Angus Energy Ltd

Bat Survey Report

Lower Stumble Exploration Site, Balcombe

2480670

MAY 2020

RSK biocensus
EXPERTS IN ECOLOGY

RSK GENERAL NOTES

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Title: Lower Stumble Exploration Site, Balcombe Re-submission- Bat Survey Report

Client: Angus Energy Ltd

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This report has been prepared by a professional ecologist and reviewed by an associate director. Both are members of the Chartered Institute of Ecology and Environmental Management (CIEEM). Names have been omitted from this report for confidentiality reasons but can be provided on request.

EXECUTIVE SUMMARY

1. This report provides details of bat surveys carried out in connection with the planned works at the 2Z borehole hydrocarbon exploration site south of the village of Balcombe.
2. The site comprises an area of hard-standing (previously used as a drilling platform) with an associated access road (hereon referred to as the “works footprint”). The works footprint is surrounded by suitable bat roosting and foraging habitat including coniferous plantation woodland, broadleaved woodland and rough grassland.
3. Bat activity and static bat detector surveys were carried out in August 2019 and compared to data collected for the site in 2017 and 2018.
4. At least six species of bat were recorded using the site. The highest levels of bat activity recorded during the transect survey were associated with the woodland edge habitat and the grassland paths bordering and dissecting the wooded areas.
5. Measures have been included to help minimise effects to local bat populations from the proposed development. These include measures to minimise light spill and also recommendations on the timing of the works. Monitoring surveys should also be undertaken to determine if the works are causing an adverse effect on bat populations.

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TABLES

FIGURES

1 INTRODUCTION

1.1 Purpose of report

This report has been prepared on behalf of Angus Energy Weald Basin No.3 Ltd (hereafter 'Angus Energy') for the proposed removal of drilling fluids and Extended Well Test (EWT) on land at Lower Stumble Wood, Hydrocarbon Exploration Site, London Road, Balcombe, Haywards Heath, RH17 6JH (hereafter 'the site').

This report contains details of bat surveys and static bat detector surveys carried out in 2019 for the proposed works at the Balcombe-2Z borehole exploration site (centred at National Grid reference TQ 31007 29251). The 2019 data has been compared with data collected in 2018 and 2017 to determine if there have been any changes to bat species using the site. *Figure 1* shows the site location and boundary.

1.2 Site History

The site has an established planning history, having been first used for exploratory drilling from 1986-1987 with the pad subsequently retained for use by Balcombe Estate (the current landowners) for forestry product storage.

The Balcombe 2Z Hydrocarbon Borehole was established in 2013 for gas and oil exploration, and the site has since been subject to several planning applications.

More recently, Angus Energy submitted an application for planning permission (planning ref. WSCC/071/19) in September 2019 for a two-stage activity, firstly to remove previously used drilling fluids from the wellbore, followed by an EWT to be carried out over a period of three years. This application was subsequently withdrawn.

1.3 Application Details

The proposed work on the Balcombe 2Z Well will take place in four distinct phases, with planning and regulatory approvals at each phase. These are as follows:

- **Phase 1 – Removal of Wellbore Fluids:** phase 1 of the works has been designed to remove wellbore fluids which are currently preventing the natural formation fluids from entering the well. This phase would effectively clean up the well in preparation for undertaking an EWT.
- **Phase 2 – Pad Membrane:** For the site to meet established onshore oil and gas standards, a site-wide impermeable membrane will be installed by a civil engineering contractor.
- **Phase 3 – Extended Well Test:** The objective of the EWT is to enhance subsurface data so Angus Energy can start estimating potential production reserves, assess the commerciality of the well and obtain empirical data e.g. water cut data, flow rates and hydrocarbon composition. The EWT is a continuation of the exploration phase to prove that a hydrocarbon resource exists.

- **Phase 4 – Plug and Site Restoration:** Phase 4 involves removing all of the surface plant and equipment from the site as well as plugging the wellbore to the prevailing HSE standards. Upon completion the site will be restored, with 50% of the pad to become deciduous woodland in accordance with the High Weald AONB Management Plan 2019-2024.

