BETTS
ECOLOGY and ESTATES

BASELINE ECOLOGICAL SITE AUDIT[1] AND PRELIMINARY BAT ROOST ASSESSMENT

PURLAND CHASE, COUGHTON, ROSS-ON-WYE, HEREFORDSHIRE
for
MR BOB CHANNON

RESULT INDICATOR OF THIS SURVEY

- RED. Do not proceed. Without major modification this project will have significant adverse ecological & biodiversity impacts. It will not be sustainable or compliant with current legislation and approved planning policy. Discussion is required with the Planning Authority.
- AMBER. Caution. The proposals as conceived would have substantial negative impacts and cannot achieve a "No Net Loss to Biodiversity" outcome unless changes are made to avoid, mitigate/restore or, as a last resort, compensate for the ecological impacts. With such changes and subject to pre-application agreement with the Planning Authority, the project is considered likely to be feasible, however.
- **GREEN.** On present information, the proposals are expected to have no or only minor adverse impacts on ecology & biodiversity, and some gains. In terms of ecology, the project can proceed providing all the recommendations are met, (particularly with regard to the protection of the bat roost), enforced and monitored.

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S6432, J000722

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N.B. Information on legally protected, rare or vulnerable species may appear in ecological reports. In such cases it is recommended that appropriate caution be used when circulating copies.

[1] Incorporates "Phase 1" habitat plan, walkover survey for protected and notable species and habitats, and appraisal in context of biodiversity and planning policies.
NB. **THIS REPORT FORMAT IS DESIGNED TO COMPLY WITH STATUTORY AUTHORITY (*e.g.* Natural England) RELEVANT STANDING ADVICE. FURTHER STUDIES MAY BE REQUIRED WHERE THERE IS EVIDENCE OF PROTECTED SPECIES OR IF OTHER NOTABLE ECOLOGICAL FACTORS ARE FOUND.**

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REPORT TITLES — AN EXPLANATORY NOTE.

Baseline ecological audits of a site are exactly that: an examination of a defined area that includes a careful and expert walk-over, often supplemented by local knowledge, landscape & planning data and published ecological records, all of which combine to provide a reliable essential reference for clients. The terminology for such reports varies between practitioners and they may be called "Extended Phase 1 Habitat Surveys", "Preliminary Ecological Appraisals", "Walk-Over Wildlife Surveys", "Ecological Impact Assessments" or several variations on this scheme. We feel that Baseline Ecological Audit is the best descriptor as it indicates that the site in question has been examined and described in a formal and organised manner to provide a general description and identify any matters that may require further specialist examination.

INTRODUCTION

As almost all baseline ecological surveys relate to a planning application, it is useful to consider our work in this context. British Standard 42020: 2013 *Biodiversity. Code of practice for planning and development* is helpful in this respect (www.bsigroup.com) as it makes recommendations in the five typical stages of a planning application:

- Stage 1 (pre-application) – biodiversity in project design, the mitigation hierarchy (avoidance, adequate mitigation, or as last resort compensation), the impacts with constraints and opportunities, proportionality, surveys and reports;
- Stage 2 (validation, registration) – ensuring submitted information is sufficient;
- Stage 3 (decision making) – consultation, further information if needed, resolving issues;
- Stage 4 (determination) – setting deliverable Conditions, obligations if not covered by Conditions, additional consents that may be needed;
- Stage 5 (implementation) – protecting wildlife/biodiversity during construction, long term management and monitoring.

We are often only contacted after a project has been designed, which can be costly and problematic if biodiversity has not been sufficiently considered. We always ask clients to contact us at the very earliest stage of a project, preferably when options for alternative sites are available. This can save significant costs and delays. We can and do assist with all five stages. Although the Baseline Ecological Audit is primarily confined to Stages 1 and 2, we include text suitable for incorporation as Conditions where relevant and we can offer assistance in negotiating, writing and discharging them. When appropriate, as is commonly the case to ensure the overarching aim of No Net Loss but rather Net Gains to Biodiversity, we can take full responsibility for all long term ecological management and monitoring as an exclusive service through our Estates division.

WORK NEEDED FOR COMPLIANCE AS REVEALED BY THE SURVEY

RESULT INDICATOR OF THIS SURVEY

- **GREEN.** On present information, the proposals are expected to have no or only minor adverse impacts on ecology & biodiversity, and some gains. In terms of ecology, the project can proceed providing all the recommendations are met, (particularly with regard to the protection of the bat roost), enforced and monitored.

Please note that, in determining the requirements listed below, Betts adopt an objective and independent view, taking account of current legislation and the official guidance published by, or used by, Local Planning Authorities and the Statutory Agencies whom they consult[2]. The aim is always to inform the project's proponents within a framework of the published policies of international, national and local governments on ecology and biodiversity, as may be relevant to the circumstances of the case, but always proportionately and based in science.

IMPORTANT

In the two Tables below, ecological requirements listed should be contained as formal Conditions within any permission the Planning Authority may be minded to issue. It is essential to include a suitable mechanism for verification, monitoring and enforcement. We will be pleased to assist with suggested wording if needed.

REQUIRED FURTHER WORK (PROTECTED SPECIES & HABITATS)	
Is further work needed to eliminate doubt regarding presence of notable/protected habitats or notable, protected or invasive species, or impacts on ecosystem services?	Yes

Work required if "yes":	Reason
There is the potential to disturb a summer roost (and possibly a maternity roost) of lesser horseshoe bats in the lean-to adjacent to the site if the refurbishment works are not carried out in a careful and sensitive manner (see conclusion). **A Method Statement that protects the roost from disturbance during and after the construction works must be written and approved before any works that may cause disturbance to the roost can begin.**	For reasons of legal, planning and environmental policy compliance and current best practice for European Protected Species.
The existing workshop and stone walls provide many opportunities for nesting birds such as swallows, house	To comply with wild bird legislation and current good

[2] The regulatory context includes the Wildlife & Countryside Act, Berne Convention, Bonn Convention, Countryside & Rights of Way Act, Natural Environment and Rural Communities Act, Convention on Biological Diversity (Rio de Janeiro, Nagoya/Aichi/Paris, *etc.* – UK Post-2010 Biodiversity Framework), British Standards 42020: 2013 and 8583: 2015, Chartered Institute of Ecology & Environmental Management ecological impact assessment guidance, *etc.*

REQUIRED FURTHER WORK (PROTECTED SPECIES & HABITATS)	
martins, house sparrows, starlings and pigeons. The trees and shrubs on site also offer nesting potential. Great care will be required and a thorough pre-works inspection prior to any activity that could disturb nests when active (March through August). If this is unavoidable, pre-clearance inspection by a suitably experienced ornithologist will be required to identify whether any nests are present, and ensure appropriate action is taken.	practice.
To avoid the risk of infringement of regulations, conduct a pre-clearance search of all areas of the site prior to site stripping to move any vulnerable taxa to safety or allow other necessary precautions to be taken prior to the commencement of development activity.	To comply with legislation and current good practice, as well as animal welfare issues and regulations.
If there are any steep-sided excavations created during construction, please ensure they are covered overnight or provided with ramps to prevent any vulnerable animals becoming trapped. Re-fill such excavations as soon as feasible. Also take care to seal/cover over open pipes, tanks, materials/rubble piles, bonfire stacks or other features that may be a danger to wildlife taking shelter/hibernating/etc.	Prevention of cruelty, maintaining best practice.

