

**ADDITIONAL
PROTECTED SPECIES SURVEYS**

**LAND AT OLDLANDS FARM
PHASE 2
BOGNOR REGIS**

JULY 2015

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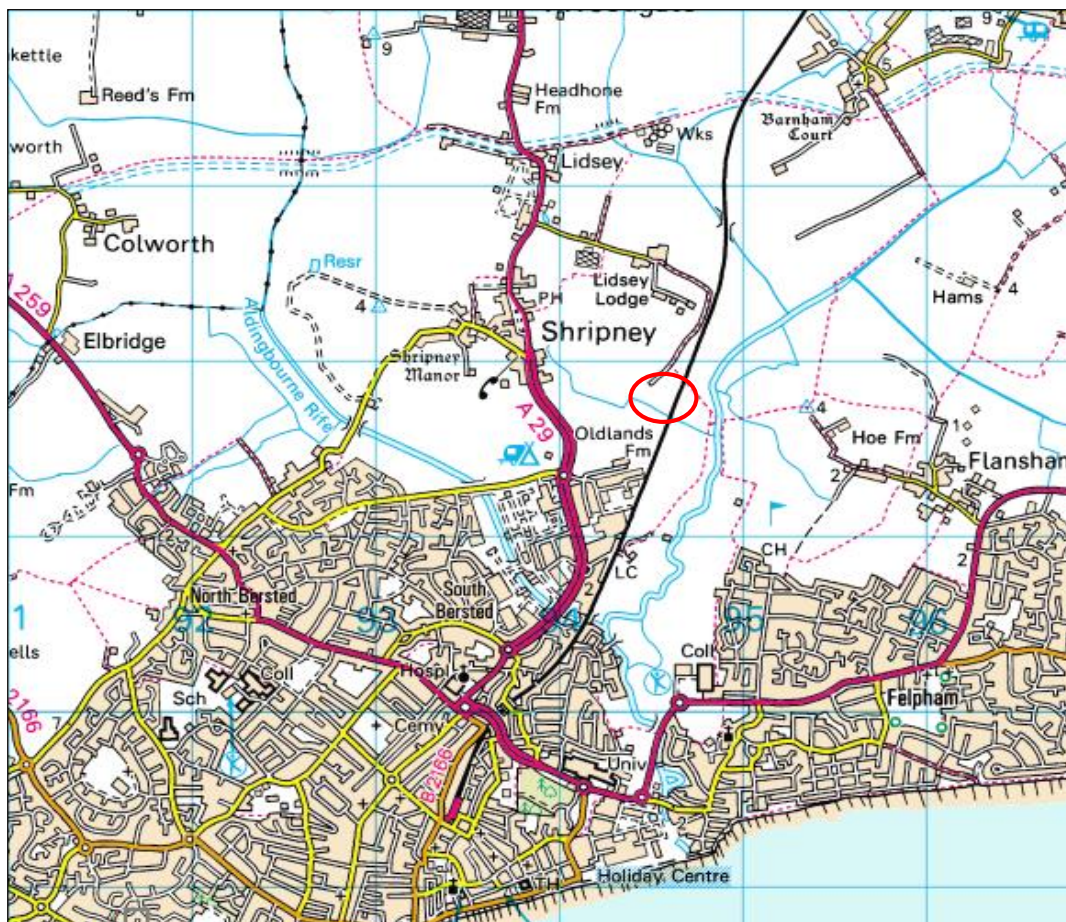
ADDITIONAL PROTECTED SPECIES SURVEYS**LAND AT OLDLANDS FARM PHASE 2
BOGNOR REGIS****JULY 2015****1.0 INTRODUCTION****1.1 Background**

1.1.1 Aluco Ecology Ltd was commissioned to carry out detailed additional Protected Species survey work on land at Phase 2 of Oldlands Farm by Hanbury Properties Ltd.

1.1.2 The results of the survey are provided below.

1.2 Site Location & Boundary

1.2.1 The land consists of intensive arable farmland. The location of the site is shown at **Figure 1** below.



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Figure 1: Location of the Site

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 sites, including protected Reptiles and Bats. Badgers are provided protection through the Protection of Badgers Act 1992. Further details on legislation are provided in **Technical Appendix 1**.

European Legislation

- 1.3.2 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. All UK Bat species are classified as a European Protected Species being listed under Annex IV of the Habitats Directive. See **Technical Appendix 2**.

National Planning Policy

- 1.3.3 The Government sets out its objectives for conserving and enhancing biodiversity in the National Planning Policy Framework. 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.'
- 1.3.4 The Framework goes on to state that at the heart of the planning system is a presumption in favour of sustainable development. Planning Practice Guidance on the Natural Environment provides information on taking biodiversity into account in planning (see Para. 007- onwards)

Local Planning Policy

- 1.3.5 In addition to the National Planning Policy Framework and the legislation outlined above, the strategic and local planning policies are the principal policies against which the outcomes of this ecological appraisal will be tested; the Arun District Council Local Development Framework contains policies in the pre-submission Core Strategy consultation Draft relating to ecology, these are outlined at **Technical Appendix 3**.

Biodiversity Action Plans

- 1.3.6 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 METHODOLOGY

2.1 Introduction

- 2.1.1 An Ecological Appraisal of the site was undertaken in 2015 (Aluco Ecology, 2015). This considered the potential for protected species presence on site, with limited habitat potential for protected species, but with hedges, watercourses and ditches around some of the site boundaries.
- 2.1.2 This report provides findings of additional detailed survey work for additional protected species survey work on site between April and July 2015. Survey work was undertaken by experienced and where necessary licensed surveyors.
- 2.1.3 The methods used in this ecological assessment follow guidance in Government Policy, and are based on best practice guidance from the Institute of Ecology and Environmental Management (IEEM, 2006). Evaluation of features described is based on this guidance, and further information is provided at **Technical Appendix 4**.

2.2 Methodology

Bird Survey

- 2.2.1 A bird survey was undertaken over the site during April – June 2015, with a total of four dates where early morning bird survey was undertaken to the methodology outlined in **Technical Appendix 5**. This survey effort was supplemented by additional recording during site visits for eg evening Bat survey work and reptile survey work.

Bat Survey

- 2.2.2 A survey to assess the site for bats and bat roosts was carried out in April - July 2015. No building or built structures are present on site. Suitable tree roost potential exists on site. Emergence and transect survey work, and remote monitoring was undertaken and carried out using the methodologies described in **Technical Appendix 6**.

Badger Survey

- 2.2.3 The site was searched for signs of the potential presence of Badgers *Meles meles* using the methods outlined in **Technical Appendix 7**. The areas more likely to contain Badger activity and sett building were monitored during the survey period.

Water Vole Survey

- 2.2.4 Survey work for Water Vole involved searching sections of the watercourse/ditches on site and adjoining watercourses for signs of the presence of the species. This includes looking for feeding signs and ‘lawns’, latrines and nesting burrows. For further detail of the methods used to survey both species see **Technical Appendix 8**. The survey included the early spring period when seasonal ditches are more suitable.

Reptile Survey

- 2.2.5 Given the potentially suitable habitats for reptiles over parts of the site a reptile survey was undertaken in spring to summer 2015, including during the peak spring period for survey.
- 2.2.6 The detailed survey was undertaken to the standard survey methodology using artificial refugia (a total of c50 were deployed) and a total of seven survey visits. The methodology of the survey is provided at **Technical Appendix 9**.

3.0 SURVEY RESULTS**3.1 Bird Survey Results****Methodology**

- 3.1.1 The area was surveyed for birds during spring and early summer 2015, including breeding bird survey visits, which included dedicated post dawn surveys, as well as surveys during times of the day other survey work was undertaken, including dusk surveys during bat survey work. Methodology, dates and a species list of birds recorded during survey work is provided at **Technical Appendix 5**. Two late winter surveys were also undertaken in March 2015, along with additional data from previous survey work, which is summarised in the Ecological Appraisal (see Aluco Ecology, 2015).

Results

- 3.1.2 A number of species of conservation concern were noted on site mostly relating to widespread farmland bird species that have declined as a result of agricultural intensification over the last 60 years. These include species that have been red listed on account of a greater than 50% decline in populations over the last 30 or so years, and the latter are Amber listed for being a species of European concern and a greater than 25% decline in populations during the period (Eaton *et al*, 2009). The species, including Yellowhammer, Reed Bunting, Skylark, Grey Partridge, Yellow Wagtail and Linnet recorded are detailed in **Table 1** below and breeding birds on site recorded on **Figure 3**.
- 3.1.3 There is limited field edge foraging habitat, mostly in the semi abandoned northern pasture field for the Schedule 1 species Barn Owl *Tyto alba*, which has been recorded locally, but no records of this species were made during survey visits on site. The July bat survey recorded one calling north of the flood compensation area around Sack Lane. Tawny Owl *Strix aluco* was recorded on site, but is likely to have bred off site given no suitable nest site (see also tree survey for Bats in 3.2.3). The Schedule 1 species Cetti's Warbler was also recorded singing on territory on the edge of the site during most survey visits.
- 3.1.4 The hedges and boundaries provided habitat for scrub edge and wetland species, including Reed Warbler, Sedge Warbler, Lesser Whitethroat, Whitethroat, and Blackcap. The presence of Reed & Sedge Warblers, Yellowhammer and Reed Bunting were probably assisted by the

crop regime in 2015, with Oil Seed Rape being present in the field adjacent to the watercourse at B2.

- 3.1.5 The red listed and BAP species Lapwing was noted foraging in the flood compensation area north of the Bognor Northern Relief Road (BNRR), but not recorded on the main site. This species breeds in the Lidsey Rife flood plain to the north west of the site.

Evaluation

- 3.1.6 The site is considered to be of **local value** on account of the widespread but declining farmland species of conservation concern present, and the assemblage of wetland and scrub species using the edge habitats around the site boundaries. It is part of the wider farmland landscape of the Lidsey Rife floodplain. The flood compensation area north of the BNRR is part of a biodiversity opportunity area in the Local Plan.

Table 1: Conservation Status of Species noted on site

Species	Status	Comments
Grey Partridge <i>Perdix perdix</i>	Red, BAP	A pair noted during late winter survey were not recorded during the spring survey work, but may have bred just north of the site in the BNNR construction zone.
Stock Dove <i>Columba oenas</i>	Amber	A flock of c70 birds recorded during one survey in April 2015 foraging on the bean crop in the flood compensation zone. Regularly recorded north of BNRR and flying over the site, but not considered to have bred on site.
Mallard <i>Anas platyrhynchos</i>	Amber	Occasional fly over.
Green Woodpecker <i>Picus viridis</i>	Amber	Recorded on site, but not considered to have bred on site. A nest with well grown young recorded in Shripney at southern edge of large wooded garden west of flood compensation area
Dunnock <i>Prunella modularis</i>	Amber BAP	Common breeding species in hedges on site
Song Thrush <i>Turdus philomelos</i>	Red, BAP	A single territory on site in B6/B7
Linnet <i>Carduelis cannabina</i>	Red, BAP	Present on site in small groups, breeding considered likely in B2 and along railway boundary
Barn Owl <i>Tyto Alba</i>	Sch 1	Recorded north of flood compensation area in July night time bat survey – heard only and distant.
Kestrel <i>Falco tinnunculus</i>	Amber	Noted in local area, but not breeding on site
Lapwing <i>Vanellus vanellus</i>	Red	2 birds recorded foraging on the flood compensation area on a couple of dates
Herring Gull <i>Larus argentatus</i>	Red	Noted overflying site, presumed breeding on the industrial units south of the site.
Lesser Black-backed Gull <i>Larus fuscus</i>	Amber	Recorded overflying the site.
Swift <i>Apus apus</i> , House Martin <i>Delichon urbicum</i> , Swallow <i>Hirundo rustica</i>	Amber	Occasionally seen over site
Cuckoo <i>Cuculus canorus</i>	Red	Not recorded in 2015, but noted in 2014 as a possible breeder (see summary in Aluco Ecology, 2015)

Species	Status	Comments
Skylark <i>Alauda arvensis</i>	Red, BAP	Recorded on site during late winter visits March 2015, however the Oil Seed Rape crop was high by main breeding period and no on site territories noted. Present to the South East and north of the BNRR, with 4-5 territories in the wider local area.
Yellow Wagtail <i>Motacilla flava</i>	Red	Recorded during spring migration and also around flood compensation area in bean crop during June/July so prob. nesting of 1pair.
Northern Wheatear <i>Oenanthe oenanthe</i>	Amber	Recorded during spring migration, but not breeding on site
Common Whitethroat <i>Sylvia communis</i>	Amber	Four territories estimated on site, associated with the hedgerows
Lesser Whitethroat <i>Sylvia curruca</i>	Green	A single territory associated with the railway scrub at B4
Reed Warbler <i>Acrocephalus scirpaceus</i>	Green	3-4 territories on site, mostly along B2 but also on B7
Sedge Warbler <i>Acrocephalus schoenobaenus</i>	Green	2 territories along B2. One territory northern edge of BNRR by flood compensation.
Blackcap <i>Sylvia atricapilla</i>	Green	3 Territories in B6. 1-3 Territories in B10
Cetti's Warbler <i>Cettia cetti</i>	Sch 1, Green	A single territory along the railway line on the south eastern edge of the site. Other territories noted east of railway off site.
House Sparrow <i>Passer domesticus</i>	Red BAP	Recorded in local area, not breeding on site
Starling <i>Sturnus vulgaris</i>	Red BAP	Recorded in local area, not breeding on site
Yellowhammer <i>Emberiza citrinella</i>	Red BAP	2 territories on site, one associated with B2 and another with B7. A couple of pairs in farmland north of BNRR
Reed Bunting <i>Emberiza schoeniclus</i>	Amber	One territory on site associated with B2 also a single territory on boundary of BNRR in flood compensation zone north of the site

Sch 1 = Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), BAP = UK Biodiversity Action Plan Species; Red/Amber – Birds of Conservation Concern on either the Red or Amber List (Eaton et al 2009)

3.2 Bat Survey Results

Habitat Potential

- 3.2.1 The site is open with limited opportunity for roosting potential that is restricted to two boundaries, B6 which has a number of mature Oak and Crack Willow trees, and B7 that has a single mature Oak. There are no buildings on site. The open site does not provide good commuting or sheltered foraging for the majority of bat species, but the internal hedges do provide some foraging and commuting potential, particularly B6 & B10.

