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**ALDER ECOLOGY** UK LTD  
Working for the Client - Working with Wildlife

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MoD three site concept statement, Bath, B&NES

AEUK301

Desk top study and assessment bats

Roger Martindale

17<sup>th</sup> January 2012



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## Contents

Executive summary .....	4
1 Introduction.....	5
2 Assessment Introduction.....	8
3 Methodology .....	9
4 Limitations to Assessment.....	10
5 Legislation.....	10
6 Results .....	12
6a Bat risk register for MoD site – Warminster road .....	17
6b Bat risk register for MoD site – Endsleigh .....	20
6c Bat risk register for MoD site – Foxhill .....	23
7 Discussion .....	26
8 Conclusions.....	28
9 Recommendations.....	29
10 References.....	30
Appendix 1 Warminster road bat records and SAC location.....	31
Appendix 2 Endsleigh bat records and SAC location .....	33
Appendix 3 Foxhill bat records and SAC location.....	35

## Executive summary

Alder Ecology UK Ltd was commissioned by Stephen George Senior Planner, Planning Policy at Bath and North East Somerset Council (BANES) to conduct a desk top survey and assessment for bats to support a planning concept statement submission for the proposed re-development three decommissioned MoD sites in Bath.

The MOD have announced proposals to relocate all staff currently based in Bath to Abbey Wood, South Gloucestershire and to dispose of their Bath sites at Foxhill, Warminster Road and Ensleigh by March 2013. The total area for all three sites is approximately 33ha consisting of buildings, hardstanding and soft landscaped (formal and informal) grounds.

The data search confirms that the general area is of high ecological significance for bat species and that the local area contains SACs which are important for breeding and hibernating horseshoe bats and up to 10 species in total Parsons 2000. The records returned show that the local area supports habitats and sites important in a UK context and that these sites have been shown to have been historically used by bat species. The data search confirms that 12 species of bat have been recorded within 0-5km of the sites and that the area around the three sites and within the site boundary has the potential to hold bat species. Warminster road and Foxhill have confirmed bat roosts within the 1km grid square of the site location making likelihood of roosting bats on site higher.

The desk study confirms that the development of all sites individually could have an indirect impact upon the integrity of the Bath and Bradford on Avon SAC and that the development of Foxhill could also have a direct impact upon the integrity of the SAC and its special interest features. The impacts are likely to occur at all stages of any potential development and throughout the life of the project and potentially post construction without suitable mitigation and/or compensation measures.

The desk study concludes that all the sites are well connected to the local landscape with features described in the Habitats directive 1992 as being of a linear and continuous nature that are essential for the migration, dispersal and genetic exchange of wild species as listed in article 10 and explained in regulation 39.

The study also concluded that there is scope to develop all three sites and that with a carefully designed scheme it would be possible to retain any bat interest on site with integrated mitigation and/or compensation features. There are opportunities for enhancements to be included in all three schemes that would be beneficial to bats species with use of native vegetation within a well designed landscape scheme and a carefully planned, implemented and monitored lighting plan. This would be in keeping with the aspirations of the local planning authority guidance on protected species and planning policy statement 9 Biodiversity and Geological conservation.

## **1 Introduction**

### **Introduction to project**

#### *Commission*

Alder Ecology UK Ltd was commissioned by Stephen George Senior Planner, Planning Policy at Bath and North East Somerset Council (BANES) to conduct a desk top survey and assessment for bats to support a planning concept statement submission for the proposed re-development three decommissioned MoD sites in Bath.

#### *Site Details*

The three MoD sites, Endsleigh, Warminster road and Foxhill are located within the curtilage of the city of Bath, North East Somerset. Two sites are situated in an urban locations (Warminster road and Foxhill) and the third (Endsleigh) is situated on the urban fringe of north Bath. The total area for all three sites is approximately 33ha consisting of buildings, hardstanding and soft landscaped (formal and informal) grounds.

#### *Background*

The MOD have announced proposals to relocate all staff currently based in Bath to Abbey Wood, South Gloucestershire and to dispose of their Bath sites at Foxhill, Warminster Road and Enslaught by March 2013.

In total the sites cover 33ha and will make a significant contribution to the Council's emerging Core Strategy target by delivering over 1000 houses and up to 1000 jobs.

Bath and North East Somerset are working in partnership with the MoD to achieve an effective disposal process and to ensure that they achieve high quality places on these prime sites. It is also proposed that joint working between BANES and the MoD extends to shared involvement in the disposal strategy and process.

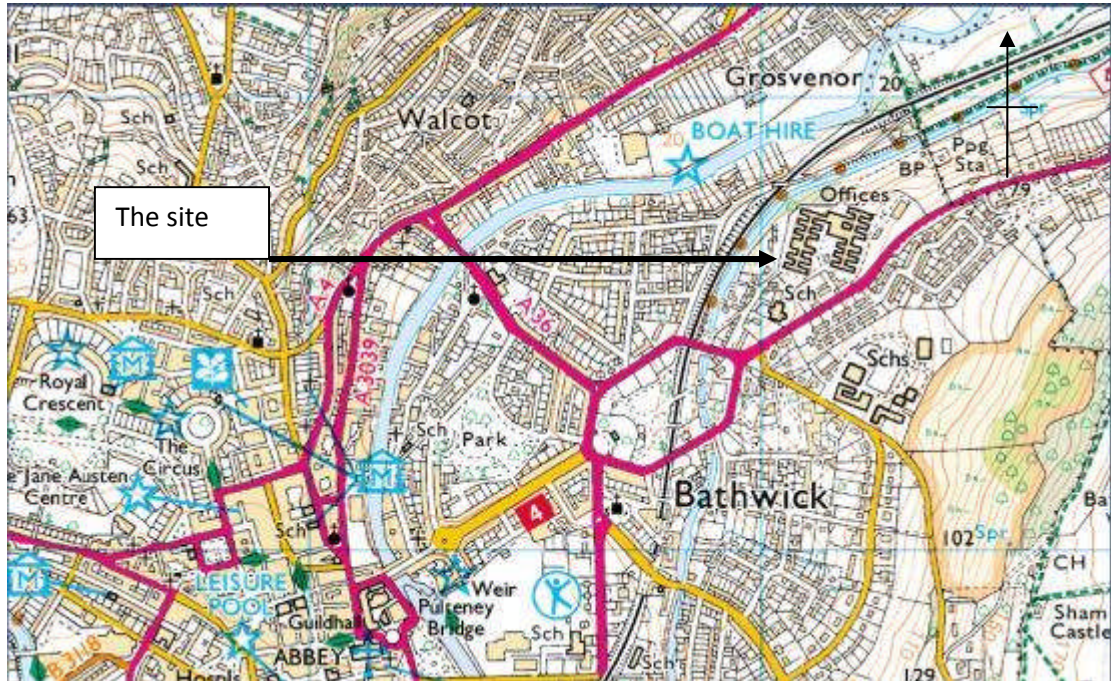
The production of this Concept Statements for ecology will set out the subsequent stages required following site disposal. It will provide the context for developers to produce Master plans and Design Codes (as appropriate) to enable appropriate development of the sites and the more detailed consideration of the planning issues affecting them.



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MoD sites Bath.

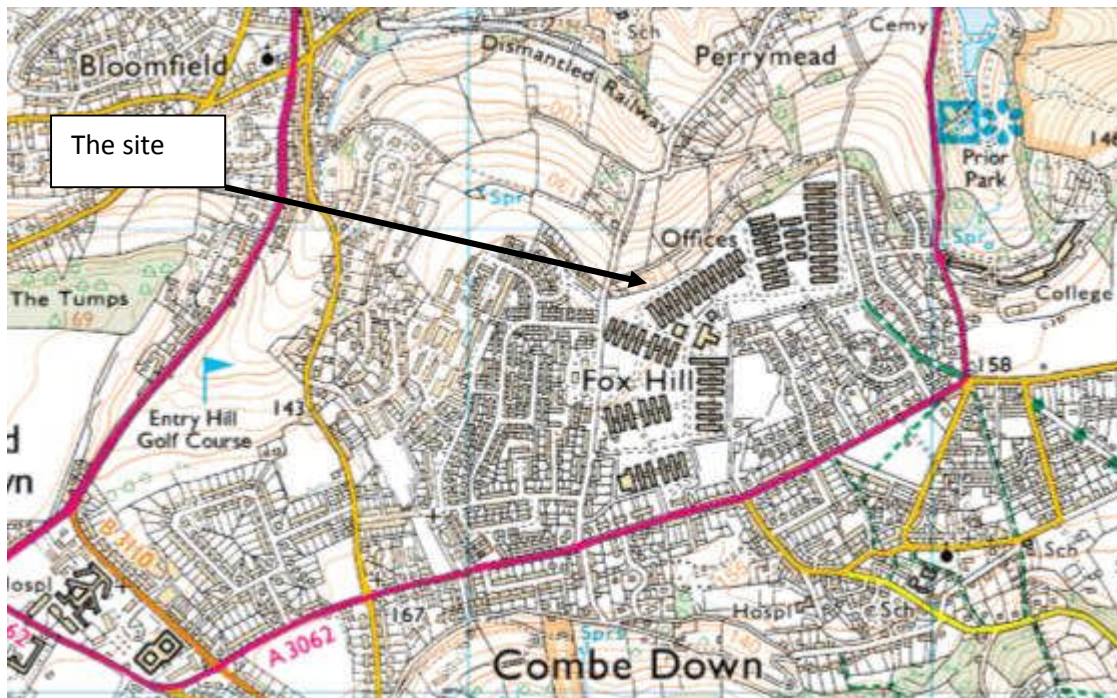
Site Location- Bath City, North Somerset.