REQUIRED FURTHER WORK FOR GENERAL REGULATORY & GOOD PRACTICE COMPLIANCE	
Is further work recommended to observe ecological best practice and/or planning policy as recognised by the various statutory authorities at local, regional, national or international levels as may be applicable (click to enter the specific policies' references if required here)?	YES
Work required if "yes":	Reason
Protect the trees to be retained in line with BS 5837, and do not remove ivy, mistletoe, standing dead wood, snags or rot unless there is a clear and material safety risk or presence of a serious pathogen. (Ask for advice on pathogens from a qualified silvicultural ecologist if in doubt.) In line with best practice and compliance with government policy on biodiversity protection and enhancement, generally retain habitats and features of manifest ecological interest and wildlife value (seeking further advice from us if uncertain) within the proposals area. The proposals show the loss of several semi-mature broad-leaved trees and shrubs. The loss of trees should be compensated through additional planting and it is recommended to use native planting (preferably of local origin) in all landscaping. If exotic species are planted, always avoid invasive species and choose those with wildlife value such as for nectar or shelter (a selection of species is available from us).	Tree and biodiversity protection; BS5837: 2012 *Trees in relation to design, demolition and construction.* For reasons of planning and environmental policy compliance and current best practice.

REQUIRED FURTHER WORK FOR GENERAL REGULATORY & GOOD PRACTICE COMPLIANCE	
Create new wildlife habitats (details can be provided) and retain those existing *e.g.* through the use of log piles, "wild" corners, and native planting. Install two bird boxes of mixed designs and two bat boxes and incorporate these into the project's landscape scheme. We can provide specific recommendations for models and siting on request but they must be of good quality and durable. Bat and bird boxes must be inspected annually and replaced when needed (usually after ten years).	
Embody Green Infrastructure protocols in landscaping of the site and ensure ecological linkage is maintained out from and into the site. Make all new boundaries permeable to hedgehogs. To follow government policy, ensure that the "carbon footprint" of all aspects of the project and its future operation is compliant with current best practice. This may include taking appropriate steps to avoid or reduce the use of fossil fuels, employing scientifically sound carbon offset/CO_2 sequestration and instating renewable energy technologies.	For reasons of planning and environmental policy compliance and current best practice.
In compliance with National Planning Policy Framework paragraph 125, avoid unnecessary negative impacts of new lighting at night, *e.g.* on bats, invertebrates, plants, night sky. Minimise the hours when lighting is used, avoid "spillage" by using directional down-lighting, reduce brightness of necessary illumination and keep light from shining on bat roost entries, mammal holes, *etc.*	To comply with NPPF and current good practice.
Formally instruct contractors and site personnel on agreed policies, recommendations and requirements to maintain environmental quality and minimise impacts during construction, generally avoiding unnecessary disturbance and pollution.	For reasons of planning and environmental policy compliance and current best practice.

RESULTS – WHAT WE FOUND

Objectives

- Conduct a baseline "extended" ecological survey and appraisal of the above site and identify notable factors/features with particular reference to bats and great crested newts;
- Prepare a 'Phase 1' Habitat Map with Target Notes to recognised standards;
- Produce a summary of results;
- Provide appropriate recommendations for protected species, biodiversity protection/ enhancement, *etc.*
- Provide specialist advice on the possible presence of protected species in relation to planning requirements in particular bats; and
- Make any appropriate recommendations and point out actions that may be required to ensure compliance with wildlife law and recognised best practice.

Methods and Limitations

The site was surveyed using appropriate methods generally following NCC (1990)[3] for Phase 1 habitat survey, with procedures appropriately selected from Institute of Environmental Assessment (1995)[4] and Jermy *et al.* (1995)[5] for species and any specialist habitat appraisal as required, and/or the current guidance on survey methods and Ecological Impact Assessment from the (Chartered) Institute of Ecology

[3] **Nature Conservancy Council (1990).** *Handbook for Phase 1 habitat survey – a technique for environmental audit.* Nature Conservancy Council, Peterborough, UK.

[4] **Institute of Environmental Assessment (1995).** *Guidelines for Baseline Ecological Assessment.* E & FN Spon, London, UK.

[5] **Jermy, A.C., Long, D., Sands, M.J.S., Stork, N.E.** and **Winser, S.** (Eds) **(1995).** *Biodiversity assessment: a guide to good practice.* Department of the Environment/HMSO, London, UK.

(footnote continued)

and Environmental Management (*e.g.* CIEEM 2013, IEEM 2007 and updates[6]) with further reference to British Standards such as 42020[7] and 8583 as appropriate.

It should be noted that, whilst the investigation of the site was appropriately intensive within the intended framework of the commission, and we feel it is unlikely that significant matters have been overlooked, a single visit will inevitably miss species not apparent on the date of survey by reason of seasonality, mobility, habits or chance. The month of January is outside the optimal survey period for many taxa of nature conservation interest in this part of the United Kingdom, however this is unlikely to have affected the outcome of this report.

It should always be recalled that wildlife surveys of the kind required for planning and development or similar project purposes are seldom granted sufficient time or resources to examine non-vascular plants, invertebrates or fungi in great detail, yet these are the fundamental elements of ecosystems that provide the niches and habitats for larger fauna to exploit. In an ideal world, all surveys would include results of full sampling of vascular and non-vascular plants, micro- and macro-invertebrates and mycological status at individual, population and community levels. As that involves skills, time and expense well beyond what is available, we ask readers of our general survey reports to understand that we do consider the larger species we record in their wider ecosystem context and take into account the impacts of proposals at an ecosystem level when prescribing avoidance, mitigation, enhancement and/or compensation.

