Ecologically Bats

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BAT SURVEYS AT OAK FARM, MANCHESTER AIPORT CHESHIRE.

Report No: 2012/EB/18
Compiled by: Dr Elizabeth Barratt
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PLANNING AND BUILDING CONTROL
21 MAR 2013

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EXECUTIVE SUMMARY

1.1 BACKGROUND

Dr Elizabeth Barratt was commissioned by Manchester Airport to undertake a bat survey of Oak Farm nr Hale, Trafford. The survey area is a pastureland farm used for cattle grazing, fields bordered by hedgerows managed under Manchester Airport Habitat Management Plan. To the west of the site is Sunbank Wood and to the south is Cotteril Clough SSSI & SBI. The farmhouse and agricultural buildings are present to the north-east side of the site (See **Appendix 1**). The Ordnance Survey for Oak Farm is SJ80597 84868

Previous surveys of the site had been carried out in August 2009 and results can be found in report 2012/EB/11. Building inspections were carried out on the 23th August, 10th October and 21st October 2012. The buildings were inspected for the presence of bats or signs of bat activity. An emergence/ activity survey were carried out on the 23rd August, 13/14th September 2012.

1.2 LEAD PERSONNEL

Dr Elizabeth Barratt is a mammal ecologist and bat specialist. She is a professional consultant with over 25 years experience in mammal conservation and survey work, specializing in bat ecology. She has been a licensed bat worker and member of the Cheshire Bat Group since 1986 and is a Voluntary Bat Warden for Natural England. Dr Barratt is a full member of the Institute of Ecology and Environmental Management.

1.3 RESULTS

Building Inspection Surveys:

Oak Farm

2012 Building Inspections

Farmhouse: an internal inspection of the accessible areas of the loft space of the farm house found evidence of old bird nests (corvid), wasp nests but no bats present within the roof space or signs of bat activity within the roof space. The roof is not felted with open access under some sections of the eaves. The area around the chimney on the west side of the building is double skinned with gaps in the brick work and it is thought that the pipistrelles seen emerging in the activity survey, may have come from this area.

Barn D: an internal inspection was carried out of the upper floors of Barn D. No felting is present beneath the slate tiles. No evidence was found of bats present inside the building. Four single pipistrelle droppings were found scattered around the northern section of the barn. The southern section of the upper floor is very light. The brick lean to on the eastern side of Barn D has a sloping tiles roof which is boarded underneath creating crevice roosting opportunities.

No bats or signs of bat activity were found during inspections of the other barns/cattle sheds on site.

Bat Activity Surveys:

Three species of bat: the Common pipistrelle, Soprano pipistrelle and a myotis species whose call had characteristics of whiskered/Brandt's bats were recorded commuting and foraging across or near the site. Bat activity was recorded on site around 20 minutes after sunset. **On 23rd August a single Common pipistrelle was observed emerging from under the tiles on the eastern edge of the brick lean to on barn D. On 13th September 2 bats (Common pipistrelle) were observed to emerge from the same point and on 17th October a single bat emerged from the same point**

On the 13th September three bats were seen to emerge from the farmhouse roof. A single bat emerged from the eve on the northern side of the farm house, followed by two bats from under the tiles on the eastern side of the northern face of the farm house. All bats were identified as being Common pipistrelles

Foraging activity was recorded throughout the emergence surveys around the mature shrubs/trees of the shelter belt next to the layby and over the garden of the farmhouse. Further activity was recorded in the open barns (A & B) and over the farmyards 1-3.

1.4 CONCLUSIONS

Building surveys

The results of the surveys repeated in summer 2012 identified a small post-maternity roost of Common pipistrelles within the farmhouse and Barn D at Oak Farm. Less than 5 bats were observed emerging from each building during the activity surveys in August and September 2012. No bats were observed emerging from these buildings at the start of the June and July 2012. Therefore this is considered to be a transitional roost site post maternity and pre-hibernation. **A bat roost is therefore present on this site**

The presence of hedgerows and treelines was found to be important to the bats using this site, permitting commuting to/from sites and providing sheltered foraging areas. In any proposed developments for these sites these linear landscape elements should be retained or replaced with similar features to permit navigation across the habitats. Planting should be supplemented with native species to improve the insect biodiversity of the site. This conclusion is subject to the constraints on survey as given in **Section 6.1** of this report.

1.5 REQUIREMENTS FOR EPS LICENSING

The evidence from the activity surveys of 2012 identified a transitional roost of Common pipistrelle in the farmhouse and barn D of Oak Farm. The population size was small (>10) and mitigation proposals will be based upon that population size but will seek to provide opportunities for population expansion.

There is a possibility that the development of the Oak Farm site would result in a breach of the law under the Wildlife and Countryside Act 1981 (as amended) under Section 9(4)(a), which states that it is an offence to 'intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a bat'. Conversion would also lead to an infringement under the Conservation (Natural Habitats & c) Regulations, which states it as an offence to 'deliberately damage or destroy a breeding site or resting place of a bat' [Regulation 39(1)(d)]. **It is therefore advised that a licence for European Protected Species (EPSL) in respect of bats will be required from DEFRA/NE to enable the development of the site to proceed within required legal constraints as detailed in Section 6.3 of the original report.**

The full details of mitigation proposals and compensatory measures will be given in the method statement of the licence application. Mitigation proposals are subject to approval by Natural England.

