

Land Off St Mary's Road
Hayling Island
December 2016
Ecological Survey Report



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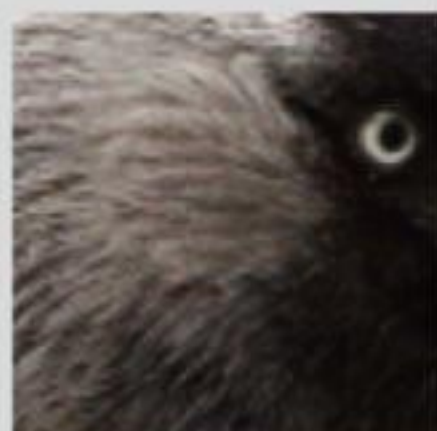
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I Introduction

I.1 The Proposed Development

- 1.1.1 Gladman Developments Limited is seeking outline planning permission for up to 230 residential dwellings and associated open space at Land Off St Mary's Road, Hayling Island.
- 1.1.2 The proposed development could potentially result in impacts on the ecological features of the site and/or its surroundings. This report details the results of targeted Phase 2 surveys for the site and describes features of ecological value found to be present. It also provides advice to help minimise impacts, thereby enabling the development to comply with current nature conservation policy and legislation.

I.2 Site Description

- 1.2.1 The site at Hayling Island is located off St Mary's Road, near Gable Head at [SZ 719 998] (approximate centre of the site) – see Figure 1 for location and approximate red-line boundary.

Figure I. Site Location



1.3 Study Scope

- 1.3.1 Baker Consultants was previously commissioned by the client to undertake a Phase 1 habitat survey and desk study, and an appraisal for protected and/or notable flora and fauna. Subsequently, further survey was recommended to gain further understanding of the value of habitats on the site and to establish the use of these habitats by fauna. Surveys carried out as part of this stage of the assessment included:
- Bat activity surveys (transects and automated detectors)
 - Breeding bird survey
 - Reptile surveys
 - Great Crested Newt surveys
- 1.3.2 The results of these surveys are presented in this report along with an assessment of impacts arising from the proposed scheme.

1.4 Surveyor Qualifications and Experience

- 1.4.1 The survey work was coordinated by Rich Hall MCIEEM, a senior ecologist with 10 years of ecological survey and project experience. The bat and great crested newt surveys were undertaken by ecologists Rich Hall and Courtenay Holden GradCIEEM, and experienced surveyors Lisha Adcock, Erika Dahlberg and Hayley Johnstone.
- 1.4.2 Breeding bird surveys were carried out by Baker Consultants staff Martin Ledger GradCIEEM and Technical Director Carlos Abrahams MCIEEM, both highly experienced ornithologists.
- 1.4.3 Lisha Adcock carried out the reptile surveys. Lisha has over eight years' professional consultancy experience.

2 Methodology

2.1 Bats

- 2.1.1 Bat activity surveys were carried out between June and August 2016 to determine how bats are using the landscape, and to evaluate the importance of features within the site for commuting and foraging bats.
- 2.1.2 The aim of the study was to help identify opportunities to protect and enhance landscape features, and maintain a permeable landscape for bats around the development, so that green infrastructure delivered within the development is functional for bats.
- 2.1.3 The purpose of the survey was to establish the following baseline information:
- Diversity of bat species within the study area;
 - The presence of rare bat species within the site;
 - Nature of the bat activity within the study area (i.e. foraging and commuting);
 - Spatial variations in the level and type of bat activity within the site and wider study area.
- 2.1.4 The objective of the assessment was to identify foraging areas and important commuting routes for bats and to provide an overall assessment of the site. This report discusses the likely impacts of the proposed development on bats and considers the requirement for appropriate mitigation, compensation and enhancement measures that will need to be provided as part of the new development and landscaped areas for public open space.

Bat Activity Survey

- 2.1.5 Walked bat detector transect surveys were undertaken to record foraging and commuting activity between April and September 2015. The survey period corresponds to the active season for bats and spans the months in which bats rear their young. The site, prior to the surveys, was considered to be of 'Low to Moderate' habitat quality for foraging and commuting bats due to the large expanse of open grassland with very little in the way of connective habitat features, such as hedgerows and woodland, being present. Areas of suitable habitat are confined to the block of woodland to the west of the site, established mature trees associated with the church and cemetery to the north-west of the site, and hedgerow boundaries.

- 2.1.6 As the site falls somewhere between low and moderate in terms of suitability, a hybrid approach to surveying was taken. Following the BCT bat survey guidelines (2012), transect surveys were undertaken once a season (spring, summer, and autumn), with a deployment of two static bat detectors during each of the transect visits.
- 2.1.7 Transect surveys covered the period of peak activity for bats at dusk, as recommended within the survey guidelines. The surveys commenced at sunset and were 1.5-2hrs in duration. The prevailing weather conditions, sunset times, and start and finish times of each survey are set out in Table 1.
- 2.1.8 The surveyors used Petterson D1000X detectors or Wildlife Acoustics' Echometer Touch (EMT) bat detectors attached to Apple iPads to record bat calls for later computer analysis. A transect around the survey area was walked in proximity to features likely to be used by roosting or commuting/foraging bats. Five-minute station stops were carried out at selected locations along the route. The route each transect took and location of stopping points are shown in figure 2 below.

Figure 2. Transect survey routes and stopping point locations.



2.1.9 Notes were taken of all bat sightings (to assist with subsequent species identification) in conjunction with the bat detector recordings. Field notes included a record of the time of each bat encounter, allowing results to be cross-referenced with the recorded data.

2.1.10 The echolocation data recorded was analysed using bat call spectrogram analysis computer software (BatSound software by Petterson Elektronik or Kaleidoscope by Wildlife Acoustics), which provides a means of species identification.

Table 1. Bat Survey Conditions

Date	Surveyors	Weather	Sunset/sunrise times (hrs)	Start/finish times of survey
27/06/16 (Late Spring/ Summer)	LA/ED	Still and slight breeze 15°C – humidity 84%.	2103	2048 -2308hrs
24/07/16 (Summer)	LA/HJ	Breezy, partly cloudy. 14°C – humidity 75%	2021	2106 - 2216
25/08/16 (Late Summer/ Autumn)	RH/CH	Dry and calm. 22°C – cloud cover 15%.	2003	2003 - 2135

Bat Automated Detector Survey

2.1.11 Wildlife Acoustics SM2 automated bat detectors were deployed on site between May and July 2016 (due to technical problems, there was no third deployment). These unattended bat detectors recorded over a period of time and automatically recorded nearby bat calls, with each digital file being appropriately dated and time-stamped. After recording, the data collected was downloaded for computer analysis. Five nights of data were analysed for each month of deployment.