Desktop Survey Data

- 3.2.2 The desk top data search returned records for seven species of Bat; Noctule *Nyctalus noctula*, Serotine *Eptesicus serotinus*, Common, Soprano and Nathusius's Pipistrelle *Pipistrellus pipistrellus*, *P. pygmaeus*, *P. nathusii*, Natterer's Bats *Myotis nattereri* and Brown Long-eared Bat *Plecotus auritus* (see also Aluco Ecology, 2015).

Detailed Survey Results: Roost Potential

- 3.2.3 A total of four Oak *Quercus robur* and five mature Crack Willow *Salix fragilis* on boundary B6 (with one of the Oaks on B7) have potential to support roosting bats and are classed as provisionally as Category 1, see **Table 2** below. These were assessed according to the methodology outlined in **Technical Appendix 6**.
- 3.2.4 These trees were subject to emergence survey work during spring-summer 2015. No emergence was noted during the survey (see **Table 3**). The first bats at B6/B7 arrived on site from the north well after sunset on each survey. Bats also entered the site from the south along the railway boundary.

Detailed Survey Results: Foraging & Commuting

- 3.2.5 A detailed bat survey was undertaken on site during April – July 2015. The results of the survey are provided in **Table 2** and **Figure 4** below. The surveys confirmed that bats utilise the site with seven species recorded; Noctule *Nyctalus noctula*, Serotine *Eptesicus serotinus*, Common, Soprano and Nathusius's Pipistrelle *Pipistrellus pipistrellus*, *P. pygmaeus*, *P. nathusii*, Natterer's Bats *Myotis nattereri*, and Whiskered *Myotis mystacinus*. No Brown Long-eared Bats were recorded, however given this species has a quiet echolocation, this species tends to be under-recorded on survey work. Sonograms from the survey can be found in **Technical Appendix 6**. Common Pipistrelle was by far the most frequently recorded species with Nathusius's Pipistrelle just regular than Soprano, which both only recorded as a very limited number of passes. The remaining species were infrequent with only one record of each *Myotis* and small numbers of Noctule and Serotine.
- 3.2.6 The survey work and overnight monitoring of the site showed that although there was a reasonable diversity of species recorded; there was only a very low use of the site by bats for foraging/commuting. During evening emergence work, bats arrived on site late having travelled from roosts off site, and 1-2 Common Pipistrelle were recorded foraging around the main woody habitat at B6.

- 3.2.7 Transect work on site (See **Table 3**) recorded very low numbers of bats on timed walks, with the only real areas of bat foraging relating to B3, B6 and B8 of the proposed development area, where passes on evening survey work related to 1-2 foraging Pipistrelles, and occasional Serotine in B6. The remainder of the open areas of the site and field boundaries had virtually no bat activity during the transect survey work.
- 3.2.8 Remote monitoring recorded an average of 681 passes along B6 almost entirely of Common Pipistrelle and most foraging occurred in the first part of the evening with very little/ no activity after 1am. From field survey this is considered to relate to regular foraging passes by a very small number of Common Pipistrelles (1-2 regularly recorded).
- 3.2.9 B7 recorded an average of 75 passes per night with a typical spread through the night with concentrations at dusk. B7 exhibited a greater diversity than B6 with three species of Pipistrelle and two Myotis. B8 was similar to B7 and recording three species of Pipistrelle, no Myotis but Noctule and Serotine. In comparison with other woodland edge and hedgerows which can often record 200 - 1000 passes per night, the level of bat use in the study area is considered to be low, particularly away from the mature trees on B6. Remote monitoring also recorded bats generally arriving at least 15 minutes after emergence times and departing early indicating much of the activity on site occurs after a commute to and from roost sites.

Table 1: Trees on Site with Bat Roost Potential

Oak Trees T1 on B7 and T2-T4 on B6. The oaks all had limb damage with resulting bat roosting opportunities in splits and lifted bark. A few holes were noted but the oak generally held few hole-roosting opportunities.	 A photograph of a grassy field with several bare trees. Red labels T1, T2, T3, T4, and Crack Willow are visible on the trees. The trees are mostly without leaves, showing their intricate branch structures. The ground is covered in dry grass and some green patches. The sky is clear and blue.
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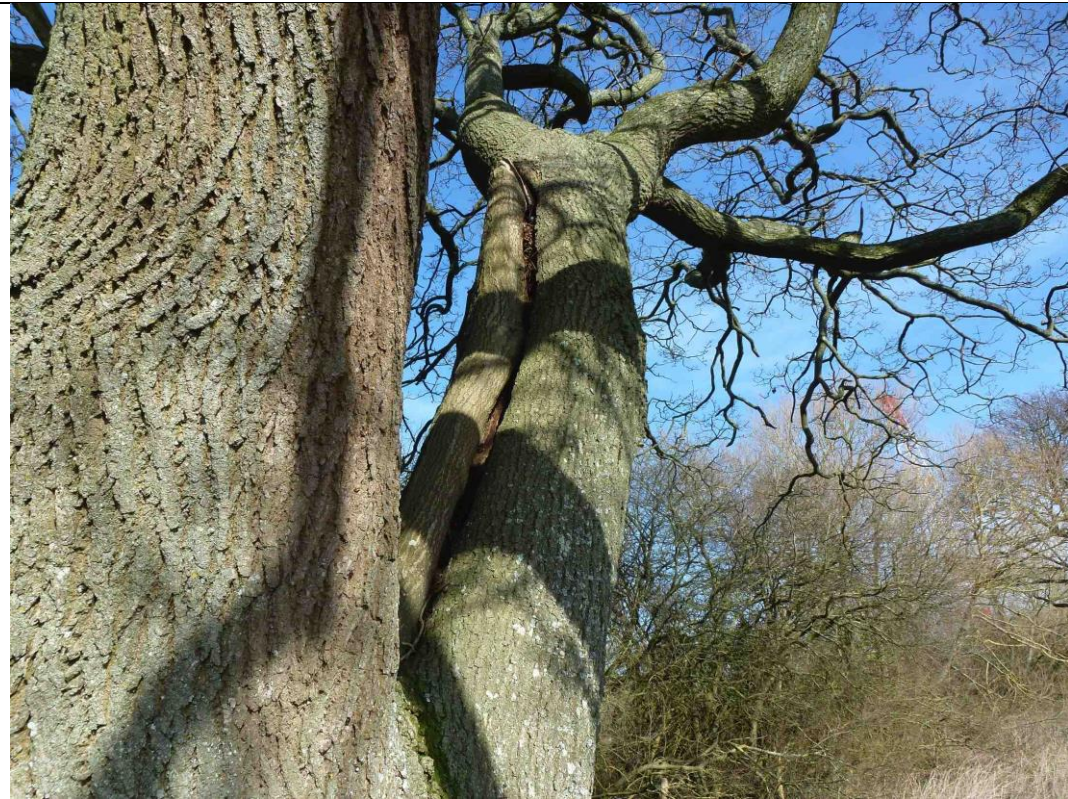
T1 Oak Category 1

A few potential Splits and cracks



T2 Oak Category 1

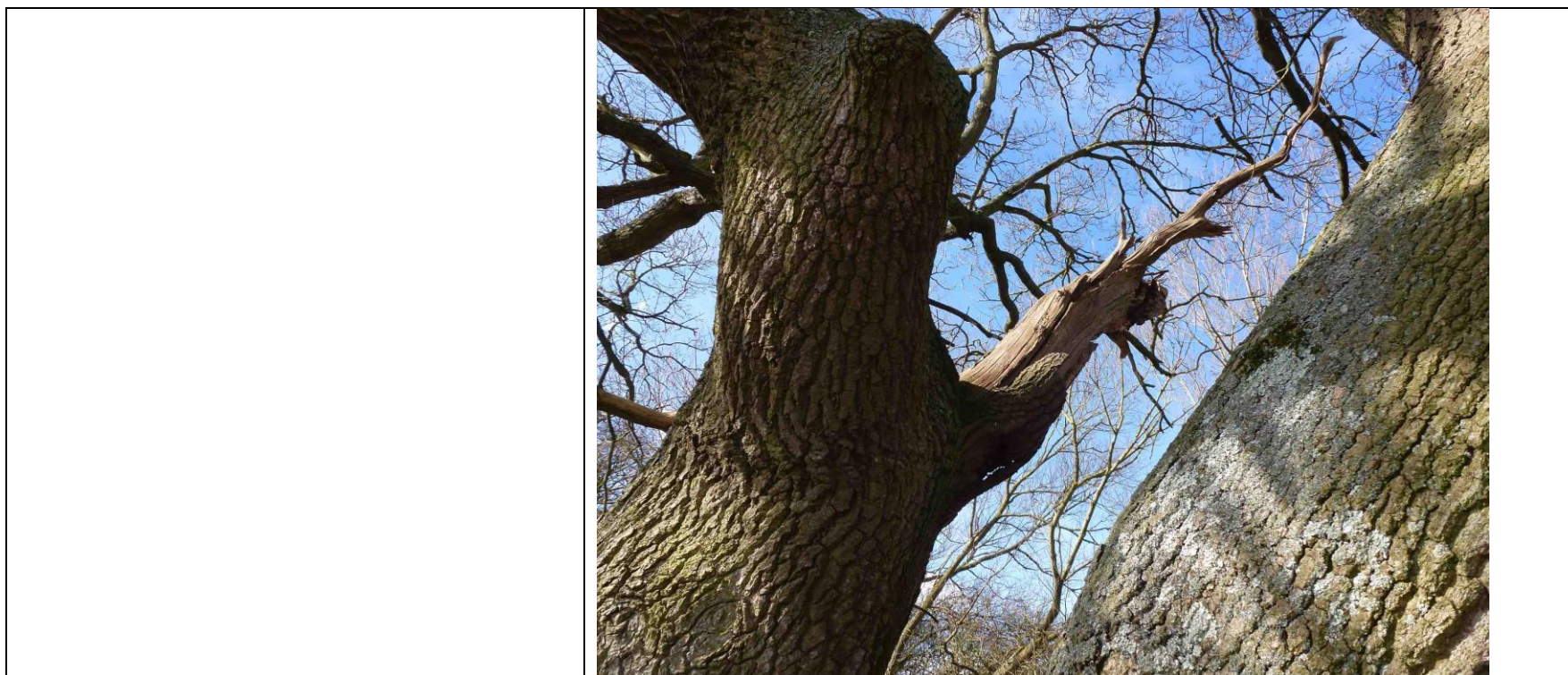
Limb damage with slit bark and at holes



T3 Oak Category 1

Limb damage with splits and holes





T4 Oak Category 1

Limb damage with splits and holes



Crack Willow Category 1

There is one large Multi stem willow with holes and hollow limbs. A few smaller less significant roosting opportunities were also noted on adjacent Crack Willows.









