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To whom it may concern,

**BAT FRIENDLY LIGHTING PLAN FOR BOOZEY FIELD, OFF GRIFFITHS
ROAD, GWERSYLLT, WREXHAM, LL11 4YF.**

Planning Reference P/2015/0790

Introduction

Planning Condition 19 of the above planning permission requires that:

19. An external bat friendly lighting scheme shall be submitted to and approved in writing by the Local Planning Authority as part of the reserved matters application. The scheme shall be fully implemented in accordance with the approved details prior to first use / occupation of the development.

A suitable Bat Friendly Lighting Plan for the site has been devised (see below) by Richard Roe (BSc, MSc, MCIEEM, CEnv) of Kingdom Ecology and Gareth Edwards of Deeco Lighting. The lighting plan has been devised based upon further bat activity surveys carried out at the site July-September 2016 (full report provided in the Appendix).

Also included within the Lighting Plan are recommendations for new bat and bird boxes at the site.

Yours sincerely,

Richard Roe
Principal Ecologist

WR
BC

13 FEB 2017

PLANNING DEPARTMENT



Further Bat Survey Summary

A Preliminary Ecological Appraisal of the site completed in February 2015 had identified the site as potentially being of value to bats. Consequently further surveys were completed during the 2016 field season to further assess these specific ecological receptors.

The bat activity surveys comprised of three walked activity transects completed July, August and September 2016. Survey aimed to identify and evaluate bat assemblages present and to assess and evaluate existing habitats in terms of their importance to local bat populations.

In summary, the bat activity transects identified four species of bat at the site comprising of four common bat species (common pipistrelle, soprano pipistrelle bat, Natterer's bat and Daubenton's bat). Noctule (a rarer species) has been recorded overflying the site but do not use the site as a foraging resource. Bats have been identified in relatively low numbers.

The site is considered to support bat assemblages that are of 'local' value in terms of their conservation importance.

Features considered to be of greatest value to bats at the site comprise of Griffiths Road which offers both foraging and commuting opportunities plus the two opposite treelines located at the western end of the site which offers good quality foraging habitat.

Low levels of bat activity were generally recorded around the centre and eastern end of the site and within the open grassland areas.

The full bat survey report is provided in the Appendix.

Bats and Lighting Overview

Lighting proposals for the site have been devised with the following aims:

- Where possible, unnecessary lighting of the site has been avoided particularly where light might spill into more valuable habitats at the western end of the site and at the western end of Griffiths Lane.
- Where lighting is required measures have been undertaken to limit the negative effects of excessive lighting such as the use of shields and low level lighting.
- The front and rear gardens of properties will be lit with low intensity porch lights were required as opposed to with security flood lights. The porch lights will be fitted with screens to limit further light spill onto boundary features.
- Lighting sources will be 'bat friendly' using LEDs or low wattage lamps.



Highway Lighting

Highway lighting will be comprise of 12 x 39 watt LED lanterns fixed on 6m columns. It is a requirement of the council that the street lighting must be fixed to columns in this area and cannot comprise of low level bollard lighting.

The lanterns are full cut off and so there will be very little, if any light above the horizontal.

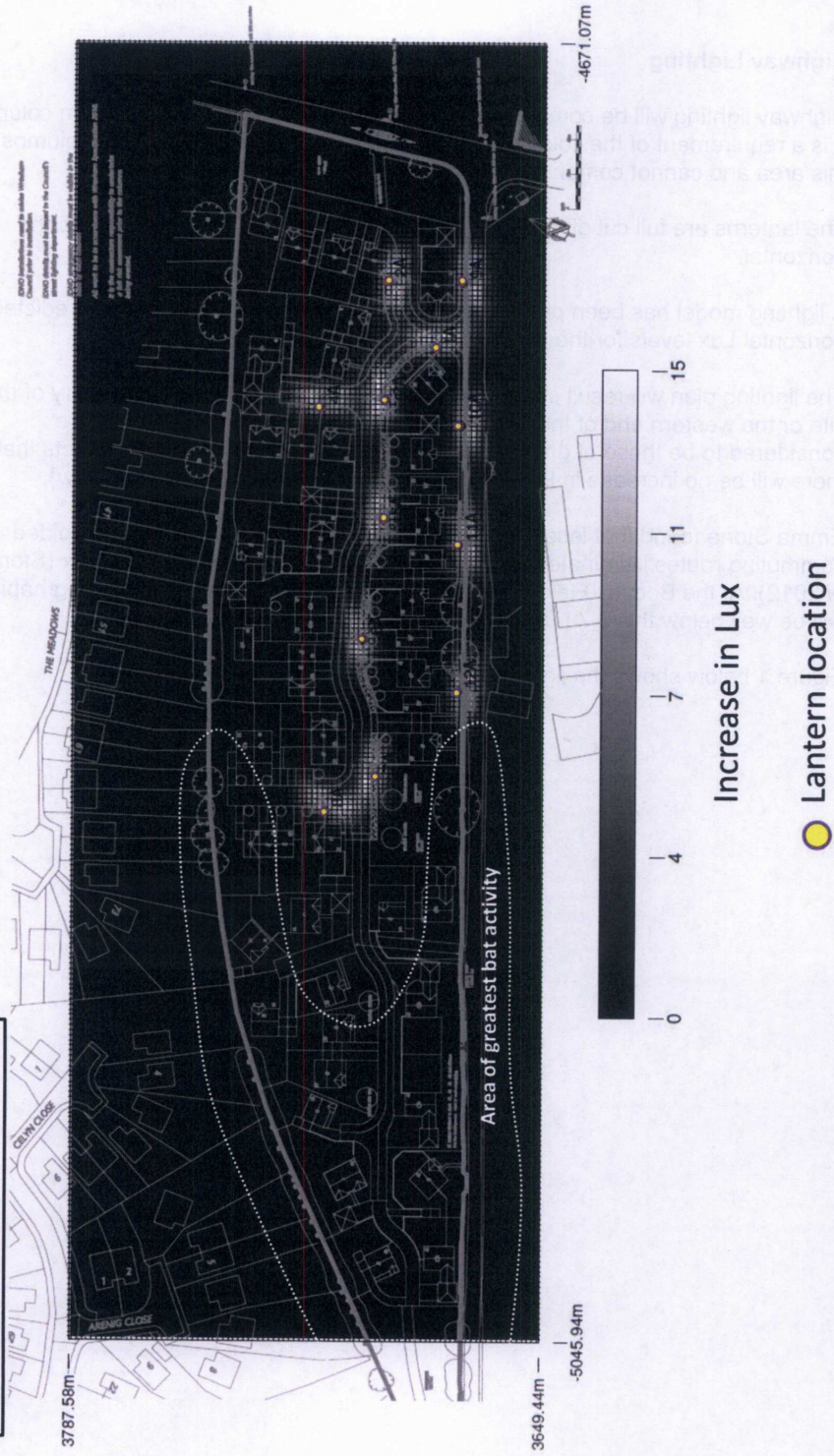
A lighting model has been produced which shows lantern locations and predicted horizontal Lux levels for the site and surrounding landscape.

