

**QINETIQ SITE,  
FORT HALSTEAD, KENT**

**DUSK EMERGENCE AND  
DAWN RE-ENTRY BAT SURVEYS**

A Report to: QinetiQ Ltd

Report No: RT-MME-153340-01 Rev C

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## REPORT VERIFICATION AND DECLARATION OF COMPLIANCE

This study has been undertaken in accordance with British Standard 42020:2013 “Biodiversity, Code of practice for planning and development”.

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The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management’s Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

## DISCLAIMER

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client’s brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

## VALIDITY OF DATA

The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified ecologist to assess any changes in the habitats present on site, and to inform a review of the conclusions and recommendations made.

## **NON-TECHNICAL SUMMARY**

In August 2020, QinetiQ commissioned Middlemarch Environmental Ltd to complete dusk emergence and dawn re-entry bat surveys of buildings X8-9, X23, X26 and X48 associated with the strategic redevelopment of QinetiQ owned land within Fort Halstead.

A range of ecological surveys were completed by Waterman Group between 2006 and 2013 and by Middlemarch Environmental Ltd in 2018, with further updated surveys in 2020, to inform a separate hybrid planning application associated with the redevelopment of the wider Fort Halstead site. Land surveyed as part of these assessments included QinetiQ owned land.

During the Preliminary Bat Roost Assessment (RT-MME-150872-04 Rev B) a total of 36 buildings were identified as having high potential to support roosting bats and 23 buildings were identified as having low potential to support roosting bats. Of these buildings, buildings X8-9, X23, X26 and X48 were assessed as having high potential to support roosting bats, with all buildings due to be impacted by the proposed strategic redevelopment of the site. Therefore, three bat surveys consisting of two dusk emergence and one dawn re-entry survey were recommended.

Dusk emergence and dawn re-entry surveys were undertaken between 24<sup>th</sup> August 2020 and 28<sup>th</sup> September 2020.

### **Dusk Emergence Surveys**

Variable levels of common pipistrelle foraging activity were recorded around buildings X8-9, X23, X26 and X48 throughout the survey period. Activity predominately occurred around woodland edge and scattered trees located close to the buildings. No bats were recorded emerging from any of the buildings or any other features associated with the site.

Low numbers of soprano pipistrelle foraging passes were recorded along the woodland edge adjacent to building X8-9 to the south during the first dusk emergence bat survey. No bats were recorded emerging from any of the buildings or any other features associated with the site.

No other species of bat were detected or observed during the dusk emergence surveys. Analysis of the sound recordings did not detect any further species of bat.

### **Dawn Re-entry Survey**

Two brown long-eared bats were recorded re-entering blast chamber X9. Both bats swarmed around the entrance to the blast chamber prior to re-entering their roost site. The exact roost location could not be identified due to the blast chamber being located behind a large wooden blast wall, resulting in complete darkness within the chamber.

A single serotine was recorded commuting over the site from west to east. No bats were recorded re-entering any of the buildings or any other features associated with the site.

No other species of bat were detected or observed during the dawn re-entry survey. Analysis of the sound recordings did not detect any further species of bat.

Following the results of the dusk emergence and dawn re-entry surveys, the following recommendations have been made:

#### **R1 Building X9**

As a bat roost/resting place has been identified in building X9, no unlicensed work can be undertaken which will contravene the legislation outlined in Appendix 1.

Examples of works which will breach this legislation include:

- Roof modifications/repairs/removal;
- Timber treatment;
- Noise, vibrations and storage of odorous and dangerous chemicals;
- Alterations to bat entrance/exit points;
- Investigations works in the roof as this can cause bats to abort their young/awake from hibernation and can alter the roof temperature/humidity; and,
- Works in the main body of the building.

*N.B. This is not an exhaustive list and a bat worker should be consulted to determine if the works are likely to breach any legislation.*

Prior to any works being undertaken which are likely to result in a breach of the legislation, a development licence must be obtained from Natural England. The licence application process will include the submission of a method statement detailing the current status of bats on site and how the favourable conservation status of the bat population will be maintained. Prior to a licence being issued, planning permission must be granted and relevant conditions relating to protected species and habitat issues must be discharged.

Dusk emergence and dawn re-entry survey data, in line with Bat Surveys: Good Practice Guidelines published by the Bat Conservation Trust (Collins, 2016), is required to inform the licence application. To ensure that the data submitted is current and appropriate for assessment by Natural England, surveys need to be carried out during the peak bat activity season closest to the start date of the proposed development. The peak bat activity season extends from May to August. Should any delays occur in the planning process which results in a delay in the bat licence application beyond September 2021, the bat activity surveys may have to be updated.

**R2 Buildings X8, X23, X26 and X48**

Buildings X8, X23, X26 and X48 have been subject to a full suite of activity surveys in line with Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), and no bat roosts were identified. The survey data obtained for the site is valid for 12 months from the survey date. If development works to the surveyed building have not commenced within this timeframe it will be essential to update the survey effort to establish if bats have colonised the buildings in the interim. Updated Preliminary Bat Roost Assessments can be undertaken at any time of year. Updated surveys requiring nocturnal or dawn assessment will need to adhere to the Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016) with the surveys undertaken between April and September inclusive. In the unlikely event that a bat is found during site works all works in that area must immediately cease and a suitably qualified ecologist should be contacted.