Site locations (all not to scale)



Map 1 Showing site location Warminster Road, Bath

Source: street map



Map 2 Showing site location Foxhill, Bath

Source: street map





Map 3 Showing site location Endsleigh, Bath

Source: street map

## 2 Assessment Introduction

### Introduction

This report presents the findings of a desk top study undertaken in January 2012 by Alder Ecology UK Ltd. An assessment has been provided on the overall value of the site for bats based on the data results obtained. Conclusions have been drawn about the site and an approach as the way the development can proceed with recommendations for the site outlined.

Mr Roger Martindale, Ecologist at Alder Ecology UK Ltd who is a full member of The Institute of Ecology and Environmental Management (IEEM) and Chartered Environmentalist (CEnv), undertook the desk top study during January 2012. The surveyor has over 19 years experience of this type of work.

The aim of the desk top study is to understand the value of the existing habitat types to bat species, to determine the existence and location of any ecologically valuable areas and to identify the presence of any protected species or habitats suitable for supporting such species. The study therefore identifies all ecological constraints in relation to bats and outlines further survey work where required.

### Objectives

The objectives of the desk study were to:

- ❑ Review the baseline information on the current habitats and ecological features in and around the three sites;
- ❑ Provide an ecological assessment for each site on its value to bat species.
- ❑ Identify the presence or potential presence of any protected species (bats) whose disturbance may require consent under the Wildlife and Countryside Act, 1981 (as amended) or The Conservation of Habitats and Species Regulations, 2010.
- ❑ Identify any species or habitats, which may require special mitigation during the proposed work and;
- ❑ Identify any potential impacts that may affect European protected sites or species.



### 3 Methodology

#### **Desk study**

##### *Data Review*

The purpose of the desk study was to review information available in the public domain. Information was searched for within 5km for protected sites and using 10km grid squares for protected species data.

The following web-based metadatabases were searched for information regarding protected habitats and species;

- ❑ National Biodiversity Network Gateway (NBN; [www.searchnbn.net](http://www.searchnbn.net));
- ❑ Multi-Agency Geographic Information for the Countryside (MAGIC; [www.magic.gov.uk](http://www.magic.gov.uk)).
- ❑ Natural England's – Nature on the Map

##### Other information sources

- ❑ Information provided by BANES
- ❑ Information provided by the local environmental records centre
- ❑ Relevant published material

## 4 Limitations to Assessment

The data provided from metadatabases is based on existing records but does not necessarily constitute a comprehensive list of protected and notable species records. These records are not exhaustive as there is currently no national or regional policy for systematic data gathering. Therefore absence of data does not constitute evidence of absence (i.e. it may be that the site has not previously been surveyed). It is also possible that other data exist within this area that has not been made available to Alder Ecology UK Ltd. The desk top study is not constrained by time of year and is therefore considered to be an accurate assessment at the time of the study.

## 5 Legislation

The Wildlife and Countryside Act 1981 (as amended) affords protection to species of fauna included in schedule 5 of the act. Additionally section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 lists species and habitats that are of principal importance for the conservation of biodiversity in England and Wales. Those pieces of legislation together with national, regional and local Biodiversity Action Plans (BAPs) seek to safeguard areas containing protected species and habitats.

The Wildlife and Countryside Act 1981, the Section 41 list and the BAPs are used to guide decision-makers such as landowners in implementing their duty to have regard to the conservation of biodiversity in England, when carrying out their normal functions. This legislation is further strengthened by the European Habitats directive 1992 which affords special protection to species and habitats of European importance. Protected species and habitats are a material consideration in the planning process and an assessment of their presence/absence from a site and the likely impact of a development on such species or habitats must be undertaken prior to any planning submission.

All British bats are protected under Section 9 Schedule 5 of the Wildlife and Countryside Act 1981 and amendments. In addition, they are protected under the Berne Convention, they are given migratory species protection within the Bonn Convention Agreement, and are protected under Schedule 2 of the EC Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (Habitats Directive).

Regulation 41 of The Conservation of Habitats and Species Regulation 2010 makes it an offence to deliberately capture or kill bats, to deliberately disturb a bat, damage or destroy a breeding site or resting site of any bat. It is an offence to disturb any bat roosting site. Presence of bats does not necessarily mean that development cannot go ahead, but that with suitable, approved mitigation, exemptions can be granted from the protection afforded to bats under regulation 41 by means of a licence. Natural England (NE) is the appropriate authority for determining licence applications for works associated with developments affecting bats, including demolition of their roost sites. In

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MoD sites Bath.

cases where licences are required, certain conditions have to be met to satisfy Natural England. Before the Statutory Nature Conservation Organisation (SNCO), in this case NE, can issue a licence to permit otherwise prohibited acts three tests have to be satisfied. The tests are:

- Regulation 53(2)(e) states that licenses may be granted by SNCO to ‘preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.
- Regulation 42(10)(a) states that a licence may not be granted unless SNCO is satisfied ‘that there is no satisfactory alternative’.
- Regulation 42(10)(b) states that a licence cannot be issued unless SNCO is satisfied that the action proposed ‘will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range’.

In order to meet the tests, SNCO usually expects the planning position to be fully resolved as this is necessary to satisfy tests 1 and 2. Full planning permission, if applicable, will need to have been granted and any conditions relating to bats fully discharged. For test 3, the licensing body seek advice from Natural England. As well as consulting with Natural England, the licensing body may also seek information from the local authority before they will determine any licence application. The licence application process may take two months before a licence is issued.

## 6 Results

### Desk study

#### *Data Review*

#### *Protected habitats*

*Table 1: Designated Site Summary*

<b>Name</b>	<b>Designation</b>	<b>Size</b>	<b>Site Summary</b>	<b>Comment</b>
<b>Twerton Roundhill</b>	LNR	4.66ha	Grassland	HPINC
<b>Carrs Woodland</b>	LNR	21.10ha	Ancient woodland	HPINC
<b>Kensington Meadows</b>	LNR	2.11ha	Meadows	HPINC
<b>River Avon System</b>	SSSI	475.9ha	River and tributaries	HPINC
<b>Midford Valley woods</b>	SSSI	23.58ha	Ancient woodland	HPINC
<b>North Quarry road</b>	SSSI	0.31ha	Bat roost	HPINC
<b>Bath and Bradford on Avon mines SAC</b>	SSSI	6.26ha	Bat roost	HPINC
	NNR			
	SAC			

#### Biodiversity Action Plan (BAP) priority habitats

The surrounding area within 10km of the three sites contains a number of identified BAP priority habitats as listed in the section 41 list of the Natural Environment and Rural Communities Act 2006 which identifies Habitats of Principal Importance for Nature Conservation (HPINC). As listed above. All of these habitats have been shown to be used by bats are all are considered important as foraging resources for bats. The three sites have the potential to contain bats as listed in the NERC Act 2006 as being Species of Principal Importance for Nature Conservation (SPINC) see table 2 below.



*Protected and Notable Species Records*

Table 2 Protected species for 10km Grid Squares ST 76

<b>Name</b>	<b>Records</b>	<b>Distance from site closest record to furthest all sites</b>	<b>Comment</b>
<b>Pipistrelle bat sp.</b>	20	0km to 10km	
<b>Daubenton's bat.</b>	9	1km to 7km	
<b>Brown Long eared</b>	15	0km to 10km	SPINC (NERC 2006)
<b>Natterer's bat</b>	10	1km to 10km	
<b>Noctule bat</b>	7	1km to 10km	SPINC (NERC 2006)
<b>Serotine bat</b>	13	2km to 8km	
<b>Whiskered/Brandt's bat</b>	14	1km to 7km	
<b>Lesser Horseshoe bat</b>	19	2km to 7km	SPINC (NERC 2006)
<b>Greater Horseshoe</b>	38	1km to 8km	SPINC (NERC 2006)
<b>Barbastelle</b>	1	4km	SPINC (NERC 2006)

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MoD sites Bath.

Summary of findings of recent studies for Bats Bath area 2000 to 2008.

*Ransome R. (2008) Bath Urban surveys: Dusk surveys for horseshoe bats around south western Bath. Assessment summer 2008.*

*Summary of findings (Quoted unchanged from report)*

Nine bat species were shown by surveyors and static systems to forage over the whole study area. Since 4 common species were likely to be represented among the Myotis calls, the true number is probably 12 species. They were Greater and Lesser horseshoe bats; Common and Soprano pipistrelles; probably at least four Myotis species – Daubenton's, Natterer's, Whiskered and Brandt's bats; Noctule and Leisler's; Brown long-eared bat and Serotine. Bechstein's bat is also known to hibernate in the Combe Down mines. Their calls cannot be distinguished from Natterer's in the field, so their presence cannot be verified by the methods used.

Static systems were more effective at detecting horseshoe bat calls, and other rare species, than roving surveyors. This is normally the case.