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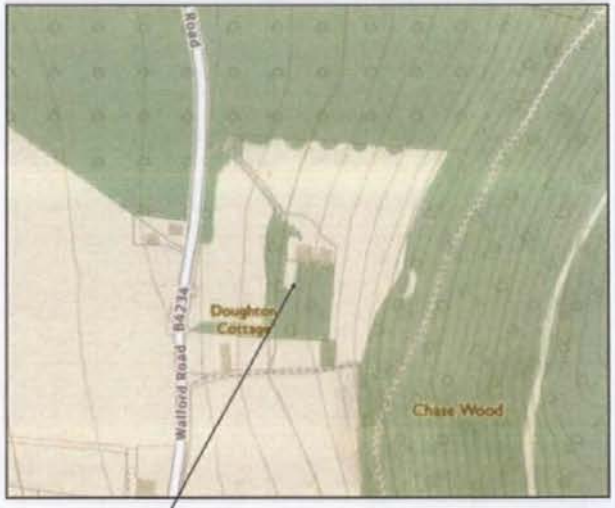
[6] **Chartered Institute of Ecology and Environmental Management (2013).** *Guidelines for Preliminary Ecological Appraisal. CIEEM, Winchester, UK.* **Institute of Ecology and Environmental Management (2007).** *Guidelines for Ecological Impact Assessment in the United Kingdom.* IEEM, Winchester, UK.

[7] **British Standards Institute (2013).** *British Standard 42020: 2013 Biodiversity. Code of practice for planning and development.* British Standards Institute, London, UK.

Figure 1: Site plan

Key:

- Survey boundary
- Dense/continuous scrub A2.1
- Broadleaf tree A3.1
- Coniferous tree A3.2
- Fence J2.4
- Wall J3.5
- Buildings J3.6
- Bare ground J4
- Hard standing J5
- (1) Target notes



Location of site

Client: Mr Bob Channon
Site: Purland Chase, Ross-on-Wye, Herefordshire HR9 5QA
Title: Baseline Ecological Site Audit
Ref: J000722/ S.6432
Date: January 2017

Please note: this plan is intended only to indicate the approximate location of features and should therefore, not be treated as an accurate scale plan.

Results Table

ITEM	OBSERVATIONS
Habitats & Vegetation (*NB.* Please be aware that several designated habitat types and many plants enjoy legal protection in Britain.)	
General description	The site is located within the estate of Purland Chase, which comprises a bungalow, several outbuildings, landscaped gardens, areas of semi-improved grassland and a small woodland. To the east of the site is an area of semi-improved grassland and a small section of woodland managed by the Herefordshire Wildlife Trust. This extends into Chase Wood, a large semi-natural broad-leaved woodland owned and managed by the Forestry Commission. The site comprises a derelict stable boy's cottage (only the foundations of the walls remain), a former stable currently used as a workshop, a modern storage room adjacent to the workshop and a large water tank extending underground. Large garden walls enclose the workshop, a detached garage (not part of the proposals) and a yard area (see Figure 1). The site is accessed from the main driveway. In the north of the site, near the entrance are several trees and shrubs including ash, silver birch, hazel, laurel sp, hawthorn, cherry, horse chestnut, wych elm and a Cypress sp. (Plate 1). The ground flora was sparse at this time of year, although ivy, cleavers and dog rose were observed. To the east of the site and outside the proposed development is an area of dense bramble scrub and a mature horse chestnut tree (Plate 2). Beyond this is an area of grassland and Chase Woods, owned and managed by the Herefordshire Nature Trust and Forestry Commission, respectively. To the south of the site is an area of garden currently used as an allotment and a mature beech (Plate 3). To the west of the site is the detached garage currently used as a workshop and beyond this, the garden wall and the main house. The buildings and structures were surveyed for their potential to support roosting bats, with emphasis on the areas of proposed demolition or refurbishment. These are discussed in the Target Notes and the bat section below.
Target Note (TN) 1 (for location of TNs please see plan below)	The old stables currently used as a workshop with a small office area on the first floor. It is the surveyor's understanding that the roof is to be removed and replaced with a flat roof. The ground floor workshop and the main garden wall (the southern wall of the building) will remain unchanged.
TN 2	The storage building adjacent to the workshop. This will be removed under the current proposals.
TN 3	The lean-to supporting a bat roost. This will not be physically affected by the proposals although is in a derelict state. Please see the bat section below and conclusions for further discussion.
TN 4	The large water tank that extends underground. This will be emptied and demolished under the current proposals.

ITEM	OBSERVATIONS
TN 5	The two mature horse chestnuts, one in the east of the site and the second off-site in an area of bramble scrub. Both trees are infected by bleeding canker (*Pseudomonas syringae pv. aesculi*) and have been recommended for removal (please see the Arboricultural Report, J Ross, 2016) (Plate 4). The trees are discussed further in the bat section below.
Statutory designations (on/near)	A public records search was not commissioned for this project. However, a search on Magic.gov.uk revealed three Special Sites of Scientific Interest (SSSIs) nearby: • Coughton Wood and Marsh SSSI 1.2 km to the south-west is designated for areas of ash and yew woodland, with wet alder carr woodland. • Wilton Bluff SSSI 2km north of the site is a small site containing Brownstone outcrops. • The River Wye SSSI is 2km north-west of the site. The proposed development is sufficiently distant that it will not affect these SSSIs. The site also falls within the Wye Valley Area of Outstanding Natural Beauty (AONB).
Non-statutory designations (on/near)	A search on Magic.gov.uk revealed that one Local Wildlife Site is wholly or partially within 2 km of the site; Purland Chase. This is a large semi-improved grassland on the opposite side of the driveway at the northern site boundary owned and managed by Herefordshire Nature Trust. The grassland includes a section of woodland on the western slopes of Chase Wood, a large area of semi-natural ancient woodland managed by the Forestry Commission. The nearby grasslands and woodland of Purland Chase will not be affected by this development proposal.
Notable hedgerows, woodland or scrub	None observed on site.
Ecologically notable trees (*e.g.* veteran, wildlife significant)[8]	There are several mature and semi-mature trees (horse chestnut, wych elm and ash) on site that will be removed for the development. Care must be taken to avoid other trees to be retained and to protect their roots from damage. Follow the guidance in arboricultural reports and surveys that adhere to *BS 5837 Trees in relation to design, demolition and construction.*
Ponds/water courses	There are two ponds within the grounds of the site. Both are discussed in the great crested newt section, below.
Notable communities	None observed on the site.
Notable vascular plants	None observed on the site.
Notable bryophytes/algae	None observed on the site.

[8] Please note that we do not check TPO status as this is a landscape/amenity planning classification.

ITEM	OBSERVATIONS
Notable lichens	Only common and widespread species observed.
Notable fungi	Common species of bracket fungus visible on the decaying trunks of the horse chestnuts.
Other notable habitats/vegetation	The lean-to adjacent to the wall in the south of the site has been identified as a bat roost. Therefore, the whole site must be regarded as ecologically valuable in an urban context, requiring care and sensitivity in planning.
Features that should be retained	The existing bat roost (TN 3) must be retained and undisturbed during and after the development. As many of the mature broadleaved trees on and adjacent to the site should be retained and protected within the development.
Mammals (*NB*. Several species and their habitats have strict protection in British law.)	
Badger	A thorough search was made of the grounds for evidence of badger, including setts, snuffle holes, latrines, guard hairs, prints and tracks. No evidence was seen on the site itself, [redacted]
Otter	Not present on the site due to lack of suitable aquatic habitat.
Other mustelids	No evidence observed but could possibly occur.