**R3 Lighting**

In accordance with best practice guidance relating to lighting and biodiversity (Miles et al, 2018; Gunnell et al, 2012), any new lighting should be carefully designed to minimise potential disturbance and fragmentation impacts on sensitive receptors, such as bat species. Examples of good practice include:

- Avoiding the installation of new lighting in proximity to key ecological features, such as hedgerows and woodland edges.
- Using modern LED fittings rather than metal halide or sodium fittings, as modern LEDs emit negligible UV radiation.
- The use of directional lighting to reduce light spill, e.g. by installing bespoke fittings or using hoods or shields. For example, downlighting can be used to illuminate features such as footpaths whilst reducing the horizontal and vertical spill of light.
- Where the use of bollard lighting is proposed, columns should be designed to reduce horizontal light spill.
- Implementing controls to ensure lighting is only active when needed, e.g. the use of timers or motion sensors.
- Use of floor surface materials with low reflective quality. This will ensure that bats using the site and surrounding area are not affected by reflected illumination.
- For internal lights, recessed light fittings cause significantly less glare than pendant type fittings. The use of low-glare glass may also be appropriate where internal lighting has the potential to influence sensitive ecological receptors.

**R4 Habitat Enhancement**

In line with the National Planning Policy Framework, the development should aim to enhance the site for bats. Bat boxes should be installed to provide roosting habitat for species such as pipistrelle. In general, bats seek warm places and for this reason boxes should be located where they will receive full/partial sun, although installing boxes in a variety of orientations will provide a range of climatic conditions. Position boxes at least 4 m above ground to prevent disturbance from people and/or predators. The planting of species which attract night flying insects is encouraged as this will be of value to foraging bats, for example: evening primrose *Oenothera biennis*, goldenrod *Solidago virgaurea*, honeysuckle *Lonicera periclymenum* and fleabane *Pulicaria dysenterica*.

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## 1. INTRODUCTION

### 1.1 PROJECT BACKGROUND

In August 2020, QinetiQ commissioned Middlemarch Environmental Ltd to complete nocturnal emergence and dawn re-entry bat surveys of buildings X8-9, X23, X26 and X48 associated with the strategic redevelopment of QinetiQ owned land within Fort Halstead. A full description of the proposals is provided in Section 5.1.

A range of ecological surveys were completed by Waterman Group between 2006 and 2013 and by Middlemarch Environmental Ltd in 2018, with further updated surveys in 2020, to inform a separate hybrid planning application associated with the redevelopment of the wider Fort Halstead site. Land surveyed as part of these assessments included QinetiQ owned land.

Middlemarch Environmental Ltd was subsequently instructed to undertake a full suite of targeted surveys of the QinetiQ owned land, comprising:

- Preliminary Arboricultural Assessment (Report RT-MME-150872-01);
- Arboricultural Impact Assessment (Report RT-MME-150872-02 Rev B);
- Preliminary Ecological Appraisal (Report RT-MME-150872-03 Rev B);
- Preliminary Bat Roost Assessment (Report RT-MME-150872-04 Rev B);
- Badger Survey (Report RT-MME-150872-05 Rev B); and,
- Winter Hibernation Bat Survey (Report RT-MME-153704-02 Rev B).

An Ecological Mitigation Strategy (Report RT-MME-150872-06 Rev B), a Bat Protection Strategy for Building X78 (Report RT-MME-150872-08 Rev B) and a Bat Mitigation Strategy for Building X9 (Report RT-MME-150872-08 Rev B) have also been prepared.

Middlemarch Environmental Ltd has also prepared a Construction Ecological Management Plan (CEcMP, Report RT-MME-153844-03 Rev C), undertaken a Biodiversity Net Gain Assessment (Report RT-MME-153844-02 Rev B) and prepared a Landscape and Ecological Management Plan (LEMP, Report RT-MME-153844-03 Rev B) for the QinetiQ redevelopment.

During the Preliminary Bat Roost Assessment (Report RT-MME-150872-04 Rev B) completed in August 2020 all buildings within the QinetiQ site boundary were assessed. The site includes a wide variety of buildings of different sizes, construction and functions including conventional brick-built offices with pitched clay-tiled roofs, small brick-built flat-roofed buildings, research, development and testing facilities. These buildings/structures were constructed using a wide range of materials including brick, concrete blocks, corrugated metal, plastic and asbestos, wooden lean-to sections and storage facilities used to house active services, materials or equipment, and large corrugated metal warehouse type buildings and hangars. The level of use of the buildings varied significantly, with some buildings still fully operational, whilst others are presently seldom or never used. Many of the buildings present were in a fairly poor state of repair, with a number of unused buildings being in particularly poor condition. A total of 36 buildings were identified as having high potential to support roosting bats, and 26 buildings were identified as having low potential to support roosting bats. Buildings X8-9, X23, X26 and X48 are scheduled to undergo repair or demolition works and all four were assessed as having high potential to support roosting bats.

Therefore, dusk emergence and dawn re-entry bat surveys were recommended. This report details the results of the surveys undertaken between 24<sup>th</sup> August 2020 and 29<sup>th</sup> September 2020.