The conclusions and recommendations in this report in respect to surveys for protected species are based upon results from surveys in August 2009, August/September 2012. These data will only be of use to the start of the next active season in April 2013, after which further survey to establish the position and possible changes in status will be necessary to ensure all activities are informed and guided by recent data on site status.

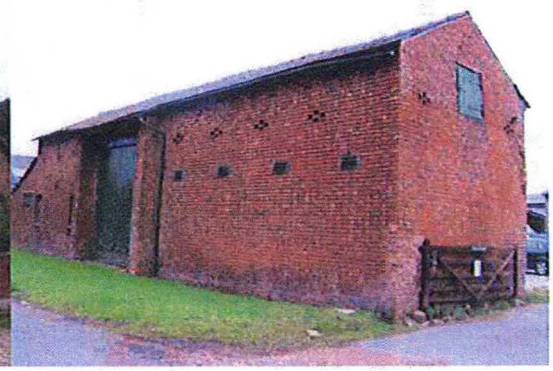
2 INTRODUCTION

2.1 SITE DESCRIPTION

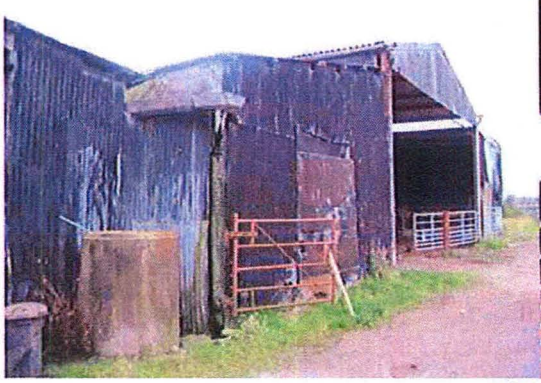
The site plan is included in **Appendix 1: Oak Farm**

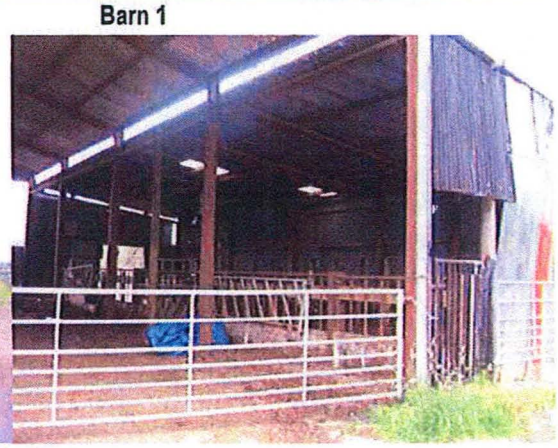


Oak Farm ~ farmhouse



Barn 1



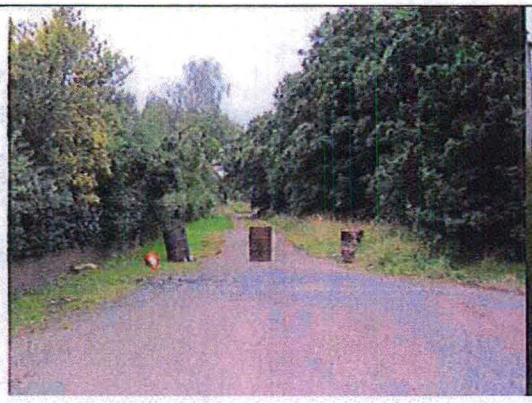


Cattle sheds

Pastureland farm used for cattle grazing, fields bordered by hedgerows managed under Manchester Airport Habitat Management Plan. To the west of the site is Sunbank Wood and to the south is Cotteril Clough SSSI & SBI. The farmhouse and agricultural buildings are present to the north-east side of the site (See **Appendix 1**).








2.2 AIMS OF STUDY

The survey was conducted to investigate the status of the site in respect to bat species. It was to:

- establish the presence / absence of protected species on the site
- gather species and population information as required for an EPS licence
- inform an assessment of potential impacts on any species found on site and establish whether there may be a requirement for further survey work to achieve this.