2.1.12 The details of each location are shown below in Table 2. The locations of the SM2s are shown in Appendix 1.

Table 2. Automated Bat Surveys

SM2 unit no.	Grid Reference	Habitat	Monitoring Period	
			Start	End
a - 003604	SZ 721 999	Hedge by churchyard	12 May	19 June
a - 012800	SZ 719 997	Ash tree by pond	12 May	19 May
b - 012800	SZ 72146 99851	Prunus by road entrance	23 June	06 Jul
b - 003604	SZ 71741 99778	Scrub woodland corner	23 June	06 Jul

Key - a: Spring | b: Summer

Bat Habitat Evaluation

- 2.1.13 The significance of the bat activity within the site has been assessed using the principles described in the CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom (2006). This places the importance of habitats and features in a geographical context, using the following hierarchy:
- International;
 - National (i.e. England);
 - Regional;
 - County;
 - District (or Unitary Authority, City or Borough);
 - Local (or Parish);
 - Site – within the immediate zone of influence only (the development site and surroundings).
- 2.1.14 Where possible, formal criteria are used to set features of conservation importance within this geographical context. For example, the Guidelines for the Selection of Biological SSSIs (Nature Conservancy Council, 1989) can be used as a basis for the assessment of features at a National level. Similarly, published guidelines for the selection of County Wildlife Sites (CWS) can be used as the basis for assessing features of County level importance.
- 2.1.15 Against an overall evaluation of the site, an evaluation of individual features has been made. When valuing commuting routes and foraging habitats, the rarity of the species involved, the approximate number of bats using them, the proximity to known roosts, and the nature and complexity of the landscape features are all factors that can be taken into account (Wray *et. al.*, 2010). This helps put the bat activity recorded into context. The criteria used to describe and evaluate features and habitats for bats in this study are given in Table 3.

Table 3. Evaluation Criteria for Features and Habitats Utilised by Bats

Geographic frame of reference	Criteria
County	A strategic flyway for the movement of the rarest species of bat. The habitat/ landscape feature is important for seasonal movement or is an essential flight route between roosts and /or to foraging areas. The flight line is likely to be used by a significant proportion of a colony of a nationally rare bat species and therefore is considered integral to the maintenance of the favourable conservation status of the species in the county.
District	A key foraging area for some of the rarest species of bat in the county. A feature that supports all, or most bat species recorded within the assessment site, including nationally rare species on a frequent basis.

Geographic frame of reference	Criteria
Local	A flight line or habitat that is close to a significant roost of a species that is widespread, but considered rarer (but not the rarest) in the county. The habitat/ feature is therefore integral to the distribution of the local bat population.
	A foraging habitat frequently used by a rarer or scarce species in the county, or consistently used by low levels of a nationally rare species.
	An important corridor for movement regularly used by common species of bat and/ or occasionally by nationally scarce species of bat.
	Features with good habitat structure that are strategically important for movement between foraging areas of local to county importance.
Site/ immediate zone of influence	Habitats and features that are important for the maintenance of local populations of species that are common and widespread. The habitat is integral for the favourable conservation status of common species in the local area.
	Foraging habitats that support a low diversity of common and widespread species.
	Commuting routes regularly used by species that more readily fly in the open and are therefore not heavily dependent on linear landscape features for sheltered flight lines. The feature is therefore not considered to provide a strategic link/ route for the local bat population, but may be a navigational feature within the site.
	Linear features that are very occasionally used by a nationally rare species, but do not constitute a regular commuting route for individual bats.
	A linear feature that links habitats and features of District and County importance.

2.2 Breeding Bird Survey

- 2.2.1 The breeding birds survey methodology broadly followed the 'Common Bird Census' (CBC) devised by the British Trust for Ornithology. This technique records the location and behaviour of every bird present within a defined survey area and includes the mapping of breeding bird territories. The Site was walked and bird activity was recorded using the standard BTO Common Bird Census notation (Marchant, 1983).
- 2.2.2 Three visits were undertaken on the Site by Ecologist Martin Ledger Grad CIEEM and Technical Director Carlos Abrahams MCIEEM, both of whom are experienced ornithologists, during the bird breeding season in suitable

weather conditions. Two visits began in the early morning, whilst the other was conducted in the early evening. The dates, times and weather conditions during these surveys are detailed in Table 4.

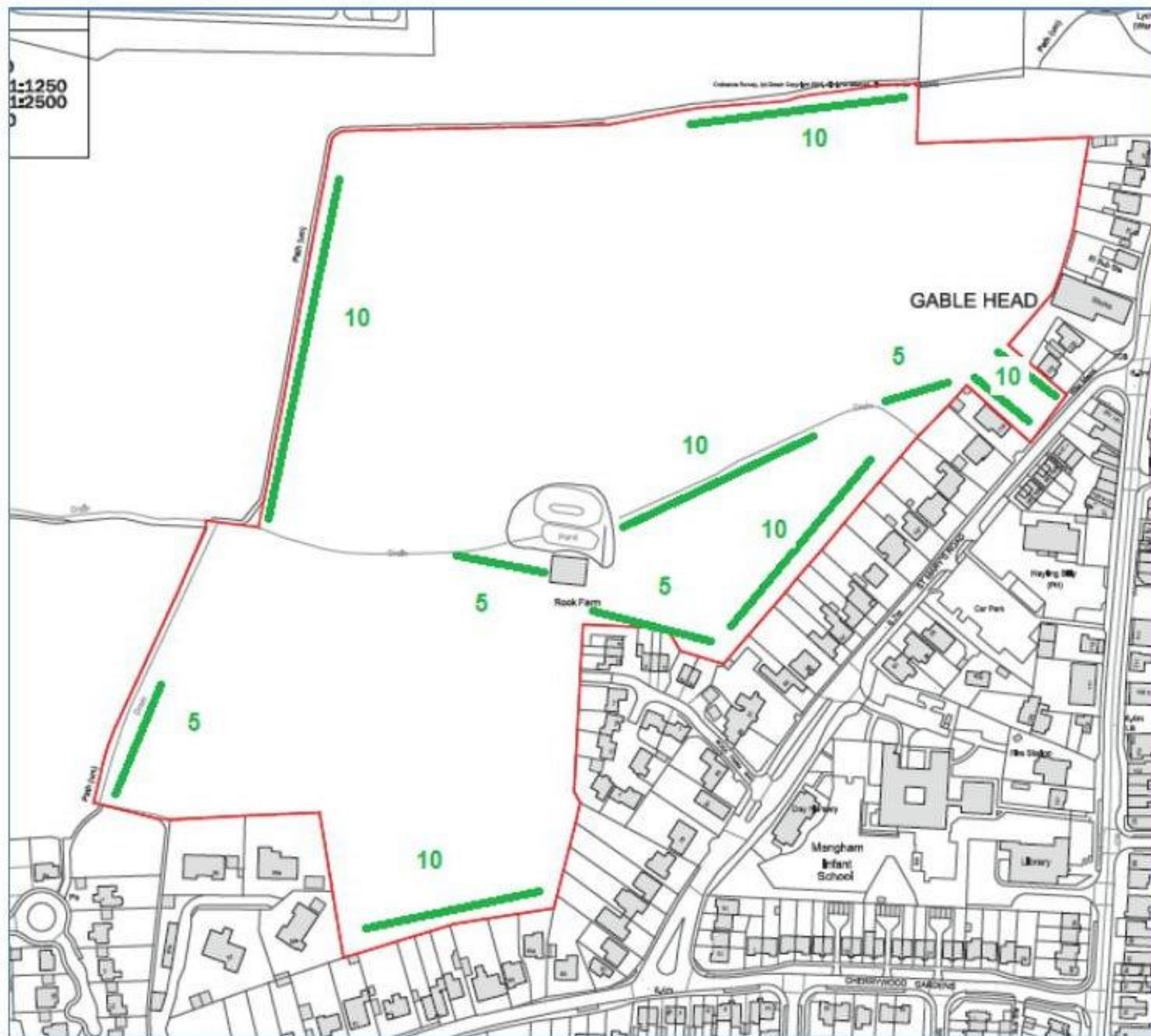
Table 4. Breeding bird survey dates and weather conditions