The lighting plan will result in minimal light spill on to the northern boundary of the site or the western end of the site and Griffiths Road. These locations were considered to be those of greatest value to bats. The lighting model predicts that there will be no increase in Lux levels in these locations (See Figure below).

Emma Stone found that lesser horseshoe bats and myotis bat species avoided commuting routes illuminated with LEDs even at low light levels of 3.7 Lux (Stone *et al* 2012). At the Boozey Field site, light spill into more valuable bat foraging habitats will be well below this 3.7 Lux threshold.

Figure 1 below shows the lighting model for the site.

**FIGURE 1 – Street
Lighting Model**

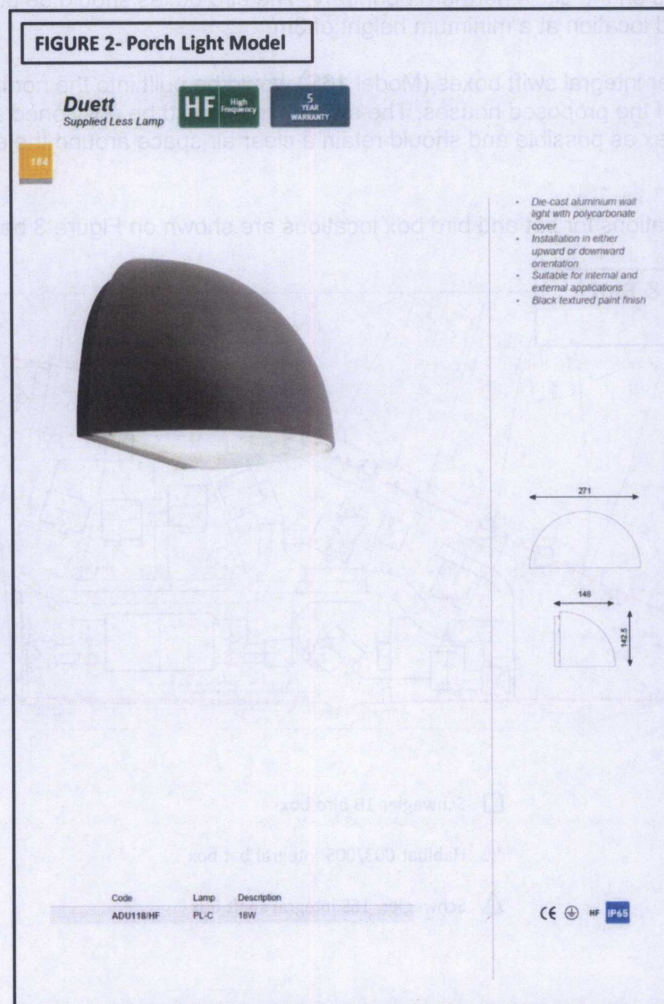


Domestic Lighting

Each property will have a porch light fitted below both the front porch and on the rear wall facing the back garden.

Suitable models of domestic lighting (Ansell Duett 18watt Porch Light) have been selected that will comprise of 18w LED lighting and that are fitted with hoods to limit light to below the horizontal.

The porch lights will be fitted so that they face downwards to limit light spill. The fitting of the light beneath the front porch will provide additional screening. The selected model of lighting is provided below (Figure 2).





Bat and Bird Box Scheme

A bat and bird box scheme is proposed for the site. Bat and bird boxes would be positioned at the western end of the scheme away from artificial street lighting associated with the main spine road and close to the retained open areas of green space.