3 BAT ECOLOGY

3.1 BATS IN BUILDINGS

Buildings such as houses, barns and outbuildings provide a number of safe dry places for bats to roost. Some bats may remain in one area, others may move around as conditions change. Outbuildings and barns are often used as night roosts and shelters. Potential roost sites in houses and outbuildings are:

walls:

- behind cladding, external tiles or weatherboarding
- inside the cavity wall spaces
- at the top of solid walls

roofs:

- tunnel under the ridge tiles
- between under-felt or boards and tiles or slates
- inside roof space at ridge ends or roof junctions
- inside roof space in gaps between timber and brickwork of chimneys
- under junctions of rafters and hip beams
- at gable end wall
- lower corners of the eaves
- between loft insulation and ceiling
- space between joist and ceiling

eaves:

- between soffit and bargeboard
- behind bargeboards or fascias

There are 6 different types of roost identified (A.M. Hutson 1993). These are:

- spring gatherings (transitional)
- maternity (summer) roosts
- mating roosts

- night and feeding roosts
- prehibernal roosts (transitional)
- hibernation roosts

Summer roosts, found between May and August, are the most obvious. These consist almost exclusively of females, most of which give birth and raise a single young over this period. These colonies usually disperse by the autumn. Some species remain in one roost all year. Some roosts may be transitional, when small numbers are present for a limited period, usually during the spring and autumn. Night roosts are often indicated by large accumulations of insect remains and some droppings.

Most species conceal themselves in crevices and are not easy to find. The presence of droppings is a key sign to their presence. Hibernating bats however leave little or no trace of their presence. Other possible signs are a characteristic odour. Also a clean or polished area at a place through which light can enter may suggest an entrance/exit hole.

The commonest bats, *Pipistrellus* sp and *Plecotus auritus* (brown long-eared), are the most commonly occurring in buildings. The former use crevices, cavity walls, behind tiles and boarding as their roost spots. The latter prefer open roof areas, and their droppings are often concentrated below ridge beams, where they roost, and scattered about the loft area.

Other species found in the area are *Nyctalus noctula (*Noctule), *Myotis brandtii* (Brandt's), *Myotis mystacinus* (whiskered), *Myotis nattereri* (Natterer's) and *Myotis daubentonii* (Daubenton's). Of these species whiskered and Natterer's are the most likely to use buildings, but are not commonly found on such sites. It is however likely these species are all under recorded throughout Britain.

3.2 BATS IN LINEAR LANDSCAPES

All UK bats feed on insects that are associated with trees. Their importance varies with species, season and foraging behaviour.

Bats use trees, tree lines and hedgerows and other linear features to navigate at night. Loss or damage to these features affects their ability to commute safely and efficiently between roosts and feeding sites. A gap of as little as 10 metres may force bats to take different routes and even change roosting sites. Linear habitats and features such as tree lines, banks, ditches, watercourses and edges, and hedgerows are important areas for foraging and for shelter against wind or from predators. Loss of connectivity and fragmentation of these features may cause bats to abandon roost sites.

4 METHODOLOGY

4.1 FIELD SURVEY

4.1.1 Bats

Building Inspections:

This was undertaken by Elizabeth Barratt, Val Cooper and Peter Giles. This observed the following protocol:

- Checking the exterior of the building for signs of bat entry/exit points; such as staining from urine and oils or excessive scratching.
- Checking the building exterior for droppings, especially on ledges and under the potential access/egress points.

- Checking the interior of the buildings for droppings and feeding remains, any staining on beams, cleared patches of cobwebs and for the bats themselves (both hanging and in crevices).
- Noting all potential access points and roosting opportunities for bats and examining them thoroughly. Any inaccessible points noted and recorded as a constraint of the survey.

Emergence Surveys

1. Emergence survey on 23rd August 2012

2. Emergence survey on 13th September 2012

3. Dawn re-entry survey on 14th September 2012

These were undertaken by Elizabeth Barratt, Val Cooper, Pete Giles and Rob Smith. Observers were positioned around the farmhouse/barns in positions which allowed all roof elevations to be assessed. All activity was monitored 15 minutes before sunset until 1.5 hours after sunset for emergence surveys and for 90 minutes before dawn, using both Heterodyne and Frequency Division (Duet) bat detectors.

5 RESULTS

5.1 FIELD SURVEY

5.1.1 BATS

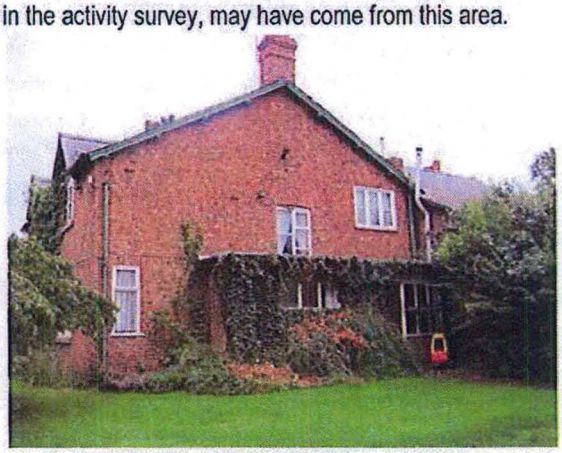
5.1.1.1 Building Inspection Surveys:

Oak Farm

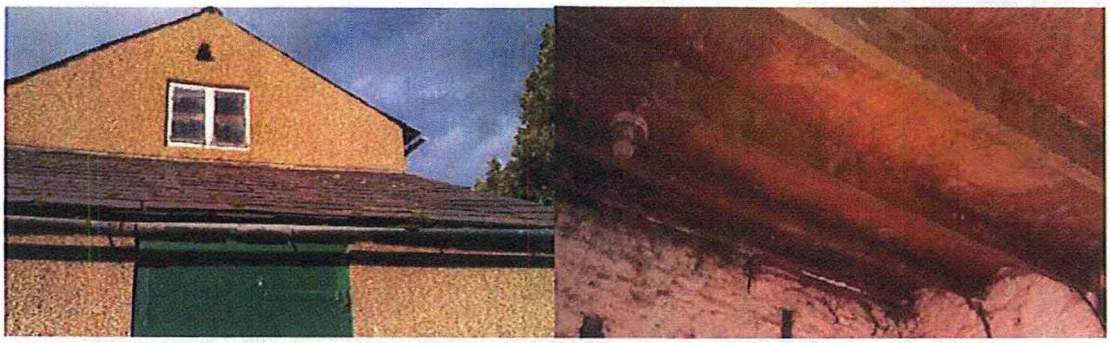
The Buildings had previously been inspected in August 2009. The inspections were repeated on 23rd August, 10th October and 21st October 20121.

2012 Building Inspections

Farmhouse: an internal inspection of the accessible areas of the loft space of the farm house found evidence of old bird nests (corvid), wasp nests but no bats present within the roof space or signs of bat activity within the roof space. The roof is not felted with open access under some sections of the eaves. The area around the chimney on the west side of the building is double skinned with gaps in the brick work and it is thought that the pipistrelles seen emerging in the activity survey, may have come from this area.



Barn D: an internal inspection was carried out of the upper floors of Barn D. No felting is present beneath the slate tiles. No evidence was found of bats present inside the building. Four single pipistrelle droppings were found scattered around the northern section of the barn. The southern section of the upper floor is very light. The brick lean to on the eastern side of Barn D has a sloping tiles roof which is boarded underneath creating crevice roosting opportunities.



No bats or signs of bat activity were found during inspections of the other barns/cattle sheds on site.

5.1.1.2 Bat Activity Surveys:

Emergence survey were carried out in August 2009 and repeated in August/September 2012.

Emergence Survey 23rd August 2012

Results, timing and conditions are detailed in **Table 1 & 2** in **Appendix 2.**
The location of bat activity recorded is given in the site diagram in **Appendix 1**

Emergence Survey 13th September 2012

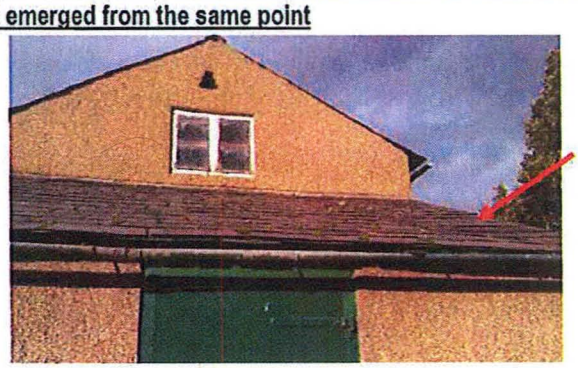
Results, timing and conditions are detailed in **Table 3 & 4** in **Appendix 2.**
The location of bat activity recorded is given in the site diagram in **Appendix 1**

Dawn re-entry Survey 14th September 2012

Results, timing and conditions are detailed in **Table 5 & 6** in **Appendix 2.**
The location of bat activity recorded is given in the site diagram in **Appendix 1**

Three species of bat: the Common pipistrelle, Soprano pipistrelle and a myotis species whose call had characteristics of whiskered/Brandt's bats were recorded commuting and foraging across or near the site.

Bat activity was recorded on site around 20 minutes after sunset**. On 23rd August a single Common pipistrelle was observed emerging from under the tiles on the eastern edge of the brick lean to on barn D. On 13th September 2 bats (Common pipistrelle) were observed to emerge from the same point and on 17th October a single bat emerged from the same point**



On the 13th September three bats were seen to emerge from the farmhouse roof. A single bat emerged from the eve on the northern side of the farm house, followed by two bats from under the tiles on the

eastern side of the northern face of the farm house. All bats were identified as being Common pipistrelles



Foraging activity was recorded throughout the emergence surveys around the mature shrubs/trees of the shelter belt next to the layby and over the garden of the farmhouse. Further activity was recorded in the open barns (A & B) and over the farmyards 1-3.

6 ASSESSMENT

6.1 CONSTRAINTS OF SURVEY

6.1.1 Surveying for bats at a specific season of the year does not provide information of use of the site by bats at other times of the year. Whilst consideration may be given to roosting at other times, there may be no evidence for this outside the survey period. The optimum survey period is May to mid-August.

6.1.2 No active bats may be present or detectable at time of survey.

6.1.3 Small roosts and single roosting bats can easily be overlooked. They can be difficult to detect during inspection as they leave few field signs.