Table 2: Bat Survey Results

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Date	Survey	Weather	Results Summary																																																																															
30/04/2015	Emergence Survey of Oaks/Willows B6/B7	Cloud 0 Wind 0 Temp 13-12.5c Precip 0	Nil Emergence. First bat arrived late on site from north = PP at 21:08 then reg. foraging around B6 for 20+mins. Transect undertaken.																																																																															
20-22/05/2015	Remote Monitoring B6	Mostly dry during surveys with occ. Heavy showers start of period. Lows down to 9c	<table><tr><th></th><th></th><th>Total</th><th colspan="2">Species</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr><tr><th>Site</th><th>Date</th><th>Passes</th><th>45P</th><th>55P</th><th>PN</th><th>ES</th><th>NN</th><th>Mn</th><th>Mm</th><th>1st</th><th>Lst</th><th>Notes</th></tr><tr><td>b6</td><td>20/05/2015</td><td>242</td><td>242</td><td></td><td></td><td></td><td></td><td></td><td></td><td>21:32</td><td>22:25</td><td>all passes in short period PM, No am foraging</td></tr><tr><td>b6</td><td>21/05/2015</td><td>862</td><td>860</td><td>1</td><td>1</td><td></td><td></td><td></td><td></td><td>21:44</td><td>00:05</td><td>all passes in short period PM, No am foraging</td></tr><tr><td>b6</td><td>22/05/2015</td><td>938</td><td>937</td><td></td><td>1</td><td></td><td></td><td></td><td></td><td>21:39</td><td>01:38</td><td>all passes in short period PM, limited am foraging</td></tr><tr><td></td><td>AVG</td><td>681</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>			Total	Species											Site	Date	Passes	45P	55P	PN	ES	NN	Mn	Mm	1st	Lst	Notes	b6	20/05/2015	242	242							21:32	22:25	all passes in short period PM, No am foraging	b6	21/05/2015	862	860	1	1					21:44	00:05	all passes in short period PM, No am foraging	b6	22/05/2015	938	937		1					21:39	01:38	all passes in short period PM, limited am foraging		AVG	681										
		Total	Species																																																																															
Site	Date	Passes	45P	55P	PN	ES	NN	Mn	Mm	1st	Lst	Notes																																																																						
b6	20/05/2015	242	242							21:32	22:25	all passes in short period PM, No am foraging																																																																						
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b6	22/05/2015	938	937		1					21:39	01:38	all passes in short period PM, limited am foraging																																																																						
	AVG	681																																																																																
22/05/2015	Emergence Survey of Oaks/Willows B6/B7	Cloud 0 Wind 0 Temp 8-10c Precip 0	Dawn Re-entry Nil roosts. PP recorded at 03:29 only bat recorded at B6 heading north.																																																																															
19/06/2015	Emergence Survey of Oaks/Willows B6/B7	Cloud 2, Wind 1SW, Temp 21-18.5c, Precip 0	Nil emergence. First bat PP arrived late from north at 22:12. PPx2 foraging along B6 following this for duration of the survey. Transect undertaken.																																																																															
20-22/06/15	Remote Monitoring B7	Mostly dry during period with occ. Showers on eve of 19 and 21st. Lows to 12c	<table><tr><th>Site</th><th>Date</th><th>Passes</th><th>45P</th><th>55P</th><th>PN</th><th>ES</th><th>NN</th><th>Mn</th><th>Mm</th><th>1st</th><th>Lst</th></tr><tr><td>b7</td><td>20/06/2015</td><td>97</td><td>92</td><td></td><td>3</td><td></td><td>2</td><td></td><td>1</td><td>22:09</td><td>03:30</td></tr><tr><td>b7</td><td>21/06/2015</td><td>87</td><td>79</td><td>5</td><td>3</td><td></td><td></td><td></td><td></td><td>22:05</td><td>03:40</td></tr><tr><td>b7</td><td>22/06/2015</td><td>40</td><td>39</td><td></td><td>1</td><td></td><td></td><td></td><td></td><td>21:58</td><td>01:14</td></tr><tr><td></td><td>AVG</td><td>75</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Site	Date	Passes	45P	55P	PN	ES	NN	Mn	Mm	1st	Lst	b7	20/06/2015	97	92		3		2		1	22:09	03:30	b7	21/06/2015	87	79	5	3					22:05	03:40	b7	22/06/2015	40	39		1					21:58	01:14		AVG	75																												
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	AVG	75																																																																																
03-05/07/15	Remote Monitoring on B8	Mostly dry and warm during period, light to mod SW wind lows to 15c	<table><tr><th>Site</th><th>Date</th><th>Passes</th><th>45P</th><th>55P</th><th>PN</th><th>ES</th><th>NN</th><th>Mn</th><th>Mm</th><th>1st</th><th>Lst</th><th>Notes</th></tr><tr><td>b8</td><td>03/07/2015</td><td>47</td><td>34</td><td>3</td><td>5</td><td></td><td>5</td><td></td><td></td><td>21:57</td><td>03:05</td><td>late on site / early to leave in am</td></tr><tr><td>b8</td><td>04/07/2015</td><td>95</td><td>74</td><td>2</td><td>11</td><td>6</td><td>2</td><td></td><td></td><td>21:55</td><td>03:56</td><td></td></tr><tr><td>b8</td><td>05/07/2015</td><td>61</td><td>45</td><td>2</td><td>8</td><td>3</td><td>2</td><td>1</td><td></td><td>22:02</td><td>04:03</td><td></td></tr><tr><td></td><td>AVG</td><td>68</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Site	Date	Passes	45P	55P	PN	ES	NN	Mn	Mm	1st	Lst	Notes	b8	03/07/2015	47	34	3	5		5			21:57	03:05	late on site / early to leave in am	b8	04/07/2015	95	74	2	11	6	2			21:55	03:56		b8	05/07/2015	61	45	2	8	3	2	1		22:02	04:03			AVG	68																								
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b8	05/07/2015	61	45	2	8	3	2	1		22:02	04:03																																																																							
	AVG	68																																																																																
06/07/15	Emergence Survey of Oaks/Willows B6/B7	Cloud 0, Wind 0, Temp 22-18.5c, Precip 0	Nil emergence. First bat PP at 21:49 from north around B6 Oaks then reg foraging by PP until transect. Only 2 ind. bats considered present.																																																																															

Key: 45P/PP= Common Pipistrelle 55P/PS = Soprano Pipistrelle, PN =Nathusius's Pipistrelle, NN=Noctule; ES = Serotine, MN = Natterer's Bat, MM = Whiskered

Table 3: Transect Monitoring Results

Transect	date	P P	P S	N N	E S	Total	Transect	date	P P	P S	N N	E S	Total
1	30/04/2015		1			1	8	30/04/2015	8				8
	22/05/2015					0		22/05/2015					0
	19/06/2015					0		19/06/2015	6				6
	06/07/2015					0		06/07/2015	15				15
						= 1							= 29
2	30/04/2015					0	9	30/04/2015					0
	22/05/2015					0		22/05/2015	4				4
	19/06/2015					0		19/06/2015	6				6
	06/07/2015	1				1		06/07/2015	18			7	25
						= 1							= 35
3	30/04/2015	4				4	10	30/04/2015			1		1
	22/05/2015	1				1		22/05/2015					0
	19/06/2015	4				4		19/06/2015					0
	06/07/2015	6				6		06/07/2015	1				1
						= 15							= 2
4	30/04/2015					0	11	30/04/2015					0
	22/05/2015	2				2		22/05/2015					0
	19/06/2015	4				4		19/06/2015					0
	06/07/2015	4				4		06/07/2015					0
						= 10							= 0
5	30/04/2015					0	12	30/04/2015					0
	22/05/2015	2				2		22/05/2015					0
	19/06/2015	7				7		19/06/2015					0
	06/07/2015	11				11		06/07/2015					0
						= 20							= 0
6	30/04/2015					0	13	30/04/2015		1			1
	22/05/2015					0		22/05/2015	3				3
	19/06/2015	1				1		19/06/2015	5				5
	06/07/2015	4				4		06/07/2015	3				3
						= 5							= 12
7	30/04/2015					0	14	30/04/2015					0
	22/05/2015	2				2		22/05/2015					0
	19/06/2015					0		19/06/2015					0
	06/07/2015					0		06/07/2015	1				1
						= 2							= 1

Key: PP= Common Pipistrelle, PS = Soprano Pipistrelle, NN=Noctule; ES = Serotine

Evaluation

- 3.2.10 The survey effort recorded seven species using the site. Although caution should be used in analysis of the data collected during activity survey given the complex variables such as weather, season and invertebrate accumulations, some species specific trends were identified from survey to date. The survey results indicate favoured foraging areas occur along B6 but these comprise small numbers of Common Pipistrelle for period of continual foraging for 1-3hrs after sunset, with some foraging by Serotine as well. Other hedgerows are far less used (1-5 passes recorded for the additional species) but have a greater range of species use, including Nathusius's Pipistrelle, which is a local species, but known to be present in the current local area including Chichester and the Manhood peninsular.
- 3.2.11 The limited foraging habitats, which are restricted to linear features along the site boundaries and internal hedges generally, suggest the site is considered likely to be of **value within the zone of influence** for foraging bat populations; and with a total of seven species using the site in low numbers the overall site value for both foraging and commuting across the landscape is considered to be **value within the zone of influence**. No evidence of roosts on site were recorded in the suitable tree roosting features on boundary B6 & B7.

3.3 Badger Survey Results

Habitats on Site

- 3.3.1 There are suitable habitats around the boundaries of the site and particularly along B6 & B10 for Badger Sett creation.

Desktop Survey Data

- 3.3.2 The nearest Badger records are from the northern edge of the site where an outlier sett was closed within the works area of the BNRR in 2012 (by B10). Badgers are known to use the local area and may occasionally use the site.

Detailed Survey Results

- 3.3.3 Survey work has been undertaken during late winter and spring 2015 to determine whether Badgers are using the site. This was undertaken to the methodology set out in **Technical Appendix 7**.
- 3.3.4 A number (6+) of currently dis-used holes are present along the length of the bank on B6, including some that are of a size and shape that could have potential historic Badger activity. These were examined for any current/recent use during survey work in April 2015 before vegetation growth; no use was recorded during the site visits, with most holes with leaf litter and no fresh earth works. It is estimated that there has been no use of the holes for a couple of years (pre 2013). A small amount of disturbance on a couple of holes was considered likely to have been created by Rabbit *Oryctolagus cuniculus*, with associated droppings and hairs recorded. Stretches of the other boundaries around the site could not be fully examined due to the extensive nature of the Bramble scrub in places, but no evidence or significant trails were recorded. No evidence of active Badger Setts was recorded on boundary B10 adjacent to where the historical outlying sett was closed under licence on the BNRR boundary as part of

the BNRR work. Here Rabbit and Brown Rat *Rattus norvegicus* holes were present in the ditch and bankside.

- 3.3.5 A Badger latrine was recorded on the railway boundary at B5 during survey work in Spring 2015. This is the only evidence of recent activity on site recorded during the survey.

Evaluation

- 3.3.6 The site boundaries are considered to be of **value in the zone of influence** to Badgers. They are present in the wider local area and use the site on occasion. There is potential for Sett creation and existing mammal holes in boundaries B6 and B10. No evidence of regular use of these boundaries was present during the current survey.

3.4 Water Vole Survey

Habitats on Site

- 3.4.1 The watercourse running along the southern boundary of the proposed development site at B2 contains low water flows (maximum noted during survey work was c20-30cm, with the eastern end of the stream mostly drying in summer 2015) and levels being dry some of the year. It is dominated by Common Reed *Phragmites australis* growth with some limited other species including Fools Watercress *Apim nodiflorum* and Yellow Flag *Iris pseudacorus*. This watercourse has habitat for Water Vole and they have been recorded in the past (for a summary see Aluco Ecology, 2015).
- 3.4.2 Ditches are present within the internal boundaries (B6-B9) of the site. The ditch at B6 (and B10 north of the BNRR) is mostly dry with some dampness towards the northern end of B6, and a ponding of stagnant water with high leaf litter at the south west end, which was dry by May 2015. The habitat is lacking aquatic vegetation and is of low value for Water Vole at present.
- 3.4.3 The ditches of boundaries B7 & B8 are mostly enclosed by woody vegetation, dense Hawthorn and Bramble, which limits aquatic marginal vegetation to a few small patches of Common Reed growing through Bramble where the Hawthorn hedge is absent, and occasional plants of Pond Sedge. The ditches contained c20cm of standing water along their length with shallow banks within the hedgerow during the late winter site visits but were dry by May 2015. A 25m section of B8 is open with damp grassy vegetation. The boundary at B9 has a damp depression at the north end of the permanent pasture, this is within the BNRR construction zone.
- 3.4.4 The ditch at B10 is a continuation of B6 north of the BNRR. This was dry during the survey period and is heavily shaded by Willows and Elder.

Detailed Survey Results

- 3.4.5 Survey of the ditches and associated banks was undertaken with specific methodical walking of ditch lines 05/03/2015 and 28/04/2015 and monitored throughout site survey from March-July 2015. This was undertaken to the methodology outlined in **Technical Appendix 8**.
- 3.4.6 **Photos 1-2** below show watercourse at B2. This is the most suitable Water Vole habitat on site, being both the wettest ditch holding water beyond April 2015 and the one with the most suitable vegetation and available food sources for Water Voles (aquatic and marginal vegetation and bankside grasses). This has recent historical Water Vole records (for summary see Aluco Ecology, 2015), but no signs were noted during the current survey.