Use of the specified locations within the study area by Greater horseshoe bats is variable according to location and month of study. Horsecombe Vale is well used for foraging for the first 3 hours of the night when moths are mainly eaten from June to August. Southstoke seems to be primarily a key commuting route to Odd Down, soon after dusk. They probably foraged on moths generated by the overgrown grasslands, developing scrubland and young ash plantations. The Tumps and West of Odd Down were rarely used, and Twerton, not at all.

Both horseshoe bats avoided using the field corner behind the clubhouse at Odd Down, despite it being a good habitat for moth generation. This was probably due to the bright floodlights used for night matches.

At Odd Down, horseshoe bats primarily used the non-arable areas, especially the scrub near the top of the ridge, and the young ash plantation strips where moths seemed abundant in mid summer.

No horseshoe bats were detected foraging around the woodland at Twerton. This may be due to its long distance from Combe Down, and/or the dominance of the surrounding arable land.

Horseshoe bats preferential use of sheltered areas at the top of the ridges for foraging at Southstoke and Odd Down, rather than in the open valleys below, may be linked to their exposure to westerly winds on windy nights, and rapid temperature falls after dusk on calm nights. Temperatures fall too low for moths to fly on calm, clear nights, even in mid summer.

The habitats and sites used by Greater horseshoe bats, changed as their diet switched from moths to primarily dung beetles in September.

At least 7 and probably 10 species of vesper bats foraged over the whole study area. Even the poorest sites, such those at Twerton, had a minimum of 6 species using them.

*Geoff Billington November 2000 Combe Down Greater Horseshoe Bats: radio tracking study*

*Summary of findings (Quoted unchanged from report)*

The activity patterns of Greater horseshoe bats, (*Rhinolophus ferrumequinum*), trapped leaving the Byfield Mine in either May/June, or in August, were investigated over a 40-day period by two surveyors.

A total of 26 bats of both sexes, including 2 juveniles, were tagged in the two sessions. Mature bats were aged from 1 to 20 years. Of this total, 25 bats were ringed. Most (21) had been ringed during winter in one of the Combe Down Mines. The other 4 were ringed in summer or autumn, either at the Iford breeding site (2), or the one at Mells (2).

Bats foraged primarily along tall hedgerows, scrub and broad-leaved woodland edges in and around fields. South-facing slopes, which were presumably warmer than others, were mainly used. They also often used wooded watercourses along streams, rivers and canals. Urban areas were rarely used for either foraging, or flight-routes.

The major foraging areas identified were the Horsecombe, and Southstoke valleys. The two juveniles began foraging in the Horsecombe Valley, before gradually extending their range. Other areas were important at certain times of the study.

Of 18 night roosts precisely identified, two stood out in importance. They were a stable at the head of Horsecombe Valley, and an outbuilding on the Hodshill estate in Southstoke. Most bats using the Horsecombe and Southstoke foraging areas and night roosts were originally ringed at Combe Down. Female bats, many in lactation, made considerable use of these night-roosts.

Some bats night roosted in the Iford breeding site, but not the one at Camerton, despite the use of foraging areas nearby. This is surprising.

Flight routes from the main Byfield Mine entrances pass southwards into the Horsecombe Valley then spread mainly east and westwards. Bats followed tall scrub, hedgerows, tree-lines and woodland edge when travelling to foraging areas. A 12-metre gap in tall vegetation seems to be the limit for crossing points.

The average distance bats commuted to their foraging areas was <3km until the end of May, but after that it was around 5km. The longest distance travelled was 10.5 km to a location near Radstock. The bat involved had originally been ringed at Mells.

The main commuting route out from the mine was south across upper Horsecombe to the Cam valley. Others routes included following Horsecombe Vale down to the Midford valley, west around the south edge of Bath towards Newton St. Loe and south-west from the Cam valley towards Radstock.

The key area for the two juvenile bats during the tracking period was Horsecombe Vale and the Midford valley.

*Katie Parsons (2000) Report on bat activity at Combe Down mines during summer and autumn 2000*

*Summary of findings (Quoted unchanged from report)*

303 individual bats were caught during 44 hours of mist-netting and harp-trapping at three entrances to the Combe Down mine system between August and November 2000.

Byfield entrance was found to have the greatest activity and diversity with a total of 292 bats of ten different species caught during seven separate catching occasions. Two catching events were performed at Grey Gables entrance, however despite fairly high activity in the vicinity of the entrance only eight bats of four species were caught. Greater and Lesser horseshoe bats were seen night-roosting close to the grille at this site. One catch was performed at St. Winifreds. This entrance had the lowest level of activity and despite the presence of Greater and Lesser horseshoe bats and Pipistrelle bats in the vicinity (identified by bat detectors) only three Daubenton's bats were captured.

The composition of species caught at the entrance at Byfield changed with time during the season. Overall, 68% of all bats caught were male, however sex ratio varied between species. Dominant species at Byfield included Brandt's bat, a species not usually found in such great numbers at a swarming site; the Lesser horseshoe bat, the Whiskered bat and the Natterer's bat. These four species contributed approximately 75% of the total caught.

Two Bechstein's bats were caught on one occasion. Very few roost sites are known for this species, therefore it is of great interest that they are found at Combe Down.



## 6a Bat risk register for MoD site – Warminster road

The risk register is based on likelihood of roosting or foraging occurring based on historic data, experience, contemporary knowledge and previous studies.

Warminster road assessment

Species	roosting on site	foraging on site	recorded within 5km of site
<b>Pipistrelle bat sp.</b>	moderate	high	yes
<b>Daubenton’s bat.</b>	low	moderate	yes
<b>Brown Long eared</b>	moderate	high	yes
<b>Natterer’s bat</b>	low	moderate	yes
<b>Noctule bat</b>	unlikely	moderate	yes
<b>Serotine bat</b>	moderate	high	yes
<b>Whiskered/Brandt’s bat</b>	low	moderate	yes
<b>Lesser Horseshoe bat</b>	moderate	moderate	yes
<b>Greater Horseshoe</b>	moderate	moderate	yes
<b>Barbastelle</b>	unlikely	low	yes
<b>Leisler’s bat</b>	low	moderate	yes
<b>Grey long eared bat</b>	unlikely	unlikely	no
<b>Myotis Alcaho</b>	unlikely	low	no
<b>Bechstein’s bat</b>	unlikely	low	yes

Criteria for roosting/foraging based on desk study information not site visit.

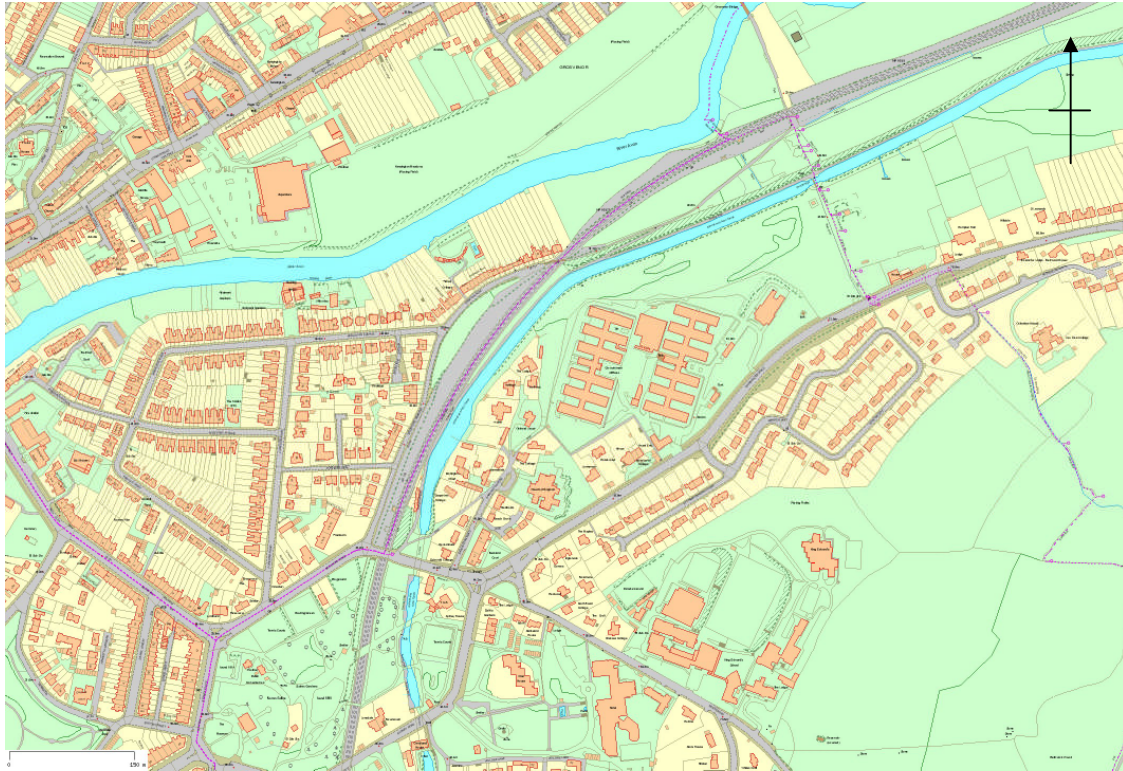
Unlikely – not considered typical habitat for that species

Low – can occur but instances are low for this species

Moderate – the bats are recorded locally but more suitable conditions prevail offsite

High – typically found using these conditions locally

\*note a site visit will alter the initial assessment as it will provide a more robust and accurate assessment.