In order to demonstrate exceptional circumstances and ensure that the development does not compromise the landscape qualities of the High Weald AONB, the proposal has been modified to decrease impact to visual amenity, and a habitat restoration plan will be implemented during Phase 4 of the operation. Please refer to the Landscape and Visual Appraisal and associated plans and drawings for further details.

1.4 Ecological context

The site lies to the south of Balcombe; a village in West Sussex. It comprises an area of hard-standing (previously used as a drilling platform) with an associated access road (hereon referred to as the "works footprint"). The area immediately surrounding the works footprint comprises planted broadleaved and coniferous trees, scrub, grassland and hedgerows and was surveyed as part of this assessment. There are patches of ancient woodland (which form part of Lower Stumble Wood and Lower Beanham Wood) to the north and south of the survey area, a railway line to the east, and London Road the B0236 to the west.

Although the works footprint solely comprises hard-standing with some encroaching ruderal vegetation, it is surrounded by habitat which is suitable for a number of protected species including bats, birds and Badgers.

2 METHODS

2.1 Personnel

Bat activity surveys were by led and assisted by RSK consultant ecologists. The lead ecologist is experienced in surveys of this type and has 3 years' experience in ecological consultancy.

2.2 Habitats

Habitats were assessed for their suitability for foraging and commuting bats during a preliminary ecological appraisal undertaken by RSK in August 2019. Areas of particular interest vary between bat species, but generally include sheltered areas and habitats with good numbers of insects such as woodland edges, hedgerows, watercourses and species-rich or rough grassland. Both Noctule bats (*Nyctalus noctula*) (Mackie and Racey, 2017) and Common Pipistrelles *(Pipistrellus pipistrellus*) (Davidson-Watts and Jones, 2006) preferentially select deciduous woodland habitats and edges for foraging.

Habitats of particular interest to foraging and commuting bats that are present on the site are:

- woodland and scrub edges;
- lines of trees; and
- grass footpaths surrounding the site.

2.3 Transect Surveys

Bat surveys followed methodology outlined in published guidelines (Collins, 2016) to identify any areas of high commuting and/or foraging activity and also to confirm the species involved (large roosts can sometimes also be identified from patterns of activity). One dusk activity survey was undertaken in August 2019, to update previous surveys undertaken in 2017 and 2018. One survey undertaken in the summer months when bats are most active was considered adequate to update the information gathered in previous years.

The transect consisted of a two hour-long dusk survey across the site. It included walking sections of a pre-defined transect (continuously recording any signs of bat activity) and stopping for five minutes at pre-determined locations before continuing along the transect route. Monitoring locations were chosen to include areas with high quality habitat where bats were likely to be encountered if present (*Figure 2*).

The transect route was walked in suitable weather (above 10°C with little or no rain and no strong winds) using a Baton XD bat detector. Targeted and continuous recordings of bat calls were made during the survey in time expansion and frequency division formats. Bat passes were marked on a map so that statistics on passes and numbers of bats could later be calculated.

Table 1 details the dates and survey times for the activity survey completed. Weather conditions recorded at the beginning and end of each survey were also recorded. These are provided in *Table 2.*

Table 1: Survey dates and timings for each transect surveys.

Date	Survey Type	Sunset Time	Start Time	End Time
28.08.2019	Dusk	19:55	19:55	22:00

Table 2: Weather conditions recorded at the beginning and end of each transect survey.

Date	Air Temperature (°C)	Cloud Cover (%)	Wind Speed (Beaufort)	Precipitation
28.08.2019	18°C	2	2	Very light rain around 21:15

The transect survey consisted of five walking sections and five-minute monitoring stops. Levels of bat activity were quantified by the number of bat passes recorded during each walking section or monitoring stop. A single pass by a bat was defined by a gap of one second or more between the end of one call and beginning of the next bat call. Species were identified either in the field or through the analysis of recordings using BatExplorer® and Kaleidoscope® software programs.

2.4 Static Surveys

A Wildlife Acoustics Song Meter 2 Bat+ (SM2) detector was installed within the drilling platform to monitor activity in the vicinity of the works footprint (see *Figure 2*). The SM2s provided complementary data collected over a minimum of five consecutive nights in accordance with Collins (2016) guidelines.