Roof repair or replacement works are scheduled to be completed on building X78. Whilst building X78 was assessed as having high potential to support roosting bats during the Preliminary Bat Roost Assessment (Report RT-MME-150872-04 Rev B), the potential roost features identified are not due to be impacted by the proposed works. Therefore, a Bat Protection Strategy (Report RT-MME-153340-02 Rev B) detailing how the proposed works are to proceed without impacting the potential roost features identified has been completed in-lieu of nocturnal emergence/dawn re-entry bat surveys.

All UK bat species are European protected species and they are capable of being material considerations in the planning process. A summary of the legislation protecting bats is included within Appendix 1. This section also provides some brief information on the ecology of British bat species.

## **1.2 SITE DESCRIPTION AND CONTEXT**

The wider Fort Halstead site is located off Star Hill Road in Halstead, Kent, centred at National Grid Reference TQ 4970 5922. It is an irregular shaped parcel of land that measures 131.89 ha in size. The wider Fort Halstead site is bordered by the A224 Polhill to the north-east and Star Hill Road to the south-west. A mixture of arable and pastoral fields, pockets of woodland and farm buildings surround the site. The wider landscape is dominated by a rural setting, consisting of agricultural land interspersed with pockets of woodland and small settlements.

The planning application site extends to 15.8 ha and sits within the wider Fort Halstead site. The site is known as the QinetiQ enclave and is located on the southern-most boundary of the wider Fort Halstead site. The application site is bound by Crow Road to the north, the Scheduled Ancient Monument to the east, ancient woodland to the west and the existing site perimeter fence to the south.

At the time of the survey, the QinetiQ enclave comprised a defence research facility which contained a number of buildings with associated areas of hardstanding, surrounded by parcels of semi-natural and plantation woodland. Areas of neutral grassland, calcareous grassland and amenity grassland were also present, as well as patches of scrub and tall ruderal vegetation.

## **1.3 DOCUMENTATION PROVIDED**

The conclusions and recommendations made in this report are based on information provided by the client regarding the scope of the project. Documentation made available by the client is listed in Table 1.1.

<b>Document Name / Drawing Number</b>	<b>Author</b>
Proposed Site Plan / 30002236-BHK-00-XX-DR-A-003	Baker Hicks

**Table 1.1: Documentation Provided by Client**

## **2. METHODOLOGY**

### **2.1 DESK STUDY**

As part of the Preliminary Ecological Appraisal completed for the wider Fort Halstead site in 2018 (Report RT-MME-127947-01) an ecological desk study (which included a search for records of bats) was undertaken within a 2 km radius. The consultee for the desk study was Kent and Medway Biological Records Centre.

Middlemarch Environmental Ltd then assimilated and reviewed the desk study data provided by this organisation. Relevant bat data are discussed in Chapter 3. In compliance with the terms and conditions relating to its commercial use, the full desk study data are not provided within this report.

The desk study included a search for statutory nature conservation sites designated for bats within a 10 km radius of the site.

### **2.2 FIELD SURVEYS**

#### **2.2.1 Overview of Dusk Emergence and Dawn Re-entry Surveys**

A total of 36 buildings on site were classed as having high potential to support roosting bats during the daytime survey. Among the 36 buildings classed as having high potential to support roosting bats were buildings X8-9, X23, X26 and X48, which are all due to undergo repair or demolition works as part of the proposed strategic redevelopment of the site. In line with Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), three bat surveys were carried out consisting of two dusk emergence bat surveys and one dawn re-entry bat survey. The aim of these surveys was to detect whether bats are roosting within the buildings, and to enable a profile of site utilisation by bats to be compiled.

#### **2.2.2 Dusk Emergence Bat Surveys**

In line with the specifications detailed in Bat Surveys: Good Practice Guidelines (Collins, 2016), the dusk surveys commenced 20 minutes prior to sunset and continued until 120 minutes after sunset. The dusk emergence surveys were conducted using electronic bat detectors (Echo Meter Touch and Bat Box Duet with associated recording devices) to facilitate the detection of bats and to aid in the determination of species of bat using the site. Subsequent computer analysis of recordings allowed all species of bat using the site to be identified.

#### **2.2.3 Dawn Re-Entry Bat Survey**

Bats swarm at their roost site 10-90 minutes prior to entering the roost at dawn (Mitchell-Jones & McLeish, 2004). Surveying for dawn swarming by bats is an efficient way of detecting bat roosts. In line with the specifications detailed by Bat Surveys: Good Practice Guidelines (Collins, 2016) the dawn survey commenced 120 minutes prior to sunrise and continued until 15 minutes after sunrise. To facilitate the detection of bats and to aid in the determination of species of bat using the site, the dawn survey was conducted using electronic bat detectors (Echo Meter Touch and Bat Box Duet with associated recording devices). Computer analysis of bat detector information collected was utilised to identify all species recorded on the site.