Photo 1: Watercourse along B2 Mix of shaded bramble sections with Common Reed



Photo 2: Watercourse along B2. The site is the left hand side of the ditch. The earth works on the right relate to the construction area of the new Roll Royce development.

- 3.4.7 **Photos 3-5** below show watercourse at B6-B8. The current survey recorded no evidence of Water Vole using the internal ditches B6-B10 on site. The internal boundaries may provide some habitat for Water Vole given the species is present in the local area; but this would be likely to be seasonal habitat such as habitat when regular sites are inundated, or commuting habitat through the landscape; and is of lower quality than the open watercourse at boundary B2. All the internal ditches were dry by the beginning of May 2015.



Photo 3: Ditch along boundary B7 – Mostly enclosed with dense bramble scrub and dry through much its length most of the year. A small area of Reed occurs at the western end. Even this area (the wettest part of this ditch) was dry by end April 2015.



Photo 4: Ditch along boundary at B8 in March 2015. As with B7, this provides the wettest and most suitable water vole habitat, as illustrated, but again dry by end April 2015



Photo 5: Ditch along boundary at B6, nettle dominated and dry in March 2015 and throughout site survey.

Evaluation

- 3.4.8 Water Voles are known to occur in low density in the area and will use the ditches on site for dispersal and during times of high water in the catchment. They are also periodically likely to occur, particularly along B2 whenever local population densities increase. Most of the ditches on site are poorly suitable/marginal habitat for Water Voles due to them being only wet during high water levels; and also being shaded by bramble/hedgerow and scrub growth, which results in lower quality feeding and poor suitable vegetation growth. The most suitable ditch is on the southern boundary of the site (B2) for which there is no evidence of use during the 2015 spring / summer survey. This ditch network has had extensive management works as part of redevelopment of the site to the south.

3.5 Reptile Survey Results

Reptile Habitats

- 3.5.1 The boundaries of the fields on site are the only areas where suitable habitat exists for populations of common reptiles to occur. North of the Bognor Northern Relief Road (BNRR) the banks around B10 contain some suitable habitat. Some of the boundary lengths contain very little reptile habitat as the fields are cultivated right to the margins. Examples of boundary reptile habitats are shown in **Photos 6**.



Photo 6: Field Boundary along Railway edge at B4. Here cultivation is right to the margin of the field with very little reptile habitat, which is generally dominated by Bramble & Nettle upto the fence/hedge

Desktop Survey Data

- 3.5.2 Grass Snake *Natrix natrix* and Slow Worm have been recorded in the local area around the watercourses connected with the Lidsey Rife (see Aluco Ecology, 2015).

Detailed Survey Results

- 3.5.3 The reptile survey work was undertaken in suitable conditions during spring 2015 according to the methodology in **Technical Appendix 9**. The details of each visit and reptiles recorded are provided in **Table 4** below. The results of the survey are also shown on **Figure 5**. A single species of reptile, Slow Worm *Anguis fragilis* was recorded in low numbers on site. A total of 3-5 individuals were recorded on B6 and on the railway boundary at B4 and adjacent B8.

Table 4: Reptile Survey Results

Date	Time	Results
28/04/2015	am	Reptile Set Up
12/05/2015	am 15c	Af= 2F
19/05/2015	am 16c	Af= 2F
22/05/2015	am 13c	Af= 1F
25/05/2015	pm 17c	AF=2F
19/06/2015	pm 18c	AF = 1F
22/06/2015	pm 18c	AF=1F, 1sub
02/07/2015	am 18c	AF = 2F

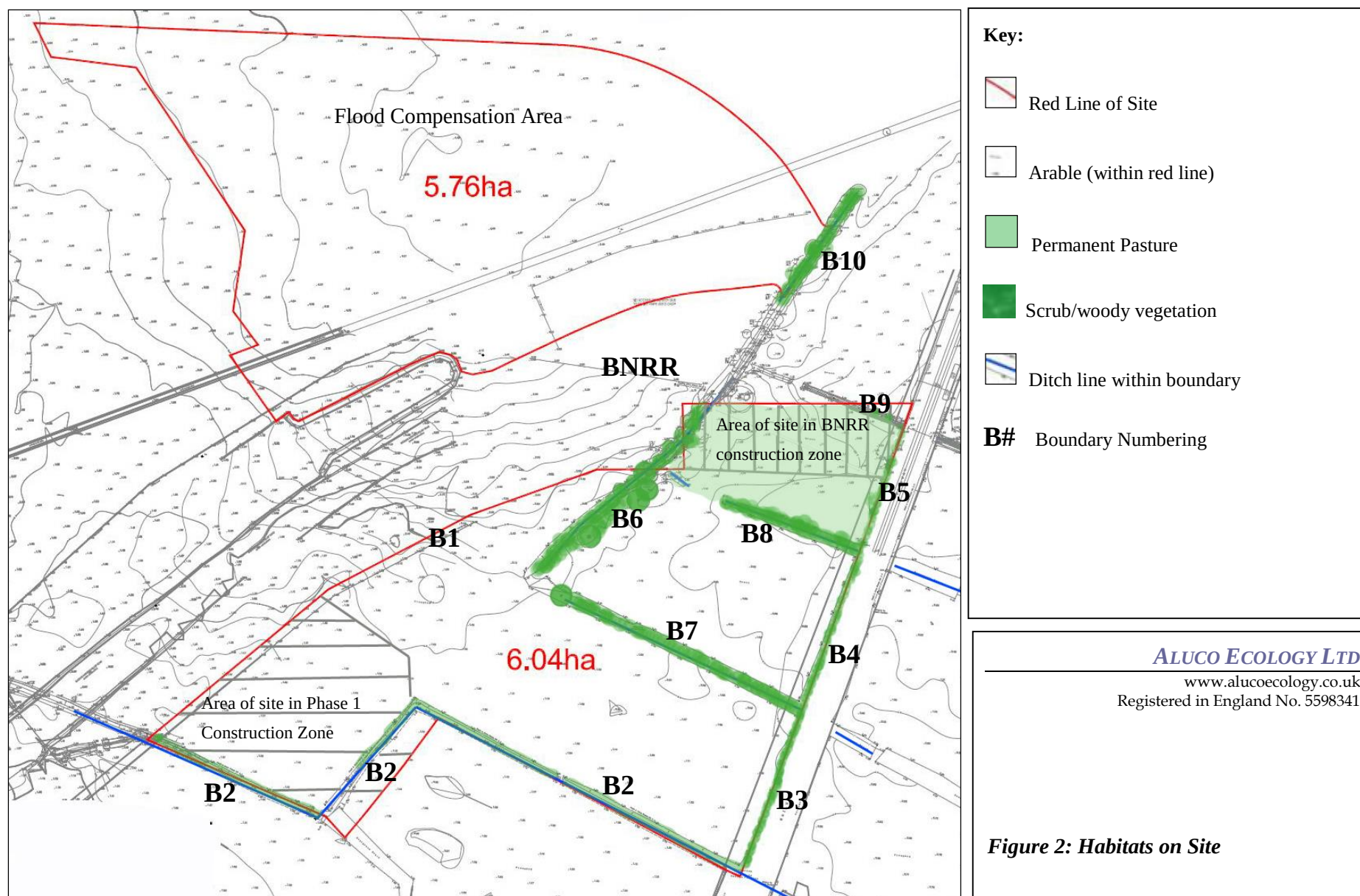
M=male, F=female, sub= sub adult, Juv = Juvenile slow worm under 2yrs