Date of survey	Times (hrs)	Surveyor(s)	Weather conditions	Sunrise/set time
13.05.2016	0555-0640	Martin Ledger	13C, 70% cloud, dry, sunny spells, wind F2 north-easterly.	0518/2043
20.05.2016	0710-0820	Carlos Abrahams	13C, 100-75% cloud, dry, sunny spells, wind F2 north-easterly.	0508/2053
22.06.2016	1920-2020	Martin Ledger	18-17 C, 75% cloud, dry, sunny spells, wind F1 south-easterly	0451/2120

2.3 Reptile Survey

- 2.3.1 Reptile surveys were completed within the areas of site considered to have the most suitable reptile habitat within the survey area, focusing in particular upon grassy field margins and areas of potential refuge.
- 2.3.2 The surveys were completed using standard presence/likely absence methodology (Froglife, 1999). Eighty reptile mats made from 0.5m x 0.5m squares of roofing felt were placed in ten groups on 7th September 2016. Figure 3 below shows the location of reptile mats.
- 2.3.3 After the reptile mats had been allowed to bed in, a series of seven site visits were undertaken through the autumn of 2016 to check the mats for reptiles sheltering underneath them, or using them for basking.
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Figure 3. Location of reptile survey tiles in areas of suitable habitat.



2.4 Great Crested Newt Survey

- 2.4.1 Four visits to the single pond on site were carried out between 12th and 27th May 2016, in order to establish whether breeding great crested newts were present.
- 2.4.2 In each visit, bottle traps were set around the perimeter of the pond, approximately every 2m, attached to canes which secured them in place, and left overnight. The bottle traps were removed and checked the following morning, with any animals present recorded and released carefully back into the pond.
- 2.4.3 On the same evening, torching was carried out- this method involves the use of a high powered LED Lenser torch to illuminate the pond surface to scan for the presence of any newts using the pond. An egg search was also carried out- this involves the careful searching of vegetation at the pond edge for signs of egg laying by great crested newt, or other species.

3 Results

3.1 Study Limitations

- 3.1.1 It is important to note that, even where data is returned for a desk study, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest since the area may simply be under-recorded. Equally, due to the level of recording, some species should be considered more frequent than indicated by the records provided within a desk study.
- 3.1.2 Whilst every effort was made in the field survey to provide a comprehensive description of the site, no investigation can ensure the complete characterisation and prediction of the natural environment. Also, natural and semi-natural habitats are subject to change, species may colonise the site after surveys have taken place and results included in this report may become less reliable over time.
- 3.1.3 Due to technical issues, a third deployment of automated detectors was not possible. In addition, it was found that the data from the second deployment was not able to be analysed. Even so, it is not considered that this results in a significant constraint, with three transect walks being carried out and full data from these survey events available. On such a low value site, this is considered to be an adequate amount of data to fully assess the impacts on bats within the site, and formulate suitable recommendations.

3.2 Bats

Bat Transect Surveys

- 3.2.1 Bat activity during the surveys tended to start soon after sunset (between 2 minutes and 32 minutes), suggesting there are bat roosts close to the site. Early recorded species included common and soprano pipistrelle (*Pipistrellus pipistrellus* and *P.pygmaeus*). The observation of an emergence from a cottage adjacent to the site on the first transect probably explains the number of common pipistrelle registrations shortly after on site.
 - 3.2.2 Bat activity during the spring transect found four species of bat across the site, with the highest number of registrations near the north-western corner of the site. An emergence of a common pipistrelle bat from a cottage off-site was noted at 2105, west of stopping point 3. Several registrations were recorded of a common pipistrelle foraging along the eastern hedge, also near stopping point 3. Soprano pipistrelle bats were recorded commuting along northern
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and western hedgerows and over a garden and field at the southern end of the site. One recording of a serotine *Eptesicus serotinus* bat was recorded flying in a north-south direction across the site. Two other registrations of *Myotis* bat species were made during the survey; the first at 2213 near stopping point 8 commuting along the western hedgerow boundary, and the second at 2244 foraging over a garden at the south-eastern corner of the site.

- 3.2.3 During the summer transect, the first bat recorded was at 2144hrs and was identified as common pipistrelle. Very low levels of activity across the site were recorded, with only three registrations made. Two of these were located at stopping point 12; foraging common pipistrelle bats. A soprano pipistrelle bat was later recorded at 22:16 in the church yard beyond the north-east corner of the site. No other activity was recorded.
- 3.2.4 During the autumn transect, the first bat was recorded 32 minutes after sunset (20:03) and was identified as a soprano pipistrelle, foraging to the north of the site near static caravans. There was limited activity for the remainder of the survey, but with a mixture of *Myotis* and common pipistrelle recorded.

Bat Automated Detector Survey

- 3.2.5 The results of the SM2 data from the sole successful deployment shows a very limited number of species present, with only pipistrelles (common and soprano), noctule and *Myotis* species present in relatively low numbers.
- 3.2.6 Under the criteria shown in Table 5, accounting for both transect and SM2 data, the site is of Low importance for bats.

Table 5. Criteria for the classification of levels of bat activity

Classification	Criteria*
High	Constant and sustained commuting or foraging activity at a location by several bats. This classification identifies an important commuting route or key foraging area.
Medium	Regular bat activity with several bat passes on a nightly basis. Sustained foraging activity with up to two bats feeding at the location.
Low	Occasional bat activity or single bat pass
*The definition of 'bat pass' is the detection of two or more bat calls in a continuous sequence on the bat detector; each sequence or pass is separated by 1 second or more in which no calls are recorded (Hundt, 2012).	