The SM2 was deployed in August 2019 for five consecutive nights to augment the data collected. Survey dates were selected when the predicted weather forecast indicated suitable weather conditions for foraging and commuting bats (i.e. air temperature above 10°C, the absence of strong winds and no precipitation). Surveys were designed to provide information on the level of bat activity and composition of bat species using the site, the relative importance of features and locations and how patterns of bat activity may change throughout the year.

The units were set up to continuously record from 30 minutes before sunset until 30 minutes after sunrise. Microphones were mounted on extension cables at least 3 m off the ground. All recordings were stored on memory cards and analysed using the Kaleidoscope Pro® software program. All automated identifications, noise and no ID files from the software were double checked by an experienced ecologist for quality assurance purposes. Echolocation calls were identified down to species or genus level

depending on the type of bat encountered (*i.e.* it is not possible to reliably identify species belonging to the genus *Myotis* and *Plecotus* and *Nyctalus* species) and the quality of the recording.

The level of bat activity was quantified by the number of files (passes) and pulses (individual echolocation pulses within a call) recorded for each recorded species for each night and monitoring period. The Kaleidoscope analysis software produced a single file for each pass made by an echolocating bat. The number of pulses within each file also gives a quantifiable measure for the approximation of the level of foraging and commuting activity.

2.5 Survey constraints

During transect surveys, bats and their direction of flight were easiest to observe during the period just after sunset when light levels were still high. As the light fades, visual observation often becomes less reliable and “heard not seen” records are more frequently made. When this occurred, only the location of the bat pass could be recorded and not the direction of flight.

The SM2 microphone failed after two nights due to heavy rainfall. However, after analysing these recordings and comparing the data gathered during the transect survey and static detector with the data collected in 2018 and 2017, it appears that the data fits previous trend showing limited changes, therefore suitable recommendations can be made in this report.

3 RESULTS

The following sections provide the findings of bat surveys completed in August 2019. The current data is also compared to data collected in the 2018 and 2017 bat activity surveys.

3.1 Transect Surveys

Table 3 shows the total number of bat passes recorded for the transect completed in August 2019. At least three different species of bat were recorded during the surveys in August 2019, these were - *Myotis* species, Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Common Pipistrelle (*Pipistrellus pipistrellus*).

Table 3. Total number of bat passes recorded during the transect survey

Pipistrellus pipistrellus	Pipistrellus pygmaeus	Myotis species	Total
16	5	9	**30**

The highest levels of bat activity were recorded along the woodland boundaries, particularly to the north and north-east of the works footprint where there are rough grassland paths forming linear clearings suitable for bats to forage along.

Both commuting and foraging activity was recorded during the surveys; with Pipistrelle and Myotis bat species being regularly noted flying along the north and north-west of the transect route. This made it clear that these species regularly used these paths bordering the adjacent woodland as both commuting and foraging habitat.

The transect survey results and stops are illustrated in *Figure 3*.

When comparing this data to that collected in 2017 and 2018 it shows that *Myotis* species, Soprano Pipistrelle, Common Pipistrelle and Serotine (*Eptesicus serotinus)* were present on site in 2017 and 2018.

Overall, the results show that, except for one Serotine bat pass recorded in 2017 and three recorded in 2018, there has been no significant change in bat species using the site since 2017.

3.2 Static Surveys

A summary of the results from the survey completed in August 2019 is presented in *Table 4*. Throughout the survey period, a total of six bat species were recorded; Common Pipistrelle, Soprano Pipistrelle, Nathusius Pipistrelle (*Pipistrellus nathusii*), Brown Long-eared Bat (*Plecotus auratus*), Noctule (*Nyctalus noctule*), and *Myotis* species. Common Pipistrelle was the most frequently recored species, closely followed by Soprano Pipistrelle. This was followed by Brown Long-eared Bat, *Myotis* species, Noctule and then Soprano Pipistrelle.

