (a) and (b):

- Cluson 1m candle-power lamp
- Endoscope
- Leica 8x 32 close-focusing binoculars
- 3.8m extendable ladder

Survey Constraints and Limitations

Lack of bat evidence cannot always be taken to mean the lack of use by bats as signs of bats can be easily washed off by wind or rain; Droppings are hard to see where rubble and other floor debris may obscure them; Low numbers of droppings can easily be missed especially where they may become damp and deteriorate; Evidence of bats may not be apparent where bats roost out of view, such as in tree and wall cavities etc.

The survey was carried out during a brief window of time, and therefore, the survey has provided only a snapshot of the site use. Since bats regularly move between different roost sites, particularly to satisfy their varying requirements at different times of the year, a bat survey often concentrates upon searching for signs to indicate the presence of roosting bats at any time of the year. Due to these survey limitations an assessment using professional judgement has been used to interpret the findings and the potential for supporting bats and is used to guide any recommendations for precautionary approaches to carrying out the proposed work.

(2) Assessment of Potential Bat Roosts in Trees

Initial Survey

Tree survey methodology involves looking for any suitable holes, cracks or crevices which could be used by bats for roosting. In addition, large or apparently unhealthy trees which have a dense covering of Ivy possibly covering holes or crevices, also have the potential to support bats.

A survey for signs of residence by bat species consists of a slow methodical search of all aspect of the tree for actual roosting bats and their signs. Droppings around holes, on the tree trunk or on the ground beneath can be used to identify species. Scratch marks and staining at roost entry and exit holes. The presence of spider webs at a potential roost can often indicate their absence at that time although does not mean that the hole is not used at all. Careful attention is given to any sounds indicating the presence of a breeding bat roost (i.e. audible social calls). The survey is completed

using binoculars from ground level and high powered torch and endoscope to inspect cavities with ladder where safe access permits.

Tree Survey Evaluation

Trees are assessed for their potential to support bat roosts either in the summer (nursery) or winter (hibernation) based on previous experience of bat occupancy at other sites, and upon the presence of suitable roost sites and access points. In particular, the presence of potential roost sites which are hidden from view was noted.

The potential for trees to support roosting or breeding bats is evaluated under the following categories:

Tree category and description	Stage 1 Survey requirements prior to determination	Stage 2 Further measures to inform mitigation	Stage 3 Likely mitigation
Category 1 Confirmed bat roost tree with field evidence of the presence of bats, e.g. droppings, scratch marks, grease marks or urine staining.	Tree identified on a map and on the ground. Further assessment to provide a best expert judgement on the likely use of the roost, numbers and species of bat, by analysis of droppings or other field evidence. Ecologist involvement <u>will</u> be required.	Avoid disturbance to trees where possible'. Further dusk and dawn surveys to establish more accurately the presence, species, numbers and type of roost present, and to inform the requirements for mitigation if felling is required.	Felled under Habitats Regulations licence ² following the installation of equivalent habitats as a replacement. Felling would be undertaken taking reasonable avoidance measures ³ such as 'soft felling' to minimise the risk of harm to individual bats.
Category 2a Trees that have a high potential to support bat roosts	Tree identified on a map and on the ground. Further assessed to provide a best expert judgement on the potential use of suitable cavities, based on the habitat preferences of bats. Ecologist involvement <u>may</u> be required.	Avoid disturbance to trees where possible'. More detailed, off-the-ground visual assessment. Further dusk and dawn surveys to establish the presence of bats and, if present, the species, numbers and type of roost to inform the requirements for mitigation if felling is required.	Trees with confirmed roosts following further survey would be upgraded to Category 1 and felled under licence as above. Trees with no confirmed roosts would be downgraded to Category 2b and felled taking reasonable avoidance measures ³ .
Category 2b Trees with a moderate/low potential to support bat roosts	None. Ecologist involvement is <u>unlikely</u> to be required.	Avoid disturbance to trees where possible'. No further surveys.	Trees would be felled taking reasonable avoidance measures ³ .
Category 3 Trees with negligible potential to support bat roosts	None. Ecologist involvement <u>will not</u> be required unless new evidence is found.	None.	No mitigation for bats required.