3.3 Breeding Birds

- 3.3.1 A total of 30 species of birds were recorded during the surveys, of which one species was confirmed breeding, five were assessed to be probably breeding and 17 possibly breeding.
- 3.3.2 Seven species were assessed to have been non-breeding visitors to the site. Table 6 lists these birds, their breeding status and the habitat in which the bird was recorded

Table 6. Bird species recorded during the 2016 breeding bird survey

Species	Conservation Concern?	Breeding Habitat?	Breeding status
Blackbird <i>Turdus merula</i>	-	Hedgerows/Scrub/Woodland/ Gardens adjoining site	Probable
Black-headed gull <i>Larus ridibundus</i>	Amber	-	Non-breeding
Blue tit <i>Cyanistes caeruleus</i>	-	Gardens adjoining site/Mature trees	Possible
Carrion crow <i>Corvus corone</i>	-	Mature trees	Possible
Chaffinch <i>Fringilla coelebs</i>	-	Gardens adjoining site/ Hedgerows/Scrub	Possible
Chiffchaff <i>Phylloscopus collybita</i>	-	Grassland edge close to Scrub/Woodland	Probable
Collared dove <i>Streptopelia decaocto</i>	-	Mature trees (especially conifers), close to houses adjoining site	Possible
Common gull <i>Larus canus</i>	Amber	-	Non-breeding
Dunnock <i>Prunella modularis</i>	Amber, SPI	Hedgerows/Scrub/Gardens adjoining site	Possible
Feral pigeon <i>Columba livia domesticus</i>	-	-	Non-breeding
Goldfinch <i>Carduelis carduelis</i>	-	Scrub/Woodland/Gardens adjoining site	Possible
Great tit <i>Parus major</i>	-	Mature trees/Gardens adjoining site	Possible
Greenfinch <i>Carduelis chloris</i>	-	Scrub/Woodland/Gardens adjoining site	Possible
Grey heron <i>Ardea cinerea</i>	-	-	Non-breeding
Herring gull <i>Larus argentatus</i>	Red, SPI	-	Non-breeding
House martin <i>Delichon urbica</i>	Amber	Houses adjoining site	Non breeding
House sparrow <i>Passer domesticus</i>	Red, SPI	Houses adjoining site	Probable
Jackdaw <i>Corvus monedula</i>	-	Mature trees	Possible
Linnet <i>Carduelis cannabina</i>	Red, SPI	Hedgerows/scrub	Possible
Magpie <i>Pica pica</i>	-	Scrub/Woodland	Possible
Moorhen <i>Gallinula chloropus</i>	-	Pond	Possible
Robin <i>Erithacus rubecula</i>	-	Hedgerows/Scrub/Woodland/ Gardens adjoining site	Probable
Rook <i>Corvus frugilegus</i>	-	-	Non-breeding

Skylark <i>Alauda arvensis</i>	Red,SPI	Fields	Possible
Song thrush <i>Turdus philomelos</i>	Red, SPI	Hedgerows / Scrub / Woodland / Gardens adjoining site	Possible
Starling <i>Sturnus vulgaris</i>	Red, SPI	Mature trees / Houses adjoining site	Possible
Stock dove <i>Columba oenas</i>	Amber	Mature trees / Buildings	Possible
Swift <i>Apus apus</i>	Amber	Houses adjoining site	Possible
Woodpigeon <i>Columba palumbus</i>	-	Scrub / Woodland	Confirmed
Wren <i>Troglodytes troglodytes</i>	-	Scrub / Woodland / Derelict nursery buildings	Probable

Key –

SPI – Species of Principal Importance for Conservation (NERC Act)

Amber – Species of Moderate Conservation Concern

Red – Species of High Conservation Concern

3.4 Reptiles

- 3.4.1 A total of two slow worms *Anguis fragilis* were recorded from seven visits in September. No other reptiles were recorded during the surveys.
- 3.4.2 The adult male and female slow worms were recorded in two different locations, on different survey dates under tiles along the eastern boundary of the site, adjacent to residential gardens.

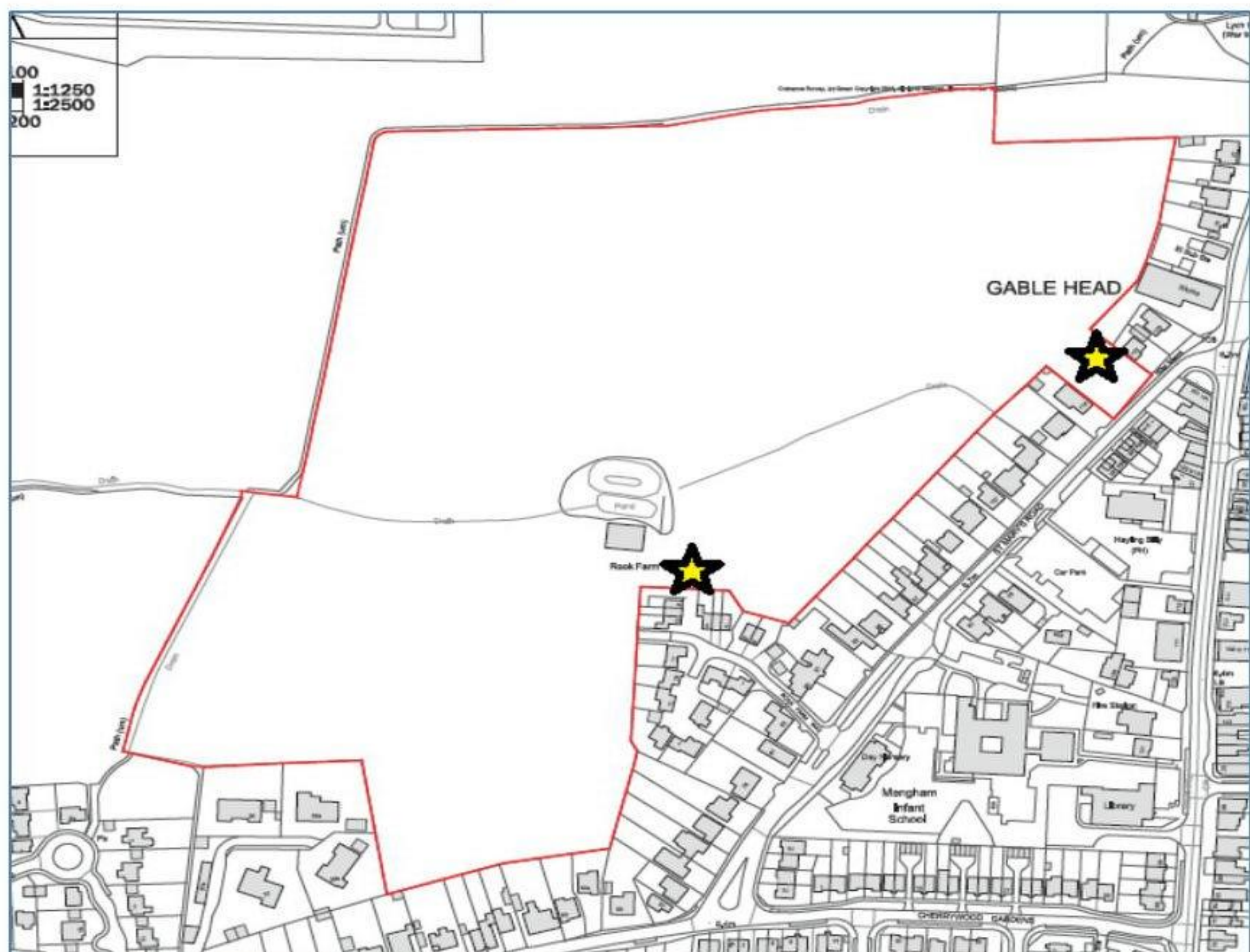
3.5 Great Crested Newt

- 3.5.1 No great crested newt, or their eggs, were observed using any of the methods described. Only smooth newts were seen to be present, with a maximum count of 20 individuals during the second visit.