Table 4. Summary of results from the seasonal static surveys

Pipistrellus pipistrellus	Pipistrellus pygmaeus	Pipistrellus nathusii	Plecotus auritus	Myotis species	Nyctalus noctula	Total
28	24	1	10	2	2	**67**

During the 2018 surveys, seven species of bats were recorded over a period of 7 nights. The most frequently recorded species were Common Pipistrelle (113), followed by *Myotis* species (28), Barbastelle (*Barbastella barbastellus*) (22), Leisler's bat (*Nyctalus leisleri*) (19) and Soprano Pipistrelle (16). Small numbers of Nathusius Pipistrelle (3) and Serotine bat (1) passes were also recorded, therefore, a total of 202 bat passes were recorded across the site.

Whereas, the 2017 surveys recorded only four species of bats - , Common Pipistrelle, Soprano Pipistrelle, Noctule and *Myotis* species over seven nights, recording a total of 0 species in May 2017, 76 in June 2017, and only 2 in September 2017.

When comparing the data collected during the transect and static monitoring surveys since 2017, recordings show that the site is commonly used by Common Pipistrelle, Soprano Pipistrelle and *Myotis* species; frequently used by Barbastelle, Leisler's bat and Brown Long-eared Bat; and occasionally used by Nathusius Pipistrelle, Noctule and Serotine bats.

4 EVALUATION AND CONCLUSIONS

4.1 Habitats

Habitats within the immediate surroundings of the works footprint were found to provide suitable foraging and commuting opportunities for bats during the activity and static surveys which recorded at least six bat species using the site during the 2019 survey but eight different species since 2017.

Optimum habitat occurs all around the boundary of the works area and comprises woodland and scrub edge habitat with linear grass clearings (foot paths). The woodland that the works footprint is situated within is connected to further suitable habitat off site with large blocks of woodland to the north and south of the works footprint and to the west on the other side of London Road B0236. In addition, there is good connectivity to the Ardingly reservoir to the east via woodland and hedgerows. The reservoir represents optimal foraging habitat for any *Myotis* species in the area such as Daubenton's Bat (*Myotis daubentonii*).

During the transect surveys, peak bat foraging and commuting activity was recorded in connection with the woodland edges and rough grassland paths that bordered and dissected wooded areas.

4.2 Potential Impacts of Development

4.2.1 Habitat loss

The works footprint is comprised entirely of crushed concrete hard-standing with some minor colonisation by scattered early successional herbaceous plants and therefore the habitat within the works footprint is of very limited value for bat species.

The highest quality habitat (*e.g.* woodland edges and rough grassland paths surrounding the works footprint) will not be physically affected by the planned works. Therefore, it is highly unlikely that the habitat lost will be detrimental to the local bat population, especially given the amount of adjacent higher quality foraging and commuting habitat that will not be affected (*e.g.* woodland edges).

4.2.2 Lighting

All species of bat are nocturnal and artificial lighting of areas in which bats are active is likely to disturb their normal activities. For example, light falling on a roost exit point will at least delay bats from emerging. This shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence could mean that this vital time for feeding is missed. At worst, bats may abandon the roost all together which could have a significant effect on the future success of the colony (Van Langevelde, F et el., 2011). This is likely to be deemed as a breach of the national and European legislation that protects bats and their roosts from disturbance.

In addition to causing disturbance to a roost, artificial lighting can also affect the feeding behaviour of bats and their commuting routes via the attraction of insects to lights with

short wavelengths (UV and blue light), and via the illumination of important foraging and commuting habitats.

Illumination of foraging areas can prevent or reduce foraging activity, causing bats to pass quickly through the lit area or avoid it completely. Lighting can disrupt the composition and abundance of insect prey and can effectively cause a loss of foraging areas for some bat species. This can have negative effects on bat communities by potentially causing competitive exclusion of less tolerant species (*e.g.* Long-eared Bat and *Myotis* species.) as more light tolerant species (*e.g. Pipistrellus sp.)* may out-compete them for insect prey. *Myotis* species were frequently recorded during the bat surveys on this site.

Some bat species actively forage at lights due to the higher numbers of insects (particularly moths) attracted to street lights, in particular low wavelength light (Eisenbeis 2006; van Langevelde *et al.* 2011). Fast flying bat species adapted to forage in open areas (particularly *Eptesicus, Pipistrellus* and *Nyctalus* species) may benefit from the increased foraging opportunities provided at lamps which attract high densities of insects. However, bats foraging at street lights may be subject to increased mortality risk because juveniles may be at higher risk of predation due to their slower and less agile flight (Racey & Swift, 1985). In addition, the insect prey of bats may be attracted away from dark areas, potentially reducing prey availability for species that do not forage in lit areas.