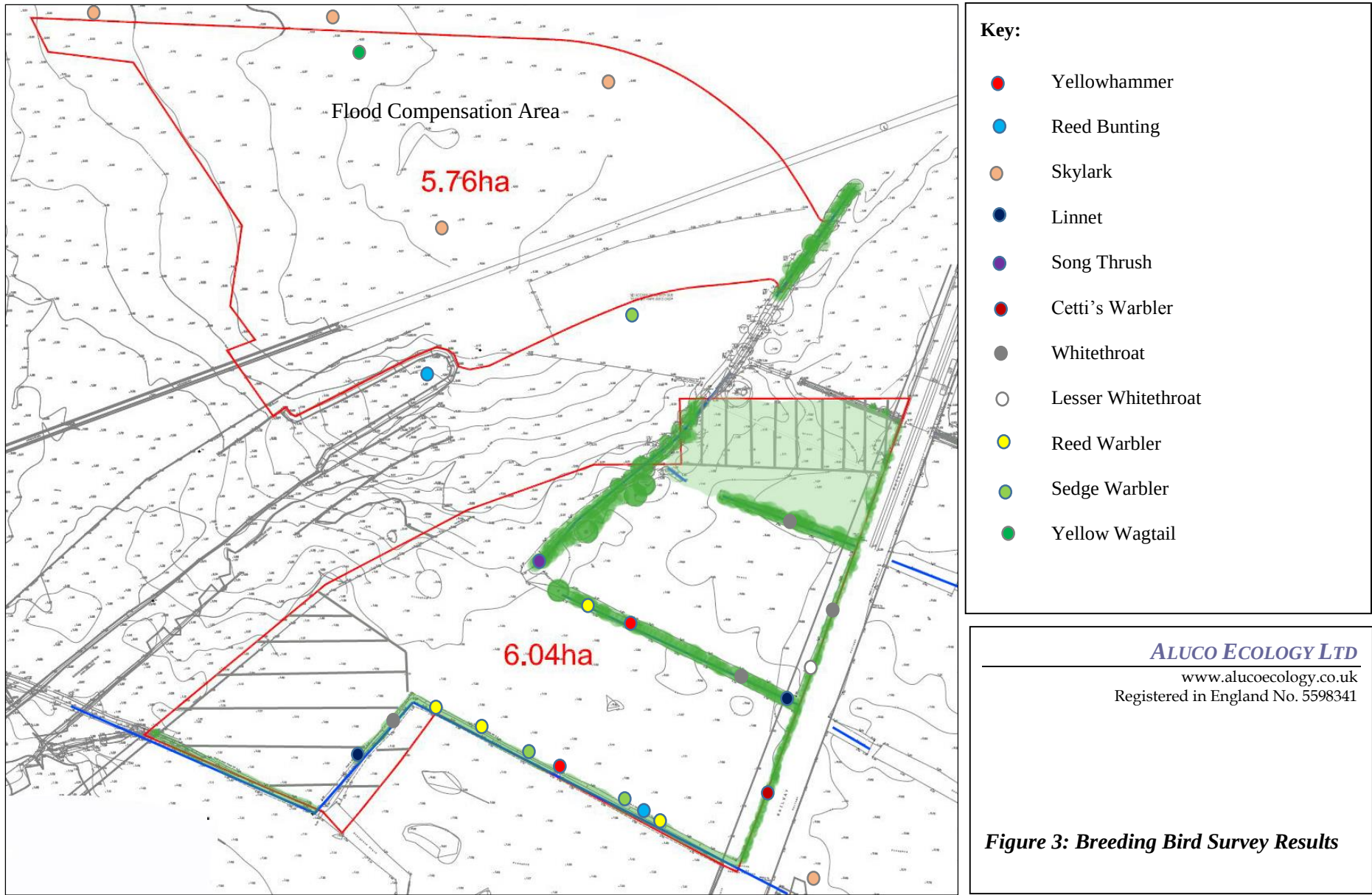
Evaluation

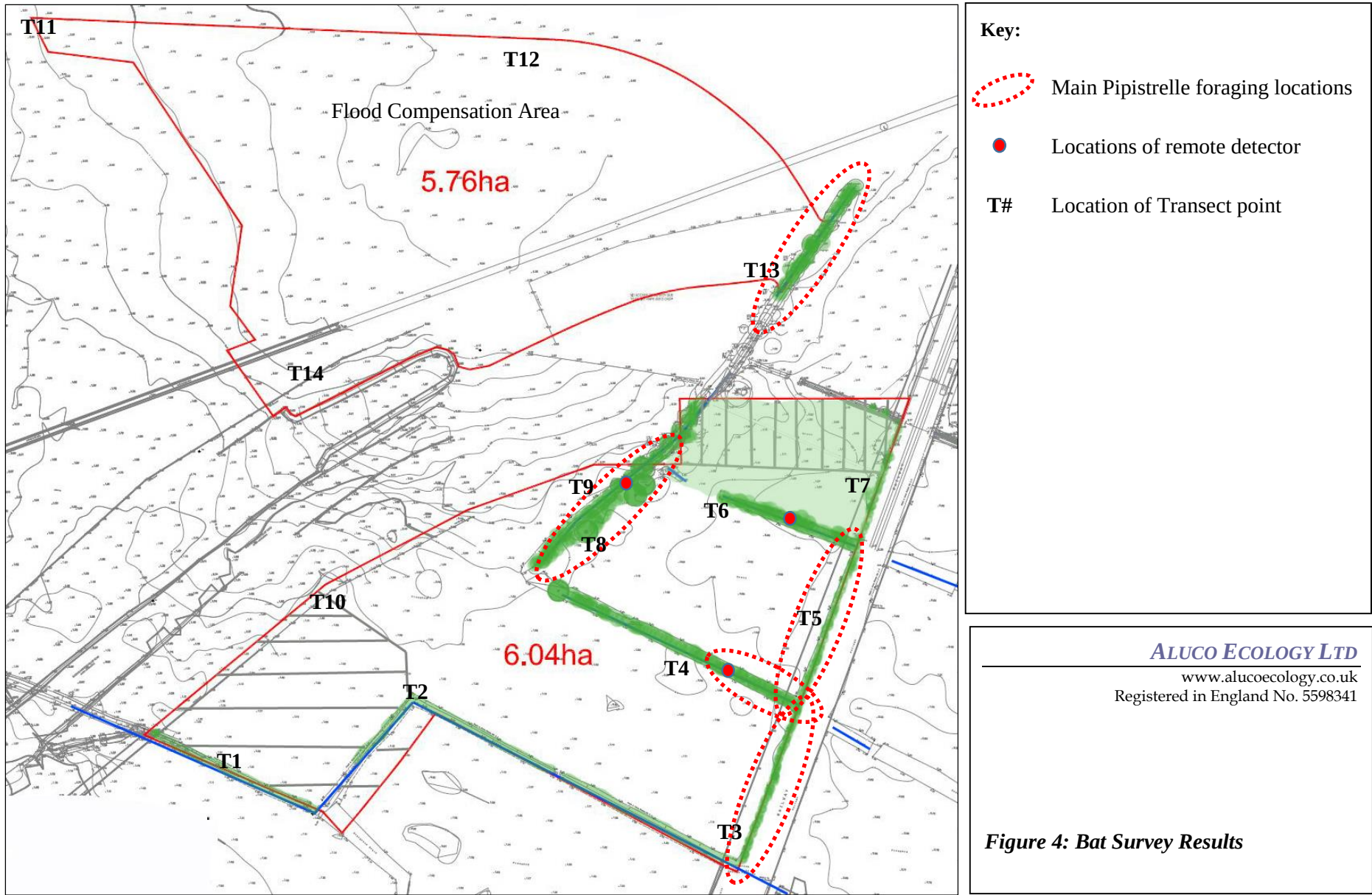
- 3.5.4 The survey only recorded a single species of reptile on the site, Slow Worm. This species was only recorded along boundaries B4, B6 and B8. A total of 3-5 individual Slow Worms were recorded, suggesting that the species is only present in low numbers. Habitat exists for the more mobile Grass Snake and as this has been recorded in the local area, it may occasionally use some of the boundary habitats on site.
- 3.5.5 The majority of habitats on site for reptiles are considered of negligible value for reptiles as the habitats are unsuitable (intensive arable farmland). The field boundaries around the main development area are considered to be of **value within the zone of influence** for reptiles on account of suitable marginal habitat that is likely to provide some suitable reptile habitat.

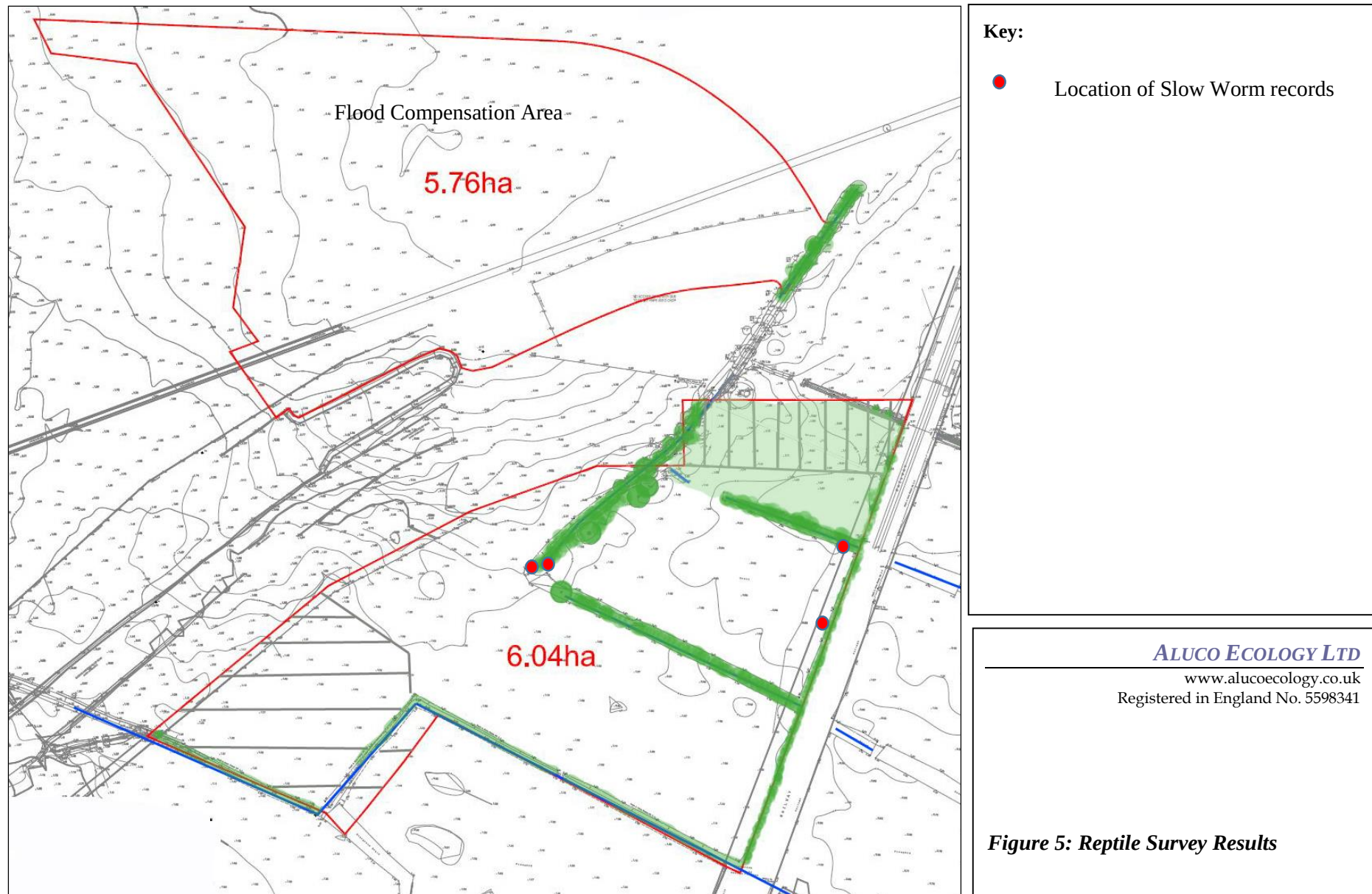
3.6 Other Notable Species

- 3.6.1 No other legally protected species are likely to occur on site. There is considered to be no suitable habitat on site for the legally protected Dormouse *Muscardinus avellanarius*, with some Bramble scrub that is generally not well connected along some of the field boundaries and species poor thorn scrub off site along the railway and along the southern boundary. The landscape is very open and no records of Dormouse are present in the wider local area. Great Crested Newt *Triturus cristatus* is also unlikely to be present on site on account of a lack of suitable breeding locations on or within proximity of the site, with the watercourses along the site boundaries being shallow and uniform; lacking in localised ponding even when drying out (likely to as a result of floodplain ditch maintenance works); shallow even during the winter periods (c20-30cm noted during late winter); and being connected to the 'on-line' Lidsy Rife with associated fish populations.
- 3.6.2 There is suitable habitat for the BAP species Brown Hare *Lepus europaeus*, but it has not been noted during survey work on site. Roe Deer *Capreolus capreolus* have been regularly recorded on site during survey work.









4.0 PROTECTED SPECIES MITIGATION & CONCLUSIONS

4.1 Mitigation

- 4.1.1 A reserved matters Application for the scheme should take into account the additional information provided by detailed protected species survey work in this report. Consideration should also be given to the assessment and mitigation options provided in the Ecological Appraisal of the site (Aluco Ecology, 2015). It is recommended that the mitigation for the site is provided at the detailed reserved Application stage in the form of (1) a series of protected species mitigation method statements to safeguard species and habitats during site construction and adhere to legal and policy requirements and (2) a detailed management plan for the retained and created habitats on site, providing habitat creation measures, and ongoing management prescriptions, to enhance the existing ecological features of the site and create new habitats. This management plan should be influenced by an experienced ecologist.
- 4.1.2 The strategy for mitigation on site should follow the broad principles set out below and shown at **Figure 6**.

(1) Protected species & habitats mitigation method statement

This should include the following:

- mitigation strategies for protected species during site construction, including methodologies and construction phasing and timing to adhere to best practice with regard to nesting birds, Reptiles, Badgers, Bats and Water Vole (taking a precautionary approach to mitigation);
- mitigation for retained habitats including adherence to British Standards for Tree Protection of retained woody habitats;
- retention and protection of semi-natural habitats within the proposed boundary buffer zones along boundaries B2, B3-5, B6, B9 & B10, including the mature Oak trees and Crack Willows in B7 & B7;
- The development would see loss of farmland habitat, with some potential for edge habitat and wetland habitat mitigation around buffer zones. There may also be potential for enhancing areas north of the BNRR for farmland birds in line with the Council's Green Infrastructure draft policy. Provision of bird nest boxes should also be considered in retained habitat as part of the strategy
- During construction any woody/reedy habitat that could contain a bird's nest should be removed outside of the nesting bird season, which is usually from end February to end August. It may be possible to check certain vegetation does not contain a bird nest during the nesting period, but this should only be done by a suitably qualified ecologist. The development construction can avoid impacts on ground nesting birds such as Skylark by ensuring that the season prior to construction crops aren't planted and the ground is left ploughed bare. Weed growth should be restricted.
- Provision of Bat Boxes in retained woody features in suitable locations on site;
- Influence on a detailed lighting strategy to ensure best practice principles for avoiding light impacts bat flight lines and retained semi-natural habitat is reduced and avoided;

- Avoiding potential secondary impacts to Badgers from a working construction zone (see Aluco Ecology, 2015);
- Pre-construction updated Water Vole monitoring on affected habitats and adherence to best practice mitigation techniques (currently Strachan, 2012 – but to be updated soon). Information on best practice techniques is summarised in Aluco Ecology, 2015;
- A reptile mitigation strategy to relocate the low population of reptiles to suitable retained habitats within the buffer zones of the site and retained boundaries. Given the results of the survey work, there is sufficient habitat for reptiles to be retained on site in a detailed scheme. Reptile translocation should follow best practice for mitigation (outlined in Aluco Ecology, 2015);
- detailed mitigation options for pollution prevention control on features of importance such as the watercourses/ditches around the site and off site;
- Updated survey work for protected species, if a reserved matters Application takes 3 years following this survey where habitats on site remain broadly the same, with the exception of Badgers and Water Vole that should be updated every 12 months and pre-construction.

(2) Management Plan for retained and created habitats

This should include the following:

- detailed design of the open spaces on site taking into account ecological information in this report and the Ecological Appraisal (Aluco Ecology, 2015);
- creation of new habitat in open spaces around the site including the 8m buffer along B2 and the 15m buffer along the railway (B3-B5). This should include habitat creation for loss of woody boundary features, seasonal ditches, and floodplain grasslands. Habitat creation of features should recreate habitat 1:1. This can be thorough planting new hedgerows along the development site of the buffer zones and providing wetland habitats, including ditches, ponds and damp grasslands within the buffer zone and adjacent to the retained ditch/watercourse network;
- Habitat creation should be from locally sourced native stock of species and include species that are present in the local area and characteristic of the Lidsey Rife floodplain;
- More formal landscaping around the site can also be influenced by native species planting, with nectar rich, berry bearing and fruiting trees also providing additional wildlife opportunities;
- Creation of new habitats will need to be created in liaison with other requirements including hydrological and landscape mitigation and the provision of such mitigation should have regard to ecological opportunities;
- A management plan for the retained and created habitats on site should provide prescriptions for ongoing establishment and management of vegetation and semi-natural habitats, including reduced rotation cutting of hedgerows for wildlife benefit, reduced rotation management of watercourses and wetlands, consultation with any local Environment Agency management recommendations for the watercourses, and suitable timing of such work;

- Management prescriptions should have regard to retaining habitat for protected species recorded on the site, and enhancing such habitats where possible.