Bats	A thorough internal and external inspection was undertaken of all buildings and trees on site, for any bat field signs or evidence of, or potential for, bat roosting such as faeces, feeding remains, oil staining, scratch marks, access points, loose claddings, cavities and hollows, *etc.* Methods followed those outlined in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines (2016). Please see Fig. 1 for the locations of the buildings described below. **The former stable (TN1)** **External inspection:** the workshop retains the original stone walls although the roof has been replaced with a shallow pitched roof with slate roof tiles and sky lights. There is a small wooden lean-to on the northern aspect with a corrugated metal roof and a further one along the western aspect with a felt lined roof (Plates 5 and 6). The walls and roof appeared to be in good condition. There were no missing or loose roof tiles and the wooden eaves appeared to be tightly fitted with no visible gaps suitable for crevice dwelling bats. The lean-tos are used for storage and were inspected thoroughly. No evidence of roosting bats was observed and the lean-tos are likely to be too flooded with daylight and exposed to inclement weather to be suitable for use by bats. **Internal inspection:** The interior is used as a workshop and for storage with steps leading up to a small area used as an office/storage area. The interior of the roof can be viewed from the storage area (Plate 7). The felt lining is visible and a few tears can be seen exposing the slate tiles above, although no daylight could be seen during the survey. The area was thoroughly inspected for evidence of roosting bats and none was observed. The workshop and office are frequently used and therefore subject to noise from machinery, lighting and other anthropogenic disturbance. **Storage building (TN 2)** **External inspection:** This building was recently built and lies adjacent to the workshop. It is single-storey, of breeze block construction and has a felt lined roof with a very shallow pitch. The wooden soffits are tightly fitted with no suitable gaps for crevice dwelling bats (Plate 8). **Interior inspection:** The ceiling is flat with visible wooden beams and felt underlining. The ceiling, walls and floor were inspected thoroughly for evidence of roosting bats and none was found. The interior is covered with large spiders' cobwebs suggesting that it is unlikely bats are present or have been recently flying in the interior (Plate 9). The workshop and the storage building have negligible potential to support roosting bats and no evidence was observed. No further surveys are recommended on this area of the site. **Lean-to (TN3)** This is a small lean-to against the southern aspect of the garden wall (Plate 10). It is supported by wooden timbers and has a corrugated metal roof and a wooden slat ceiling, upon which the bats appear to be roosting (Plate 11). It has an open doorway and two unglazed

	windows. There are many holes and gaps in the timber frame, although it is heavily overgrown with ivy which is likely to be providing the lean-to with shelter and shading and may be supporting the frame. The structure is in a derelict state and the wood is rotting in places. The interior of the lean-to is surprisingly well protected from the elements by the substantial garden wall and the thick ivy growth covering much of the frame. As it is also south facing it is likely to act as a 'heat sink' during the day, radiating heat back into the roost at night[9], providing an ideal environment as a summer roost for bats. The lean-to is used for storage of gardening equipment and is infrequently used and therefore undisturbed. In the past, the lean-to was used by blacksmiths who would pass horseshoes though a small window into the adjacent stable. This window has a wooden shutter that can also be viewed on the other side of the wall in the workshop and is no longer used. The area was inspected thoroughly for evidence of roosting bats and the surveyor was informed by the land owner that bats have been known to use the area as a roost for some time. Several upturned containers on the workbenches contained large numbers of bat droppings of various ages, indicating that this is a well-established bat roost (Plate 12). Samples of droppings were taken for DNA analysis and confirmed to be that of the lesser horseshoe bat (see Appendix III). It was confirmed to the surveyor that this lean-to will not be affected by the development and the roost will remain in place. Please see the recommendations and conclusions sections for further comments on the roost and the requirements necessary to ensure its protection during and after development. Attached to the eastern side of the lean-to is a glass structure, used in the past to grow fruits (Plate 13). No evidence of bats was observed and it is likely to be too illuminated in the summer to act as a roost. **The water tank (TN4)** The large water tank that extends underground is constructed of stone with bricks over the top (Plate 8). This was inspected for bats several years ago before it was bricked over for safety (pers. comm. with land owner). No evidence of bats using the structure as a roost were observed. **Horse chestnuts (TN5)** The two mature horse chestnuts infected by bleeding canker (*Pseudomonas syringae pv. aesculi*) and recommended for removal (please see the Arboricultural Report, J Ross, 2016). The tree off-site in the east has been recently pollarded (Plate 2). No potential roosting features were visible; a small rot hole on the eastern side of the trunk was inspected with a high-powered torch and binoculars and found to be of insufficient depth for roosting bats. The tree on-site has been recently lopped. Partially detached platey bark was visible at head height; this was inspected with a torch but no evidence of roosting bats was found and is unlikely to provide enough shelter and protection at this low level. Due to the low suitability of potential roosting features for bats in these trees and the other trees scheduled for removal, no further surveys are necessary.

ITEM	OBSERVATIONS
	The large garage to the west of the site (which will not be affected by the development) was also inspected due to its close proximity to the site. It is of brick construction with a corrugated metal roof and large wooden doors. There are no gaps or crevices suitable for roosting bats and no evidence was observed.
Water vole	None observed on the site and unlikely to occur due to absence of suitable water courses nearby.
Common or hazel dormouse	Chase Wood is known to contain a population of hazel dormice; however the proposals will not affect this, and they are unlikely to occur on the site itself due to lack of suitable habitat.
Deer	None observed on the site, but are known to use the areas of nearby woodland (pers. comm. with landowner).
Hedgehog	None observed on the site, but are likely to occur.
Shrews	None observed on the site, but are likely to occur.
Others	Foxes and grey squirrels are likely to use the site as well as brown rats/mice/voles.
Birds (*NB.* With the exception of eleven derogated pest or very common species, the Wildlife and Countryside Act (1981 and amendments) gives protection to all wild birds in Britain from killing, injuring or taking as well as taking, damaging or destroying nests in use or being built, and taking or destroying eggs. Many species are also protected by international statutes to which Britain is a signatory. [10])	
Red list	None observed.
Amber list	None observed.
Active nests	None observed (out of season).
Other	Blackbird, great tit and robin were observed on or adjacent to the site.
Comments on ornithology	The trees both on and adjacent to the site provide an ideal habitat for a variety of birds for nesting and foraging. The workshop and areas of the large stone wall provide suitable areas for nesting birds and this has been considered in the recommendation for a range of nest boxes. Great care will be required and thorough pre-works inspection prior to any activity that could disturb nests when active (March through August).