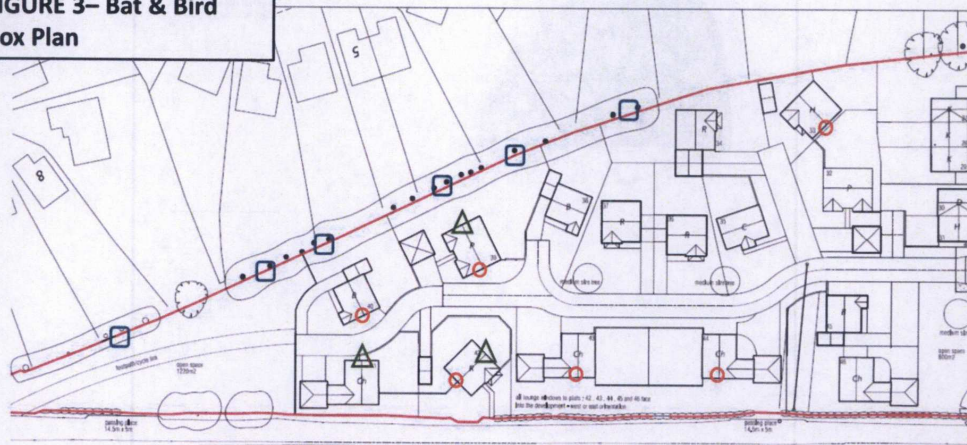
Bat boxes would comprise of 6 x Habibat integral bat boxes (Model 003 or 005) which would be built into the south facing gable ends of 6 of the proposed houses. The bat boxes should be positioned at a minimum height of 5m and located as close to the gable apex as possible.

Bird boxes would comprises of 6 x Schwegler 1B bird boxes which would be fitted to retained trees on the site's northern boundary. The bird boxes should be positioned in a sheltered location at a minimum height of 3m.

3 x Schwegler integral swift boxes (Model 16S) would be built into the north facing gables of 3 of the proposed houses. The swift boxes should be positioned as close to the gable apex as possible and should retain a clear air space around the entrance hole.

Recommendations for bat and bird box locations are shown on Figure 3 below.

**FIGURE 3– Bat & Bird
Box Plan**



- Schwegler 1B bird box
- Habibat 003/005 integral bat box
- △ Schwegler 16S integral swift box



Appendix- Bat Activity Report



Boozey Field,
Griffiths Road, Gwersyllt

Further Bat Survey

29 September 2016

Authored by Richard Roe BSc MSc MCIEEM CEnv

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1 Introduction

1.1 Background

Kingdom Ecology have carried out further bat activity surveys of an area of improved pasture land known as Boozey Field located in Gwersyllt, Wrexham. The ecological assessment has been carried out in support of a planning application to redevelop the site as housing.

Development proposals are to construct approximately 65 new dwellings at the site with associated gardens and infrastructure. The development will require the removal of some boundary features and immature trees to provide site access.

Bat activity surveys, comprising of three walked activity transects, have been carried out in July, August and September 2016.

Surveys were carried out by Richard Roe (BSc, MSc, MIEEM, CEnv). Richard has extensive experience of undertaking habitat and protected species surveys as a professional ecological consultant with over twelve years experience. Richard is also a licensed bat worker.

1.2 Purpose of Report

This report provides and outlines the findings of the additional bat activity surveys carried out at the site in July, August and September 2016.

The report evaluates the conservation importance of identified species assemblages, identifies habitat features within the site which may be of importance to the species concerned and goes on to make recommendations for further works, mitigation and ecological enhancement measures where relevant.

1.3 Study Area

The study area comprises of a 2.4ha field land known as Boozey Field and is located immediately to the north of Griffiths Road, Gwersyllt, Wrexham, LL11 4YT. (Ordnance Survey Grid Reference SJ 318 524). The site location is shown on Figure 1 in the Appendix.

The field comprises of horse grazed pasture land. The site is bounded to the south by Griffiths Road, to the east by Old Mold road and to the north and west by the gardens of residential properties located on Glascoed Way, The Meadows, Vyrny Close and Celyn Close.

The boundary features at the site include fencing, tree lines and stone walls. The site is accessed via a gate on Griffiths Road.

Surrounding habitats comprise of suburban housing and gardens to the north and agricultural land to the south, east and west. The A541 Mold Road lies approximately 75m to the east of the site.

1.4 Evaluation Methodology

The results of the desktop and field surveys are used to identify ecological resources that may be of relevance to the proposals. The IEEM *Guidelines for Ecological Impact Assessment* (IEEM, 2006) sets out the recommended approach for valuing ecological resources, and for assessing the effects of proposed activities on them. It suggests that three types of value can be attributed to ecological resources – biodiversity value, community/social value and economic value, and that these should, as far as possible, be considered separately. IEEM (2006) also advises that legal protection should be considered separately from value, and that the value of an ecological or nature conservation resource should be determined within a defined geographical context; it recommends that the following frame of reference be used:

- International
- UK
- National
- Regional
- County or Metropolitan
- District (or Unitary Authority, City or Borough)
- Local or Parish
- Within zone of influence only (this may be the project site or a larger area)

Designated sites (eg. SSSIs, SPAs etc) are generally straightforward to evaluate in relation to this frame of reference. Evaluation of other habitats and species needs to take into consideration a range of criteria, such as their rarity, diversity levels, population sizes and trends, whether they are replaceable or 're-creatable' (for habitats) etc. Appropriate criteria are proposed and discussed in various documents, such as in *A Nature Conservation Review* (Ratcliffe, 1977)¹, *Guidelines for the selection of biological SSSIs* (JNCC, 1989)², *Local Sites* (Defra,

¹ Ratcliffe, D.A. 1977. *A Nature Conservation Review*. Cambridge University Press.

² JNCC, 1989. *Guidelines for the selection of Biological SSSIs*. Nature Conservancy Council, Peterborough.