4.2 Conclusions

- 4.2.1 Additional protected species survey work has been undertaken during April – July 2015 on land at Oldlands Farm, Phase 2 area. This has recorded the presence of protected species in low numbers, including a breeding and wintering bird assemblage with declining farmland species present, low use by a number of Bat species for foraging, potential for Water Vole presence in the main watercourse particularly along the southern boundary of the site, and low populations of reptiles restricted to the field margins in a few localities.
- 4.2.2 The habitats on site, location and use of the site by protected species suggests that mitigation and habitat creation options are possible to provide mitigation and enhancements in retained areas to biodiversity on the site, and if necessary within the flood compensation area, through a future development scheme. This has been set out in outline above and in the Ecological Appraisal (Aluco Ecology, 2015). A detailed reserved matters Application for the scheme should look at providing the detailed mitigation and enhancement strategies for ecological features as part of the scheme proposals.



5.0 REFERENCES

Aluco Ecology (2015) Ecological Appraisal, Land at Oldlands Farm, Phase 2 Bognor Regis

Aluco Ecology (2012) BNRR Update Ecology Mitigation for Bognor Northern Relief Road, Lidsey Rife Temporary Crossing Works & Adjacent Watercourses

Aluco Ecology (2011) BNRR Update Ecology Strategy Bognor Northern Relief Road, A29 – Stanover Lane Section.

Aluco Ecology (2008) Felpham Site 6 and Bognor Northern Relief Road, Ecological Mitigation Strategy;

CIEEM (2015) Guidelines for Ecological Report Writing

IEEM (2006). Guidelines for Ecological Impact Assessment in the United Kingdom, Institute of Ecology and Environmental Management, Winchester.

Strachan R, ed (2012) The Watervole Conservation Handbook, third Edition Wildcru

Technical Appendix 1

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.

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/uksi/2010/490/regulation/42/made>

2013-2028 Draft Local Plan Policies

Policy DM 26

Development and Biodiversity

Development schemes shall, in the first instance, protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement.

Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person.

All developments shall have regard to Natural England's standing advice for protected species.

Developments shall also be consistent with all other local plan policies.

Policy SP 23

Natural Environment

Arun District Council will encourage and promote the conservation and enhancement of biodiversity and the natural environment through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects sites listed in Tables 19.1-19.6 that are recognised for the species and habitats contained within them.

Name	New Site Code ⁽³⁾
Pagham Harbour	UK 11052

Table 19.1 Ramsar Sites

Name	Site Code
Pagham Harbour	UK 9012041
Arun Valley	UK 9020281

Table 19.2 Special Protection Areas

Name	Site Code
Pagham Harbour	1000243
Bognor Reef	1000219
Felpham	1000357
Climping Beach	1000225

Table 19.3 Sites of Special Scientific Interest

Name	Site Code
Pagham Harbour	1009061
West Beach	1009233

Table 19.4 Local Nature Reserves

Name	Site Code
Ferring Rife & Meadows	Ar12
Littlehampton Golf Course and Atherington Beach, Littlehampton	Ar06
Elmer Rocks	Ar18
Fontwell Park Race Course	Ar01

Table 19.5 Sites of Nature Conservation Importance

Name	Site Code
Felpham Foreshore, Bognor Regis	1475602
Climping Sand Dune System	1475611
Bognor Foreshore	1475600
Pagham Harbour	1475608

Table 19.6 Local Geological Site

Policy DM 34

Designated Nature Sites

It is the policy of the Council to maintain, protect and where possible enhance the conservation value of International, European, National and Local designated sites as listed in Tables 19.1 - 19.6. Development not directly connected with or necessary to the management of the designated site(s) and which is likely to have an adverse effect on the site(s), will generally not be permitted however such development may be permitted where any of the following can be demonstrated:

1. there is no alternative solution (which shall be adequately demonstrated by the developer) or
2. there are reasons of public health or public safety or
3. there are benefits of primary importance to the environment or
4. there are imperative reasons of overriding public interest

Notwithstanding the above however, the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined.

Where development is permitted, the use of conditions or planning obligations will be used in order to avoid and minimise harm to the site(s). In any event, any adverse impacts shall be minimised and mitigated or compensated in full as agreed with the planning authority.

Developments shall also be consistent with all other local plan policies.

Policy DM 35

Pagham Harbour

1. Within Zone A (<400m) as identified on the Proposals Map, development will only be permitted in exceptional circumstances which shall be demonstrated by the developer. These circumstances shall relate to the impact, type and the effects of any proposed development on Pagham Harbour, including on non-native species.

2. Within Zone B (400m – 5km) all new residential development will be required to:

(a) contribute financially towards improved access management at Pagham Harbour. Access management measures shall be undertaken and shall include wardening, access management and site protection, habitat improvements, provision for interpretation, education and signage and monitoring of wildlife and visitor numbers

and

(b) create easily accessible new green spaces for recreation within or adjacent to the development site, or to make developer contributions towards the provision of such green spaces to serve the area. New spaces shall be capable of accommodating the predicted increases in demand for local walking and dog walking. Good pedestrian links shall be provided between housing areas and new and existing green space in order to discourage car use.

3. Large scale developments taking place outside Zone B and close to its boundary will be considered on a case by case basis for potential effects on Pagham Harbour, and the need for avoidance or mitigation measures.

A tariff will be set to ensure sufficient funds are available to secure the required access management measures and the provision of alternative green space of a suitable size, design and location, where necessary, in advance of the occupation of new development and to ensure it is appropriately managed in perpetuity.

Developments shall also be consistent with all other local plan policies.

Policy DM 36

Appropriate Assessment

An Appropriate Assessment shall be carried out in respect of any plan or project likely to have a significant effect on Pagham Harbour or any other Natura 2000 sites outside the district (where appropriate), either individually or in combination with other plans or projects. If after completing an Appropriate Assessment of a plan or project the Planning Authority is unable to conclude that there will be no adverse effect on the integrity of these sites, the project will not be approved, unless otherwise in compliance with the Habitats Directive.

Projects which may give rise to significant cumulative, direct, indirect or secondary impacts on these sites will only be permitted (either individually or in combination with other plans or projects) for reasons of overriding public interest.

Developments shall also be consistent with all other local plan policies.

Policy DM 37

Non Designated Sites

Within Biodiversity Opportunity Areas (BOA's) and the Marine Conservation Zone (MCZ) (see Proposals Map), development shall

(i) retain and sympathetically incorporate locally valued and important habitats, including wildlife corridors and stepping stones

(ii) be designed in order to minimise disturbance to habitats

Where development proposals are likely to have an impact on species or habitats within either the BOA's or recommended MCZ, any application for planning permission shall include a properly conducted survey of the presence of that species and habitat and any impact that development may have on either. Development proposals that do not reasonably address opportunities for enhancing BOA's and the recommended MCZ through their design, layout and landscaping shall not be permitted. Where a development scheme would result in a habitat loss, mitigation measures shall be proposed as part of the proposed scheme and such measures agreed with the planning authority prior to the determination of any planning application.

Developments shall also be consistent with all other Local Plan policies.

Policy DM 38

Protection of Trees

Development will only be permitted where it will not damage or destroy tree(s) protected by a tree preservation order(s), (TPO) identified as ancient woodland, in a conservation area or contributing to local amenity, unless to do so:

- (i) would result in the removal of one or more trees in the interests of good arboricultural practice. This shall be demonstrated by the developer following the advice of a suitably qualified person which shall be guided by BS 5837. Details of any advice received having regard to BS 5837 shall be submitted, in writing, as part of a planning application or
- (ii) would enhance the survival and growth prospects of other protected trees
- (iii) the benefits of the proposed development in a particular location outweigh the loss of trees or woodland, especially ancient woodland

Where planning permission is granted in any of the above instances, conditions shall be used to ensure that, for any trees which are removed as part of a development, at least an equivalent number of a similar species and age (where practical) are planted on the proposed development site. Sufficient space for replacement trees to mature shall be provided. The planting of new trees shall form an integral part of the design of any development scheme.

Proper provision must be made for the protection and management of trees or areas of woodland on-site when undertaking development. A management plan shall be provided as part of a planning application in accordance with BS 5837 in order to ensure that trees are adequately protected during development. Conditions for the continued protection of trees on sites shall be included in any planning consent given.

Where there are existing trees on or adjacent to a development site, developers shall be required to provide:

- (i) land and tree surveys
- (ii) a tree constraints plan
- (iii) an arboricultural implications assessment to include a tree protection plan and arboricultural method statement

These will ensure that development is planned to take a comprehensive view of tree issues at an early stage in the design process and that development works do not have a negative impact on existing trees.

Developments shall also be consistent with all other Local Plan policies.

ARUN LOCAL PLAN POLICIES

Policies Relevant to Ecology saved from the Local Plan 2011 (Adopted 2003)

POLICY GEN3 Protection of the Countryside

Outside the Built-Up Area, as defined on the Proposals Map, the countryside will be safeguarded for its own sake. Development will not be permitted unless:

- (i) it meets the operational needs of agriculture, forestry, the extraction of minerals or the deposit of waste; or
- (ii) for quiet, informal recreation; or
- (iii) for the diversification of the rural economy; or
- (iv) for essential road schemes; or
- (v) it is in accordance with a policy in Sections 2 and 3 of the plan referring to a specific use or type of development.

Permission will not be given for the extension of isolated groups of buildings or the consolidation of linear or sporadic development unless the proposal accords with criteria (i) to (iii) or (v).

POLICY GEN23 The Water Environment

Development will not be permitted if it would have a direct or indirect unacceptable adverse impact on the water environment, notably in relation to rivers, ponds, wetlands, public access in river corridors and water related recreation.

Where appropriate, the Council will support initiatives which seek to restore or enhance the water environment.

POLICY GEN25 Water Resources

Development will only be permitted where the Local Planning Authority is satisfied that adequate water resources are available or will be provided in time to serve the development, and that provision is not considered detrimental to existing abstractions, river flows, water quality, fisheries, amenity or nature conservation.

POLICY GEN26 Water Quality

Development will only be permitted where the Local Planning Authority is satisfied that it would not lead to a deterioration in the quality or potential yield of surface and ground water resources.

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.

Retained Ecology Policies of the West Sussex Structure Plan 2001-2016

Nature conservation

Policy ERA2

(a) Development should not be permitted unless the wide range of habitats, species and geological features of the County will be protected, conserved and, where possible, enhanced particularly through long-term management mechanisms and habitat creation schemes. A particularly high level of protection should be afforded to sites and features of national and international importance. Proposals for the extension or creation of new habitats should be permitted provided that they are consistent with wider environmental objectives.

(b) Local plans will include policies to:

(1) ensure that site evaluation is undertaken to establish the nature conservation importance of proposed development sites;

(2) protect sites or features of nature conservation importance, including those protected under legislation and prevent development unless there are no alternative solutions and there are overriding reasons which outweigh the need to safeguard the value of sites or features;

(3) ensure that where development would result in the loss of an important nature conservation resource, a new resource is provided which is of at least equivalent value, where possible;

(4) where appropriate, secure the restoration, creation and management of habitats through development proposals; and

(5) where necessary, ensure the investigation and recording of sites and features of nature conservation importance, and, where appropriate, the preservation of any finds.

CIEEM Evaluation Guidelines

Assessment Guidelines

Introduction

The IEEM guidelines (2006) provide three principal reasons for an ecological feature being valued and therefore included within the EcIA: biodiversity value, social/community value, and economic value.

The evaluation and assessment undertaken assigns one of a number of value labels based on a geographic scale as follows:

- International
- National
- Regional
- County
- District
- Local (Parish)
- Within the zone of influence
- Negligible

Value is determined with reference to the following factors:

- level of designation (sites) or biodiversity-based protection (legal and policy);
- biodiversity value (e.g. inclusion in Biodiversity Action Plans, rarity, position in ecosystem, assemblages and communities, size and diversity);
- social and economic value;
- legal issues (eg protected sites).

Breeding Bird Survey Methods

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.

Categorisation of Records

The nomenclature used follows Knox, A.G., Collinson, M., Helbig, A.J., Parkin, D.P. and Sangster, G. 2002. Taxonomic recommendations for British birds. *Ibis* 144 : 707-710.

For site evaluations reference is given to BAP species, species listed in Schedule 1 of the Wildlife & Countryside Act 1981, and species listed under birds of Conservation Concern in the UK (Eaton *et al.*, 2009). The criteria for the latter is given below:

Red listed species are those that meet the following criteria:

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 are those that meet the following criteria and not also Red List criteria:

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 (WI) population found in the UK.