### 3. DESK STUDY

#### 3.1 STATUTORY NATURE CONSERVATION SITES

The site is located within 10 km of Westerham Mines SSSI, which is located 6.93 km to the south-west of the survey area. The principal interest of this site is the use of its abandoned ragstone mines by a variety of hibernating bats. With the increasing scarcity of bats in south-east England and the continued loss of the few suitable hibernacula remaining available to them, these mines represent an important winter refuge for bats in the county. Five species have been recorded hibernating here: Brandt's bat *Myotis brandti*, brown long-eared bat *Plecotus auratus*, Daubenton's bat *Myotis daubentoni*, Natterer's bat *Myotis nattereri* and whiskered bat *Myotis mystacinus*. The number of bats using the mines declined from the 1950s onwards, largely because of disturbance, but the fitting of grilles (allowing access for bats but not humans) and devices to maintain the air flow through the mines is thought to have led to an increase in numbers in recent years. However, it is very difficult to locate all the bats using the tunnels, and different species use them at different times during the winter. Thus, it is extremely hard to estimate the true numbers using the mines. There is also evidence that some use is made of the mines by bats in summer.

#### 3.2 SPECIES RECORDS

The data search was carried out in July 2018 by Kent and Medway Biological Records Centre. Records of bat species within a 2 km radius of the wider Fort Halstead site provided by the consultee are summarised in Table 3.1. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area.

Species	No. of Records	Most Recent Record	Proximity of Nearest Record to Study Area	Species of Principal Importance?	Legislation
Natterer's bat <i>Myotis nattereri</i>	4	2016	On site	-	ECH 4, WCA 5, WCA 6
Unidentified myotis <i>Myotis</i> sp.	3	2016	On site	#	ECH 2 #, ECH 4, WCA 5, WCA 6
Common pipistrelle <i>Pipistrellus pipistrellus</i>	17	2014	On site	-	ECH 4, WCA 5, WCA 6
Brown long-eared bat <i>Plecotus auritus</i>	5	2012	On site	✓	ECH 4, WCA 5, WCA 6
Leisler's bat <i>Nyctalus leisleri</i>	1	2007	On site	-	ECH 4, WCA 5, WCA 6
Serotine bat <i>Eptesicus serotinus</i>	20	2015	840 m south-east	-	ECH 4, WCA 5, WCA 6
Unidentified bat <i>Chiroptera</i> sp.	5	1999	960 m south-west	#	ECH 2 #, ECH 4, WCA 5, WCA 6
Pipistrelle species <i>Pipistrellus</i> sp.	5	2005	1,150 m north	#	ECH 4, WCA 5, WCA 6
Noctule <i>Nyctalus noctula</i>	4	2011	1,410 m west	✓	ECH 4, WCA 5, WCA 6
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	2	2013	1,580 m east	✓	ECH 4, WCA 5, WCA 6
Long-eared bat <i>Plecotus</i> sp.	1	2002	1,960 m north-west	#	ECH 4, WCA 5, WCA 6
<b>Key:</b> # : Dependent on species.  ECH 2: Annex II of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation. ECH 4: Annex IV of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest in need of strict protection. WCA 5: Schedule 5 of Wildlife and Countryside Act 1981 (as amended). Protected animals (other than birds). WCA 6: Schedule 6 of Wildlife and Countryside Act 1981 (as amended). Animals which may not be killed or taken by certain methods. Species of Principal Importance: Species of Principal Importance for Nature Conservation in England.					

**Table 3.1: Bat Species Records Within 2 km of Survey Area**

### **3.3 PREVIOUS BAT SURVEYS**

A suite of baseline surveys have been completed across the wider Fort Halstead site by Waterman Group between 2006 and 2013, the results of which are provided in an Ecological Appraisal (Report EED12715-102.R.2.3.7.LM) and Protected Species and Habitat Survey (Report EED12715-102.R.3.3.6.LM), and summarised in the ecology chapter of an Environmental Impact Assessment.

Based on surveys undertaken between 2007 and 2013, evidence of roosting bats was found in ten buildings on site: A13, A14, A25, F6, H38, HR1, HR2, M10, N10 and R29. All roosts recorded were of low numbers (between one and four individuals) of common pipistrelle; however, two brown long-eared bats were recorded hibernating in the disused air-raid shelters inside the security fence (HR1 and HR2) with one individual in each shelter. One presumed summer roost was identified during the internal inspections in one of the bunkers within the Fort (Building F6), where bat droppings were recorded on the ground. It was not possible to determine the species of bat from the droppings, but it was considered likely to be a *Myotis* species roost.

Buildings A25 and M10 have since been demolished, and R29 has been subject to repair works.

Updated bat surveys were completed across the wider Fort Halstead site by Middlemarch Environmental Ltd in 2018 for CBRE Ltd, with the results detailed in Nocturnal Emergence and Dawn Re-entry Bat Surveys Report RT-MME-127947-03 Rev A and Bat Activity Survey Report RT-MME-127947-04 Rev A. The 2018 surveys identified bat roosts in six of the surveyed buildings, located within the wider Fort Halstead site, but outside of the QinetiQ enclave: A3, F11, N2, Q4, Q7 and R64. The bat roosts consisted of one brown long-eared bat maternity roost in R64 and five common pipistrelle day roosts in the other buildings. No bat roosts were identified within any of the buildings located within the QinetiQ site boundary.

## 4. SURVEY RESULTS

### 4.1 FIRST DUSK EMERGENCE SURVEY

The first dusk emergence surveys were undertaken on 24<sup>th</sup> and 25<sup>th</sup> August 2020 by Jamie Fletcher (Senior Ecological Consultant), Sophie Moy (Senior Ecological Consultant, Bat Class Licence Number: 2018-33168-CLS-CLS), Victoria Aelen (Ecological Consultant), Richard Sainsbury (Ecological Consultant), Matthew Fletcher (Ecological Project Officer) and Sachi McFarland (Ecological Project Officer). The weather conditions recorded at the time of the survey are detailed in Table 4.1.