Figure 5. Slow worm found on site



Figure 6. Locations where reptiles were found



4 Assessment

4.1 Legislation and Policy

4.1.1 The National Planning Policy Framework (NPPF) is intended to help deliver sustainable development, with environmental issues being one of the three dimensions within this. It includes a range of statements and policies relating to biodiversity and nature conservation, with the aim of 'moving from a net loss of biodiversity to achieving net gains for nature' (Paragraph 9). Key sections of the NPPF are highlighted below:

- Paragraph 109 'The planning system should contribute to and enhance the natural and local environment by --- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity'
- Paragraph 118 Local planning authorities should aim to conserve and enhance biodiversity when determining planning applications by ensuring that: significant harm is avoided, mitigated or compensated (especially for irreplaceable habitats); impacts on designated sites are prevented and; biodiversity is incorporated in and around developments.
- Paragraph 165 To allow the appropriate consideration of ecological issues within applications, planning decisions, 'should be based on up-to-date information about the natural environment – this should include an assessment of existing and potential components of ecological networks'.

4.1.2 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places a duty on every public authority to have regard to conserving biodiversity. Section 41 of the same Act requires that the Secretary of State must publish a list of the living organisms and types of habitats that are of 'Principal Importance' for the purpose of conserving biodiversity. The Secretary of State must take steps, as appear reasonably practicable, to further the conservation of those living organisms and habitats in any list published under this section. The list of species and habitats of principal importance currently includes 943 species and 56 habitats.

4.2 Bats

4.2.1 Bats and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended by the CROW Act 2000), and by the Conservation of Habitats and Species Regulations 2010. Taken together, these make it an offence to:

- a) Deliberately capture, injure or kill a bat;

- b) Deliberately disturb any bat, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.
 - c) To be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
 - d) Damage or destroy a breeding site or resting place of a bat;
 - e) Intentionally or recklessly obstruct access to any place that bat uses for shelter or protection;
 - f) Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection.
- 4.2.2 A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to re-use the same roost sites, current legal opinion is that a bat roost is protected whether or not the bats are present at the time.
- 4.2.3 Seven bat species are listed in the UK Biodiversity Action Plan and are listed as Species of Principal Importance under the provisions of the NERC Act 2006.

Evaluation and Interpretation of the Results

- 4.2.4 The activity surveys revealed at least four species of bat foraging across the site, although only two were recorded on a regular basis.
- 4.2.5 Most of the site is open and flat arable land with very few connective habitat features suitable for bats. Woodland, hedgerows and scrub are present but occur around the periphery of the site, with the exception of a centrally-located area of scrub around a pond. Outside the site boundary, there are features that provide suitable foraging and commuting habitat for bats in the local vicinity. This includes the church and cemetery to the north-east of the site, a small patch of woodland to the west of the site, and two boundaries with residential gardens.
- 4.2.6 The site itself does not support roosting potential, as there are no mature trees offering potential roost features, and the one building on site is of modern steel fabrication and is unlikely to offer opportunities for bats. Bat activity was recorded close to sunset and sunrise times and may suggest roost locations on or within close proximity to the site. One emergence of a common pipistrelle bat was observed on the second transect survey, from a cottage to the east of the site.
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- 4.2.7 The general activity recorded across the site is low; only four species were regularly recorded foraging on the site and these were within areas that are the fragmented habitats discussed above.
- 4.2.8 Due to the overall expanse of the site, the habitat resource available and the lack of connectivity of habitats present, foraging and commuting activity is low and patchy. It is therefore considered that the site is of value at a Site level only (Wray *et al.*, 2010).

Impact Assessment

- 4.2.9 Future development has the potential to enhance habitats across the site by incorporating linear habitat features that are largely absent from the site. This will improve connectivity across the site and provide additional foraging and commuting habitats for bats.
- 4.2.10 Street lighting could cause a major negative impact on how bats use the site, and is possibly one of the most significant negative factors that would result from the change of land use.
- 4.2.11 Given the extent of the proposed development, the potential adverse effect is considered to be a negative impact at a Site level, should no suitable mitigation measures be implemented. However, due to the fact that the Site is of low overall habitat quality, there is scope to enhance the habitat for local bat populations. Together with a sympathetic lighting scheme and the creation of dark corridors, species diversity could potentially also be retained in the vicinity of the site.

Other Mammals

- 4.2.12 Foxes and rabbits, while not covered under specific legislation are covered generally under the Wild Mammals (Protection) Act 1996. This makes it an offence to mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with the intent to inflict unnecessary suffering.
- 4.2.13 No mammals or mammal field signs were noted during the breeding bird surveys on Site, but to avoid a possible offence under the Wild Mammals Act, due care and attention should be taken when carrying out works (for example operations near burrows or nests) with the potential to affect any wild mammal in this way, regardless of whether they are legally protected through other conservation legislation or not.

Birds

- 4.2.14 All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally kill, injure or take

any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to intentionally or recklessly disturb them while they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

- 4.2.15 The Birds of Conservation Concern (BoCC) initiative (Eaton *et al*, 2009) publishes lists of Red and Amber species. Birds on the Red list are of high conservation concern within the UK, while those on the Amber list are of medium conservation concern.
- 4.2.16 In addition, a number of bird species are also included as Species of Principal Importance under the provisions of the Natural Environment and Rural Communities (NERC) Act 2006. Section 41 of the Act places a duty on every public authority to have regard to conserving biodiversity. This Section also requires that the Secretary of State must publish a list of the living organisms and types of habitats which are of principal importance for the purpose of biodiversity. The Secretary of State must take steps, as appear reasonably practicable, to further the conservation of those living organisms and habitats in any list published under this section. The list of species and habitats of principal importance currently includes 943 species and 56 habitats. A number of bird species are Species of Principal Importance (SPI), listed under the provisions of the Act. Species of Principal Importance are a material consideration for a Local Planning Authority in the exercise of its duties. Many of the birds listed as SPI's are also United Kingdom Biodiversity Action Plan priority species.
- 4.2.17 Biodiversity Action Plans (BAPs) define concrete actions and measures to meet the objectives defined in national and local habitat and species conservation. The UK Biodiversity Action Plan (UKBAP) covers the same species and habitats as Section 41.
- 4.2.18 A total of 30 species of birds were recorded within and adjoining the site boundary during the 2016 breeding bird surveys. Table 7 provides a summary of bird species of ecological interest. A total of 12 bird species are on the Amber or Red BOCC lists and seven of these species are listed as Species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act, 2006.