2006)³, *Local Wildlife Site Selection Criteria for the Cheshire Region* (Cheshire Wildlife Trust 2014)⁴ and also in local and national Biodiversity Plans (BAPs) including Species and Habitat Action Plans (SAPs and HAPs)(see Anon, 1995 for UK BAP)⁵.

Species may be evaluated by reference to their rarity and status in the national or local context. In addition to protected species, rare species, as defined in the Red Data Books/Red Lists/Scarce species lists and in the national and local Biodiversity Action Plans, are recognised to hold value.

The list of national priority BAP species has recently been updated (available on: <http://www.ukbap.org.uk/NewPriorityList.aspx>). The conservation status of declining British birds has been defined in the *Birds of Conservation Concern Report 2009* (Eaton et al. 2009)⁶; where appropriate, this assigns bird species to the Red or Amber list of birds of either high or medium conservation concern, according to a range of defined criteria.

1.5 Legislative and Policy Context

This report and its recommendations have been produced in accordance with relevant legislation, best practice guidance and local biodiversity targets. They also take into account the National Planning Policy Framework (NPPF)⁷ in addition to nature conservation policies within local and regional planning policy documents.

The principal legislation relating to ecological resources that are relevant to this appraisal are as follows:

Conservation of Habitats and Species Regulations (as amended) 2010 - these Regulations implement protection for European protected sites and species, updating and consolidating the Conservation (Natural Habitats &c.) Regulations (as amended) 1994. The level of protection afforded to habitats and species remains the same. The Regulations

³ DEFRA 2006. Local Sites Guidance on their Identification, Selection and Management

⁴ Cheshire Wildlife Trust 2014, *Local Wildlife Site Selection Criteria for the Cheshire Region*

⁵ Anon, 1995. Biodiversity: The UK Biodiversity Steering Group Report. Vol. 2. Action Plans. HMSO.

⁶ Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD (2009) *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. British Birds 102, pp296-341

⁷ National Planning Policy Framework (NPPF) (2012). Department for Communities and Local Government. March 2012.

implement the Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC).

Wildlife and Countryside Act (1981) (as amended) – this Act comprises the principal means of protecting wildlife in the UK and provides the mechanism by which a number of international directives are implemented in the UK.

Countryside and Rights of Way (CROW) Act (2000) – this Act strengthens the Wildlife and Countryside Act in relation to SSSIs and threatened species.

Natural Environment and Rural Communities (NERC) Act (2006) – this Act places an obligation on public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity.

Biodiversity Action Plan (BAP) – the UK BAP and local BAPs is the UK Government's response to the Convention on Biological Diversity, signed in 1992. The BAPs describe the UK's biological resources and commits a detailed plan for the protection of these resources through the implementation of Habitat and Species Action Plans. Whilst UK BAP species and habitats are afforded no statutory protection, their conservation must be considered by a planning authority during the planning process as described under the NERC Act 2006.

1.6 Protected Species Legislation

1.6.1 Bats

All British bat species are fully protected under the Wildlife and Countryside Act 1981 (as amended) and through their inclusion in Schedule II of the Habitats Regulations 2010 which transpose Annex II of the Council Directive 92/43/EEC 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora ("EC Habitats Directive") which defines European protected species of animals.

British bats species are afforded further protection by the Countryside and Rights of Way Act 2000; and the Natural Environment and Rural Communities Act 2006.

Taken together, this legislation makes it an offence to:

- Intentionally or deliberately kill, injure or capture bats.
- Deliberately disturb bats, whether at roost or not.
- Damage, destroy or obstruct access to bat roosts.
- Possess or transport bats, unless acquired legally.
- Sell, barter or exchange bats.

A bat roost is interpreted as “any structure or place, which any wild bat uses for shelter or protection.” (Bat Conservation Trust 2012⁸). A bat roost is protected whether or not bats are present at the time.

All species of British bat are considered a European Protected Species (EPS). The Conservation of Habitat and Species Regulations (2010) provide derogation against certain offences which could potentially affect an EPS through the EPS Licensing system.

⁸ Bat Conservation Trust (2012) ‘Bat Surveys: Good Practice Guidelines 2nd Edition’

2 Field Survey Methods

2.1 Survey Aims and Objectives

A Preliminary Ecological Appraisal of the site completed in February 2015 had identified the site as potentially being of value to bats. Consequently further surveys were completed during the 2016 field season to further assess these specific ecological receptors.

The bat activity surveys comprised of three walked activity transects completed July, August and September 2016. Survey aimed to identify and evaluate bat assemblages present and to assess and evaluate existing habitats in terms of their importance to local bat populations.

2.2 Bats Activity Transects

The survey objectives were to identify and evaluate bat foraging and commuting habitat at the site and to identify and evaluate bat species assemblages present.

Surveys were based upon recommendations provided in the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* 3rd Edition (BCT 2016)⁹.

2.2.1 Transect Methodology

Bat activity transect surveys were targeted at identifying the type and intensity of bat activity, both spatially and temporally, as well as the bat species present. The survey also aimed to assess the relative abundance of species present and the importance of different habitat features/areas.

Surveys were carried out along a pre-determined transect route, devised to encompass a wide range of habitats within the assessment area including grassland, treelines and country lanes.

Transects were interspaced by seven 'listening station' stops or 'point counts', where the surveyor would pause for five minutes to record levels of bat activity, including the number and species of bat, number of bat passes (discrete bursts of echolocation) of each species, and activity types i.e. commuting, foraging and/or social calling. An average of the number of the number of bat passes at each point count location was taken for the entire survey period to produce an index of activity.