Although total absence of light is best for bats this may not always be possible due to the necessity for 24-hour operations during pumping operations which is likely to last for around 4 weeks. It is not currently known whether the works will be taking place during the active season for bats (generally considered to be between May and October). Therefore, there is potential for disturbance to occur if works are scheduled within that period of time. The well test phase will also involve 24-hour operation which is likely to last for around 12 months, thus furthering the potential that complete absence of light may not always be possible. Mitigation in accordance with condition 10 of planning approval WSCC/040/17/BA to detail a lighting strategy has been suggested in the instance that works are carried out between May and October.

4.3 Mitigation

4.3.1 Timing of works

Works which require night time lighting should be undertaken between November to April where possible. This is outside the active season for bats. However, where this is not possible the following mitigation measures will be put in place and detailed within a lighting plan for the works.

4.3.2 Lighting

The lighting plan (in accordance with condition 10: Site lighting strategy) will seek to keep areas where high bat activity was recorded (*i.e.* surrounding woodland boundaries) as dark as possible.

During the flow testing operations, the site will be operational over 24 hours and may require some minor night time lighting of the working areas; however, minimal human

activity is expected during this time so lighting requirements are likely to be very temporary and brief and impacts upon bats would be negligible. To minimise the potential disturbance to bats during these periods of 24 hour working all operational areas of the drilling platform will be lit with task-based lighting e.g. SMC TL90 lighting towers, which will be inward facing to avoid light spill to areas outside of the works footprint and therefore minimising the potential for negative impacts to bats. Lighting cowls should be utilised to further reduce light spillage to areas outside of the works footprint. This is particularly important for bat species that are less tolerant of artificial light such as *Myotis* species which were frequently encountered during the site surveys so are known to use the habitats surrounding the works footprint.

It is anticipated that during phases 2 and 4 no or very minor night-time lighting will be required in the bat active season as Angus Energy plan to work between the hours of 07:00 and 19:00.

4.3.3 Monitoring Surveys

The site is surrounded by habitat suitable for commuting and foraging bats. There is potential for disturbance to bats if the works are left unmitigated. Therefore, a monitoring strategy will be followed to determine if the development is having adverse impacts on local bat populations, in accordance with condition 17 of planning approval WSCC/040/17/BA. These monitoring surveys will be undertaken in accordance with best practice guidelines, one per season in the bat active months (April to October inclusive). One survey will be undertaken prior to works commencing to provide additional baseline data, the second will commence during works on site and the third on completion of the works. If, through the results of these surveys, it is thought that there is an adverse effect to local bat populations arising as a result of the development, then it will be reported to the relevant site operators and the Minerals Planning Authority. Mitigation works would need to be implemented immediately to reduce these impacts where applicable.

4.3.4 Enclosed Flare

An enclosed flare with a maximum height of 13.8 m will be located on the site as this is an essential part of the testing equipment and is necessary to burn off any associated gas produced during the 12-month flow testing period.

The flare will be situated within the stone drilling platform fenced compound which offers negligible potential for foraging and commuting bats which will likely utilise the habitats surrounding the works footprint. Additionally, this area will also be lit during the testing phase which will further dissuade bats from entering the working footprint. This combination of factors will limit the potential for bats to be disturbed by the light produced by the flare. The potential impact of the flare on bat species in the area is therefore deemed to be negligible.