Notes

1 A general principle for those involved in advising on and undertaking tree works should be, wherever possible, to avoid disturbance and retain all features which offer some value to bats. For safety-related tree work, a balance should be sought between tree safety standards and the impact on wildlife.

2 When a Habitats Regulations licence to undertake work on a tree roost is required, the licence will need to demonstrate that alternative approaches have been previously considered to try to avoid works to the tree. These may

be options such as diverting paths away from hazardous trees and removing unsafe limbs, instead of felling an entire tree.

3 Reasonable avoidance measures are considered to be good practice. 'Soft felling' is a generic term used to describe more cautious felling approaches, using lowering and cushioning techniques to reduce the impact of felling limbs which may still have bats within cavities. Where proportionate to the impact, best practice approaches to felling may include methods such as additional dusk emergence or dawn re-entry surveys immediately prior to felling (during the active bat season) or the use of non-return valves to ensure that bats can leave but not return to a roost cavity before works begin.

Detailed survey

Where the value of an individual tree or woodland area is found to be high during a preliminary survey, a more comprehensive survey in order to fully assess the likely value of the potential bat

feature is undertaken. The scope of additional work will vary depending on a range of environmental factors.

Survey techniques are likely to include:

- Emergence survey during early evening (i.e. prior to emergence and at emergence), with the aid of a bat detector for ultrasonic calls.
- Climb-and-inspect assessment of selected trees to check for cavities and inspection with an endoscope or mirrors if appropriate.
- Foraging and transect walks through habitat surrounding potential tree roosts to understand local bat use of the site.

Survey work is tailored to each individual case, and the degree of evening emergence and foraging work undertaken is based on the following factors:

- size of the site;
- number of trees to be affected;
- habitats on site (eg water features/woodland);
- habitats and protected sites in the wider countryside;
- knowledge of bat use in local area;
- geographical range of rare species;
- proximity to known or suspected roosts.

Limitations of Tree Survey

Bats may move regularly between different tree roosts, and if used infrequently, signs to indicate the use of such trees by bats are unlikely to be evident. In addition, any signs which are left on trees by bats as a result of their use of a roost site (e.g. droppings below a roost exit) may be washed off as a result of wind and rain. Consequently, it is often difficult to confirm the presence of a bat tree roost. Surveys are best described as a sampling tool to assess presence of different bat species using the site at that time and place and general use of the area by bats.

Best practice methods for Tree Work

Works to trees used by bats (even if the bats are not present at the time) may result in an offence being committed under this law. If bats or bat roosts are found to be present in a tree, a European Protected Species (EPS) license from Natural England is likely to be required to legally undertake works on that tree. Where a satisfactory survey has resulted in no evidence of bats being found, and bats are then incidentally discovered during work, it is a legal requirement that the activities are halted immediately and Natural England consulted.

To reduce the chance of disturbing a bat roost it is important to avoid the summer (breeding season) and winter (hibernation) months. Works to trees with potential for bats is best done in September when young bats are mobile and on the wing, female bats are unlikely to be pregnant and the

hibernation season has not yet begun. March is also a suitable time, (although careful survey is required for nesting birds as these are legally protected during this period).

Bats may move regularly between different tree roosts, and if used infrequently, signs to indicate the use of such trees by bats are unlikely to be evident. In addition, any signs which are left on trees by bats as a result of their use of a roost site (e.g. droppings below a roost exit) may be washed off as a result of wind and rain.

Consequently, it is often difficult to confirm the presence of a bat tree roost, and as a result an assessment of the trees to identify those with potential to support a bat roost is usually undertaken with trees with bat potential categorised into three categories.

There are a number of procedures that can be used by tree surgeons to ensure that best practice is maintained when undertaking tree felling/pruning operations. These are detailed below. The application of these principals apply to both Category 1 and Category 2 listed trees (see BCT, 2007). These methods should be used on these trees during the suitable tree felling periods (September and March).