References

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

Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD (2009) Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102, pp296–341

Marchant J H (1980) "Common Bird Census Instructions" BTO

Natural England Standing Advice on Wild Birds available at <https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals>

Full List of Birds Recorded On or Adjacent to the Site or Flying Over

Mallard Anas platyrhynchos AC2C4	Sedge Warbler Acrocephalus schoenobaenus A
Grey Partridge Perdix perdix AC	Eurasian Reed Warbler Acrocephalus scirpaceus A
Common Pheasant Phasianus colchicus C1	Blackcap Sylvia atricapilla A
Grey Heron Ardea cinerea A	Lesser Whitethroat Sylvia curruca A
Common Kestrel Falco tinnunculus A	Common Whitethroat Sylvia communis A
Northern Lapwing Vanellus vanellus A	Common Chiffchaff Phylloscopus collybita A
Lesser Black-backed Gull Larus fuscus A	Goldcrest Regulus regulus A
Herring Gull Larus argentatus A	Long-tailed Tit Aegithalos caudatus A
Stock Pigeon Columba oenas A	Blue Tit Cyanistes caeruleus A
Common Wood Pigeon Columba palumbus A	Great Tit Parus major A
Eurasian Collared Dove Streptopelia decaocto A	Black-billed Magpie Pica pica A
Barn Owl Tyto alba A	Eurasian Jackdaw Corvus monedula A
Tawny Owl Strix aluco A	Carrion Crow Corvus corone A
Common Swift Apus apus A	Common Starling Sturnus vulgaris A
Green Woodpecker Picus viridis A	House Sparrow Passer domesticus A
Sky Lark Alauda arvensis A	Chaffinch Fringilla coelebs A
Barn Swallow Hirundo rustica A	European Greenfinch Carduelis chloris A
House Martin Delichon urbicum A	European Goldfinch Carduelis carduelis A
White / Pied Wagtail Motacilla alba A	Common Linnet Carduelis cannabina A
Winter Wren Troglodytes troglodytes A	Yellowhammer Emberiza citrinella A
Hedge Accentor Prunella modularis A	Reed Bunting C26 A
European Robin Erithacus rubecula A	Common Buzzard Buteo buteo A
Northern Wheatear Oenanthe oenanthe A	
Common Blackbird Turdus merula A	
Song Thrush Turdus philomelos A	
Cetti's Warbler Cettia cetti A	

Total = 47 species

Nomenclature follows - Knox, A.G., Collinson, M., Helbig, A.J., Parkin, D.P. and Sangster, G. 2002.
Taxonomic recommendations for British birds. Ibis 144 : 707-710.

Key

- A Species that have been recorded in an apparently natural state at least once since 1 January 1950.
C1 Naturalized introduced species – species that have occurred only as a result of introduction

Bat Survey Methodology

Bat Emergence and Activity Monitoring

1) Trees Survey Method

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).

Initial Survey

Tree survey methodology involves looking for any suitable holes, cracks, niches 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 some potential to support bats. These are all termed potential roost features.

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 are considered.

The potential for trees to support roosting or breeding bats is evaluated under the following protocol for the visual inspection of trees:

Tree category and description	Stage 1 Initial survey requirements	Stage 2 Further measures to inform proposed mitigation	Stage 3 Likely mitigation
Known or confirmed roost	Follow SNCO guidance and these guidelines wherever possible, to establish the extent to which bats use the site. This is particularly important for roosts of high risk species and/or roosts of district or higher importance and above		The tree can be felled only under EPS licence following the installation of equivalent habitats as a replacement.
Category 1* Trees with multiple, highly suitable features capable of supporting larger roosts	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. <i>A consultant ecologist is required</i>	Avoid disturbance to trees, where possible. Further dusk and pre-dawn survey to establish more accurately the presence, species, numbers of bats present and the type of roost, and to inform the requirements for mitigation if felling is required.	Felling would be undertaken taking reasonable avoidance measures' such as 'soft felling' to minimise the risk of harm to individual bats.
Category 1 Trees with definite bat potential, supporting fewer suitable features than category 1* trees or with potential for use by single bats	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. <i>A consultant ecologist required</i>	Avoid disturbance to trees, where possible. More detailed, off the ground visual assessment. Further dusk and pre-dawn survey to establish the presence of bats, and if present, the species and numbers of bats and type of roost, to inform the requirements for mitigation if felling is required.	Trees with confirmed roosts following further survey are upgraded to Category 1* and felled under licence as above. Trees with no confirmed roosts may be downgraded to Category 2 dependent on survey findings
Category 2 Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks or crevices being found; or the tree supports some features which may have limited potential to support bats.	None. <i>A consultant ecologist is unlikely to be required</i>	Avoid disturbance to trees, where possible. No further surveys.	Trees may be felled taking reasonable avoidance measures. Stop works and seek advice in the event bats are found, in order to comply with relevant legislation.
Category 3 Trees with no potential to support bats	None. <i>A consultant ecologist is not required unless new evidence is found</i>	None.	No mitigation for bats required.

Adapted from a protocol by Corylus Ecology Ltd in BCT (2012)

Detailed Tree 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.

(2) Bat Activity Survey

Introduction

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

Line transects are carried out by a surveyor carrying a bat detector/s (example used, Bat box Duet , Petterson D240x, Anabat SD1) who walks at a constant speed along a planned route and records sound for subsequent analysis, and/or bat passes or species. The data collected can be used to provide an index of bat activity along the transect. Line transects are best suited to open habitats with linear features, such as hedgerows, field boundaries and woodland rides. Transect surveys, when repeated should be undertaken in opposite directions and, if possible, started from different points along the route. The number of transects required to cover the main habitat features depend on the size and complexity of the site. Transects should be sampled within 2-3 hours after sunset. The transect methodology identifies listening points where a minimum of 3 minutes recording is undertaken along the route and or combined with activity monitoring with recording equipment left for longer periods recording all bat passes. (BCT, 2012)

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.

In addition the Anabat SD1 Automated recorder was used to allow greater survey intensity than with manual bat detector surveys. They can allow longer periods of time coverage than could be practically and economically covered by manual survey, 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 event / bat passes.

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 follow 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 bat passes 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).

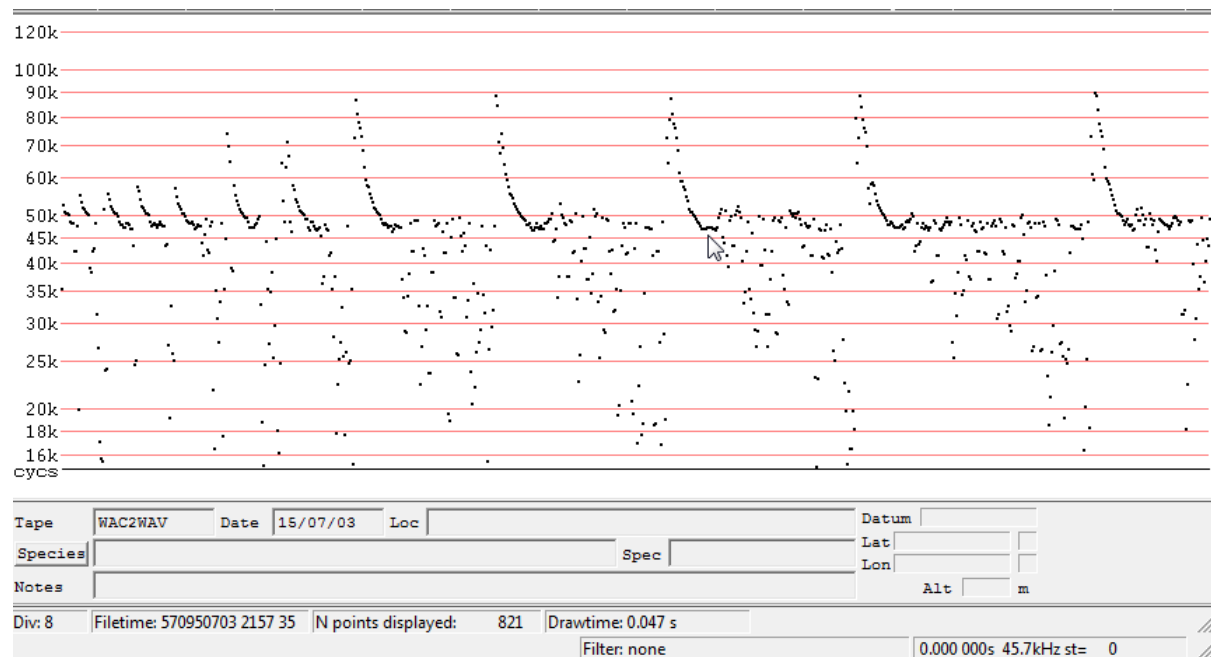
References

Bat Conservation Trust. (2012) Bat Surveys Good Practice Guidelines. 2nd Edition. Bat Conservation Trust. March 2012. ISBN-13: 9781872745985

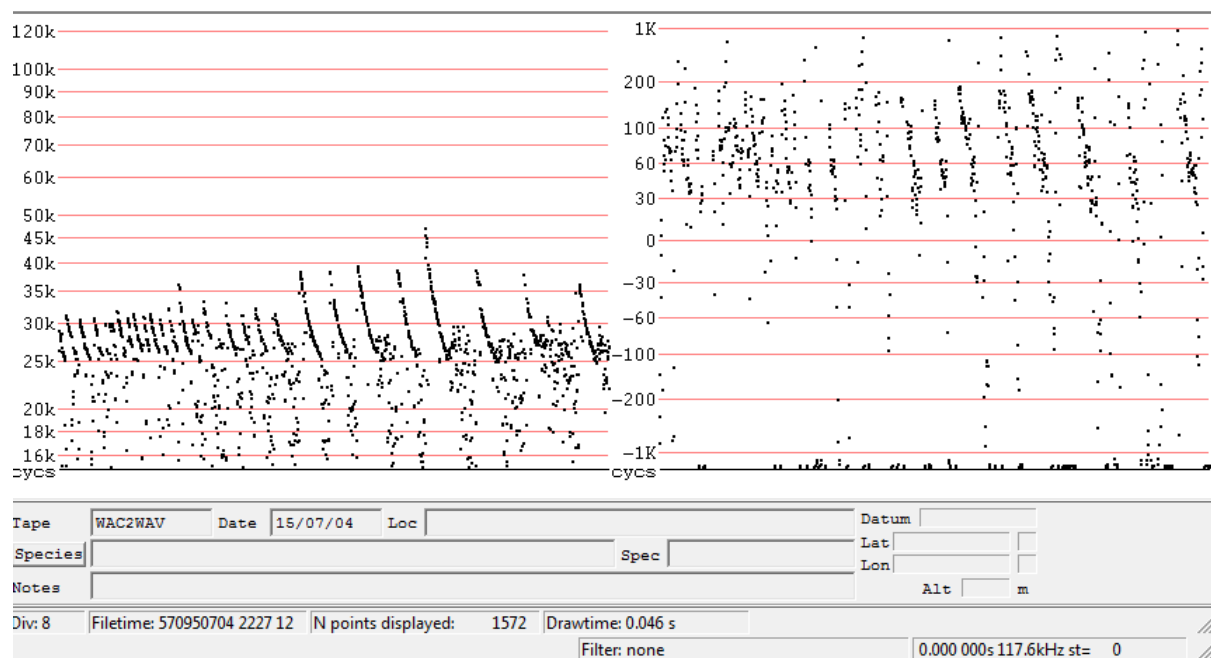
Mitchell-Jones ed. (2006) "Bat Conservation Handbook" Third Edition, English Nature

Natural England (2013) Standing Advice for Bats via <https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals>

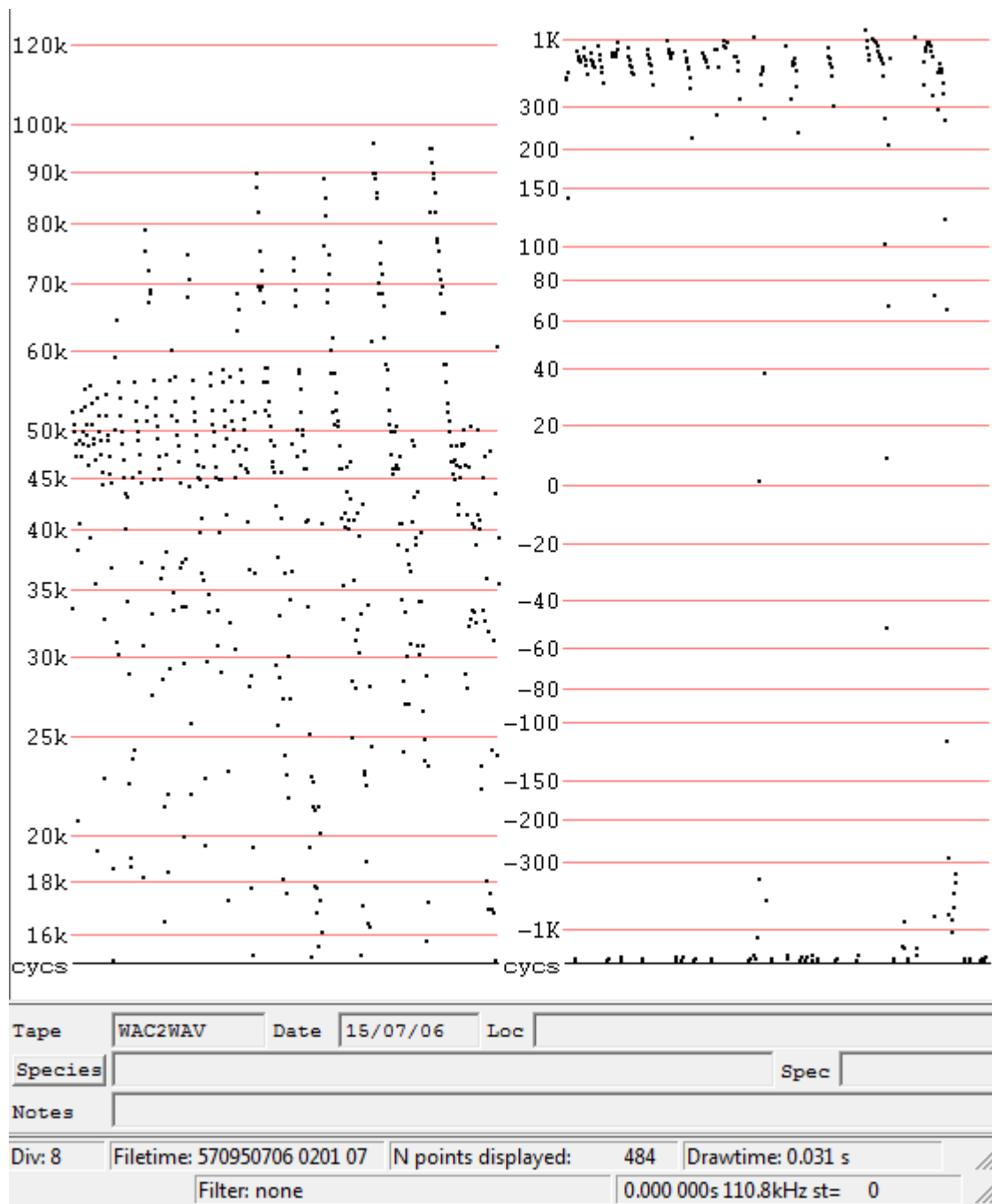
Sample Sonograms of Bat Species recorded.