*Site plan Warminster road (not to scale)*

*Connections to local landscape – Warminster road*

The site is well connected to the local landscape by three corridors to the north east which are the Kennet and Avon Canal, the mainline railway line and the River Avon. The site is also connected by two corridors to the south west which are the mainline railway line and Kennet and Avon Canal. The corridors directly link to the northern site boundary and would provide easy unhindered access for bat species flying away from the site or coming to the site. The site is within easy reach of habitats considered important for nature conservation such as woodland, wet meadows, grazed pasture and linear waterbodies which also provide a high proportion of foraging for bat species as identified in Billington 2000. Such linear wildlife corridors are listed as an important conservation features in the Habitats directive 1992

The presence of landscape features of major importance for wild fauna and flora (as identified in article 10 of the Habitat Directive 1992, Regulation 39 (3) of the Conservation of Habitats and Species Regulations 2010)

The site links to the following landscape features as listed in article 10 and explained in regulation 39:

- Hedgerows
- Rivers
- Canals

The site links to features of a ‘...linear and continuous structure... that are essential for the migration, dispersal and genetic exchange of wild species.’ The site clearly has value in respect of this criterion.

#### *Effects of lighting – Warminster road*

The immediate site (area of the buildings) will have high lux levels due to security issues for a government site. However, some bat species such as serotine and pipistrelle bats have been recorded foraging in areas of high lux levels and regularly feed around high pressure sodium lights as they attract insects Rydell and Racey 1995.

The north of the site is likely to have lower lux levels where it links to the Canal and therefore a greater diversity of bat species particularly those that are considered to be sensitive to high lux levels (myotis sp. long eared sp and horseshoe sp.) may utilise this area. Local bats may use the site as a foraging resource as they commute through the area to access the wider landscape.

Maintenance of a lighting baseline and protection of the linear corridors from light spill will be essential to ensuring the maintenance of local bat species.

#### *Impacts of site development on the Bath and Bradford on Avon SAC sites*

Warminster road site has direct uninterrupted links to all the SAC’s mapped on the data search and to Box mines SAC via the mainline railway line. Bats are known to travel extensive distance for foraging and breeding, Billington 2000 recorded one greater horseshoe 10.5km from the Combe down roost and the site forms part of a corridor of movement for bats accessing the landscape for such purposes. If the site is developed and the existing footprint is used and current baseline conditions are maintained or improved eg. Lux levels maintained or lowered then the development is unlikely to have a direct impact on the SAC’s or the special interest features of the SAC’s. However, further detailed study will be required to confirm or deny this ascertain.

However, if all three sites were developed either simultaneously or in phases then the plans would need to consider the in combination effect on the SAC’s and the integrity of the special interest features. Bat movements and the sustenance zones would need to be understood to fully discount any negative impact. Negative impacts may be ameliorated or reduced with appropriate and well considered mitigation measures. Any development would need to consider the requirement of a habitat regulation assessment to be undertaken to fulfil legal considerations under the habitats directive 1992.

## 6b Bat risk register for MoD site – Endsleigh

### Endsleigh assessment

Species	roosting on site	foraging on site	recorded within 5km of site
<b>Pipistrelle bat sp.</b>	moderate	high	yes
<b>Daubenton’s bat.</b>	low	low	yes
<b>Brown Long eared</b>	moderate	high	yes
<b>Natterer’s bat</b>	moderate	moderate	yes
<b>Noctule bat</b>	low	moderate	yes
<b>Serotine bat</b>	moderate	high	yes
<b>Whiskered/Brandt’s bat</b>	low	moderate	yes
<b>Lesser Horseshoe bat</b>	moderate	moderate	yes
<b>Greater Horseshoe</b>	moderate	moderate	yes
<b>Barbastelle</b>	unlikely	low	yes
<b>Leisler’s bat</b>	low	moderate	yes
<b>Grey long eared bat</b>	unlikely	unlikely	no
<b>Myotis Alcatheo</b>	unlikely	low	no
<b>Bechstein’s bat</b>	unlikely	low	yes

Criteria for roosting/foraging based on desk study information not site visit.

Unlikely – not considered typical habitat for that species

Low – can occur but instances are low for this species

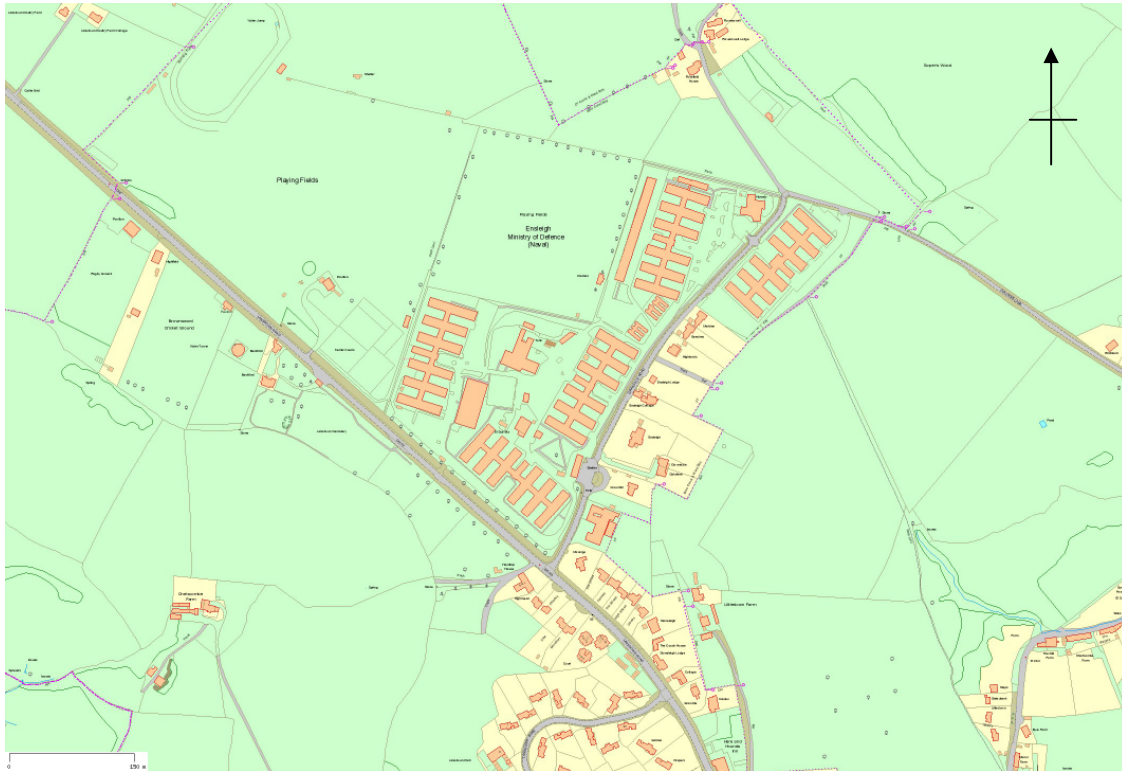
Moderate – the bats are recorded locally but more suitable conditions prevail offsite

High – typically found using these conditions locally

\*note a site visit will alter the initial assessment as it will provide a more robust and accurate assessment.



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MoD sites Bath.



*Site Plan Endsleigh (not to scale)*

*Connections to local landscape – Endsleigh*

The site is linked to the local landscape by hedgerow corridors to the north and west which connect to the wider landscape north of Bath City. The site is situated in a rural setting and close to ancient woodland and the Swainswick valley which provides suitable foraging for bats species as identified in Billington 2000. Hedgerows and small woodland blocks provide linear wildlife corridors and stepping stones for movement for bats and are listed as an important conservation feature in the Habitats directive 1992

The presence of landscape features of major importance for wild fauna and flora (as identified in article 10 of the Habitat Directive 1992, Regulation 39 (3) of the Conservation of Habitats and Species Regulations 2010)

The site links to the following landscape features as listed in article 10 and explained in regulation 39:

- Hedgerows
- Small woodland blocks

The site links to features of a ‘...linear and continuous structure... that are essential for the migration, dispersal and genetic exchange of wild species.’ The site links to such landscape features and clearly has value in respect of this criterion.

**Project:** Concept Statement three

MoD sites Bath.

*Effects of lighting – Endsleigh*

The immediate site (area of the buildings) will have high lux levels similar to Warminster road due to security issues but some bat species such as serotine and pipistrelle bats have been recorded foraging in areas of high lux levels and regularly feed around high pressure sodium lights as they attract insects. The effect of high light levels will be more pronounced due to the rural setting of the site and may dissuade local bats not habituated to higher light levels from using the site.

The north and west of the site is likely to have lower lux levels where it links to the open countryside and Kingswood sports playing fields and therefore a greater diversity of bat species particularly those that are considered to be sensitive to high lux levels have potential to use this part of the site. Local bats may use the site as a foraging resource or night roosting as they commute through the area to access the wider landscape.

As for Warminster road maintenance of a lighting baseline and protection of the linear corridors will be essential to ensuring the maintenance of local bat species as stipulated in Planning Policy Statement 9.