- Keep tree work to a minimum retaining all potential roosts where possible.
- A precautionary inspection of the tree(s) by the tree surgeon looking for signs of bats should be carried out before starting work. This should include an inspection of all holes and niches using a torch and preferably an endoscope. If bats or signs of bats are found no work should start and Natural England should be contacted for further advice.
- Where possible avoid cross cutting in proximity to cavities or hollows.
- Limbs with internal fissures should be pruned carefully to maintain integrity of features as potential roost sites.
- Any sections felled containing cavities should be lowered carefully and left on the ground (preferably for 24 hours) with the openings clear, allowing anything inside an opportunity to escape.
- Split limbs that are under tension may need to be wedged open to prevent their closure when pressure is released, potentially trapping bats.
- Where ivy covers areas of a tree's trunk or branches, there may be hidden roosting potential behind it. Dealing with ivy covered trees depends on the amount of ivy. If there is a thick mass of ivy growth it may be practical to consider felling the tree on the basis that the thickness of the foliage will soften the fall and reduce the shock. This tree can then be inspected on the ground and if possible left for 24hours, before section cutting. If the tree is only partially covered, pruning or sectioning may be more appropriate. If the works

are not urgent cutting the ivy at its base and completing the work when the ivy is dead, thus reducing the bat roosting potential should be considered. However where stems of ivy create a dense mass against the trunk there will always be roosting potential.

If bats or evidence of bats are found at anytime, all works must stop immediately and Natural England contacted for further advice.

(3) Bat Survey Emergence - Buildings

Evening and dawn surveys are completed in order to observe the building for any bats emerging from or returning to potential roosts and monitor bat activity within or around the site.

Bat detectors were used to listen for bats and observations were made for any bats emerging from roosts. Bats flying over the site were also identified and their behaviour assessed e.g. commuting, foraging or other behaviour to determine how any bats on or adjacent to the site may use it.

During the survey the building was monitored from at least 15mins before sunset onwards, for 1-2 hours depending upon levels of activity. Dawn Survey, where undertaken, commenced a minimum of 1.5hrs before sunrise. Where required sample bat recordings are recorded digitally on an Edirol R1 and analysed using Bat Scan software to confirm species identity. Emergence and dawn checks are primarily conducted using a fixed point method at key emergence and return times with localised movement after within the survey zone depending upon activity levels. The survey points are carefully selected to ensure all aspects of the building are viewed by the observer/s and automated recorders, survey is then refined to survey in detail particular bat roosting features.. Survey effort is determined with reference to The Bat Survey Guidelines, but also by scale and nature of the bat roost in combination with the scale and nature of the proposals using professional judgement to ensure survey data is accurate and also proportionate.

Equipment used included:

- Batbox Duet (frequency division and heterodyne bat detector)
- Petterson D-240X (time expansion and heterodyne bat detector)
- Edirol R1 Digital recorder
- Batscan v9.6 (sound analysis software)
- Anabat SD1 / Analook sound analysis software

Following the emergence checks, bat activity surveys are then carried out over the site. These concentrate on those areas assessed as having greatest potential to be used by bats as flight lines (e.g. linear features) or foraging habitat (sheltered areas where the abundance of insects is likely to be high).

The survey was undertaken during suitable weather conditions when bats would be expected to be active. The weather conditions during the evening emergence survey were favourable for bat foraging, being dry with clear skies, warm and still.

Limitations of Survey

A bat survey is often based upon searching for signs to indicate use by bats at any time of the year because bats regularly move between different roost sites to satisfy their varying requirements throughout the year. The evening emergence survey is a useful addition to the bat survey in order to confirm use of a building by bats.

Seasonality and Behaviour: Any bat survey can only provide a 'snapshot' view of activity in time. Bat behaviour can be affected by temperature, wind, rain and insect emergence.

Visual Detection: Being nocturnal, bats are difficult to see and some species such as Long eared bats emerge late in the evening when they may be hard to see against the night sky or vegetation. It is possible therefore that emergence counts and field surveys could overlook numbers of individuals.

Use and Interpretation of Bat Detectors: Long eared bats in particular are quiet bats, which are seldom heard on a bat detector. The surveyor needs to be in close range to the bat to detect it. Furthermore bat detectors are directional instruments meaning that a bat may not be detected flying at certain angle to a detector.

Weather conditions: Weather conditions, particularly wind strength and direction are likely to have a significant effect upon where bats forage since insects, upon which bats feed, will tend to gather in sheltered areas when conditions are breezy. Therefore, observations of areas used by bats during the present surveys may differ at other times during different (e.g. more severe) weather conditions and with differing wind directions.