⁹ Bat Conservation Trust (2016) *Bat surveys – Good Practice Guidelines* 3rd Edition. Bat Conservation Trust, London.

Where constant bat activity was recorded at a point count location, 20 bat passes were attributed. The bat activity index was scored as follows:

- 0.1-3 passes- Low bat activity
- 3.1-7 passes- Moderate bat activity
- 7.1-12 passes- High bat activity
- 12.1-20 passes- Very high bat activity

Information on incidental bat activity and species encountered were also target noted when walking between point counts, including direction of bat travel and bat use of features in the landscape.

Notes on weather conditions and survey times were also recorded. Surveys were undertaken during suitable weather conditions i.e. >8°C with minimal rainfall and wind.

Surveys were carried out using heterodyne and time expansion bat detector (Anabat Walkabout) combined with an Anabat Express frequency division bat detector to record calls in real time in a zero crossing format to permit further call analysis with AnalookW software.

Three transects were walked in total on the 5th July, 3rd August and 21st September 2016.

Transect surveys commenced within 10 minutes of sunset and ended approximately two hours after thus coinciding with the peak periods of bat activity.

The transect route, covering Point Counts 1-6, was walked twice allowing sampling of bat activity both immediately following sunset and also later in the same evening. Point Count 7, located immediately outside of the site was only walked once at the end of each of survey.

Activity transects were carried out by Richard Roe (BSc, MSc, MCIEEM, CEnv). Richard has over fourteen years' experience as a professional bat consultant and is a licensed bat worker.

2.2.2 Evaluation of Bat Habitats

Using the activity survey results, the site was assessed in terms of its value as foraging and commuting habitat for bats.

The process for determining this evaluation is based upon a scoring system presented at the Mammal Society/CIEEM *Advances in Ecological Impact Assessment for Mammals Symposium* 2007 (Wray *et al.* unpublished).



Boozey Field Further Bat Survey



This scoring system assesses the following factors when determining the value of a site for bats:-

- Rarity of species present
- Numbers of bats of each species encountered
- Presence of roosts nearby
- Landscape characteristics

Each of these factors is examined and allocated a 'point score'. The points are then totalled to produce a value for the site based upon the CIEEM *Guidelines for Ecological Impact Assessment* geographical frames of reference as described in Section 1.4 and shown in Table 1 below.

Table 1 - Bat habitat evaluation - assessment score in relation to ecological evaluation category

Score	Evaluation Category
0-10	Site only
11-20	Locally important
21-30	Important at District Level
31-40	Important at County Level
41-50	Regionally important
>50	Nationally/internationally important

Each individual factor is determined and scored as follows:-

Rarity of Species

The rarity of each species encountered on site is determined using the JNCC's UK Mammals: Species *Status and Population Trends* (Battersby 2005¹⁰). This document provides an estimate of population number, rarity and conservation status in Wales and the rest of the UK.

¹⁰ Battersby, J. (Ed) & Tracking Mammals Partnership. 2005. *UK Mammals: Species Status and Population Trends. First Report by the Tracking Mammals Partnership*. JNCC/Tracking Mammals Partnership, Peterborough.

- Common species (population over 100,000) include: common pipistrelle, soprano pipistrelle, brown long-eared, Natterer's and Daubenton's bat.
- Rarer species (population between 10,000–100,000) include: lesser horseshoe, whiskered, Brandt's, Leisler's and noctule bat
- Rarest species (population less than 10,000) include: Nathusius' pipistrelle, greater horseshoe, barbastelle, Bechstein's and serotine bat.

Scores are attributed as follows:

- Common species – 2 points
- Rarer species – 5 points
- Rarest – 20 points

The presence of bat species at the site is determined from the evening activity surveys.

Number of bats encountered

Across the three activity surveys, the highest numbers of bats recorded is used to determine the points score for the 'number of bats encountered'.

- Individual bats – 2 points
- Small numbers – 5 points
- Moderate numbers – 10 points
- Large numbers – 20 points

The number of bats present at the site is determined through the evening activity surveys.

Proximity of roosts/potential roosts

The score for the proximity of actual or potential roosts is determined as follows:-

- No roosts or suitable roosting habitat – 1 point
- Small number of roosts– 3 points
- Moderate number of roosts/unknown number of roosts- 4 points
- Large number of roosts or close to SSSI for species- 5 points
- Close to SAC for species- 20 points

Habitat Characteristics

Habitat at the study site is assessed and scored with regards to suitability for foraging or commuting bats. This assessment takes



account of likely aerial insect densities, connectivity of habitats, diversity of habitats available and suitability of foraging habitat.

Where habitats do not fit in to the descriptions below, a score has been attributed based upon professional judgement. Scores are calculated as follows:-

- Limited suitable habitat e.g. industrial landscape or new housing estate with no established planting - 1 point
- Low value suitable habitat e.g. suburban or intensive agricultural landscape - 2 points
- Moderate value suitable habitat e.g. isolated patches of woodland within less intensive agricultural landscape- 3 points
- High value suitable habitat e.g. mixed agricultural landscape with small patches of woodland - 4 points
- Very high value suitable habitat e.g. complex mosaic of woodland pasture and wetland habitats - 5 points

3 Results

3.1 Bats

3.1.1 Activity Survey Results

Bat surveys were carried out on the 5th July, 3rd August and 21st September 2016 under suitable weather conditions.

Dates, weather conditions and sunset times are given in Table 1 in the Appendix.