[9] Schofield, H.W. (2008) The Lesser Horseshoe Bat Conservation Handbook. The Vincent Wildlife Trust, Herefordshire

[10] Please also see www.rspb.org.uk/wildlife/birdguide/status_explained.aspx and www.bto.org/sites/default/files/u38/downloads/home-news/2011-11/SUKB%202011%20final.pdf for red and amber lists *etc.*, and explanations.

ITEM	OBSERVATIONS
Herpetofauna (*NB*. The grass snake, slow-worm, viviparous (common) lizard and adder (viper) are all protected from intentional killing and injury under Schedule 5, Section 9(1), of the Wildlife and Countryside Act as amended/reinforced by the CROW Act 2000. They are also protected under Schedule 5, Section 9(5) which prohibits selling, offering for sale, possessing or transporting for the purpose of sale, or advertising for sale, any live or dead animal, or any part of, or anything derived from the species. Other rarer species and their habitats have stricter protection.)	
Adder	None observed, no suitable habitat on the site.
Grass snake	None observed; no suitable habitat on the site although they may occur in the wider area.
Slow-worm	None observed; no suitable habitat on the site although they may occur in the wider area.
Common lizard	None observed; no suitable habitat on the site although they may occur in the wider area.
Rarer reptiles	Out of area.
Great crested newt	There are two ponds within the landscaped gardens of the estate, both within 50m of the site. Although it is out of season, an estimate of the Habitat Suitability of the ponds for great crested newts (GCNs) was possible based on the evidence available. Please see the Appendix for full results. Pond 1: A small, lined pond on the edge of the lawn approximately 30m to the west of the site (Plate 14). The pond is well maintained and stocked with fish. The Habitat Suitability Index (HSI) confirmed that the pond has a poor suitability to support GCN, although smooth newts are known to be present (pers. comm. with landowner). Pond 2: A small pond approximately 40m south-west of the site (Plate 15). It was shallow on the day of the visit with an abundance of emergent vegetation. The HSI confirmed that this pond also had poor suitability to support GCNs. On the balance of evidence, due to the presence of unsuitable habitat (closely-mown amenity grassland) and barriers to dispersal (large stone wall) of amphibians between the ponds and development site, and the 'poor' results of HSI, further surveys for GCN are not considered necessary.
Natterjack toad	Out of area.
Other amphibia	The ponds are likely to support breeding frogs, toads and smooth newt. Although the site provides ideal refugia for amphibians, the area between the ponds and the site comprises closely mown lawn and the substantial stone garden wall, which are likely to act as a barrier to dispersal of amphibians A precautionary pre-clearance inspection has been recommended to remove any vulnerable taxa to safety.

ITEM	OBSERVATIONS
Fish (*NB.* Various levels of legal protection.)	
Significant fishery	None present on the site as no suitable aquatic habitats are present.
Bullhead	
Shad	
Lampreys	
Salmonids	
Other notable fish	
Macro-invertebrates (*NB.* Several species enjoy legal protection.)	
Notable assemblage (terrestrial)	None observed or likely on the site.
Notable assemblage (aquatic)	None present on the site.
Crayfish	None present on the site as no suitable aquatic habitats are present.
Roman snail	None present on the site (out of area).
Other molluscs	None present on the site (out of area and no suitable water bodies).
Lesser silver water-beetle	None observed on the site – unlikely.
Stag beetle	None observed on the site though some species may occur.
Other notable beetles	None observed on the site.
Butterflies/moths	None observed on the site (out of season).
Bees, wasps, flies, *etc.*	None observed on the site (out of season).
Dragonflies/damselflies	None observed on the site (out of season).
Other notable entomological spp or groups	None observed on the site.

ITEM	OBSERVATIONS
Notable invertebrate habitat	None observed on the site
Invasive Alien Species (IAS) and pathogens (There are an increasing number of these being listed by authorities. More and more are becoming subject to regulatory control within criminal law that carries significant sanctions.)	
IAS (plants) (Wildlife & Countryside Act Article14, Schedule 9.)	None observed on the site.
Weeds Act natives (common ragwort, creeping and spear thistles, curled and broad-leaved docks)	None observed on the site
Other exotic plants that may cause problems.	None observed on the site
Invasive animals (signal crayfish, killer shrimp, oak processionary moth, harlequin ladybird, zebra mussel, grey squirrel, *etc.*)	None observed on the site
Phytophthora ramorum and other serious plant diseases/pathogens (ash dieback, sudden oak death, *etc.*)	The two mature horse chestnuts infected by bleeding canker (*Pseudomonas syringae pv. aesculi*) (see above).
Policy[11]	
Are there any known conflicts with local planning biodiversity policy (if so, please describe)?	Not researched by us.
Are there any known conflicts with national planning biodiversity policy (if so, please describe)?	None known.

[11] It is important that projects incorporate relevant elements of Green Infrastructure Planning (please see www.naturalengland.org.uk/ourwork/planningdevelopment/greeninfrastructure/default.aspx)
"Green Infrastructure (GI) is a strategically planned and delivered network of high quality green spaces and other environmental features. It should be designed and managed as a multifunctional resource capable of delivering a wide range of environmental and quality of life benefits for local communities. Green Infrastructure includes parks, open spaces, playing fields, woodlands, allotments and private gardens."

ITEM	OBSERVATIONS
Are there any known conflicts with international biodiversity policy (if so, please describe)?	None known.

Ecosystem Services

ECOSYSTEM SERVICES	YES/NO	COMMENT/ACTION REQUIRED IF "YES"
Has the survey revealed, in the context of the proposed project, any significant adverse impacts on the following Ecosystem Services?		
Provisioning	No	The trees, building and wall provide a nesting and foraging resource for a variety of bird species therefore nesting boxes have been recommended on the new building.
Regulating	No	None.
Cultural	No	None.
Supporting	No	Retention and creation of biodiversity-enhanced greenspace in good ecological design, including green roofs/walls, will help and should increase important ecosystem services such as pollinator habitat.

Geological Conservation

GEOLOGICAL CONSERVATION (Geodiversity is a material planning consideration)	YES/NO	ACTION REQUIRED IF "YES"
Are there any features of geological importance on the development site?	No	N/A
Are there any features of geological importance adjacent to the development site or that might be affected by the development (during or post construction)?	No	N/A

ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES

- External lighting should be minimised as much as possible and avoided altogether in the south of the site to avoid impacting on nocturnal mammals, especially bats, birds and invertebrates.
- The development footprint should be enhanced by wildlife-friendly gardening, creating wildflower areas and planting native shrubs, trees and hedgerows, green roofs and walls.
- Two bird boxes (of varying design) should be fitted to the new building.
- A bat box should be installed on the southern aspect of the wall and adjacent to the bat roost in the lean-to. This information will be provided in the recommended Method Statement.
- Any new drives/paths should be constructed as permeable surfaces.
- The existing bat roost must be protected in a Method Statement.