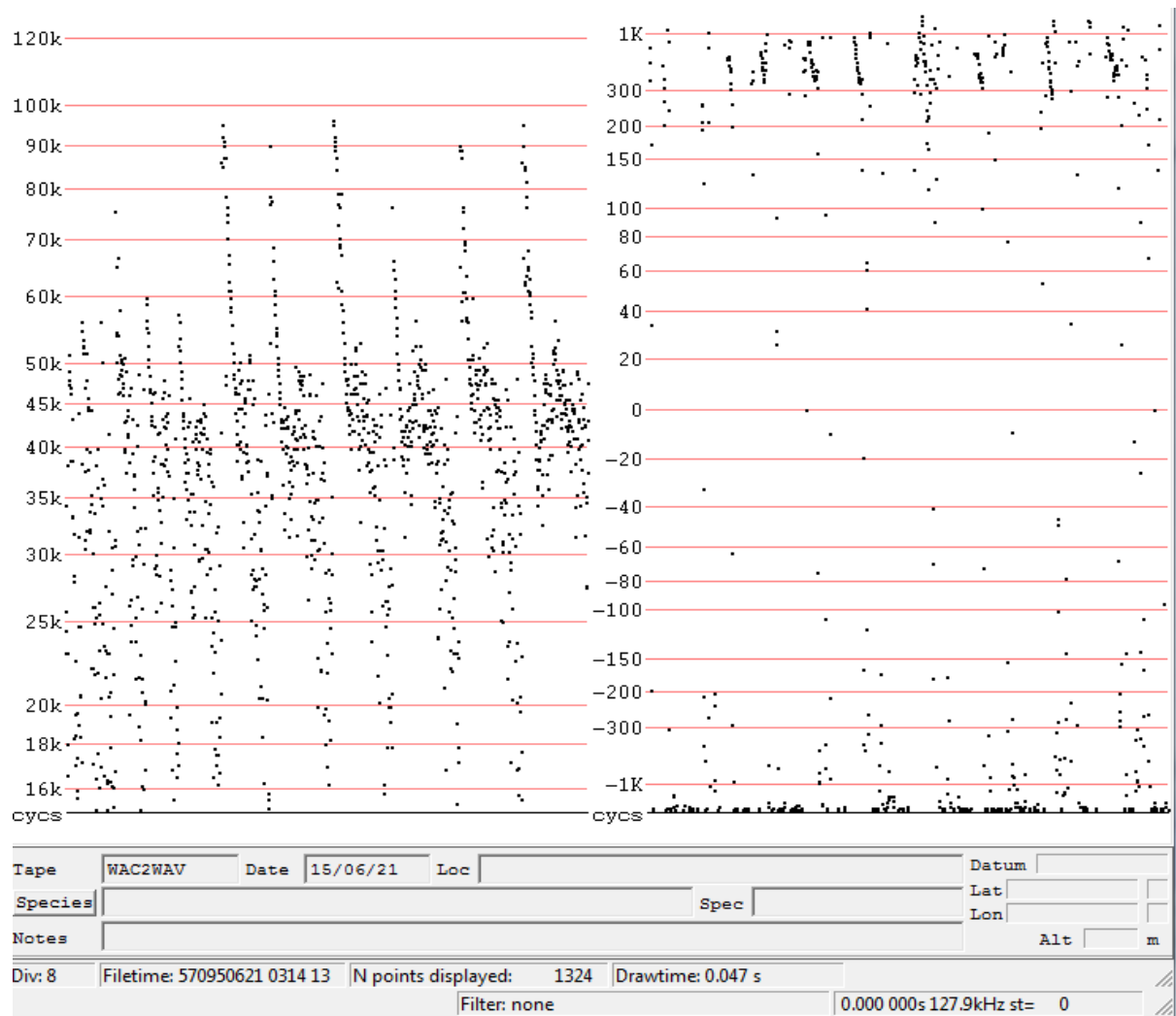
Common Pipistrelle



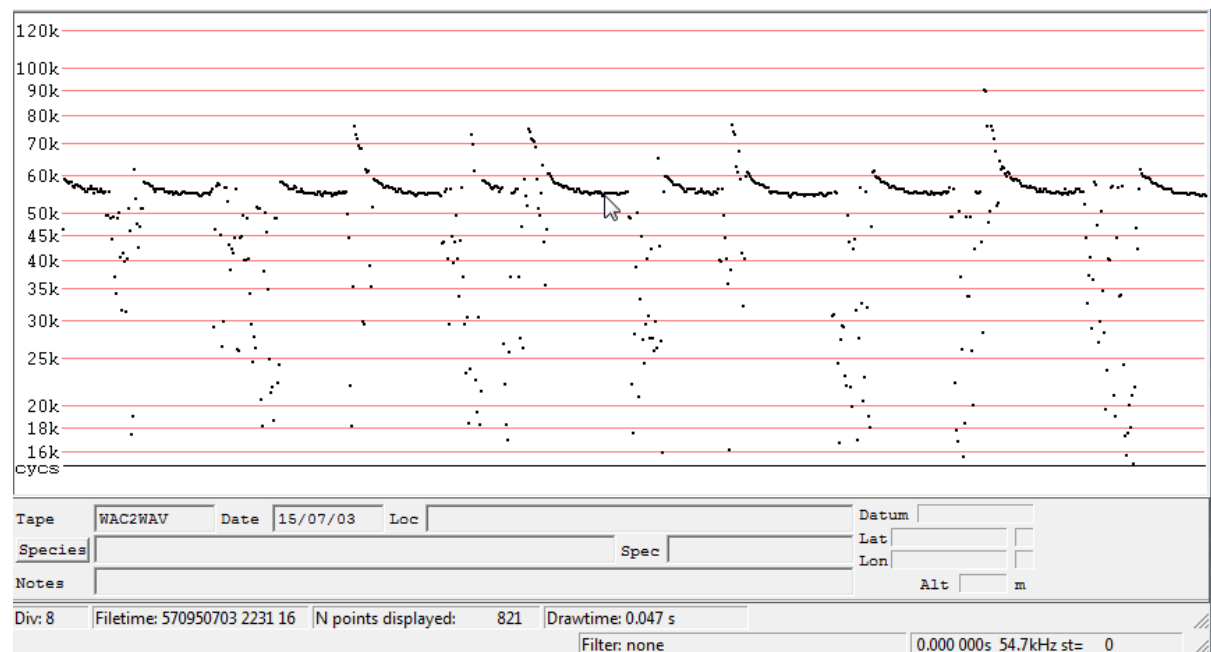
Serotine



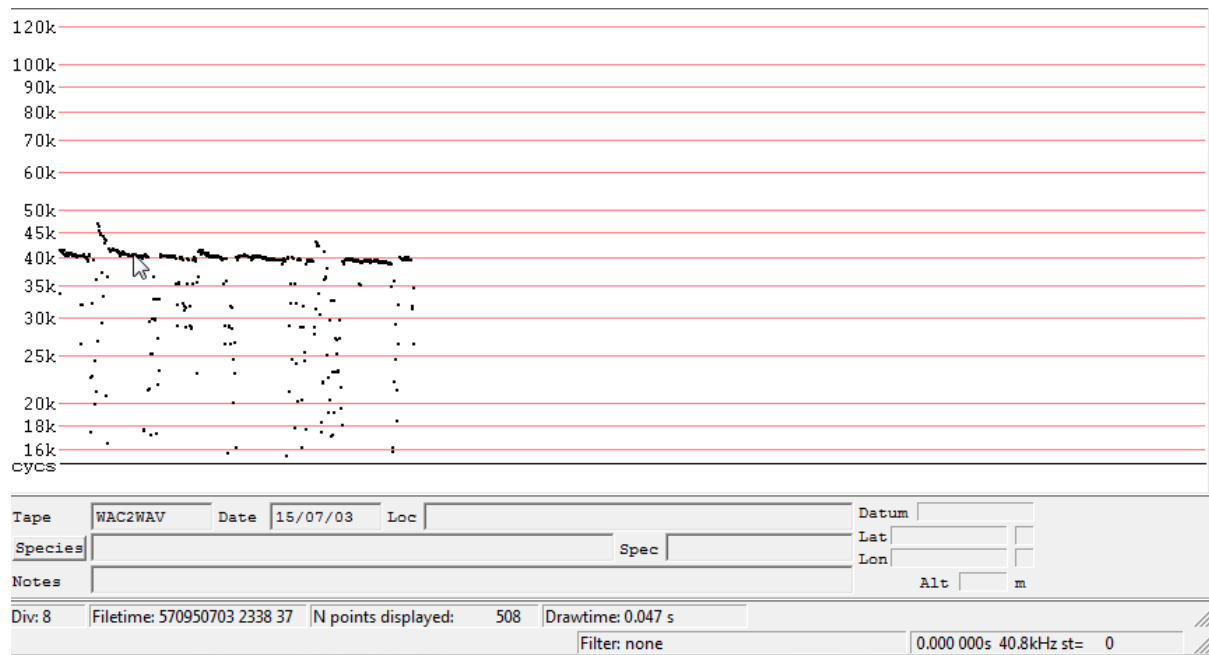
Probable Natterers's



Probable Whiskered



Soprano Pipistrelle



Nathusius's Pipistrelle

Badger Survey Methodology

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.

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 (2015) Standing Advice for Badgers via <https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals>

Water Vole Survey Methodology

Introduction

Both Otter *Lutra lutra* and Water Vole *Arvicola terrestris* are afforded protection under the Wildlife & Countryside Act 1981 (as amended). Otters are also afforded protection under Annex II and IV of the Habitats Directive, which is implemented in the UK through the Habitat Regulations 2010. Water Voles and their habitat are protected under the Wildlife & Countryside Act, which was amended in 1998 and 2008 to protect their habitat and individuals from harm (respectively); whilst both Otters and their habitat are protected under the Habitat Regulations.

Survey Techniques for Water Vole

Site surveys for water vole will again begin with a desk top survey to understand the local area populations of Water Vole. This will then allow a field survey to be targeted.

Field survey work involves identifying all potential Water Vole habitat, rivers, wetlands, watercourses and ditches and surveying in detail each area of habitat within the study area/development site. The field survey examines habitat for the following signs of Water Vole presence:

1. Faeces;
2. latrines;
3. Feeding Stations;
4. Signs of feeding on marginal aquatic vegetation;
5. Burrows.
6. Footprints

Water Vole reduce their activity during the winter period, therefore survey work during winter will be aware of this potential issue. The optimum time for survey is between March and October.

References

Design Manual for Roads & Bridges (DMRB) (1999) Volume 10 Section 1 Part 9 HA 81/99 Nature Conservation Advice in Relation to Otters.

English Nature (2001) Water Voles and Development A Good Practice Guide, English Nature, Peterborough

Natural England (2015) Standing Advice for Watervoles and Otters via <https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals>

Strachen et al (2012) Watervole Conservation Handbook 3rd Edition

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

Herpetofauna 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.

Natural England (2015) Standing Advice for Reptiles via <https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals>