(4) Bat Activity Survey - Transect

The value of a site to bats can be arrived at using activity surveys to understand how many bats use the site, the degree of use and what species are involved.

Timing

An activity survey is undertaken in conditions when bats are likely to be active. Evening surveys commenced from sunset, often beginning with monitoring certain potential bat roost trees or woodland areas where such trees exist, for any emerging bats.

Dawn survey work may also be undertaken, usually recording activity up to two hours before, and sometimes up to an hour after sunrise.

Activity surveys are undertaken during the period when bats are not hibernating, this is usually between the end of April to October.

Methods

During the survey a site is walked slowly, mainly following woodland edges, tree lines, hedgerows, paths or rides through woodland, and incorporating all features of the landscape that may be of value to bats. A transect is often followed, worked out prior to the survey commences.

Bat detectors (Bat box III & Petterson D240x) are used as an aid to detecting bats on the site, and also in determining the species which were present. Each survey visit generally continued for 2 hours or more, after sunset.

Since different species of bats echolocate using different frequencies, there is a risk that certain species will be missed if the bat detector is not tuned to the frequency used by that species at the time. Therefore, during the majority of the survey period, a surveyor scans through different frequency ranges to ensure as many bats were recorded as possible. The main frequency ranges used were as follows:

- 32-55khz to detect the smaller species of bats, such as Pipistrelle spp, Myotis spp, etc.
- Around 22-30 khz to detect the larger bat species, including Noctule and Serotine bats.

Assessment of Landscape for Potentially Good Bat Foraging sites or Flight Lines

The habitats across the site are surveyed and assessed on their likely use by bats for foraging and for use in commuting across the landscape. This assessment is based upon the following main factors:

- Sheltered areas where insects are likely to gather;
- Presence of rough grassland or other habitats likely to result in higher insect numbers;
- Provision of linear links across otherwise open habitat to allow bats to following features within shadows (i.e. hidden from predators), while also providing foraging potential.

Data Collected

Time, flight direction and species of bat are recorded for each bat heard or seen and these were mapped on individual site maps. Time of sunset/sunrise and weather conditions are also recorded for each survey.

The following data is gathered for every bat pass recorded:

- Location of observation (data highlighted on a map);
- Whether the bat was foraging or commuting (if commuting, in which direction was it travelling and whether the bat was following any landscape features);
- Species of bat observed (where possible).

(5) Bat Activity Monitoring- Recording

Automated systems allow greater survey intensity than with manual bat detector surveys with more consistent and recorded results. They can allow longer periods of time coverage than could be practically and economically covered, providing more comparable results, or be used to provide a more flexible timetable for surveying.

Automated systems are triggered by sound (via a detector) and these sounds are then recorded as events. The Anabat SD1 is a remote system for the recording and analysis of ultrasonic bat calls which can be left on site to record bats night after night and can be left recording for two weeks or more.

The system consists of a frequency division detector together with an analysis module, the CF storage Zero Crossing Analysis Interface Module (CF storage ZCAIM). The ZCAIM performs an analysis of the sound signal produced by the detector and stores the result on a compact flash card. The detector and ZCAIM can be powered either by internal dry batteries or by an external rechargeable 12V battery.

The analysis software is used to display frequency-time representations of bat calls in sequences of up to 15 seconds at a time. A wide range of frequency scales and time zoom levels is available and each sequence is labelled with a date and time.

Method

The remote equipment can be used at any time of year but careful interpretation is required depending upon the environmental conditions of the survey and the roost / habitat type and weather. As the numbers of bat passes recorded can vary appreciably from night to night, season to season and location. Depending upon environmental conditions, bat regularly arouse from hibernation but as activity levels will be lower in winter, detection can be very sporadic and most likely to be picked up close to a roost site.

To record seasonal use it is recommended that three separate sessions should be carried out at each location, spaced between May and September. The remote automated detector is set to activate at least 30 minutes before dusk and switch off at 30 minutes after dawn. In long term studies it is also useful to correlate results to weather conditions.