6.1.4 In winter and during cold spells bats, when temperatures drop below 9 or 10 degrees, the bats become less active. If torpid and/or hibernating, they may squeeze deep into cracks and crevices in brickwork, stonework and woodwork. They can be difficult to spot even with the help of an endoscope

6.1.5 Access was limited to the roof voids of some buildings due to the unsafe nature of the roof structure

6.2 CONCLUSIONS

6.2.1 **Bats**

Building surveys

The results of the surveys repeated in summer 2012 identified a small post-maternity roost of Common pipistrelles within the farmhouse and Barn D at Oak Farm. Less than 5 bats were observed emerging from each building during the activity surveys in August and September 2012. No bats were observed emerging from these

buildings at the start of the June and July 2012. Therefore this is considered to be a transitional roost site post maternity and pre-hibernation. **A bat roost is therefore present on this site**

The presence of hedgerows and treelines was found to be important to the bats using this site, permitting commuting to/from sites and providing sheltered foraging areas. In any proposed developments for these sites these linear landscape elements should be retained or replaced with similar features to permit navigation across the habitats. Planting should be supplemented with native species to improve the insect biodiversity of the site.

This conclusion is subject to the constraints on survey as given in **Section 6.1** of this report.

6.3 LEGISLATION AND POLICY GUIDANCE

Bats are offered special protection under the following legislation:

- **The Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.** This Act transposes into UK law the **Convention on the Conservation of European Wildlife and Natural Habitats** (commonly referred to as the "Bern Convention". The WCA was recently amended by the **Countryside and Rights of Way [CroW] Act 2000.** This makes it is an offence to:
  - Intentionally kill, injure or take any species of bat [Section 9(1)]
  - Possess or control any live or dead specimens or anything derived from a bat [Section 9(2)]
  - Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a bat [Section 9(4)(a)]
  - Intentionally or recklessly disturb a bat while it is occupying a place or structure which it uses for that purpose [Section 9(4)(b)]

- **The Conservation (Natural Habitats &c) Regulations 1994** (The Habitats Directive) transposes into UK law **Council Directive 92/43/eec** of 21st May 1992 on the **Conservation of Natural Habitats of Wild Fauna and Flora** (referred to as the Habitats [and Species] Directive). Bats are listed on Annex II and Annex IV of the Directive. Inclusion in Annex II serves to underline their (the bats') conservation significance; inclusion in Annex IV (European Protected Species) means that member states are required to put into place a system of strict protection as outlined in Article 12. This is done through inclusion in Schedule 2 of the Regulations. Regulation 39 makes it an offence to:
  - deliberately capture or kill a bat [Regulation 39 (1)(a)]
  - deliberately disturb a bat [Regulation 39(1)(b)]
  - deliberately damage or destroy a breeding site or resting place of a bat [Regulation 39(1)(d)].

There are several exceptions to the provisions listed above. Licenses permit unlawful activities and are granted for certain purposes by Natural England for scientific, education or conservation purposes (including survey). Natural England issues licenses through the Wildlife Licensing Unit for the purposes of "*preserving public health or 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 44(2)(e)].

6.4 POTENTIAL IMPACTS

6.4 POTENTIAL IMPACTS

Common pipistrelles are roosting under the tiles/in the chimney brickwork of the farmhouse and the brick lean to of Barn D at Oak Farm. Demolition/conversion of these buildings will result in the loss of a roosting site and possible disturbance of the resident bat population. **Therefore a DEFRA licence is required before the start of any demolition/conversion works on these buildings**

With the presence of a bat roost for Common pipistrelles (*Pipistrellus pipistrellus)* in the farmhouse/Barn D of Oak Farm, there is potential for the following impacts to bats roosting on site through the demolition of the current structures:

- disturbance and potential injury to bats during demolition works
- disturbance to bats post-development due to increased activity on site
- destruction, modification or exclusion from roosting sites in the barns

The numbers of bats observed was considered low and *Pipistrellus pipistrellus* is the most common UK bat species. The loss of a transitional roost site for of a common species is considered of low-medium conservation significance and may impact on the long-term survival of the species. Common pipistrelles use buildings as roost sites and the Oak Farm site is in an isolated position. Therefore the proposed mitigation for the site will provide alternative roost sites and should reduce the impacts of the proposed redevelopment and retain the bat population in the local area. Mitigation proposals are subject to approval by Natural England.

Current population data is required for an European Protected Species (EPS) licence application and supplementary information may be required by Natural England (NE) dependent upon the time of submission of the licence application. Information has been gathered to inform a suitable plan to mitigate and compensate for the presence of bats at the property. An EPS licence will be required from DEFRA/NE. This can only be applied for once full planning permission has been granted and must be in place before any work can proceed on site). The EPS method statement will outline the timing and method of working plus the compensatory measures to be put in place for the bats (see section 7).

7 RECOMMENDATIONS AND MITIGATION

7.1 FURTHER SURVEY

7.1.1 Bats

There is no requirement for further survey work with respect to bats at this time prior to the submission of a DEFRA EPS licence application if the demolition proceeds before the start of the next active season (i.e. prior to April 2013).