*Impacts of site development on the Bath and Bradford on Avon SAC sites*

The Endsleigh site is the furthest site away from the Bath and Bradford on Avon SAC and the only site that shows no recorded bat roost in the 1km grid square of the site footprint. The site is surrounded by bat species records (see appendix 2) and the area is of significance for local bat species. However, the development of the site according to the studied data is unlikely to have a direct impact on the Bath and Bradford on Avon SAC. The author has a contemporary knowledge of the area can reveal that both Greater and Lesser horseshoe bats have been recorded night roosting and foraging in Swainswick valley in 2011 at a site approximately 2km to the east. It is likely that as the landscape conditions between the two sites are similar and they are linked by corridors of a linear and continuous nature as described in Billington 2000 and Ransome 2008 that both species could access the site for night roosting and foraging if the baseline conditions changed to be more favourable to occupation. Further detailed study will be required before potential impacts can be understood for the site.

However, if all three sites were developed either simultaneously or in phases then the plans would need to consider the in combination effect on the SAC's and the integrity of the special interest features. Bat movements and the sustenance zones would need to be understood to fully discount any negative impact. Negative impacts may be ameliorated or reduced with appropriate and well considered mitigation measures. Any development would need to consider the requirement of a habitat regulation assessment to be undertaken to fulfil legal considerations under the habitats directive 1992.

## 6c Bat risk register for MoD site – Foxhill

Foxhill assessment

Species	roosting on site	foraging on site	recorded within 5km of site
<b>Pipistrelle bat sp.</b>	moderate	high	yes
<b>Daubenton’s bat.</b>	low	low	yes
<b>Brown Long eared</b>	moderate	high	yes
<b>Natterer’s bat</b>	low	moderate	yes
<b>Noctule bat</b>	low	moderate	yes
<b>Serotine bat</b>	moderate	high	yes
<b>Whiskered/Brandt’s bat</b>	low	moderate	yes
<b>Lesser Horseshoe bat</b>	moderate	high	yes
<b>Greater Horseshoe</b>	moderate	high	yes
<b>Barbastelle</b>	unlikely	low	yes
<b>Leisler’s bat</b>	low	moderate	yes
<b>Grey long eared bat</b>	unlikely	unlikely	no
<b>Myotis Alcatloe</b>	unlikely	low	no
<b>Bechstein’s bat</b>	unlikely	low	yes

Criteria for roosting/foraging based on desk study information not site visit.

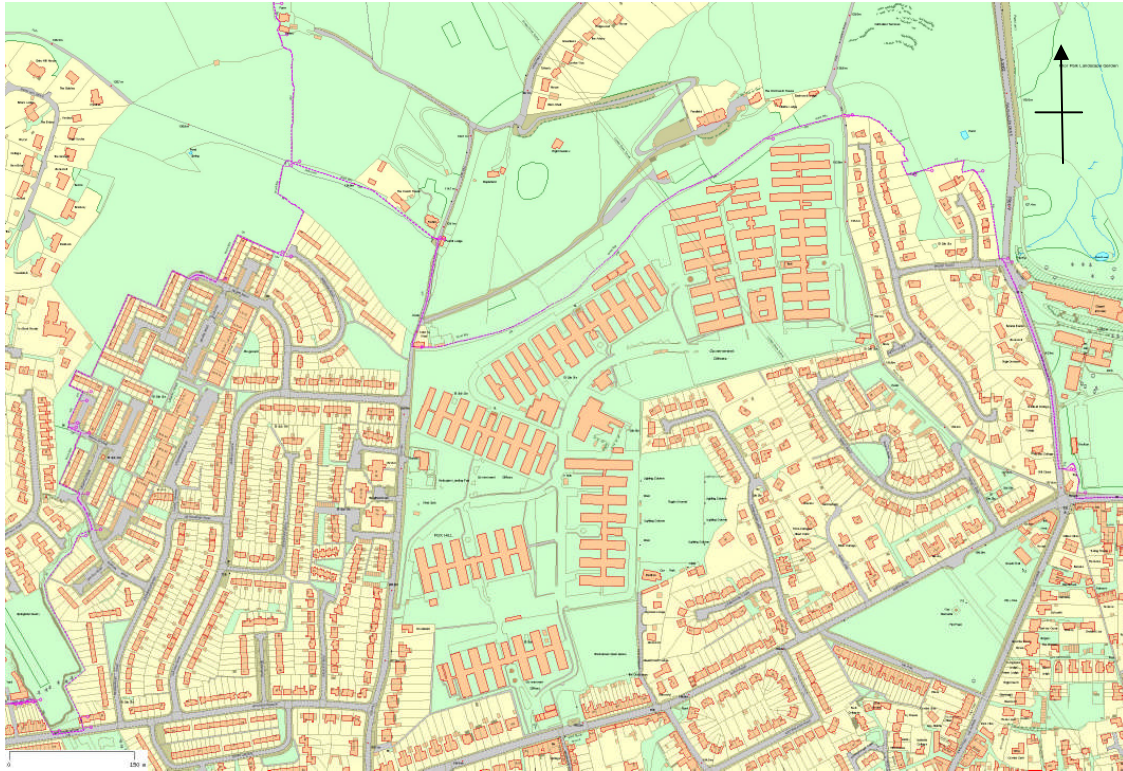
Unlikely – not considered typical habitat for that species

Low – can occur but instances are low for this species

Moderate – the bats are recorded locally but more suitable conditions prevail offsite

High – typically found using these conditions locally

\*note a site visit will alter the initial assessment as it will provide a more robust and accurate assessment.



*Site plan Foxhill (not to scale)*

#### *Connections to local landscape – Foxhill*

The site very well connected to the local landscape in the north, north east and north west of the site with mature grazed parkland with hedgerows and small copse of trees features identified by Billington 2000 and Ransome 2008 as important for particularly horseshoe bat commuting and foraging throughout the year. The site is approximately 200m from the Bath and Bradford on Avon SAC (Combe down mine) and both recorded roosts and recorded foraging have been identified in the 1km grid square of the site. A greater horseshoe radio tracking study undertaken by Billington 2000, identified important foraging resources to the north west of the site boundary at Foxhill Lodge and the adjacent meadow. Greater horseshoe bats have been radio tracked through this area following continuous linear corridors such as hedgerows identified as important by Billington 2000 and Ransome 2008 for bats particularly horseshoe bats around the south of Bath city. Such linear wildlife corridors are listed as an important conservation feature in the Habitats directive 1992. Such studies do not get routine access to secure sites such as Foxhill so the results need to understood in this context.

The presence of landscape features of major importance for wild fauna and flora (as identified in article 10 of the Habitat Directive 1992, Regulation 39 (3) of the Conservation of Habitats and Species Regulations 2010)

**Project:** Concept Statement three

MoD sites Bath.

The site links to the following landscape features as listed in article 10 and explained in regulation 39:

- Hedgerows
- Small blocks of woodland

The site links to features of a ‘...linear and continuous structure... that are essential for the migration, dispersal and genetic exchange of wild species.’ The site clearly has value in respect of this criterion.

*Effects of lighting – Foxhill*

The immediate site as with the other two sites (area of the buildings) will have high lux levels due to security issues but some bat species such as serotine and pipistrelle bats have been recorded foraging in areas of high lux levels and regularly feed around high pressure sodium lights as they attract insects.

The north of the site is likely to have lower lux levels where it links to the pasture and woodland areas. This will provide good opportunities for foraging within and outwith the site boundary. Any change to the current baseline and subsequent light spill could impact adversely on the foraging areas and commuting routes outwith the site boundary which are recorded as well used and critical resources for local greater horseshoe bats.

Maintenance of a lighting baseline and protection of the linear corridors will be essential to ensuring the maintenance of local bat species.

*Impacts of site development on the Bath and Bradford on Avon SAC sites*

The Foxhill site is the closest site to the Bath and Bradford on Avon bat SAC and the closest site to a recorded and well used foraging ground for greater horseshoe bats from the study undertaken in 2000 by Billington. Therefore any development of this site has the potential to have a direct impact on the SAC and the special interest features of it throughout all stages of the development. The potential loss of commuting routes and/or foraging grounds may impact upon breeding success of the breeding population of bats using the SAC. It has been shown that changes to foraging areas and increase in distances to foraging sites can reduce the success in maternity colonies and subsequently effect maintenance of favourable conservation status of the species concerned in their natural range. Further detailed study will be required before potential impacts can be understood for the site.

If all three sites were developed either simultaneously or in phases then the plans would need to consider the in combination effect on the SAC's and the integrity of the special interest features. Bat movements and the sustenance zones would need to be understood to fully discount any negative impact. Negative impacts may be ameliorated or reduced with appropriate and well considered mitigation measures. Any development would need to consider the requirement of a habitat regulation assessment to be undertaken to fulfil legal considerations under the habitats directive 1992.



## 7 Discussion

### *Habitats*

All the sites are well connected to the local landscape with features described in the Habitats directive 1992 as being of a linear and continuous nature and offer conditions suitable for roosting and foraging bat species. Currently roosting conditions appear limited by the nature of the buildings on site, the presence of personnel and site conditions as the sites are currently occupied. However, given the current conditions with high levels of lighting roosting opportunities may be more restricted than would normally be the case for sites set in such good bat locations with the abundance of bat records provided from the data search, the risk of occupation by bats will increase as the sites become decommissioned.