Table 7. Notable species recorded in the breeding bird surveys.

Species	Legal / Policy Status
Dunnock <i>Prunella modularis</i>	Amber, SPI
House sparrow <i>Passer domesticus</i>	Red, SPI
Linnet <i>Carduelis cannabina</i>	Red, SPI
Skylark <i>Alauda arvensis</i>	Red, SPI
Song thrush <i>Turdus philomelos</i>	Red, SPI

Starling *Sturnus vulgaris*

Red, SPI

Stock dove *Columba oenas*

Amber

Key

SPI – Species of Principal Importance for Conservation (NERC Act)

Amber – Species of Medium Conservation Concern

Red – Species of High Conservation Concern

4.2.19 To assess the overall breeding bird assemblage Fuller (1980) described a method for assessing the ornithological interest of sites, whereby the importance of a site is defined by the number of breeding species present. The Chartered Institute of Ecology and Environmental Management (CIEEM) has adapted the method to fit geographical levels and to reflect on-going declines in bird populations (see Table 8).

Table 8. Site value by number of breeding bird species present

Number of breeding bird species	Site value
<25	Local
25 – 49	District
50 – 69	County
70 – 84	Regional
>85	National

4.2.20 A total of seven species have been assessed as either confirmed or probable breeders within or adjoining the survey area during the 2016 breeding bird surveys. Using the adapted version of Fuller's criteria, the survey area is therefore considered to be of low local importance during the breeding season.

Impact Assessment

4.2.21 Works undertaken during the bird breeding season could potentially result in committing the broad offence of intentional destruction of nests but also potentially the higher offence of intentional and reckless disturbance of a species listed in Schedule 1 of Wildlife and Countryside Act, although no bird species listed within Schedule 1 of the Act were recorded during the breeding bird surveys. Construction work during the summer months in high sensitivity areas may give rise to disturbance. This offence can be avoided by timing works to remove vegetation outside the bird breeding season (beginning of March to the end of August).

4.2.22 If the whole of the site were to be developed and no habitat retained then a loss of bird biodiversity is likely to occur. Additionally, features within the landscape such as scrub and treelines, which provide links through this site to other habitats in the broader landscape, could be lost.

4.3 Reptiles

- 4.3.1 All British reptiles are protected under the Wildlife and Countryside Act 1981 (as amended by the CROW Act 2000). Grass snake, slow worm, common lizard and adder are protected against intentional killing or injury and against sale. In addition, all British reptiles are UK Biodiversity Action Plan species and are listed as Species of Principal Importance under the provisions of the NERC Act 2006.
- 4.3.2 Two slow worms were found under different tiles on different occasions during the reptile surveys. Low numbers of this species are therefore likely to be using the garden boundary on occasion.
- 4.3.3 As a result of a very low population size class for this species, and no other reptiles recorded, the impact of the works is considered to be negligible at Site level. Simple and effective mitigation measures will be applied to ensure that individuals are protected from harm or death, and that the habitat within the site is enhanced appropriately to favour reptiles in general. As there is existing residential development around the site, their presence indicates that the area is capable of hosting a small population of these reptiles, and the provision of appropriate refugia will be an important consideration in the Masterplan.

5 Recommendations

5.1 Further Survey

- 5.1.1 This ecological assessment has provided further information to provide a baseline of ecological information to describe the main characteristics of the proposed development site.

Bats

- 5.1.2 A further survey of the single structure on the site is recommended, prior to its removal. This survey should take the form of an initial internal and external inspection to establish if there is any evidence of roosting bats, and if this is the case, further targeted survey or a possible development licence from Natural England will be required.

5.2 Mitigation Measures

Bats

- 5.2.1 Based on the almost complete absence of commuting corridors or foraging features on the site, an opportunity exists to promote bat presence by establishing vegetated and dark corridors through the site. This could take the form of treelines or hedgerows, and use lighting systems with features such as shields, louvres, timed or movement sensitive lighting, or low level bollards.
- 5.2.2 Bat boxes can also be placed on retained trees as a simple and inexpensive option to enhance bat roosting potential around the site.
- 5.2.3 During construction, it is recommended that work not be carried out during dark hours, and no lighting be utilised during this period for any purpose.

Breeding Birds

- 5.2.4 Buffer areas should be put in place alongside woodlands and the churchyard bordering the site. This will reduce adverse impacts on wildlife found within the woodland and churchyard areas and retain habitat on the edge of the woodland that is important for a host of bird, mammal, reptile, amphibian and invertebrate species. The pond and surrounding habitat on the site should be retained to provide habitat for bird species that require wetland habitats for breeding and foraging.
- 5.2.5 Tree planting of species good for birds across the site will increase biodiversity. Trees producing winter berries or fruit in spring/summer such as rowan *Sorbus aucuparia*, hawthorn *Crataegus monogyna*, whitebeam *Sorbus*

aria, wild cherry *Prunus avium*, bird cherry *Prunus padus*, elder *Sambucus nigra*, dogwood *Cornus sanguinea*, holly *Ilex aquifolium* and yew *Taxus baccata* are desirable. Also good for birds are seed producing trees such as alder *Alnus glutinosa* and willow species *Salix spp* (in damper areas of the site) or silver *Betula pendula* or downy birch *Betula pubescens* (in the drier areas of the site). A scattering of tall conifer trees within the site will attract birds using them for nesting, foraging or cover such as goldcrest *Regulus regulus*, coal tit *Parus ater*, long-tailed tit *Aegithalos caudatus*, tawny owl *Strix aluco* (none of which were recorded on the site during the breeding bird surveys), greenfinch and collared dove.

- 5.2.6 Gardens increase breeding and foraging opportunities for a range of wildlife, especially birds. Birds such as song thrush, dunnock, house sparrow, starling, blackbird, blue tit, woodpigeon, chaffinch, robin, great tit, goldfinch and collared dove are among many species of bird that would benefit from the creation of gardens around the site. Nest boxes installed into the fabric of houses can benefit species such as house sparrow, swift and starling. Bird boxes with entrance holes or of open fronted design placed around the whole site, or attached to trees in the woodlands bordering the site at varying heights, could be used by many species including blue tit, great tit, coal tit, house sparrow, treecreeper *Certhia familiaris*, robin and marsh tit *Poecile palustris*. Different sized boxes and styles could be used to cater for larger birds such as starling, great-spotted woodpecker *Dendrocopos major* and little owl *Athene noctua*.
- 5.2.7 It is anticipated that few bird species would suffer a loss in numbers, should the mitigation measures outlined be implemented, with the majority of species expected to benefit from the overall plan. From the bird surveys conducted on the site, it seems clear that several bird species are currently under-represented. Winter migrant birds such as redwing *Turdus iliacus* and fieldfare *Turdus pilaris* should increase in number under the plan to plant more winter fruit bearing trees. Other birds such as mistle thrush *Turdus viscivorus* and bullfinch *Pyrrhula pyrrhula* should also benefit from the planting of berry trees. Siskin *Carduelis spinus* and lesser redpoll *Carduelis cabaret* could be enticed to the site if seed bearing trees (especially birch and alder) are planted.
- 5.2.8 Where vegetation removal is required, in order to avoid committing an offence under the Wildlife and Countryside Act 1981 (as amended) it will be necessary to programme this to take place outside the bird-breeding season. The bird breeding season is normally taken to be March – August inclusive, with September – February inclusive being the best time for vegetation clearance. Where this is not possible, any vegetation scheduled for removal should be inspected immediately prior to this and, if breeding birds are found, a buffer area should be put into place and no vegetation removal should proceed prior to the young fledging the nest.
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Reptiles, Amphibians and Other Species