5 REFERENCES

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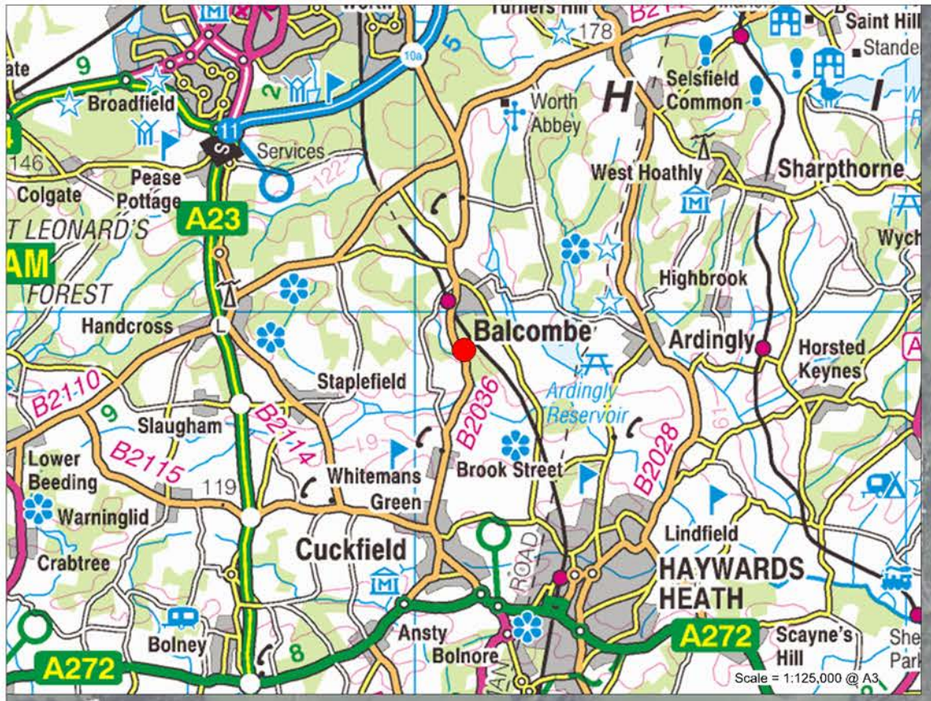
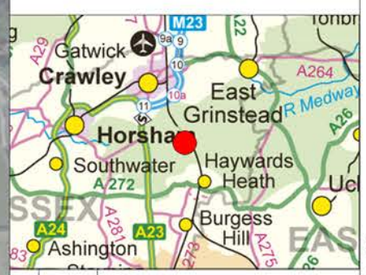
6 FIGURES



Site boundary

Survey Area



Rev	Date	Description
00	11.09.19	858544

Balcombe

Figure 1

Site Location Plan

0 300

Metres

Scale = 1:10,000 @ A3

N W E S

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Site boundary

Survey area

Transect route and stop points

Static bat detector location

Rev	Date	Description
00	11.09.19	858544

Balcombe

Figure 2

Bat Transect Route and SM2 Location

0 30

metres

Scale = 1:1,000 @ A3

N W E S

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Site boundary
Survey area
Transect route and stop points
Common Pipistrelle Bat
Soprano Pipistrelle Bat
Myotis Bat Species

Rev	Date	Description
00	11.09.19	858544

Balcombe

Figure 3

Transect Results
August 2019

0 30
metres
Scale = 1:1,000 @ A3

N
W E
S

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7 APPENDIX 1 – BAT LEGISLATION

All species of British bat are protected by The Wildlife and Countryside Act 1981 (as amended) extended by the Countryside and Rights of Way Act 2000. This legislation makes it an offence to:

- intentionally kill, injure or take a bat;
- possess or control a bat;
- intentionally or recklessly damage, destroy or obstruct access to a bat roost; and
- intentionally or recklessly disturb a bat whilst is occupies a bat roost.
- Bats are also European Protected Species listed on The Conservation (Natural Habitats, & c.) Regulations 1994 (as amended). This legislation makes it an offence to:
- deliberately capture, injure or kill a bat;
- deliberately disturb a bat (in such a way as to be likely to significantly affect: (i) the ability of a significant group of bats to survive, breed or rear/nuture their young; or (ii) the local distribution or abundance of the species concerned);
- damage or destroy a breeding site or resting place of a bat; and
- possess, control, transport, sell, exchange a bat, or offer a bat for sale or exchange.

All bat roosting sites receive legal protection even when bats are not present.

Where it is necessary to carry out an action that could result in an offence under The Conservation (of Habitats and Species Regulations 2017 (as amended) it is possible to apply for a European Protected Species (EPS) licence from Natural England. Licences are only issued where Natural England are satisfied that there is no satisfactory alternative, works are for overriding reasons of public interest and that the favourable conservation status of bat populations will not be detrimentally affected.