The risk of roosting bats would become more elevated as the site becomes redundant and open access to buildings becomes available. If such conditions prevail and the light levels are reduced then the sites are likely to be utilised by bat species for permanent and night roosting. Evidence from similar local sites such as Rudloe Manor, Corsham and Ark royal Corsham has shown that bats will quickly utilise any built structure for rest or shelter once the baseline conditions become more favourable and the risk of disturbance reduces. To minimise the risk of occupation the baseline conditions need to remain the same or similar and buildings need to be securely sealed and maintained to reduce chances of occupation by bats.

There are significant opportunities at all three sites for habitat enhancement work which can be provided alongside any proposed development without compromising the profitability of the building or incurring significant extra costs. All sites connect well with the wider landscape and this could be improved with planting of semi natural vegetation and management of existing vegetation to strengthen boundaries of sites in places that provide links to and from the site. Opportunities will be greatly enhanced with use of native species in new planting schemes and landscape design to provide areas of shelter, linear features for commuting and foraging resources for local bat species. A sensitive lighting plan minimising light spill will be critical to providing conditions suitable for local bats to continue using the area and providing corridors of movement as described in habitats directive 1992.

### *Bats*

The conditions on and around all three sites is suitable for bats and is similar to conditions described by Billington 2000 and Ransome 2008 as being favourable for all local species of bat. Foxhill has the closest link to foraging bats from the radio tracking studies of Billington 2000 and therefore this elevates the potential risk of bat occupation. However, few if any known studies have been undertaken to the north of Bath city so data for the Endsleigh site is purely based on environmental record centre data, a similar situation exists for the Warminster road site. The majority of the studies on horseshoe bats in particular have focused on the area south and south west of Bath due to the nature of the investigations being examined.



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MoD sites Bath.

The data from the studies and environmental records centre provides good contextual information for a desk based assessment a detailed site specific study will need to be undertaken to assess the impacts upon the SAC and also the impact upon local bat roosts and foraging for other bat species which also receive protection from both national and European legislation.

Bat species will opportunistically use all three sites during all phases of any potential development so it is important that all measures are undertaken to prevent access by bats to buildings during, demolition and reconstruction on site. The risk for all sites is elevated given the location of the sites (in south west England), the high number of local records of bats and the close proximity of the sites to the Bath and Bradford on Avon SAC.

The environmental data has records for 12 species of bat and this is backed up by site investigations by Ransom 2008, local conditions around all three sites are suitable to be able to support foraging and potentially roosting bats of the identified species. The buildings on site are not considered highly suitable for bat species however, bats are opportunistic and will utilise sub-optimal roosting resources to access high quality foraging resources and such conditions persist locally around all three sites.

If bats are found to be present on site roosting then it is possible to incorporate mitigation and/or compensation features to maintain the population into any newly designed scheme. If bats from the SAC are found to be utilising resources on site further investigation will be required to understand how to design the scheme while maintaining foraging and commuting routes and maintaining the integrity of the SAC populations.

## 8 Conclusions

The data search confirms that the general area is of high ecological significance for bat species and that the local area contains SACs which are important for breeding and hibernating horseshoe bats and up to 10 species in total Parsons 2000. The records returned show that the local area supports habitats and sites important in a UK context and that these sites have been shown to have been historically used by bat species. The data search confirms that 12 species of bat have been recorded within 0-5km of the sites and that the area around the three sites and within the site boundary has the potential to hold bat species. Warminster road and Foxhill have confirmed bat roosts within the 1km grid square of the site location making likelihood of roosting bats on site higher.

The desk study confirms that the development of all sites individually could have an indirect impact upon the integrity of the Bath and Bradford on Avon SAC and that the development of Foxhill could also have a direct impact upon the integrity of the SAC and its special interest features. The impacts are likely to occur at all stages of any potential development and throughout the life of the project and potentially post construction without suitable mitigation and/or compensation measures.

The desk study concludes that all the sites are well connected to the local landscape with features described in the Habitats directive 1992 as being of a linear and continuous nature that are essential for the migration, dispersal and genetic exchange of wild species as listed in article 10 and explained in regulation 39.

It is likely that the sites (upon completion of field studies) could be subject to in combination effects upon the SAC and special interest features that may have an adverse effect upon protected bat species and their favourable conservation status in their natural range. Therefore further detailed studies will be required to fully understand any potential adverse effects.

The study also concluded that there is scope to develop all three sites and that with a carefully designed scheme it would be possible to retain any bat interest on site with integrated mitigation and/or compensation features. There are opportunities for enhancements to be included in all three schemes that would be beneficial to bats species with use of native vegetation within a well designed landscape scheme and a carefully planned, implemented and monitored lighting plan. This would be in keeping with the aspirations of the local planning authority guidance on protected species and planning policy statement 9 Biodiversity and Geological conservation.

## 9 Recommendations

The following recommendations are made for the site based on the desk based study assessment.

1. Undertake a building, tree and underground structure assessment of all three sites in relation to roosting bats.
2. Undertake targeted acoustic bat surveys at all three sites to fully understand how and if bats are using the sites for permanent, intermittent or ephemeral roosting and if the sites are used by foraging and commuting bats and which areas of the sites are most important for bat species.
3. If required, upon completion of points above radio track bats to show important foraging and commuting areas at or close to each site.
4. Maintain building integrity and security to prevent free access by bat species.
5. Maintain current baseline light levels to reduce the risk of occupation by bat species.
6. Secure redundant buildings currently providing free access to bats once they have been checked by a licensed bat expert and confirmed as not legally a place of rest or shelter for bats.
7. Liaise with master planners and landscape architects to provide bat friendly features or enhancements eg. Corridors of movement to allow bats to continue to use the areas upon completion of any subsequent development. This needs to be understood from the earliest stages of any development.
8. Build mitigation and/or compensation features into any approved scheme from the start of the project.
9. Undertake if required, based on findings of points one and two above a habitat regulations assessment to fully understand direct and indirect impacts on the Bath and Bradford on Avon SAC and in combination effects of the proposed development of all three sites

## 10 References

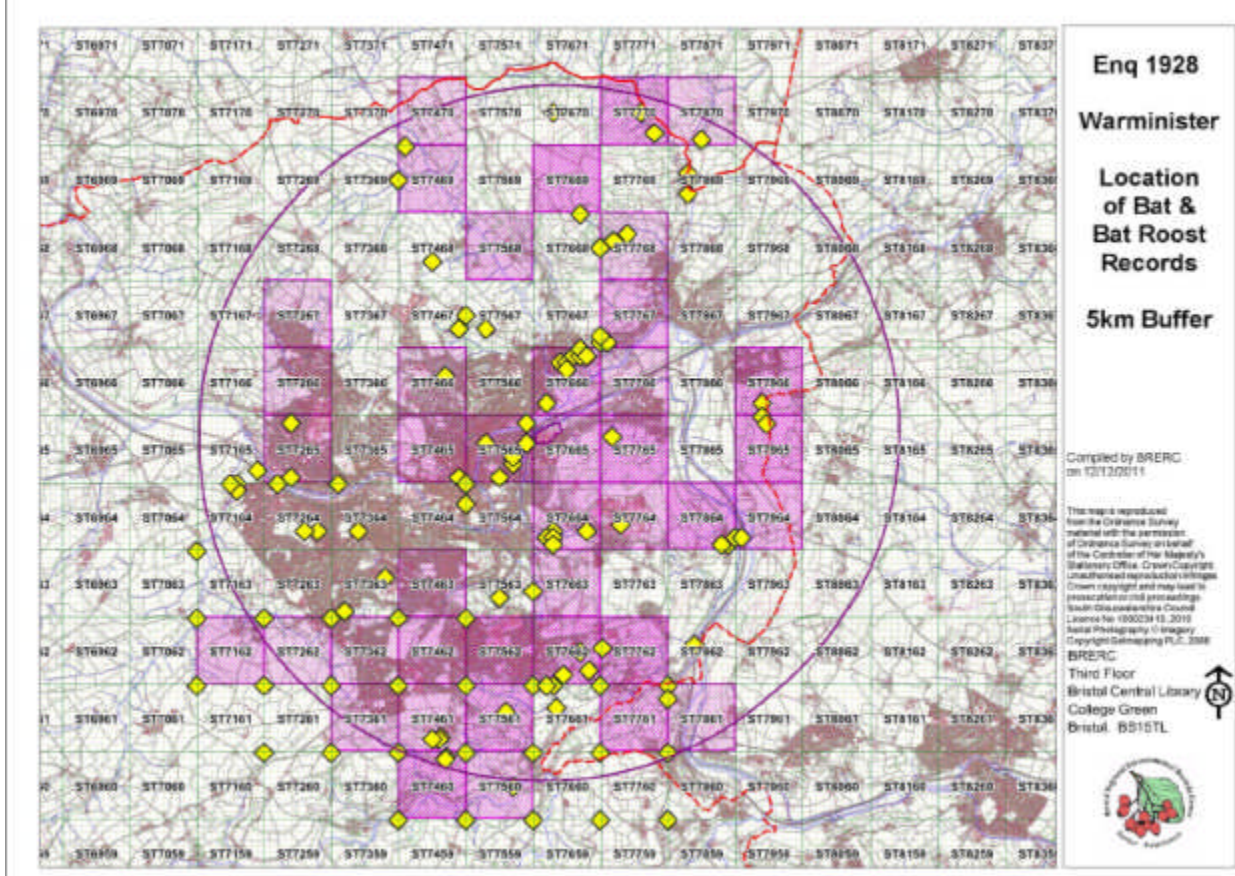
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## Appendix 1 Warminster road bat records and SAC location