Parameter	24/08/2020		25/08/2020	
	Conditions		Conditions	
	Start	Finish	Start	Finish
Temperature (°C)	19	20	18	16
Cloud Cover (%)	50	75	100	100
Precipitation	Nil	Nil	Nil	Light rain
Wind Speed (Beaufort)	F1	F1	F3	F3

**Table 4.1: Weather Conditions During First Dusk Emergence Survey**

The dusk emergence survey of buildings X8-9 and X48 commenced 20 minutes prior to sunset and continued until 120 minutes after sunset. Sunset was at 20:02 hrs (BBC Weather Centre Data for Halstead). Two species of bat, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus*, were recorded during the survey. Survey results are plotted on Drawing C153340-01-01 in Chapter 7.

The dusk emergence survey of buildings X23 and X26 commenced 20 minutes prior to sunset and continued until 120 minutes after sunset. Sunset was at 20:00 hrs (BBC Weather Centre Data for Halstead). No bats were recorded during the survey. Surveyor locations are plotted on Drawing C153340-01-01 in Chapter 7.

#### Building X8-9

##### **Common pipistrelle**

Common pipistrelle foraging activity was recorded along the woodland edge opposite building X8-9 to the south intermittently throughout the survey period, with the first detection at 20:11 and the last detection at 21:01. No bats were recorded emerging from the building.

##### **Soprano pipistrelle**

Two soprano pipistrelle foraging passes were recorded along the woodland edge opposite building X8-9 to the south at 20:30 and 20:41. No bats were recorded emerging from the building.

No other species of bat were detected or observed during this survey. Analysis of the sound recordings did not detect any further species of bat.

#### Building X48

No bat activity was recorded during the survey period. Analysis of the sound recordings did not detect any further species of bat.

#### Building X23

No bat activity was recorded during the survey period. Analysis of the sound recordings did not detect any further species of bat.

#### Building X26

No bat activity was recorded during the survey period. Analysis of the sound recordings did not detect any further species of bat.

## 4.2 SECOND DUSK EMERGENCE SURVEY

The second dusk emergence bat surveys were undertaken on 14<sup>th</sup> September 2020 and 15<sup>th</sup> September 2020 by Paul Roebuck (South-East Manager, Natural England Bat Class Licence Number: 2018-33337-CLS-CLS) Jamie Fletcher (Senior Ecological Consultant), Sophie Moy (Senior Ecological Consultant, Natural England Bat Class Licence Number: 2018-33168-CLS-CLS), Will Rees (Ecological Consultant), Matthew Fletcher (Ecological Project Officer), Caitlin Ehlers (Ecological Project Officer) and Sachi McFarland (Ecological Project Officer). The weather conditions recorded at the time of the survey are detailed in Table 4.2.

Parameter	14/09/2020		15/09/2020	
	Conditions		Conditions	
	Start	Finish	Start	Finish
Temperature (°C)	21	19	23	21
Cloud Cover (%)	0	0	25	10
Precipitation	Nil	Nil	Nil	Nil
Wind Speed (Beaufort)	F0	F0	F0	F0

**Table 4.2: Weather Conditions During Second Dusk Emergence Surveys**

The dusk emergence survey of buildings X8-9 and X48 commenced 20 minutes prior to sunset and continued until 120 minutes after sunset. Sunset was at 19:15 hrs (BBC Weather Centre Data for Halstead). One species of bat, common pipistrelle, was recorded during the survey. Survey results are plotted on Drawing C153340-01-02 in Chapter 7.

The dusk emergence survey of buildings X23 and X26 commenced 20 minutes prior to sunset and continued until 120 minutes after sunset. Sunset was at 19:13 hrs (BBC Weather Centre Data for Halstead). One species of bat, common pipistrelle, was recorded during the survey. Survey results are plotted on Drawing C153340-01-02 in Chapter 7.

### Building X8-9

#### **Common Pipistrelle**

Two common pipistrelle foraging passes were recorded along the woodland edge opposite building X8-9 to the south at 19:43 and 19:55. No bats were recorded emerging from the building.

No other species of bat were detected or observed during this survey. Analysis of the sound recordings did not detect any further species of bat.

### Building X48

#### **Common Pipistrelle**

Common pipistrelle foraging passes were recorded around building X48 almost constantly between 19:30 and 20:15. The majority of the foraging activity occurred around scattered mature trees located around the building. No bats were recorded emerging from the building.

No other species of bat were detected or observed during this survey. Analysis of the sound recordings did not detect any further species of bat.

### Building X23

#### **Common Pipistrelle**

Sporadic common pipistrelle foraging activity was recorded around building X23 and around scattered trees located around the building between 19:50 and 20:30. No bats were recorded emerging from the building.

No other species of bat were detected or observed during this survey. Analysis of the sound recordings did not detect any further species of bat.

#### Building X26

##### **Common Pipistrelle**

Moderate levels of common pipistrelle foraging activity were recorded between 19:50 and 20:12, with the majority of foraging activity recorded around trees located around the building. No bats were recorded emerging from the building.

No other species of bat were detected or observed during this survey. Analysis of the sound recordings did not detect any further species of bat.