7.1.2 **The conclusions and recommendations in this report in respect to surveys for protected species are based upon results from surveys in August 2009, August/September 2012. These data will only be of use to the start of the next active season in April 2013, after which further survey to establish the position and possible changes in status will be necessary to ensure all activities are informed and guided by recent data on site status.**

7.2 METHOD OF DEMOLITION AND PROPSED MITIGATION STRATEGY

All measures will be designed to reduce or remove all impacts identified in respect of bat species on the site during and following the development of the site. This will include:

- optimal timing of the works to ensure minimum disturbance to bats on the site
- measures during building works to prevent the entrapment, injury or death of individual bats
- installation of appropriate compensatory measures for the loss, modification or any other impact on the roosting places on the site
- post-mitigation measures to sustain the status of the species for the long-term and ensure there is no detrimental effect on the conservation of bat populations in the location, county or region.

The measures will be implemented in accordance with the full plan of mitigation and compensation measures detailed in the preparation and submission of an application for a European Protected Species Licence (EPSL) from Natural **The measures will be subject to agreement with Natural England and may be reviewed and adapted as required to satisfy licensing requirements.**

Prior to the start of works:

- compensation measures for bats will be completed as far as possible to ensure that any displaced bats have alternative accommodation available on the site

The details of the phasing of work and any preparatory work prior to licence will be given in the licence application.

Timing of works

Bats are highly mobile and use occasional places to roost in small numbers during all active times of the year. It is therefore recommended on sites where bats are known to be active that work is begun outside the breeding season of May to August and, if possible, outside the active period of April to late September. The optimum windows for undertaking for the start of demolition/roof removal is from late October/early November or March/April. These timings may be affected by seasonal variation in the weather (early spring/early onset of cold weather in autumn etc.). Where nesting birds are present the best practice window for the start of work is September-November.

Best practice measures

Are used as part of an EPS licence method statement. These are:

- During demolition/refurbishment the roof cover and any cavity wall areas are removed by hand using a 'soft protocol' method. Tiles and the flat roof covering are all removed by hand by lifting and carefully peeling back outer layers. Bats are often found between the upper surfaces of internal divisions and the roof cover, and in the ridge and gable ends and can be crushed if care is not taken. Where an EPS licence is required a licenced bat worker should be on site during the removal of the roof.
- Deconstruction of the external wall and any interior walls will also be done using similar methods if there is any possibility of bats being present in the wall/partition structure. Any crevices that cannot be inspected must be opened carefully to expose any enclosed areas. The work must be done by hand with the hand-removal of bricks and wall coverings to prevent crushing bats.
- Any external work involving the removal and replacement of apertures will be done at a sensitive time to avoid trapping bats. The best time is between October/November or March/April, when bats are less vulnerable to disturbance. Between April and September it may be necessary to employ measures to prevent bats entering through open apertures and becoming trapped inside buildings under development.
- any replacements to apertures should be done by completing the removal and replacement in a day to prevent any crevices being left open overnight. The same applies to new builds where buildings need to be sealed overnight to avoid entrapment of bats
- all external sealing works are completed before the installation of internal fittings such as battened walls etc where any bats that may get in might enter and get trapped.
- all external doors and windows are kept shut overnight to discourage bats from entering the building.

Further advice on measures to prevent entrapment of bats and methods of preventing entry will be given as required by a qualified consultant bat specialist.

If bats or signs of bats are found at any time when any demolition, renovation or construction work is being undertaken then work should stop and advice sought from a qualified bat specialist or representative of Natural England. On no account should bat(s) be handled by anyone other than a licensed bat worker.

Mitigation for the loss of a bat roost site is required as part of an EPS licence application. Common pipistrelle bats (*Pipistrellus pipistrelles)* are crevice dwelling bats and on this site the population is small. Mitigation for this species can be achieved through the use of bat boxes incorporated into the walls of new build structure giving a range of roosting opportunities.

The mitigation proposals to accommodate this population and provide opportunities for future expansion are:

(1) Incorporation of 3 interlinked 2R Modular Bat Tubes (Schwegler) on a minimum of ten buildings in the northern end of the Oak Farm site, giving a range of roosting aspects. Two sets are to be placed as close to the original access points in the farmhouse and barn as possible.

(2) Up to ten additional bat boxes should be erected upon the mature trees within this section of the site, facing different aspects to provide a range of roosting opportunities.

All mitigation and compensation measures would be detailed in an application for EPS licence to Natural England if required, and may be reviewed and altered subject to agreement with NE.

- It is recommended that insect attracting shrubs be incorporated into any future planting scheme to encourage the presence of insects and thereby provide suitable foraging sites for local bats which have been observed to use the site for foraging (see **Appendix 3.**)

- Lighting around the site should be designed to point downwards and away from any potential roosting sites/bat boxes on trees and buildings and away from commuting routes/foraging sites.

- Where possible, the mature trees and hedgerows on around and near the site should be retained. These have potential to develop into natural roosting sites

Further information can be found in *Bat Mitigation Guidelines* (2004) available from Natural England and Habitat management for Bats (JNCC, 2001).