References

Bat Conservation Trust (2007). "Bat Surveys Good Practice Guidelines." Bat Conservation Trust, London. ISBN 978-1-872745-99-2

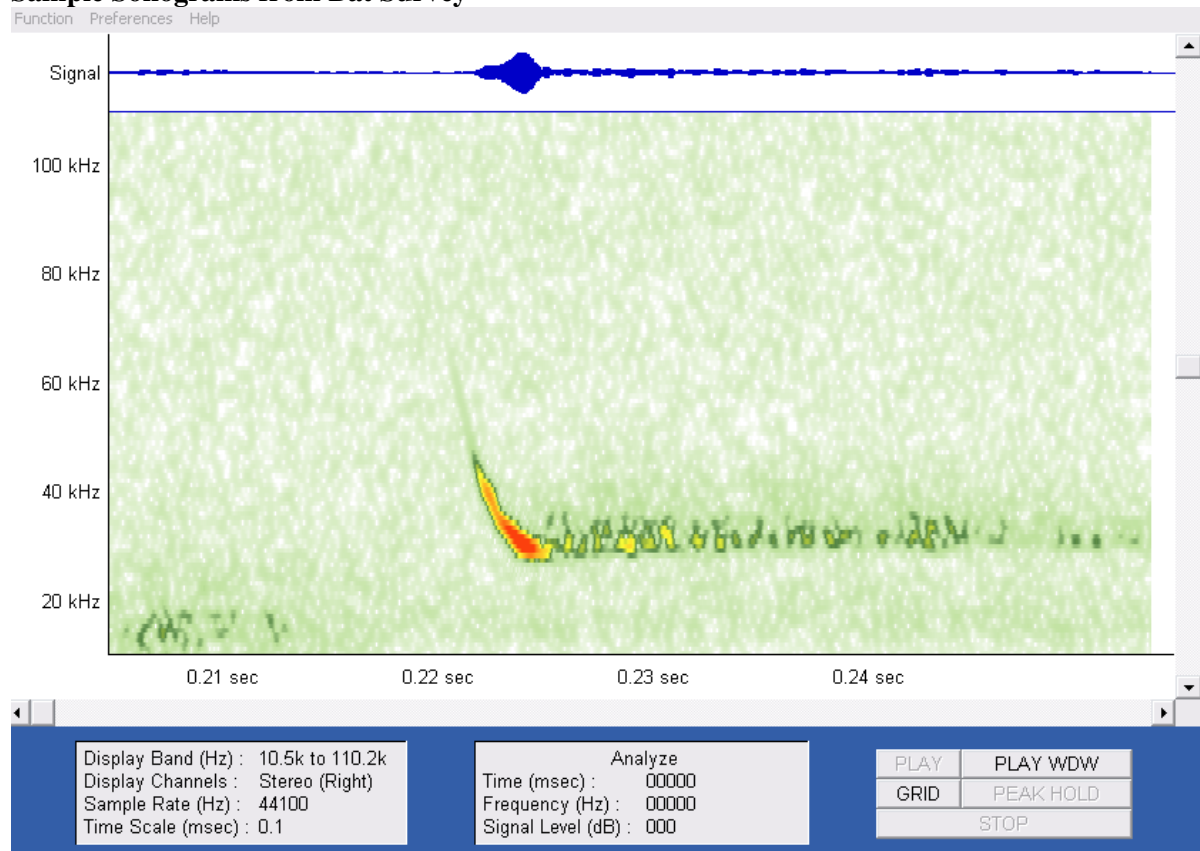
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Bat Conservation Trust (2001) *The UK National Bat Monitoring Programme*.