### **4.3 DAWN RE-ENTRY SURVEY**

The dawn re-entry surveys were undertaken on 28<sup>th</sup> September 2020 and 29<sup>th</sup> September 2020 by Jamie Fletcher (Senior Ecological Consultant), Sophie Moy (Senior Ecological Consultant, Natural England Bat Class Licence Number: 2018-33168-CLS-CLS), Will Rees (Ecological Consultant), Richard Sainsbury (Ecological Consultant), Harry Stone (Ecological Project Officer), Matthew Fletcher (Ecological Project Officer) and Caitlin Ehlers (Ecological Project Officer). The weather conditions recorded at the time of the survey are detailed in Table 4.3.

Parameter	28/09/2020		29/09/2020	
	Conditions		Conditions	
	Start	Finish	Start	Finish
Temperature (°C)	10	10	13	13
Cloud Cover (%)	100	100	100	100
Precipitation	Nil	Nil	Nil	Light rain
Wind Speed (Beaufort)	F2	F3	F0	F0

**Table 4.3: Weather Conditions During Dawn Re-entry Surveys**

The dawn re-entry survey of buildings X8-9 and X48 commenced 120 minutes prior to sunrise and continued until 15 minutes after sunrise. Sunrise was at 06:56 hrs (BBC Weather Centre Data for Halstead). One species of bat, brown long-eared bat, was recorded during the survey. Survey results are plotted on Drawing C153340-01-03 in Chapter 7.

The dawn re-entry survey of buildings X23 and X26 commenced 120 minutes prior to sunrise and continued until 15 minutes after sunrise. Sunrise was at 06:57 hrs (BBC Weather Centre Data for Halstead). One species of bat, serotine *Eptesicus serotinus*, was recorded during the survey. Survey results are plotted on Drawing C153340-01-03 in Chapter 7.

#### Building X8-9

##### **Brown Long-Eared Bat**

Two brown long-eared bats were recorded re-entering blast chamber X9 at 06:33 and 06:37. Both bats swarmed around the entrance to the blast chamber prior to re-entering their roost site. The exact roost locations could not be identified due to the blast chamber being located behind a large wooden blast wall, resulting in complete darkness within the chamber.

No other species of bat were detected or observed during this survey. Analysis of the sound recordings did not detect any further species of bat.

#### Building X48

No bat activity was recorded during the survey period. Analysis of the sound recordings did not detect any further species of bat.

#### Building X23

No bat activity was recorded during the survey period. Analysis of the sound recordings did not detect any further species of bat.

Building X26

**Serotine**

A single serotine was recorded commuting over the site from west to east at 06:02. No bats were recorded re-entering any features associated with the site.

No other species of bat were detected or observed during this survey. Analysis of the sound recordings did not detect any further species of bat.

## 5. DISCUSSION AND CONCLUSIONS

### 5.1 SUMMARY OF PROPOSALS

The proposals for the site are as follows:

*Works to the proposed QinetiQ enclave comprising the erection of perimeter security fence, erection of a new reception building, creation of a new main site entrance along Crow Road, refurbishment of existing buildings including plant installation, creation of a new surface level car park and access, installation of two new explosive magazine stores and surrounding pendine block walls, demolition of existing buildings, installation of 6no. storage containers, installation of new site utilities and landscaping works.*

It is understood that building X8-9 is to undergo 'minor cosmetic upgrades' in order to become operational again, including the installation of doors and the repair or replacement of damaged internal metal blast panels. Roof replacement or repair works are scheduled for buildings X23 and X48 and building X26 will potentially be demolished in order to facilitate the development of a sub-station.

### 5.2 SUMMARY OF DUSK EMERGENCE AND DAWN RE-ENTRY SURVEYS

#### 5.2.1 Dusk Emergence Surveys

Variable levels of common pipistrelle foraging activity were recorded around buildings X8-9, X23, X26 and X48 throughout the survey period. Activity predominately occurred around woodland edge and scattered trees located close to the buildings. No bats were recorded emerging from any of the buildings or any other features associated with the site.

Low numbers of soprano pipistrelle foraging passes were recorded along the woodland edge adjacent to building X8-9 to the south during the first dusk emergence bat survey. No bats were recorded emerging from any of the buildings or any other features associated with the site. No other species of bat were detected or observed during the dusk emergence surveys. Analysis of the sound recordings did not detect any further species of bat.

#### 5.2.2 Dawn Re-entry Survey

Two brown long-eared bats were recorded re-entering blast chamber X9. Both bats swarmed around the entrance to the blast chamber prior to re-entering their roost site. The exact roost locations could not be identified due to the blast chamber being located behind a large wooden blast wall, resulting in complete darkness within the chamber.

A single serotine was recorded commuting over the site from west to east. No bats were recorded re-entering any of the buildings or any other features associated with the site. No other species of bat were detected or observed during the dawn re-entry survey. Analysis of the sound recordings did not detect any further species of bat.

### 5.3 CONCLUSIONS

Following the suite of survey work undertaken on site it can be confirmed that blast chamber X9 contains a bat roost used by brown long-eared bats. Due to the observation of two brown long-eared bats re-entering the building it is considered that building X9 is used as a transitional roost. Therefore, no unlicensed works can be undertaken. A recommendation regarding the licence application is made in Chapter 6.