- 5.2.9 During construction in general, care should be taken during any vegetation removal and this should be carried out using hand tools only. Any wildlife discovered should be allowed to escape unharmed.
- 5.2.10 Excavations should not be left uncovered overnight in order to ensure no animals fall in and become trapped; at the very minimum escape ramps of some form should be provided.
- 5.2.11 Particular care should be taken in the areas where slow worm presence has been identified, as well as the ruderal/ weedy areas around the pond and the large soil mound and ditches. It is recommended that a suitably qualified Ecological Clerk of Works (ECoW) be present during clearance of vegetation in these areas. In addition, it is recommended that works in these areas do not take place between November and mid-March, when reptiles are likely to be hibernating and thus subject to a greater risk of harm.
- 5.2.12 The retention of suitable areas of habitat around the pond and the newly created SUDs areas should be considered to enhance the site for reptiles, amphibians and a range of other species. Simple measures such as the provision of log piles, and the planting of denser scrub around watercourses will enhance the site for these species, particularly reptiles and amphibians such as smooth newts. It will also assist in protecting these species from the potentially higher risk of predation by cats as a result of the increase in human presence on the new development.

6 References

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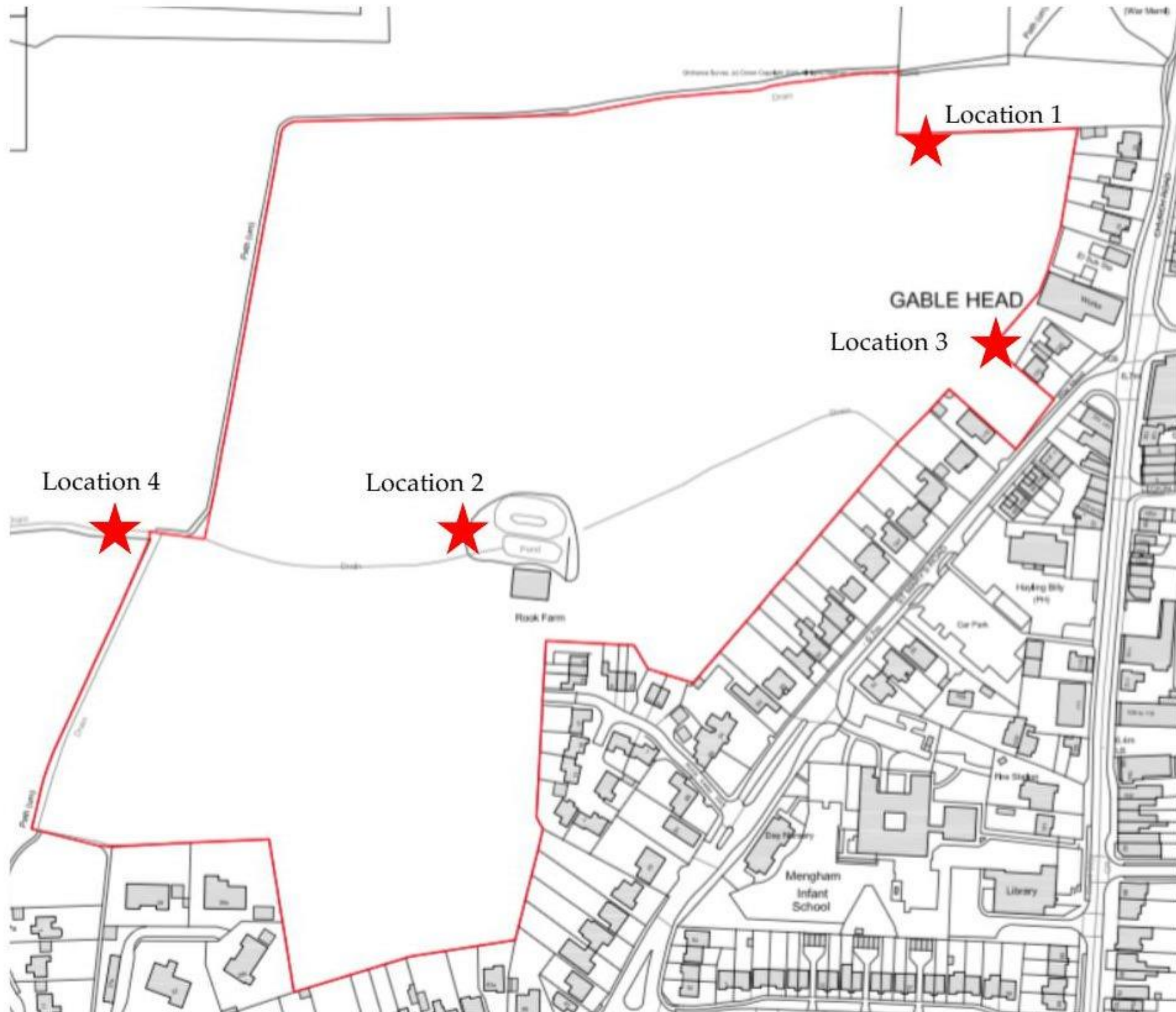
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Appendix I: SM2 locations



Appendix 2. Bat transect data

Transect One (Spring):