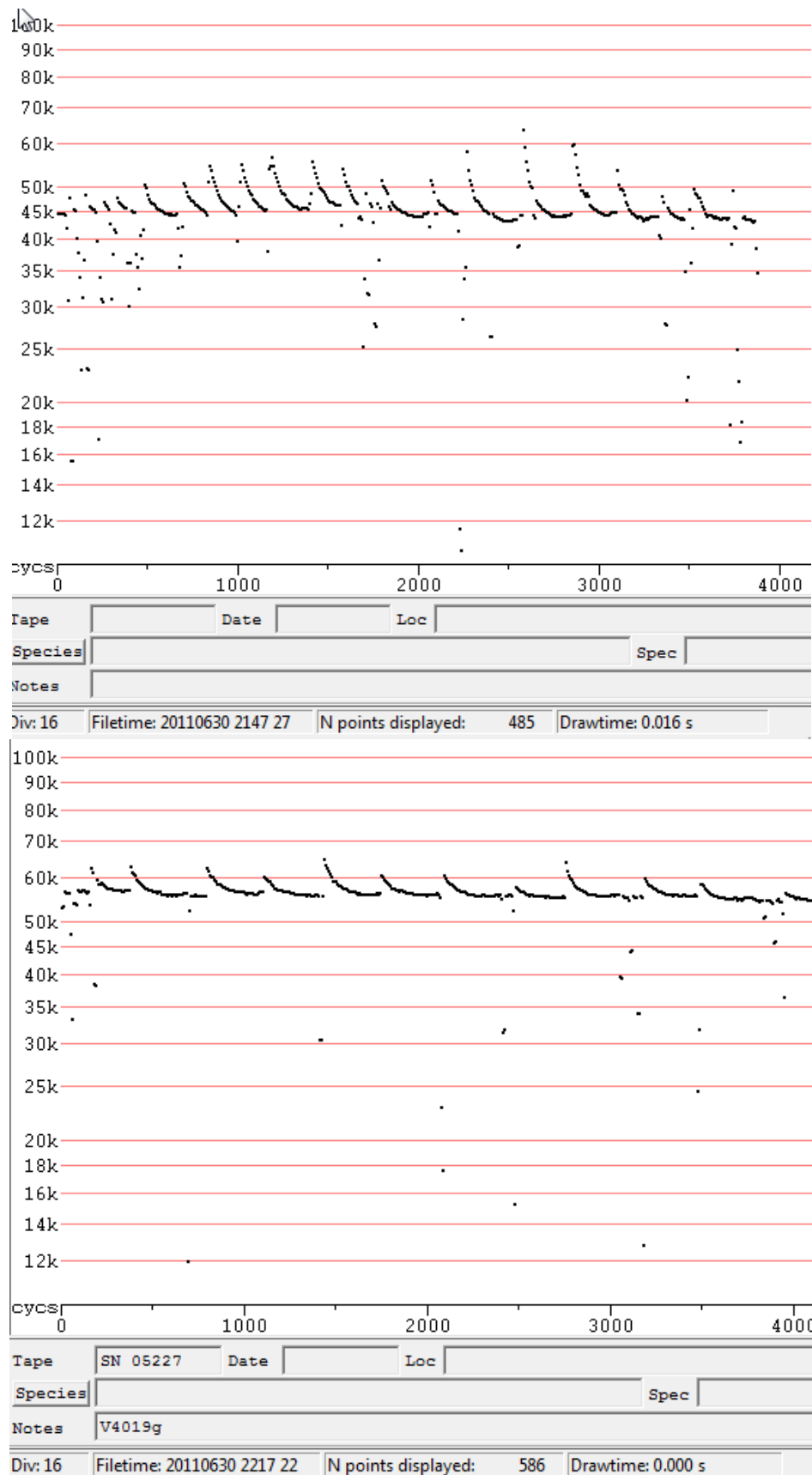
Mitchell-Jones, A. J. & McLeish, A.P.(ed) (2004). *Bat Workers' Manual*. 3rd ed. JNCC

English Nature (2004) *Bat Mitigation Guidelines*. English Nature: Peterborough.

Sample Sonograms from Bat Survey



Serotine 27/6/2011



Soprano and Common Pipistrelle 30/6/11

Survey Methods

Survey work involves systematically searching for the presence of Badgers *Meles meles*, in particular badger setts, on or near (30-40m) of the site. A site is also assessed for the presence of badger foraging activity and territorial behaviour. Such signs include foraging trails, foraging scrapes in short grass, which are commonly known as 'snuffle holes' (shallow scrapes in soft ground or even turf rolling created by foraging for ground-dwelling invertebrates such as worms and grubs), footprints, hairs caught under fences, sett entrances, and latrine sites.