Note: all maps not to scale

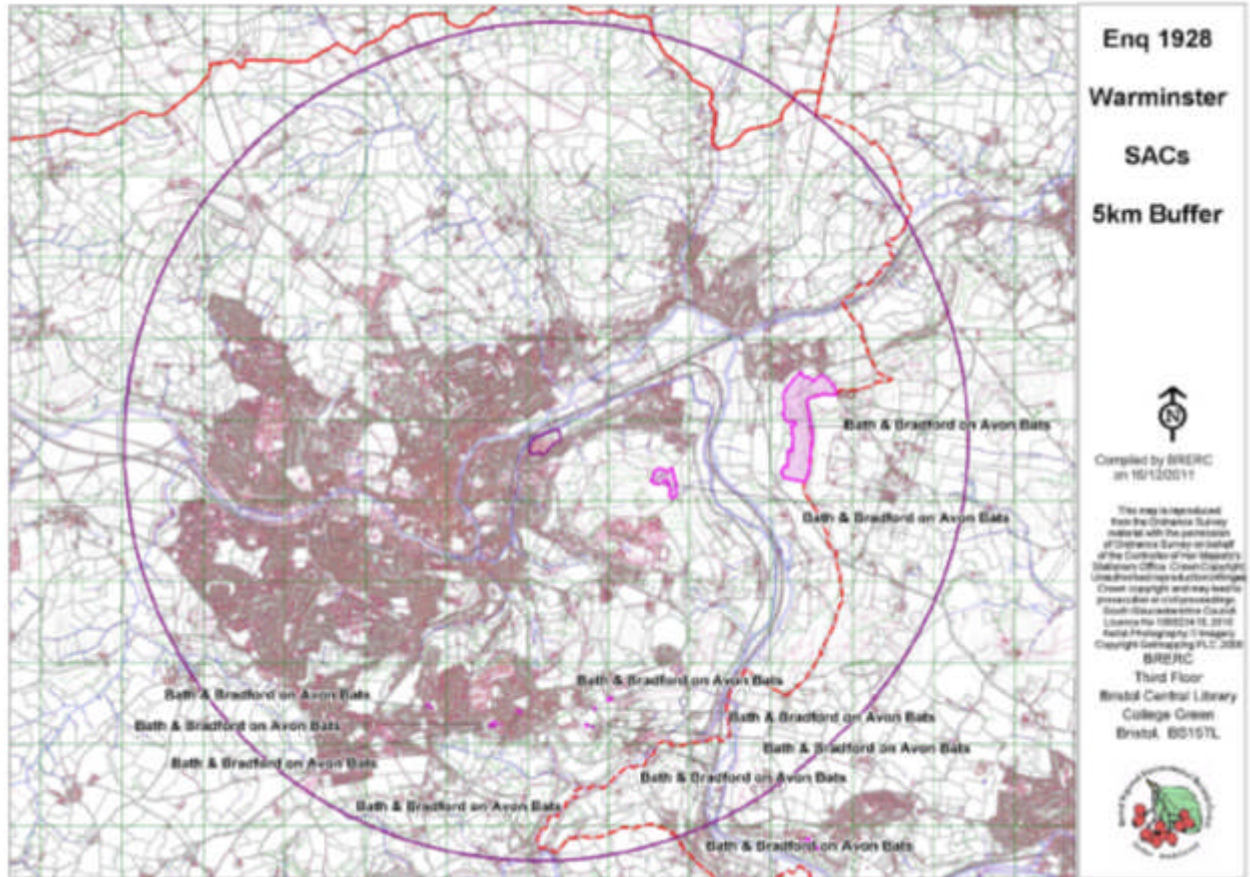
Shaded square bat roost approximate location

Yellow diamond bat record





SAC location Warminster road



Site outline purple

SAC pink



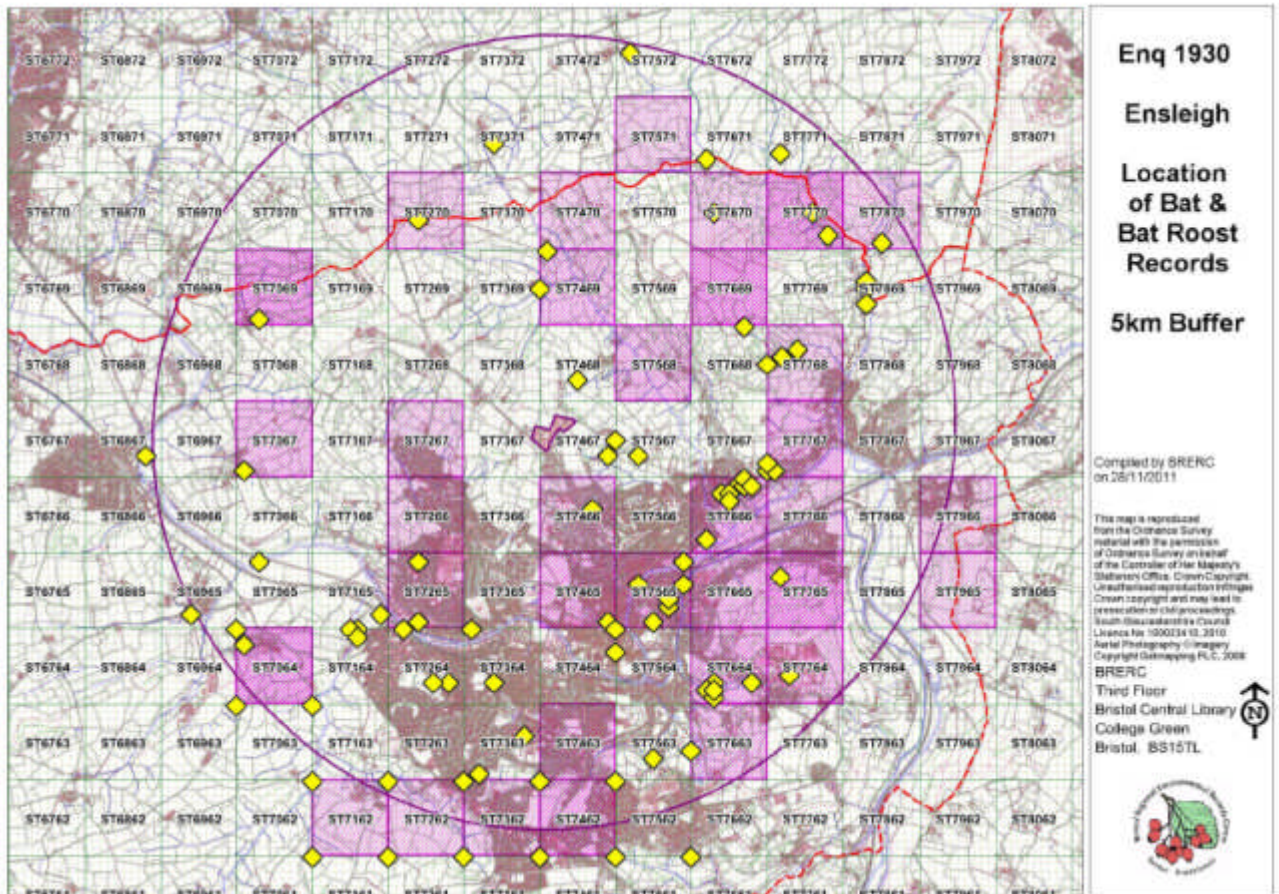
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## Appendix 2 Endsleigh bat records and SAC location