Stopping point	Time	Recording Number	Species	Activity	Flight Direction
1	20:48			Start of survey	
1	21:05	00117	Common pipistrelle	Emergence cottage west of stopping point 3	East
3	21:24	00118	Common pipistrelle	Foraging east hedge	S-N
3	21:24	00119	Common pipistrelle	Foraging east hedge	N-S
3	21:24	00120	Common pipistrelle	Foraging east hedge	N-S/ S-N
3	21:25	00121	Common pipistrelle	Foraging east hedge	N-S/ S-N
3	21:25	00122	Common pipistrelle	Foraging east hedge	N-S/ S-N
3	21:25	00123	Common pipistrelle	Foraging east hedge	N-S/ S-N
3	21:26	00124	Common pipistrelle	Foraging east hedge	N-S/ S-N
3	21:26	00125	Common pipistrelle	Foraging east hedge	N-S/ S-N
3	21:26	00126	Common pipistrelle	Foraging east hedge	N-S/ S-N
3	21:27	00130	Common pipistrelle	Foraging east hedge	N-S/ S-N
5	21:43	00180	Soprano pipistrelle	Foraging east hedge	N-S/ S-N
5	21:48	00203	Soprano pipistrelle	Foraging east hedge	N-S/ S-N
5	21:50	00214	Soprano pipistrelle	Commuting north hedgerow	E-W
6	21:57	00237	Common pipistrelle	Commuting across field	N-S
7	22:08	00268	Common pipistrelle	Foraging to the south over fields	W-E
8	22:13	00283	Myotis species	Commuting west of ditch	N-S
8	22:14	00284	Soprano pipistrelle	Commuting west of ditch	N-S
9	22:27	00316	Soprano pipistrelle	Commute across corner	W-N
9	22:31	00335	Soprano pipistrelle	Foraging in garden along W edge	
10	22:38	00340	Soprano pipistrelle		
10	22:38	00341	Soprano pipistrelle	2 bats, 1 in garden, 1 middle of field	
10	22:38	00342	Soprano pipistrelle	2 bats, 1 in garden, 1 middle of field	
10	22:39	00343	Soprano pipistrelle	2 bats, 1 in garden, 1 middle of field	
10	22:40	00346	Common pipistrelle	Commuting across field	E-W
11	22:44	00355	Myotis species	Foraging west garden	

				corner	
11	22:48	00359	Soprano pipistrelle	Commuting across west garden	N-S
12	22:53	00374	Soprano pipistrelle	Foraging west garden corner	
13	23:08	00417	Serotine	Commuting over field	N-S

Transect Two (Summer):

Stopping points	Time	Recording Number	Species	Activity	Flight Direction
9	21:06			Start of survey	
12	21:44	00214	Common pipistrelle	Foraging west hedge	S-N
12	21:45	00215	Common pipistrelle	Foraging east hedge	S-N
3	22:16	00413	Soprano pipistrelle	Foraging in church yard	

Transect Three (Autumn):

Stopping points	Time	Recording Number	Species	Activity	Flight Direction
	20:03			Start of survey	
3	20:31	203145	Soprano pipistrelle	Brief pass over hedge	
3	20:31	203149	Soprano pipistrelle	Commuting near static caravans	E-W
5	20:44	204409	Soprano pipistrelle		
5-6	20:50	205003	Soprano pipistrelle	Foraging along soil mound	E-W/ W-E
5-6	20:50	205017	Soprano pipistrelle	Foraging along soil mound	E-W/ W-E
5-6	20:50	205026	Soprano and common pipistrelle	Foraging along soil mound	E-W/ W-E
5-6	20:50	205040	Common pipistrelle	Foraging along soil mound	E-W/ W-E
5-6	20:50	205056	Soprano and common pipistrelle	Foraging along soil mound	E-W/ W-E
5-6	20:51	205143	Common pipistrelle	Foraging along soil mound	E-W/ W-E
5-6	20:52	205227	Common pipistrelle	Foraging along soil mound	E-W/ W-E
6	20:57	205713	Myotis species	Foraging along trees and field edge	
6	21:00	210004	Myotis species	Foraging along trees and field edge	
6	21:00	210048	Myotis species	Foraging along trees and field edge	
6-7	21:01	210151	Common pipistrelle	Foraging along trees	

				and field edge	
6-7	21:03	210351	Myotis species	Foraging along trees and field edge	
7	21:04	210424	Myotis species	Foraging along trees	
7	21:06	210600	Myotis species	Foraging along trees	
7	21:07	210746	Common pipistrelle and Myotis species	Foraging along trees	
8	21:12	211245	Myotis species	Foraging along hedgerow west	
10	21:31	213124	Common pipistrelle	Foraging over garden	

Appendix 3. Breeding bird definitions

Legislative status –

BirDir	Listed in Annex 1 of the Birds Directive (2009)
NERC	s41 species on Natural Environment and Rural Communities Act (2006)
WCASch1	Listed in Schedule 1 of the Wildlife and Countryside Act (1981) As amended
BB	Breeding bird, all protected by Wildlife and Countryside Act (1981) As amended.

BoCC –

R	Species is red listed
A	Species is amber listed
G	Species is green listed
No status	Non-native species, not assessed

BAP –

UK	Priority Species in UK Biodiversity Action Plan
LBAP	Priority Species in Local Biodiversity Action Plan

Birds of Conservation Concern (BoCC)

Birds are included on the BoCC list after assessment against a set of objective criteria which places each species on one of three lists, green, amber or red, indicating an increasing level of conservation concern.

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

- Species listed by BirdLife International as being Globally Threatened using the International Union for Conservation of Nature (IUCN) criteria.
- Species has demonstrated a severe decline in population between 1800 and 1995 without substantial recovery.
- A severe decline (more than 50%) in the UK breeding population size.
- A severe contraction (more than 50%) in the UK range.

Species that meet the following criteria are Amber listed:

- Categorised as a Species of European Conservation Concern.
- Previously red listed for historical decline but with substantial recent recovery.
- Moderate population decline (between 25 and 50%).
- Moderate range contraction (between 25 and 50%)

- UK breeding population of <300 pairs or a UK non-breeding population of <900 individuals.
- At least 50% of the UK breeding or non-breeding population found in 10 or fewer sites.
- At least 20% of the European breeding or non-breeding population found in the UK.

Breeding Status

The breeding status of birds encountered within the survey area are classified in three categories as a result of behaviour observed during the surveys and following the criteria set out by the European Ornithology Atlas Committee:

Confirmed breeding: Nest containing eggs located.

Nests with young seen or heard.

Used nests or eggshells found.

Recently fledged or downy young observed.

Adults entering/leaving nest, particularly if with food or faecal sacs.

Distraction display or injury feigning by disturbed adult.

Probable breeding: Pairs observed in suitable nesting habitat in the breeding season.

Permanent territory presumed through registration or territorial behaviour on at least two different visits at the same place.

Display and courtship behaviour observed.

Birds seen visiting probable nest site.

Agitated behaviour or anxiety calls from adults.

Building nest or excavating nest hole.

Possible breeding: Species observed in breeding season in likely nesting habitat

Singing male(s) present or breeding calls heard.

Appendix 4. Reptile Survey Metadata

Date	Surveyor	Start time	Species found	Temp	Cloud cover	General weather conditions
07/09/16	Hayley Johnstone	Tile set up				
21/09/16	Lisha Adcock	11:00	adult female slow worm	18	1	sunny, clear
22/09/16	Lisha Adcock	10:30	nil	15	7	overcast, warm, dry
26/09/16	Lisha Adcock	11:30	nil	18	4	cloud cleared towards the end of survey
27/09/16	Lisha Adcock	12:30	adult male slow worm	15	5	sunny after an overcast day
28/09/16	Lisha Adcock	11:00	nil	16	2	sunny after a rainy morning
30/09/16	Lisha Adcock	14:30	nil	17	3	sunny with cloud



baker*consultants*