A thorough check of all fencing on site is also undertaken, looking for any potential access points. This can be located by looking for pushed up fencing. These access points can be created by any large mammals included dogs, cats, foxes as well as badgers. The area around a potential access point is methodically searched for mammal hairs as these are usually found underneath any regularly used access point. Any hairs found can be used to identify the species. In addition the vegetation around the entrance gives an indication of frequency of use.

Badger Sett Classification

Badger setts and their holes are identified and classified according to the following definitions:

Main Sett

These are large, well-established structures with a number of entrance holes, both used and disused, and large spoil heaps. Main setts are always active with well-worn paths leading to the sett and inter-connecting with the various holes. They are usually built in the optimum position for soil type, slope, aspect and shrub cover. Such suitable sett sites are at a premium, therefore many main setts are long-established structures within the landscape that may have been in use for decades or even centuries. Main setts typically have an average of 15 holes that show varying levels of use.

Annexe Sett

Annexe setts are closely associated with the main sett, usually between 50–150m away, linked by a series of well-used paths. They can have a number of entrances ranging from one to several, although not all of them will be in use at once. Annexe setts are primarily in use during the breeding season, and will be used by any sub-dominant female that breeds at the same time as the dominant female. The annexe may also be used late in the season if a second litter of cubs is born.

Subsidiary Sett

Subsidiary setts not obviously associated with the main sett, as they are not connected via well-used paths, and can have a variable number of entrances. The sett is not always in use either annually or seasonally, and the ownership of the sett can often only be identified through the use of a bait-marking study.

Outlier Sett

Outlier setts usually have only 1 or 2 holes and can be located anywhere within the social group's territory. Such setts are not associated with any of the larger setts. They are not very extensive underground, as indicated by small spoil heaps and are often used by foxes or rabbits when not occupied by badgers.

Classification of Individual Entrance Hole Activity

The number and degree of use of each hole will help to classify the type of sett. The holes within each sett can be classified according to their level of use as follows:

Well-used Holes

These are clear of debris and leaves, and have smooth sides where the animals enter and exit the sett. They will have well-worn paths leading to them that are free from moss and vegetation. Such holes may have pieces of fresh bedding material, straw, grass or hay on the spoil heap, and fresh footprints and claw marks may be evident on the spoil heap and pieces of excavated material. Fresh badger hairs are also likely to be present in many of the entrances and on the spoil heaps.

Partially used Holes

Partially used holes are not in regular use and have wind blown debris (leaves and twigs) in the entrance, and may have moss or other plants growing around or over the hole. Old, brittle badger hairs may also still be evident within the entrance and on the spoil material. Partially used holes only require a minimum amount of clearance to make them usable again in a very short time.

Disused Holes

Disused holes may be partially collapsed or blocked with debris such as large pieces of branches, rocks or pieces of earth, and the spoil heap and hole may have become completely obscured by vegetation. This type of hole will require a large amount of clearance to become a viable entrance.

References

- Kruuk, H., Parish, T., Brown, C.A.J. & Carrera, J. (1979). The use of pasture by the European badger (*Meles meles*). *Journal of Applied Ecology*, 16, 453-459.
- Cresswell, W.J. & Harris, S. (1988) Foraging behaviour and home-range utilisation in a suburban badger (*Meles meles*) population. *Mammal Review*, 18, 37 – 49.
- Natural England 2007 Badgers & Development, A Guide to Best Practice and Licensing Interim Guidance. Natural England, Sheffield.

Technical Appendix 9

Reptile Survey Methodology

For Common Reptile Species

Introduction

All of the common reptile species (Grass Snake, Adder, Common Lizard and Slow-worm) native to Britain are protected by the 1981 Wildlife & Countryside Act 1981 (as amended) under Sections 9(1) and 9(5). This legislation makes it illegal to intentionally kill or injure a common reptile and also, to sell, barter, exchange or transport for sale these animals or parts of them. However, their habitat is not directly protected.

Survey Methods

Survey work involves the placing of cut up roofing felt or other flat materials such as corrugated iron sheeting, wood or plastic that reptiles hide under. The reptiles use these artificial refugia as they warm faster than the surrounding environment and are attractive to shelter beneath. In order to be effective, refugia need to be placed in the most suitable habitat and in the best locations within those habitats for reptiles. Survey refugia are placed at a minimum of 10/ha.