Please also see the Tables of Requirements at the beginning of this report.

CONCLUSION

A confirmed lesser horseshoe bat (*Rhinolophus hipposideros*) roost is located in the lean-to adjacent to the wall of the stable, in the south of the site. Herefordshire is near the northern extreme of the distribution for this rare species, which is designated as a priority species with an individual Species Action Plan. All UK bat species are listed on Annex IV of the Habitats and Species Directive, however, lesser horseshoe bats are also listed on Annex II, relating to Special Areas of Conservation. Based on the number of droppings, the roost may serve as a maternity roost. This can be confirmed through further survey work.

The bat roost in the lean-to must remain untouched during the development. However, it is our understanding that the plans include removal and replacement of the workshop roof on the other side of the wall with a flat roof that will act as a patio area/terrace for the new dwelling. The workshop on the ground floor will remain unchanged. There is concern that the construction works (noise, vibrations, dust, *etc.*) could cause some temporary disturbance to the roost if they are not carried out in a sensitive and sympathetic manner. Therefore, a detailed Method Statement, written, approved and implemented before works begin is required to ensure the protection of the roost and foraging areas during and after development works. This method statement will include details of retention of access points to the roost, restricted areas of working and, lighting, and most importantly the timing of the works so that any potential disturbance to bats can be avoided.

Implementation of a Method Statement will negate the need for a development licence from Natural England as no offence will be committed (please see the Appendix for the relevant wildlife legislation).

Based on the aspect of the entrances and exits to the roost (the open doorway and windows), it is likely that the bats are utilising the area of woodland to the south of the site for foraging. The large beech tree to the south-east of the roost and the garden wall along the south-eastern boundary of the garden are a continuous

landscape feature linking the roost to the woodland. Although these are not part of the development, they should be retained.

Also noted during the visit, and which is of concern to the landowner, is the derelict state of the roost. Future pruning of the ivy is not recommended unless approved by a bat ecologist, as it is may compromise the integrity (shelter and thermal properties) of the roost. However, the weight of the ivy, combined with the rotting nature of the wood will, ultimately, cause the structure to collapse. Further advice should be sought to preserve and retain the roost and sources of information will be provided to the landowner.

If, during construction, bats are found to be present in areas of the buildings that will be affected by the development, further surveys will be required to inform the application for a bat mitigation and compensation (development) licence from the statutory body, Natural England.

Subject to the results of the required further work and satisfactory execution of any mitigation, there are no obvious ecological counter indications to the proposed project at this stage if carefully implemented with ecological features being compensated for. Indeed, the recommended ecological protection and enhancements may be expected to deliver planning & biodiversity gains, assuring there is No Net Loss to Biodiversity and no unacceptable adverse impact on Ecosystem Services.

It is essential that the ecological recommendations of this report are securely incorporated as formal Conditions within any planning consent the Local Authority is minded to grant, and that their implementation and ongoing care are verified and monitored.

Notes

Please note that there is complex and strict legislation protecting many species and habitats. For European Protected Species (including bats, great crested newt, dormouse, otter, *etc.*) there is no longer a clear defence against harm being caused as an incidental result of an otherwise lawful operation. Full details are available on the web sites of DEFRA and the various statutory authorities, some of which now have direct powers of enforcement. If you are in any doubt about the status of species or habitats on your site, please be sure to contact us before undertaking any site work. You should also make sure that you are aware of, and have allowed for, all national and local planning policies relating to wildlife and nature conservation before proceeding.

This baseline audit may not be sufficient on its own for planning application purposes where notable habitats/species are present or potentially present, especially European Protected Species (EPS), particularly where necessary further studies have been indicated in the text.

PHOTOGRAPHS

Photographs were taken on 10 January 2017.

Plate 1: The northern site boundary showing the entrance off the main driveway. These mature and semi-mature trees will be retained.

Plate 2: The horse chestnut off-site to the east (Chase Woods can be seen in the background).

Plate 3: The allotment area to the south of the site showing the beech tree (lhs).

Plate 4: One of the horse chestnuts showing the damage caused by bleeding canker.

Plate 5: The workshop on the right-hand side showing the two lean-tos.

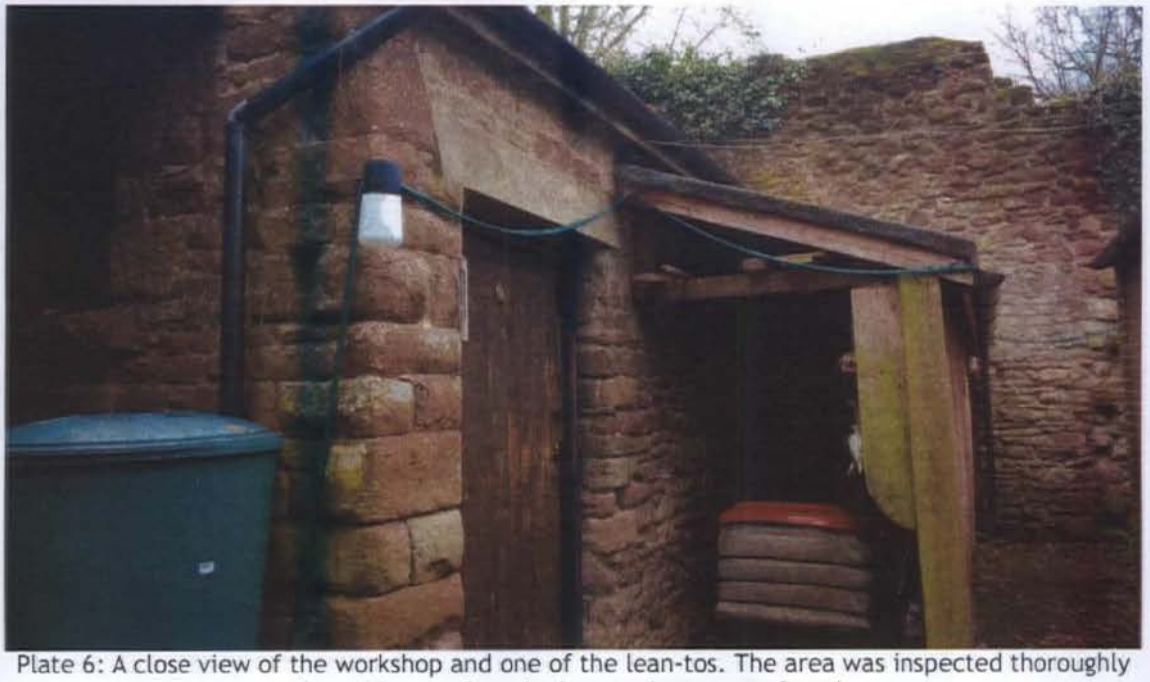


Plate 6: A close view of the workshop and one of the lean-tos. The area was inspected thoroughly for evidence of use by bats and none was found.