It is strongly advised that no work is carried out on site until the method statement, which will form the basis of the licence application, is formulated and formally agreed through the submission of the application.

When carryout a redevelopment, developers should be aware that if bats or signs of bats are found during works, all work should cease and Natural England or a licensed bat consultant contacted immediately and their advice followed. Failure to do so may result in an offence under the legislation in relation to bats as detailed in Section 6.3 of this report. On no account should the bat(s) be handled by anyone other than a licensed bat worker.

The conclusions and recommendations in this report in respect to surveys for bats are based upon results from surveys in summer/autumn 2012. These data will only be of use until April 2013 after which further survey to establish the position and possible changes in status will be necessary to ensure all activities are informed and guided by recent data on site status.

7.3 REQUIREMENTS FOR EPS LICENSING

7.3.1 BATS

The evidence from the activity surveys of 2012 identified a transitional roost of Common pipistrelle in the farmhouse and barn D of Oak Farm. The population size was small (>10) and mitigation proposals will be based upon that population size but will seek to provide opportunities for population expansion.

There is a possibility that the development of the Oak Farm site would result in a breach of the law under the Wildlife and Countryside Act 1981 (as amended) under Section 9(4)(a), which states that it is an offence to 'intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a bat'. Conversion would also lead to an infringement under the Conservation (Natural Habitats & c) Regulations, which states it as an offence to 'deliberately damage or destroy a breeding site or resting place of a bat' [Regulation 39(1)(d)]. **It is therefore advised that a licence for European Protected Species (EPSL) in**

respect of bats will be required from DEFRA/NE to enable the development of the site to proceed within required legal constraints as detailed in Section 6.3 of the original report.

The full details of mitigation proposals and compensatory measures will be given in the method statement of the licence application. Mitigation proposals are subject to approval by Natural England.

8 REFERENCES

English Nature (2004) *Bat Mitigation Guidelines* Version January 2004
BCT (2012) *Bat Surveys Good Practice Guidelines*
JNCC (2004) *Bat Workers Manual* Third Edition.

9 APPENDICES

Appendix 1: Site plan at Oak Farm
Appendix 2: Activity Survey Results for Oak Farm
Appendix 3: Habitat improvement for bats

Appendix 1: Site plan of Oak Farm



Appendix 2: Results tables for activity surveys at Oak Farm, Manchester Airport

Key:
Pip *spp* = pipistrelle species
Pip 45 = Common pipistrelle (*Pipistrellus pipistrellus*)
Pip 55 = soprano pipistrelle (*Pipstrellus pygmaeus*)
BLE = brown long-eared (*Plecotus auritus*)
Myotis = one of *Myotis* genera of bats
Noctule = noctule bat (*Nyctalus noctula*)
HNS = heard not seen
EL = echolocation
CP = commuting pass
SC = social calls

Bold type indicates emergence/entry by bat(s)
Bold italic indicates potential emergence/entry by bat(s)

Table 1: Timing and conditions for emergence survey on 23rd August 2012

	Time	Temperature	Wind	Cloud cover	Precipitation
Start	20.00	14.5ºC	Still	100%	Dry
End	22.00	11.5ºC		70%	
Sunset	20.19				

Table 2: Emergence survey on 23rd August 2012

Observer 1: Yard 3		
time	**species**	**activity**
20.45	*Common pipistrelle*	In courtyard – arrived from across the road
20.51	*Unknown*	Distant contact
20.54	*Common pipistrelle*	In barns at east side feeding and flying
20.57	*Common pipistrelle*	Flew into cowshed behind main L-shaped barn then out again
21.00 – 21.15	*Common pipistrelle*	2 x bats. Flying round barns with occasional feeding buzzes
21.16	*Soprano pipistrelle*	CP. HNS
21.16 onwards	*Unknown*	Lot of distant and indistinct bat contacts
21.49	*Soprano pipistrelle*	Flying and feeding in cow shed

Observer 3: Front of house, garden and lane and brick barn D		
time	**species**	**activity**
20.38 – 21.08	***Pip sp***	**Single bat emerged from lean to on barn and foraged along lane for 30 minutes**
20.45	Common pipistrelle	2 bats foraging along layby, round barn and round tree lines on layby
20.51	Common pipistrelle	CP east to west along layby
20.59	Common pipistrelle	Foraging along tree line behind barns and sheds
21.00	Soprano pipistrelle	Flying south to north between barn and sheds

21.23	Common pipistrelle	2 bats along lane/lay by
21.29	Common pipistrelle, Soprano pipistrelle & Myotis sp	Foraging along lane/lay by
21.50 – end of survey	Common pipistrelle, Soprano pipistrelle	Foraging along lane/lay by

Table 3: Timing and conditions for emergence survey on 13th September 2012

	Time	Temperature	Wind	Cloud cover	Precipitation
Start	19.00	12.5ºC	Light breeze	40%	dry
End	21.00	11.5ºC		30%	
Sunset	19.28				