Reptiles can be surveyed using this technique between early spring and late autumn. The times of the year that provide optimum survey are April to late June, and late August to the end of September.

Survey work is undertaken during suitable weather conditions (i.e. between 9 and 18°C with little or no wind and no rain). High temperatures in late June to late August mean that suitable weather conditions occur the morning / late afternoon, after and even during rain in warm weather, and on overcast days.

Refugia survey is always complemented by visual searching for reptiles which are not utilising refugia.

Population Size Assessment

In order to assess the importance of a population the population size needs to be assessed. This uses standard numbers from the Herpetofauna Groups of the British Isles (HGBI, 1999) advisory notes for Amphibian and Reptile Groups (ARGs) **Table T1** below.

Table T1: Assessing Reptile Populations

Species	Population size (adult density)		
	High	Medium	Low
Slow-worm	(> 100 / ha)	(> 50 / ha)	(< 50 / ha)
Common lizard	(> 80 / ha)	(> 40 / ha)	(< 20 / ha)
Adder	(> 4 / ha)	(2 - 4 / ha)	(< 2 / ha)
Grass snake	(> 4 / ha)	(2 - 4 / ha)	(< 2 / ha)

References

Herptofauna Groups of the British Isles (HGBI) Guidelines (1998) “Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards.” HGBI Advisory notes for Amphibian and Reptile Groups (ARGs). HGBI, c/o Froglife, Halesworth, personal collection.

Froglife, 1999. Froglife Advice Sheet 10. Reptile Survey. An introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife, Halesworth, Suffolk.

Technical Appendix 10
Species Lists for Wildflower Grassland Seed Mixes

WFG 7 BSH Free Draining Soils wildflower seed mix	WFG 18 BSH Butterfly and Honey Bee wildflower seed mix
Cynosurus Cristatus 25%	Hard Fescue 25%
Slender Creeping Red Fescue	Sheeps Fescue 20%
Tall Fescue 25%	Chewings Fescue 15%
Small Leaved Timothy 5%	Slender Creeping Red Fescue 15%
Black Medick 3%	Browntop Bent 5%
Lady's Bedstraw 3%	Oxeye Daisy 2%
White Campion 3%	White Melliot 1.75%
Wild Carrot 2.3%	Birdsfoot Trefoil 1%
Oxeye Daisy 2.1%	Common Knapweed 1%
Yarrow 2%	Cornflower 1%
Birdsfoot Trefoil 1%	Golden Oat Grass 1%
Dark Mullein 1%	Greater Knapweed 1%
Yellow Rattle 0.7%	Kidney Vetch 1%
Kidney Vetch 0.4%	Lady's Bedstraw 1%
V Bugloss 0.4%	Red Campion 1%
Weld 0.4%	White Campion 1%
Wild Mignonette 0.4%	Yarrow 1%
Rough Hawksbit 0.2%	Common Vetch 0.75%
Harebell 0.1%	Tufted Vetch 0.75%
	Cowslip 0.5%
	F. Teasel 0.5%
	Field Scabious 0.5%
	Foxglove 0.5%
	Garlic Mustard 0.5%
	Musk Mallow 0.5%
	Red Clover 0.5%
	Cow Parsley 0.25%
	Dandelion 0.25%
	Marjoram 0.25%
	Meadow Cranesbill 0.25%
	Small Scabious 0.25%

WFG 8
BSH Shaded Areas
wildflower seed mix

Slender Creeping Red Fescue 25%
Tall Fescue 25%
Cynosurus Cristatus 20%
Small Leaved Timothy 5%
Wood Meadow Grass 5%
Hedge Woundwort 3%
Borage 2.2%
Red Campion 2%
White Campion 2%
Wood Aven 2%
Wood Sage 1.5%
Hedge Bedstraw 1.1%
Hedge Parsley (Upright) 1%
Meadow Sweet 1%
Perforated St. Johns Wort 1%
White Melilot 1%
Bluebell 0.5%
Greater Stitchwort 0.5%
Foxglove 0.4%
Ragged Robin 0.4%
Traveller's Joy 0.3%
Ransoms 0.1%

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