Plate 7: The interior of the storage area on the first floor of the workshop; the area is well illuminated by the window on the left. No evidence of bats was observed.

Plate 8: The storage building (breeze block structure) The edge of the workshop can also be seen on the right. The water tank is shown on the right (red arrow) and the mature horse chestnut is clearly visible at the corner of the building.

Plate 9: The interior of the storage building; the cobwebs on the ceiling are clearly shown.

Plate 10: The lean-to against the southern aspect of the garden wall where the bat roost is located. The entrances to the roost are shown (red arrows).

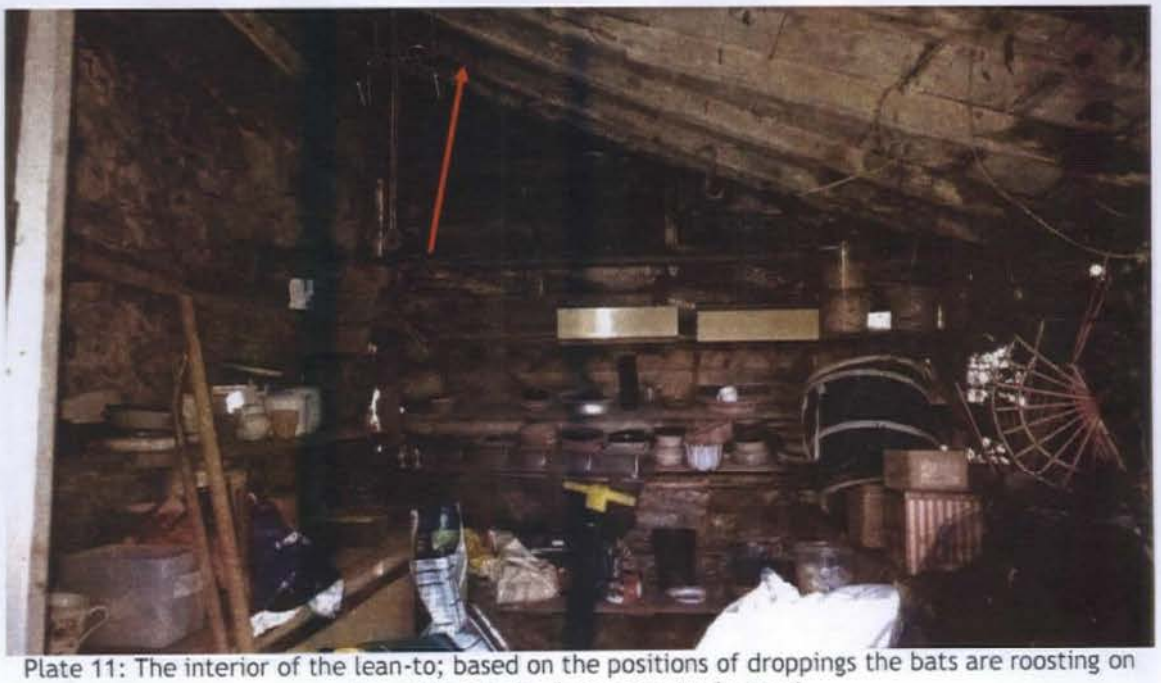


Plate 11: The interior of the lean-to; based on the positions of droppings the bats are roosting on the ceiling in the far corner (red arrow).

Plate 12: One of the containers containing large amounts of bat droppings of varying age.

Plate 13: The glass structure attached to the eastern aspect of the lean-to (located on the left of the photo).

Plate 14: Pond 1, to the west of the site; smooth newts and frogs are known to use this for breeding. It will not be affected by the development.

+++

IMPORTANT

Please be aware that, because the natural environment is dynamic, ecological reports generally have a limited period of currency. Many statutory authorities now regard one year as the maximum time that should elapse before a report will need to be updated: occasionally it may be longer but it may also be less. Where a statutory wildlife licence is to be applied for, a walk-over of the site should be carried out **within three months** of an application being submitted to check that the habitats have not changed significantly since the survey was carried out.

Betts are a scientific practice. Any information relating to legal matters in this report is provided in good faith but does not purport in any way to give any advice on or interpretation of the law whatsoever. Professional legal advice should always be sought. Any designs, specifications, advice, suggestions, or comments written or verbal relating to construction or supervision of building-related work of any kind

are provided for consideration only and under no circumstances are to be interpreted as provision of design, management or supervision *sensu* the Construction (Design and Management) Regulations 2007.

APPENDIX I

Great Crested Newt Habitat Suitability Index

A Habitat Suitability Index (*sensu* Oldham *et al.* 2000) for great crested newts was calculated for the two ponds on the western side of the site as given below. Pond 1 is to the west of the site and Pond 2 is to the south-west.

Habitat Suitability Index

An HSI is a numerical score where values closer to 0 indicate unsuitable habitat and values closer to 1 represent optimal habitats. The HSI for the great crested newt incorporates ten component suitability scores, all of which are factors believed to affect this species.

Categorisation of HSI Scores[12]:

HSI		Pond Suitability
<0.5	=	poor
0.5 - 0.59	=	below average
0.6 - 0.69	=	average
0.7 - 0.79	=	good
>0.8	=	excellent

Table 1: Habitat Suitability Index Scores for the ponds at Purland Chase

HSI Factor	Pond 1	Pond 2
SI 1 - Location	1	1
SI 2 - Pond area	0.05	0.05
SI 3 - Pond drying	1	0.1
SI 4 - Water quality	0.67	0.67
SI 5 - Shade (to 1m from edge)	1	1
SI 6 - Fowl	1	1
SI 7 - Fish	0.01	1
SI 8 - Ponds	0.45	0.45

[12] Taken from: *Habitat Suitability Index – guidance note* – produced by National Amphibian and Reptile Recording Scheme (NARRS).

SI 9 - Terrestrial habitat	0.67	0.67
SI 10 - Macrophytes	0.8	0.8
HSI Score	0.39	0.49
Pond Suitability	**Poor**	**Poor**

NOTE: $HSI = (SI_1 \times SI_2 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/10}$

Therefore, these ponds are classified at the following level of pond suitability for great crested newts: Pond 1 = **Poor** (HSI score = 0.39), and Pond 2 = **Poor** (HSI score 0.49).