Results of surveys are shown on Figure 2 in the Appendix. Figure 2 shows the walked transect route, Point Count locations (with activity index levels) and Target Note locations overlaid on top of the Phase 1 Habitat Survey results. Summary data of the Target Note descriptions and Point Count results are given in Tables 2 and 3 in the Appendix.

3.1.2 Results Summary and Evaluation of Habitat Features for Bats

The activity surveys identified the site as supporting relatively low numbers of foraging bats. Bats were generally encountered individually.

Species encountered comprised mainly of common pipistrelle, with occasional soprano pipistrelle.

Other species recorded included four *Myotis* registrations across all three surveys and noctule were recorded overflying the site during the July and September surveys. Sonogram analysis of the *myotis* bats recorded suggests that three of the registrations were likely attributable to Natterer's bat and one was likely attributable to a commuting Daubenton's bat.

Common pipistrelle, soprano pipistrelle, Natterer's bat and Daubenton's bat are considered common in the North Wales area and the UK as a whole.

Noctule bat was recorded overflying the site but were not recorded using the site as a foraging resource.

Overall, the surveys recorded relatively low levels of bat activity with bats principally encountered foraging along treelines associated with the site's boundary features.

The open grassland habitats are considered to be of negligible value with limited bat activity recorded in the areas away from the site boundaries.

The greatest levels of bat activity were generally recorded at the western end of the site. In this area the tree lines are more mature and denser providing a more sheltered environment. Light pollution from Old Mold Road is also less in this area with this location being reasonably dark.

Moderate levels of bat activity was also recorded at the western end of Griffiths Road. Griffiths Road provides a dark corridor of mature trees and has very low levels of traffic use of an evening.

Low levels of bat activity were generally recorded around the centre and eastern end of the site.

Features considered to be of greatest value to bats at the site comprise of Griffiths Lane which offers both foraging and commuting opportunities plus the two opposite treelines located at the western end of the site which offers good quality foraging habitat.

3.1.3 Habitat Evaluation

The overall value of the site has been assessed and scored following the methods described in section 2.2.2.

In summary the site was found to support common species of bats in individual numbers with possible nearby roosts (good roosting opportunities are offered within the housing estate located to the north of the site). The habitats at the site and surrounding the site are considered to be of moderate value for bats.

The assessment scored a total of **11 points** which equates to an assessment of '**local**' value for the site with regards to the CIEEM (2006) evaluation framework.

The assessment results and scores are given in Table 2 below.

Table 2 - Site Results and Evaluation Score

Category	Results	Score
Species rarity?	Common species	2
Numbers of bats?	Individual bats	2
Nearby roosts?	Unknown/moderate	4
Landscape character?	Moderate	3
Total Score		11

4 Summary & Recommendations

4.1 Bats

4.1.1 Results Summary

Bat activity transects have identified four species of bat at the site comprising of four common bat species (common pipistrelle, soprano pipistrelle bat, Natterer's bat and Daubenton's bat). Noctule (a rarer species) has been recorded overflying the site but do not use the site as a foraging resource. Bats have been identified in relatively low numbers.

The site is considered to support bat assemblages that are of 'local' value in terms of their conservation importance.

Features considered to be of greatest value to bats at the site comprise of Griffiths Road which offers both foraging and commuting opportunities plus the two opposite treelines located at the western end of the site which offers good quality foraging habitat.

Low levels of bat activity were generally recorded around the centre and eastern end of the site and within the open grassland areas.

4.2 Recommendations

Recommendations for bats as previously described in the Preliminary Ecological Appraisal still stand.

Recommendations are as follows:

4.2.1 Bats and Lighting

A lighting designer will be appointed during the detailed design stage of the project. The lighting designer should consult the 'Bats and Lighting Research Project' (Stone 2013) which provides recommendations for limiting the negative effects of lighting on bats.

Where possible the use of artificial lighting should be avoided. Street lighting should be limited by restricting lighting to the central spine roads where possible with no new lighting proposed along any proposed side roads within 15m of the northern and western site boundaries. The lighting within the central spine roads and along the side roads should be designed to avoid light trespass into surrounding areas by the fitting of hoods and cowls.

Lighting proposals should aim to retain dark corridors along key bat foraging and commuting routes (in this case, at the western end of the site and along Griffiths Road). The plan should also aim to limit any light trespass from the development into the surrounding landscape.