Table 4: Emergence survey on 13th September 2012

Observer 1: Front of house & garden		
time	**species**	**activity**
19.57	Common pipistrelle	**Emerged out of western eve above window on the north side, and flew off towards east**
19.59 – 20.02	*Soprano pipistrelle*	f/cp around house and along tree bordered lane
20.04	***Common pipistrelle***	**2 bats foraging along southern boundary by tree having emerged from beneath the tiles on the north corner of the farmhouse**
20.10	*Soprano pipistrelle*	F around garden
20.10 – 20.14	*myotis*	F over garden
20.21	Common pipistrelle	2 bats f along southern boundary by tree
20.27-20.53	Common pipistrelle *and Soprano pipistrelle*	F over garden round tree
20.40	Common pipistrelle	FP, HNS
20.51	*Soprano pipistrelle*	FP, HNS

Observer 2: Yard 3		
time	**species**	**activity**
20.12-20.14	Common pipistrelle	Into courtyard over gate at road. Flew towards back of the site
20.19	*Pip spp*	Distant contact

Observer 4: Brick barn D and layby		
time	**species**	**activity**
19.42	***Common pipistrelle***	**Emerged from corner of lean to on south east side of barn D and flew up and down lay by**

19.56	*Soprano pipistrelle*	Foraging along the layby and trees
19.57	***Common pipistrelle***	**Emerged from corner of lean to on south east side of barn D and foraged along lay by and in front of barn D**
20.00 – 20.22	Common pipistrelle	2 bats foraging along layby, round barn and round tree lines on layby
20.52	Common pipistrelle	Foraging along tree line behind barns and sheds
20.29 – end of survey	Common pipistrelle, Soprano pipistrelle & Myotis sp	Multiple bats foraging along lane/lay by (3+)

Table 5: Timing and conditions for dawn survey on 14th September 2012

	Time	Temperature	Wind	Cloud cover	Precipitation
Start	5.05	13.5°C	Fresh wind, rising mid-survey and dropping to end	100%	Fresh wind, rising mid-survey and dropping to end
End	6.45	11.1°C		70%	
Sunset	6.40				

Table 6: Dawn re-entry survey on 14th September 2012

Observer 1: Front of farm house and garden		
time	**species**	**activity**
05.18	*Soprano pipistrelle*	HNS
05.20	*Soprano pipistrelle*	HNS
05.26-05.28	*Soprano pipistrelle*	Several passes round farmhouse
05.33	*Soprano pipistrelle*	Commuting pass heading south

Observer 2: Yard 1&3 and Barn D/layby		
time	**species**	**activity**
5.05	Common pipistrelle	In courtyard on arrival
5.18	*Soprano pipistrelle*	Up and down tree line outside on road
5.26	Common pipistrelle	In courtyard. CP and social calls
5.50	*RAIN*	Rain starts in earnest, wind has risen to moderate No further contacts heard Rain stops around 6.05

Appendix 3: Landscaping and the conservation of bat populations

Planting to enhance a site for bats should aim to provide a habitat rich in insects, and with the potential for alternative roosting sites. The construction of shelter belts, especially around a pond will create areas with high densities of insects.

Trees and Shrubs

Oak	*Quercus robur*
Ash	*Fraxinus excelsior*
Silver Birch	*Betula pendula*
Field Maple	*Acer campestre*
Hawthorn	*Crataegus monogyna*
Alder	*Alnus glutinosa*
Goat Willow	*Salix caprea*
Guelder Rose	*Viburnum opulus*
Hazel	*Coryllus avellana*
Blackthorn	*Prunus spinosa*
Elder	*Sambucus nigra*
Butterfly-bush	*Buddleja davidii*

Night-scented flowers

As bats usually feed at dusk and dawn it is advantageous to use night-scented flowers which will attract moths and other night-flying insects.

Nottingham Catchfly	*Silene nutans*
Night -flowering Catchfly	*S. noctiflora*
Bladder Campion	*S. vulgaris*
Night-scented Stock	*Matthiola bicornis*
Dame's-violet	*Hesperis matronalis*
Common Evening-primrose	*Oenothera biennis*
Soapwort	*Saponaria officinalis*
Tobacco plant	*Nicotiana affinis*
Cherry pie	*Heliotopum x hybridum*

Scented herbs

Chives	*Allium schoenoprasum*
Sage	*Salvia officinalis*
Marjoram	*Origanum vulgare*
Borage	*Borago officinalus*
Mint	*Mentha* sp.

Climbers

Perfoliate Honeysuckle	*Lonicera caprifolium*
Italian Honeysuckle (garden)	*L. etrusca*
Japanese Honeysuckle	*L. japonica*
Honeysuckle (native)	*L. periclymenum*
White jasmine	*Jasminium officinale*
Dog-rose	*Rosa canina*
Sweet-briar	*R. rubiginosa*
Field-rose	*R. arvensis*
Ivy	*Hedera helix*
Bramble	Rubus fruticisos agg.

Leaving areas of grass uncut allows larval stages of these insects to develop.

Source:

Bats in the garden by Shirley Thompson, 1989. School Garden Company. Spalding Lincs
Bat Conservation Trust leaflet 'Garden for Bats'