APPENDIX II

Bat Signs

Signs of bat activity may include the following:

- Faeces – these typically contain fragments of insect exoskeleton and crumble (unlike those of small rodents, which typically harden with time). Bat droppings will stick to surfaces including walls, windows and window ledges. They may also become caught in cobwebs below a roost site or feeding perch.
- Feeding remains – these include the discarded wings of flying invertebrates, which may accumulate under a well-used feeding perch. Some species, such as the brown long-eared bat, have a well known penchant for moths of the noctuid family. Hence the accumulated wings of these moths assist in suggesting the presence of this bat.
- Oil staining – the fur of bats may leave an oily residue on surfaces close to occupied roost sites and access/egress points.
- Diurnal vocalisations – these are most pronounced at larger roost sites during periods of hot weather.
- Absence of cobwebs – a well used bat roost and its access points are typically clear of cobwebs.
- Scratchings – scratch marks produced by the claws of many bats may be apparent close to the access point for a well-used roost.
- Dead bats.
- Tracks in dust.
- Odour - most bats have a distinctive odour and certain species, such as the noctule and soprano pipistrelle, are noted for their pungent roosts resulting from their urine scent marking activity and oily fur.

Bats and Their Protection

There are eighteen species of bats recorded as resident in the UK. The greater mouse-eared bat (*Myotis myotis*) was regarded as extinct until a hibernating individual was recorded in a Sussex hibernaculum in December 2002 and Alcathoe's bat (*Myotis alcathoe*) was found here in 2010. The pond bat (*Myotis dasycneme*) may currently be in the process of colonising the country, based on an increase in recent sightings. All British bats are insectivorous, feeding on a range of invertebrates from gnats to ground beetles and spiders. Two families of bats occur in the UK, the ***Rhinolophidae*** or "horseshoe bats" and the ***Vespertilionidae*** or "vesper bats". Bats are believed to have declined in range and numbers in the UK, due primarily to loss of roosts and suitable habitats (JNCC, 2004). All British bats use high frequency sound (range 20–130 kHz approx.) as a form of echolocation. This

allows bats to orientate themselves within their environment, detect and catch prey and communicate with other bats.

Bats use a variety of different structures for the purposes of roosting, including mature trees, caves, mines, buildings (both modern and ancient), bridges and tunnels. In addition, many bat species will occupy purpose-built bat-boxes or even boxes designed to house nesting birds (English Nature, 2002). Bats use different types of roost at different times of year. Maternity roosts, where large numbers of female bats congregate to give birth and rear their young, are typically associated with warm, sheltered conditions. Hibernation sites are characterised by stable temperatures and humidity approaching 100%. The use of roosts is rather unpredictable, particularly amongst tree-roosting species, but female bats are typically loyal to maternity roosts.

The Conservation of Habitats and Species Regulations 2010 transpose the stipulations of Council Directive 92/43/EEC ("The Habitats Directive") into UK Law. European Protected Species (EPS), which include bats, are listed in Annex IV of the Habitats Directive, and are thus afforded strict protection. Some bat species are regarded as being of higher conservation concern in a European context, and these are listed under Annex II of the Habitats Directive. These species include the barbastelle and Bechstein's bat, as well as greater and lesser horseshoe bats. The habitats of species listed on Annex II may be candidates for the designation of Special Areas of Conservation (SACs). It should be noted that there is no longer a defence of harmful actions being "the incidental result of an otherwise lawful operation" for EPS and there is "strict liability" in the legal sense. Specifically proscribed by this legislation with significant penalties for offenders are:

- deliberate capture, injury or killing;
- deliberate disturbance likely significantly to affect population survival, breeding, rearing young, local distribution or abundance;
- damage or destruction of a breeding site or resting place;
- possessing, controlling transporting, selling or exchanging, or offering for sale or exchange, any bat or any part of a bat or anything derived from one.

All British bats are also afforded protection under the Wildlife and Countryside Act 1981 (WCA). The WCA has been amended on several occasions, most recently by the Countryside and Rights of Way (CRoW) Act 2000, the Natural Environment and Rural Communities (NERC) Act 2006 and by the Conservation of Habitats and Species Regulations 2010 (above). *Inter alia*, intentional or reckless damage of roosts is specifically proscribed. Owing to the tendency of bats to remain loyal to certain roost sites, sites known to be used by roosting bats are regarded as roosts regardless of whether they contain bats at the time of survey.

With the exception of the more abundant pipistrelle species, all UK bats are also protected under Appendix II of the Berne Convention (Convention on the Conservation of European Wildlife and

European Habitats), which lists strictly protected fauna, and Appendix II of the Bonn Convention on the Conservation of Migratory Species of Wild Animals. Pipistrelles receive a lower level of protection under the Berne Convention than other UK bat species.

Section 74 (2) of the CRoW Act 2000 (now updated by Section 41 of the NERC Act 2006) requires the publication of lists of habitats and species that are of principal importance for the purpose of conserving biological diversity in accordance with the requirements of the United Nations Convention Environmental Programme Convention on Biological Diversity (CBD)1992. The list is regularly updated and many bats appear on it. The NERC Act consolidates the requirements of the CRoW Act in placing duties upon government agencies, including local authorities, to ensure the conservation of Biodiversity.

APPENDIX III

WARWICK
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EcoWarwicker
Ecological Forensics

1 February 2017

Re: Bat Identification Results for Gemma Cone, Betts Ecology

Bat job number 9012, received 13 January 2017
Sample labelled: GC Betts Ecology
PCR amplification successful. DNA sequence:
GTCTGATGTGTAGTGTATGGCTAGAAAGAGGCCTGTAAGGATTTGTATGGCCAGGCA
TACTCCTAGTAGGGATCCAAAGTTTCATCAGGAGGAAATACTTGATGGGGCAGGTAG
ATC

Phylogenetic analysis identification: *Rhinolophus hipposideros*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

The EcoWarwicker Team

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

Professor Robin Allaby

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Gemma Cone – BSc MRes ACIEEM, MRSB, FBNA Ecologist
Gemma's academic and research background is in marine biology but her field skills and experience cover a wide range of terrestrial ecology and protected species work (including reptile, bat, badger, newt, otter and field surveys), as well as laboratory and office duties. Gemma completed the LEMUR traineeship with the Worcestershire Wildlife Consultancy which led to her employment as an assistant ecologist with that Consultancy. She is a botanist and chiropterist and has undertaken contracts for Betts as a field operative before joining the Practice as a member of staff in 2015. In her spare time, Gemma is a volunteer with the Worcestershire Wildlife Trust and the Worcestershire Biological Records Centre, assisting in practical habitat management and updating species records, respectively. She is a member of the Worcestershire Bat Group and holds a bat Class 2 Licence and a Class 1 Licence for great crested newts. She has also undergone training sessions in many areas of general ecology, including grasslands, woodlands and bats.

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