Common pipistrelle foraging activity was recorded around buildings X8-9, X23, X26 and X48 during the survey period, though no bats were recorded emerging from or re-entering any of the buildings or any other features associated with the site. Soprano pipistrelle foraging activity was also recorded around building X8-9, though no bats were recorded emerging from or re-entering the building or any other features associated with the site.

The woodland edge opposite building X8-9 to the south is considered to be of high value to foraging and commuting bats, with bats recorded using this feature throughout the survey period. Furthermore, scattered mature trees and tree lined boundaries around buildings X23, X26 and X48 are also considered to be of high value to foraging bats.

## 6. RECOMMENDATIONS

All recommendations provided in this section are based on Middlemarch Environmental Ltd's current understanding of the site proposals, correct at the time the report was compiled. Should the proposals alter, the conclusions and recommendations made in the report should be reviewed to ensure that they remain appropriate.

### R1 Building X9

As a bat roost/resting place has been identified in building X9, no unlicensed work can be undertaken which will contravene the legislation outlined in Appendix 1.

Examples of works which will breach this legislation include:

- Roof modifications/repairs/removal;
- Timber treatment;
- Noise, vibrations and storage of odorous and dangerous chemicals;
- Alterations to bat entrance/exit points;
- Investigations works in the roof as this can cause bats to abort their young/awake from hibernation and can alter the roof temperature/humidity; and,
- Works in the main body of the building.

*N.B. This is not an exhaustive list and a bat worker should be consulted to determine if the works are likely to breach any legislation.*

Prior to any works being undertaken which are likely to result in a breach of the legislation, a development licence must be obtained from Natural England. The licence application process will include the submission of a method statement detailing the current status of bats on site and how the favourable conservation status of the bat population will be maintained. Prior to a licence being issued, planning permission must be granted and relevant conditions relating to protected species and habitat issues must be discharged.

Dusk emergence and dawn re-entry survey data, in line with Bat Surveys: Good Practice Guidelines published by the Bat Conservation Trust (Collins, 2016), is required to inform the licence application. To ensure that the data submitted is current and appropriate for assessment by Natural England, surveys need to be carried out during the peak bat activity season closest to the start date of the proposed development. The peak bat activity season extends from May to August. Should any delays occur in the planning process which results in a delay in the bat licence application beyond September 2021, the bat activity surveys may have to be updated.

### R2 Buildings X8, X23, X26 and X48

Buildings X8, X23, X26 and X48 have been subject to a full suite of activity surveys in line with Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), and no bat roosts were identified. The survey data obtained for the site is valid for 12 months from the survey date. If development works to the surveyed building have not commenced within this timeframe it will be essential to update the survey effort to establish if bats have colonised the buildings in the interim. Updated Preliminary Bat Roost Assessments can be undertaken at any time of year. Updated surveys requiring nocturnal or dawn assessment will need to adhere to the Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016) with the surveys undertaken between April and September inclusive. In the unlikely event that a bat is found during site works all works in that area must immediately cease and a suitably qualified ecologist should be contacted.

### R3 Lighting

In accordance with best practice guidance relating to lighting and biodiversity (Miles et al, 2018; Gunnell et al, 2012), any new lighting should be carefully designed to minimise potential disturbance and fragmentation impacts on sensitive receptors, such as bat species. Examples of good practice include:

- Avoiding the installation of new lighting in proximity to key ecological features, such as hedgerows and woodland edges.
- Using modern LED fittings rather than metal halide or sodium fittings, as modern LEDs emit negligible UV radiation.



- The use of directional lighting to reduce light spill, e.g. by installing bespoke fittings or using hoods or shields. For example, downlighting can be used to illuminate features such as footpaths whilst reducing the horizontal and vertical spill of light.
- Where the use of bollard lighting is proposed, columns should be designed to reduce horizontal light spill.
- Implementing controls to ensure lighting is only active when needed, e.g. the use of timers or motion sensors.
- Use of floor surface materials with low reflective quality. This will ensure that bats using the site and surrounding area are not affected by reflected illumination.
- For internal lights, recessed light fittings cause significantly less glare than pendant type fittings. The use of low-glare glass may also be appropriate where internal lighting has the potential to influence sensitive ecological receptors.

#### **R4 Habitat Enhancement**

In line with the National Planning Policy Framework, the development should aim to enhance the site for bats. Bat boxes should be installed to provide roosting habitat for species such as pipistrelle. In general, bats seek warm places and for this reason boxes should be located where they will receive full/partial sun, although installing boxes in a variety of orientations will provide a range of climatic conditions. Position boxes at least 4 m above ground to prevent disturbance from people and/or predators. The planting of species which attract night flying insects is encouraged as this will be of value to foraging bats, for example: evening primrose *Oenothera biennis*, goldenrod *Solidago virgaurea*, honeysuckle *Lonicera periclymenum* and fleabane *Pulicaria dysenterica*.