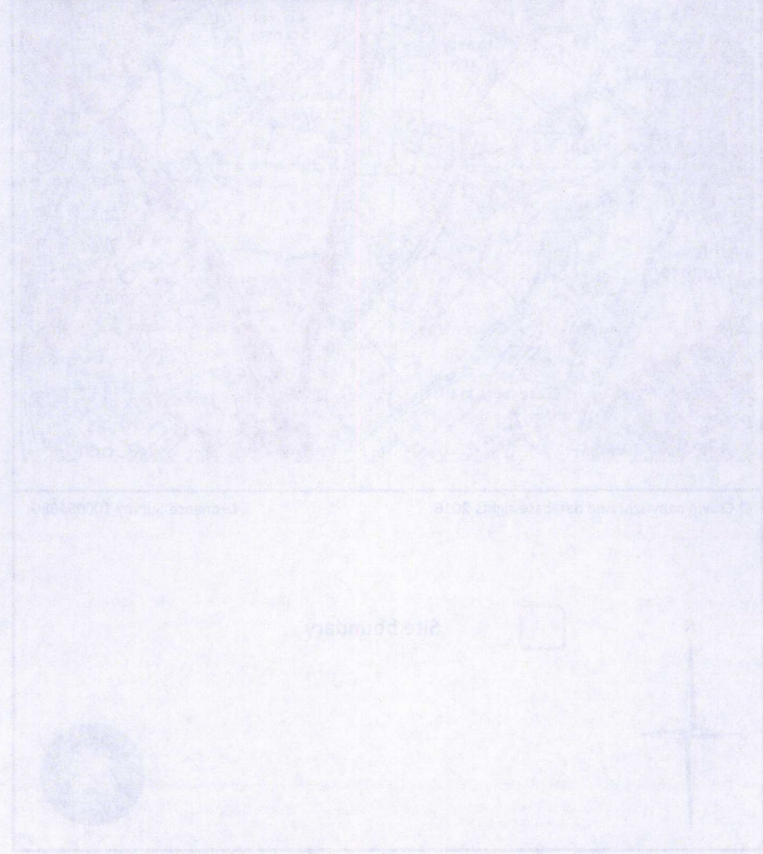


The front and rear gardens of properties located adjacent to site boundaries should be lit with low intensity porch lights as opposed to with security flood lights. The porch lights should be fitted with screens to limit further light spill onto boundary features.

Lighting sources should be 'bat friendly' using LEDs or low wattage lamps.

4.2.2 Bat Boxes Scheme

It is recommended that a bat box scheme is produced for the site. The scheme should include the incorporation of at least 6 bat boxes which should be built into the south facing gable ends of new houses ideally adjoining the northern or western site boundary. Suitable models of bat box include the Habibat 003 or 005 which can be built into the brickwork of the new houses.



5 Appendix

Figure 1- Site Location

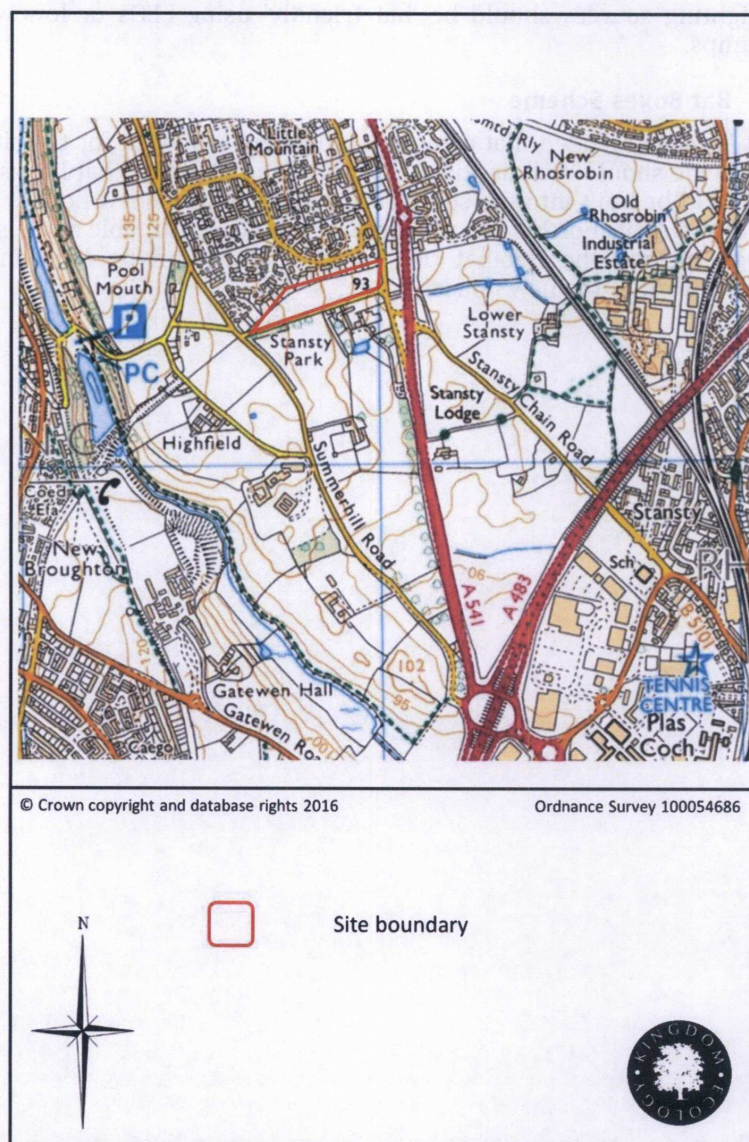
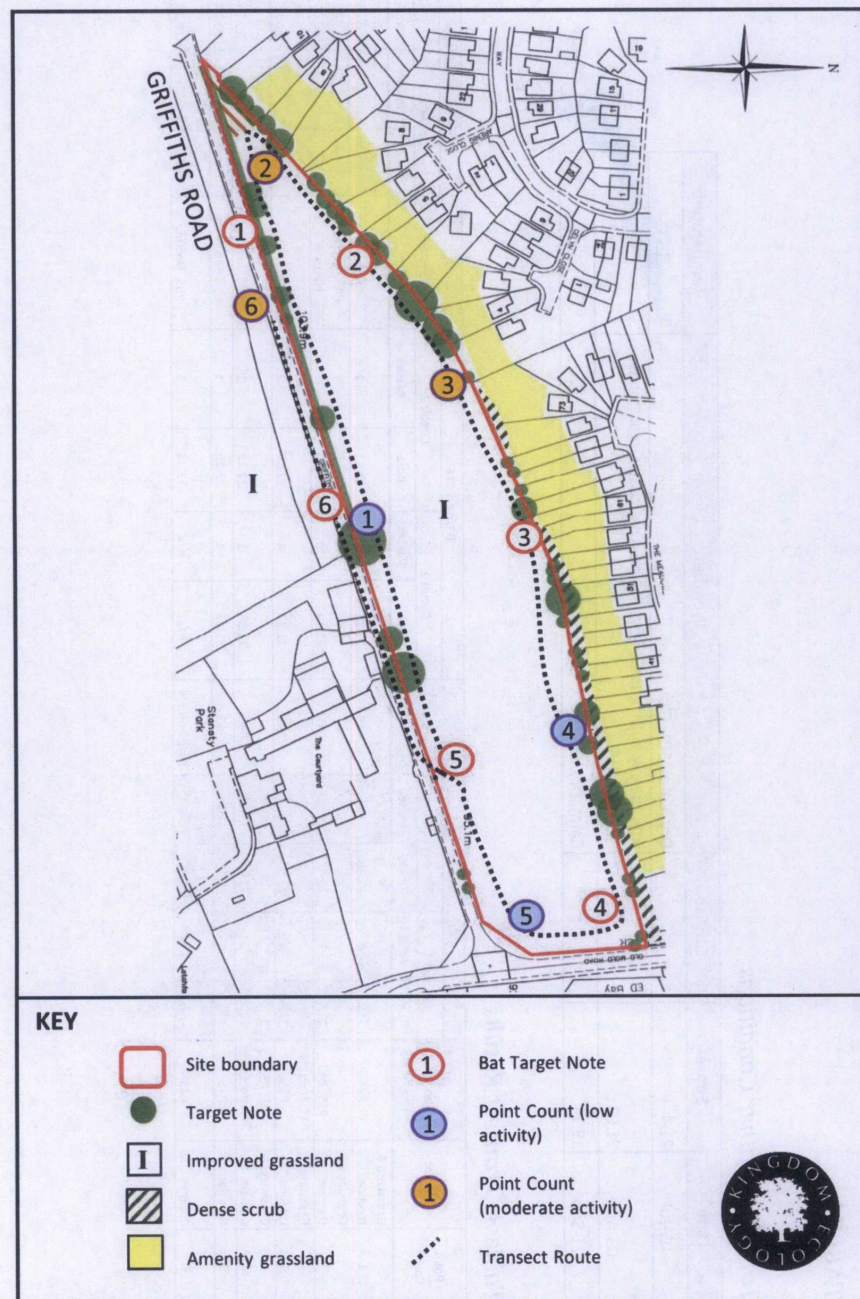