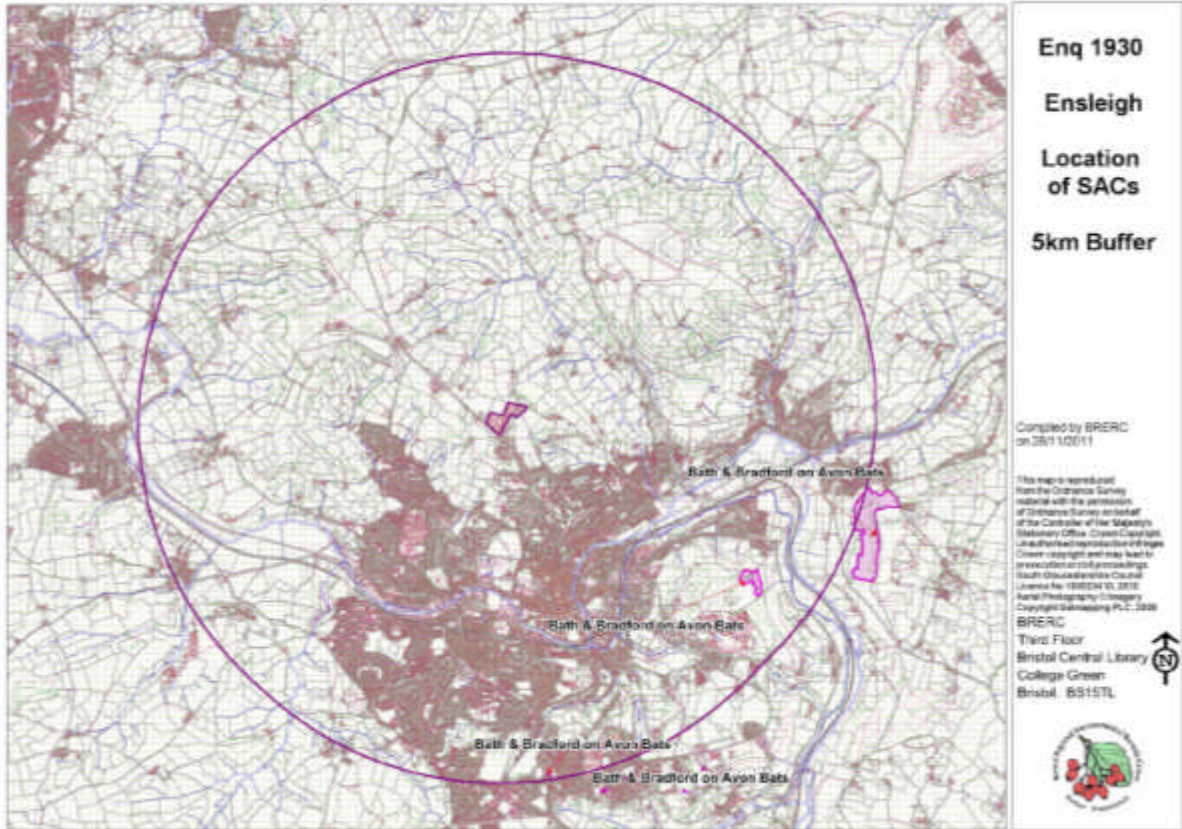
Note: all maps not to scale

Shaded square bat roost approximate location

Yellow diamond bat record



SAC location Endsleigh



Site outline purple

SAC pink



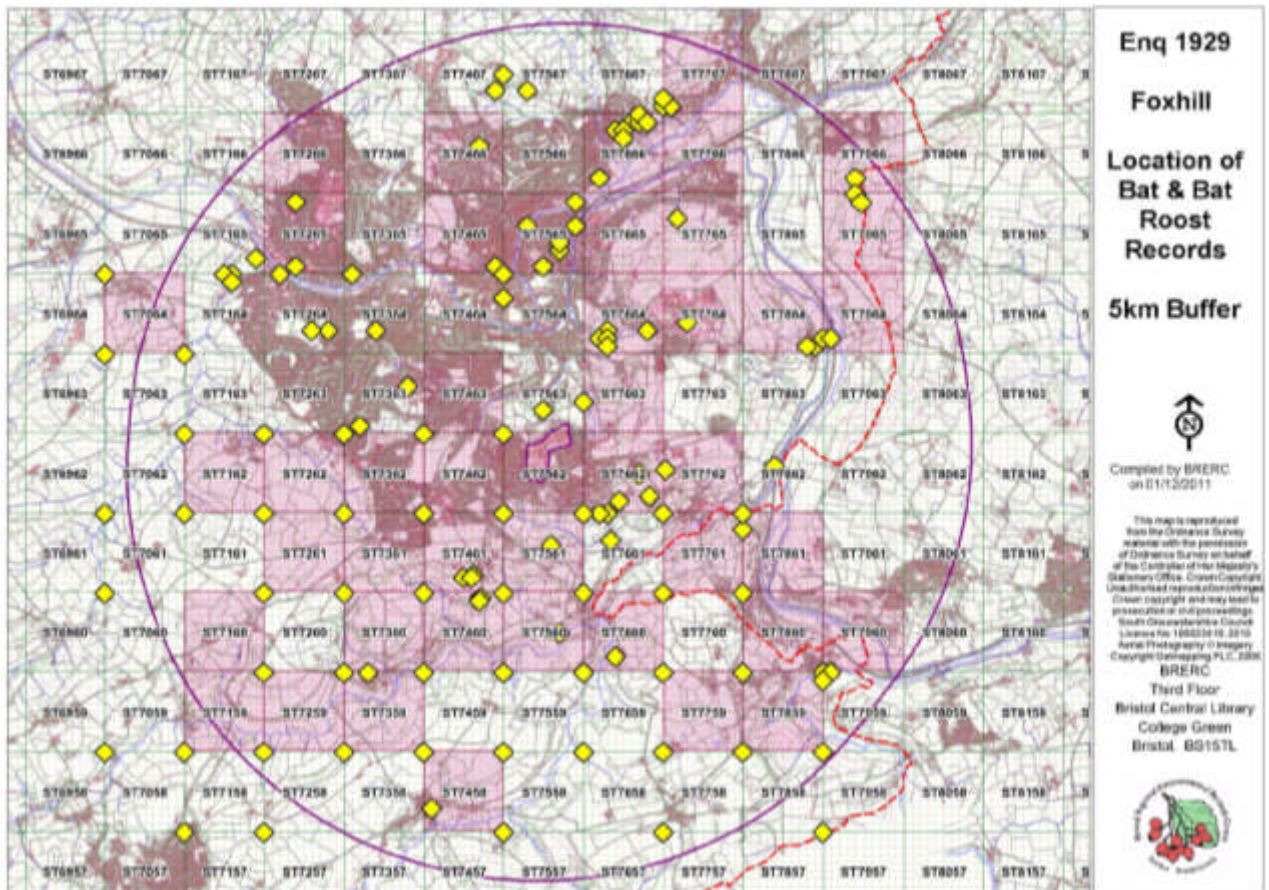
**Project:** Concept Statement three  
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## Appendix 3 Foxhill bat records and SAC location

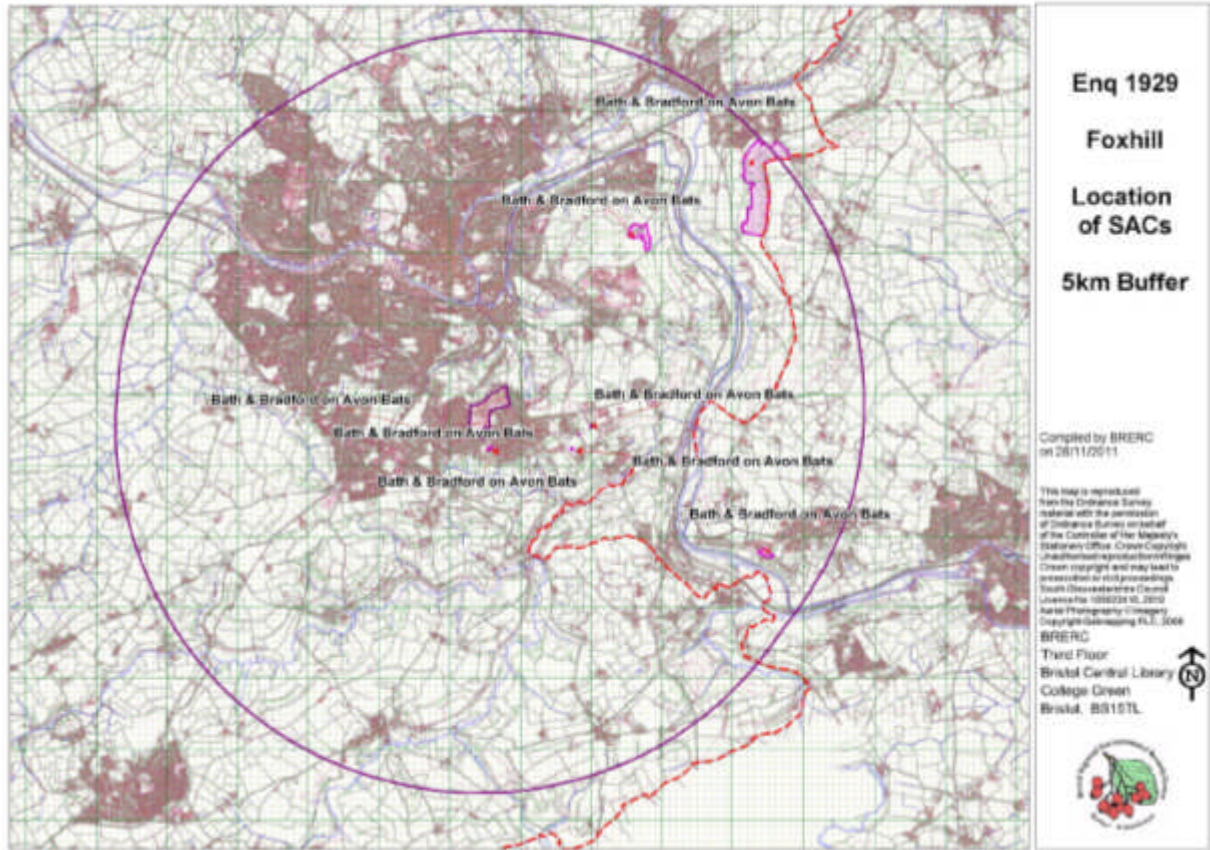
Note: all maps not to scale

Shaded square bat roost approximate location

Yellow diamond bat record



SAC location Foxhill



Site outline purple

SAC pink