## **7. DRAWINGS**

Drawing C153340-01-01 – First Dusk Emergence Surveys

Drawing C153340-01-02 – Second Dusk Emergence Surveys

Drawing C153340-01-03 – Dawn Re-entry Surveys



C153340-01-01-RevA

Legend

Site boundary

Surveyor location

Common pipistrelle foraging

Soprano pipistrelle foraging

Building surveyed

Note:

X8/9 and X48 surveyed 24/08/2020

X23 and X26 surveyed 25/08/2020

Project

QinetiQ Site, Fort Halstead, Kent

Drawing

First Nocturnal Emergence Survey

Client

QinetiQ

Drawing Number

C153340-01-01-RevA

Revision

Rev A

Scale @ A3

1:2,500

Date

May 2021

Approved By

JF

Drawn By

RP

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C153340-01-02-RevA

Legend

Site boundary

Surveyor location

Common pipistrelle foraging

Building surveyed

Note:

X8/9 and X48 surveyed 14/09/2020

X23 and X26 surveyed 15/09/2020

Project

QinetiQ Site, Fort Halstead, Kent

Drawing

Second Nocturnal Emergence Survey

Client

QinetiQ

Drawing Number

C153340-01-02-RevA

Revision

Rev A

Scale @ A3

1:2,500

Date

May 2021

Approved By

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C153340-01-03-RevA

Legend

Site boundary

Surveyor location

Brown long-eared bat re-entry point (x2)

Serotine commuting

Building surveyed

Note:

X8/9 and X48 surveyed 28/09/2020

X23 and X26 surveyed 29/09/2020

Project

QinetiQ Site, Fort Halstead, Kent

Drawing

Dawn Re-Entry Survey

Client

QinetiQ

Drawing Number

C153340-01-03-RevA

Revision

Rev A

Scale @ A3

1:2,500

Date

May 2021

Approved By

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## APPENDIX 1

### LEGISLATION

Bats and the places they use for shelter or protection (i.e. roosts) receive legal protection under the Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2017) and the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019 (Habitats Regulations 2019). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. This protection means that bats, and the places they use for shelter or protection, are capable of being a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2017, states that a person commits an offence if they:

- deliberately capture, injure or kill a bat;
- deliberately disturb bats; or
- damage or destroy a bat roost (breeding site or resting place).

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

It is an offence under the Habitats Regulations 2017 for any person to have in his possession or control, to transport, to sell or exchange or to offer for sale, any live or dead bats, part of a bat or anything derived from bats, which has been unlawfully taken from the wild.

Changes have been made to parts of the Habitats Regulations 2017 so that they operate effectively from 1st January 2021. The changes are made by the Habitats Regulations 2019, which transfer functions from the European Commission to the appropriate authorities in England and Wales.

All other processes or terms in the 2017 Regulations remain unchanged and existing guidance is still relevant.

The obligations of a competent authority in the 2017 Regulations for the protection of species do not change. A competent authority is a public body, statutory undertaker, minister or department of government, or anyone holding public office.

Whilst broadly similar to the above legislation, the WCA 1981 (as amended) differs in the following ways:

- Section 9(1) of the WCA makes it an offence to *intentionally* kill, injure or take any protected species.
- Section 9(4)(a) of the WCA makes it an offence to *intentionally or recklessly\** damage or destroy, or *obstruct access to*, any structure or place which a protected species uses for shelter or protection.
- Section 9(4)(b) of the WCA makes it an offence to *intentionally or recklessly\** disturb any protected species *while it is occupying a structure or place which it uses for shelter or protection*.

\*Reckless offences were added by the Countryside and Rights of Way (CROW) Act 2000.

As bats re-use the same roosts (breeding site or resting place) after periods of vacancy, legal opinion is that roosts are protected whether or not bats are present.

The reader should refer to the original legislation for the definitive interpretation.

The following bat species are Species of Principal Importance for Nature Conservation in England: barbastelle bat *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros*. Species of Principal Importance for Nature Conservation in England are material considerations in the planning process. The list of species is derived from Section 41 list of the Natural Environmental and Rural Communities (NERC) Act 2006.

## **ECOLOGY**

At present, 18 species of bats are known to live within the United Kingdom, of which 17 species are confirmed as breeding. All UK bat species are classed as insectivorous, feeding on a variety of invertebrates including midges, mosquitoes, lacewings, moths, beetles and small spiders.

Bats will roost within a variety of different roosting locations, included houses, farm buildings, churches, bridges, walls, trees, culverts, caves and tunnels. At different times of the year the bats roosting requirements alter and they can have different roosting locations for maternity roosts, mating roosts and hibernation roosts. Certain bat species will also change roosts throughout the bat activity season with the bat colony using the site to roost for a few days, abandoning the roost and then returning a few days or weeks later. This change can be for a variety of reasons including climatic conditions and prey availability. Bats are known live for several years and if the climatic conditions are unfavourable at a particular roost, they may abandon it for a number of years, before returning when conditions change. Due to the matriarchal nature of bat colonies, the locations of these roosts can be passed down through the generations.

Bats usually start to come out of hibernation in March and early April (weather dependent), when they start to forage and replenish the body weight lost during the hibernation period. The female bats then start to congregate together in maternity roosts prior to giving birth and a single baby is born in June or July. The female then works hard to feed her young so that they can become independent and of a sufficient weight to survive the winter before the weather gets too cold and invertebrate activity reduces. Males generally live solitary lives, or in small groups with other males, although in some species the males can be found living with the females all year. The mating season begins in the autumn. During the winter bats hibernate in safe locations which provide relatively constant conditions, although they may venture outside to forage on warmer winter nights.