Figure 2- Bat Transect Results Map



TABLES

Table 2- Weather Conditions

Date	Sunset	Sunrise	Weather	Temperature
05-Jul	21.4		Dry, Calm, 50% Cloud	15°C
03-Aug	21.03		Dry, Breezy with gusts of light wind, Overcast, Occasional fine Drizzle	18°C
21-Sep	19.14		Calm, Dry, Overcast	17°C

Table 3- Transect Results

Point Count	Habitat	Species	05/07/2016				Species	03/08/2016				Species	21/09/2016				Average	Activity Index
			Circuit 1		Circuit 2			Circuit 1		Circuit 2			Circuit 1		Circuit 2			
			Time	Passes	Time	Passes		Time	Passes	Time	Passes		Time	Passes	Time	Passes		
1	Grassland & treeline	P45	21.45	0	22.38	1	P45	21.11	0	21.51	2	Noctule	19.17	1	19.55	0	0.67	Low
2	Grassland & treeline	P55, P45	21.57	7	22.48	12	P45	21.19	9	22.00	1	P45, Noctule, Natterer's	19.25	3	20.04	3	5.83	Moderate
3	Grassland & treeline	P45, Noctule, P55	22.08	4	22.55	9	P45	21.27	4	22.07	2	P45, P55	19.32	2	20.11	0	3.50	Moderate
4	Grassland & treeline	P45, P55, Natterer's	22.19	5	23.05	4	P45	21.35	1	22.19	1	P45, Myotis	19.40	2	20.19	0	2.17	Low
5	Grassland	P45	22.28	1	23.15	0	P45	21.43	1	22.26	1	P45	19.48	3	20.28	0	1.00	Low
6	Country lane	P45	n/a	n/a	23.25	6	P45, Daubenton's	n/a	n/a	22.34	5	P55, Noctule	n/a	n/a	20.39	2	4.33	Moderate

Table 4- Target Notes

Date	Target Note Number	Time	Notes
05/07/2016	1	21.55	P55 Commuting along Boozy Lane - Heard not seen
	2	22.05	P45 Foraging next to trees 4 passes, P55 Foraging over scrub
	3	22.15	P45 Foraging along treeline- 7 passes, P55 Foraging along treeline- 2 passes
	4	22.26	P45 Foraging over field, in field corner- 4 passes
	5	22.35	P45 Foraging over field 4 passes
03/08/2016	1	21.58	Natterer's Foraging- 2 passes, P45 Foraging- 1 pass
	6	22.39	2 x P45 Foraging on lane - 3 passes
21/09/2016	3	19.38	P45 Foraging along treeline- 2 passes
	4	19.46	P45- 1 pass
	6	20.37	P45 commuting- 1 pass over road

PHOTOGRAPHS

Photograph 1- Boozey Field viewed from east



Photograph 2- Target Note 2 viewed from east



Photograph 3- Target Note 3 & Griffiths Road viewed from south west corner of site also showing wall around Stansty Park

