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Bat Survey Report

Site Name

Amberley Museum Bagging Shed

Client

Amberley Museum &
Heritage Centre

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Author

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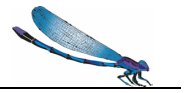
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About the Author

This report has been prepared by Paul Whitby, a Principal Ecologist at The Ecology Co-op, with 17 years experience. He has a Level 2 bat survey license and has prepared numerous European Protected Species licenses for bats. As a Full member of the Chartered Institute for Ecology and Environmental Management (CIEEM) and as a Chartered Ecologist through this body, he is bound by their code of professional conduct.

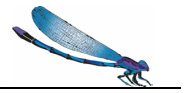
About the Reviewer

This report has been reviewed by Rebecca Carter-Whitehead, a Consultant Ecologist at The Ecology Co-op, with 7 years' experience. She holds hazel dormouse and great crested newt Level 1 survey licenses, and is working as an accredited agent Level 1 bat surveyor.



Report Summary

| | |
|------------------------|---|
| Purpose | The Ecology Co-op was commissioned by the Amberley Museum & Heritage Centre to undertake a Bat Emergence survey at The Bagging Shed at Amberley Museum, further to a proposal to renovate and repair this structure. |
| Context | The site currently comprises of a range of buildings associated with Amberley Museum, though the focus of this assessment is solely upon the bagging shed. A previous survey of the site by Verdant Ecology in identified bat potential associated with crevices where timbers meet within the building, whilst a very small number of scattered bat droppings were identified. Based on the above assessment and in line with Bat Conservation Trust Guidelines, two bat emergence survey visits were carried out between June and July 2023 to determine the presence of roosting bats and evaluate the conservation importance of the site for bats. The purpose of this survey work was to provide advice to inform a planning application for the renovation and restoration of this building. |
| Key findings | No bats were seen to emerge from the building at any time, however activity was captured of pipistrelle bats flying in and out of the bagging shed via an opening on the eastern side. The brevity of this access does not appear to suggest the presence of a night roost, but simply the investigation of the building by bats, or perhaps the exploitation of a foraging resource. |
| Interpretation | These surveys have indicated that roosting bats are likely absent from the building, though bat activity at the site illustrates the need to consider the impact of artificial lights upon bats in the future. |
| Recommendations | No further surveys or detailed mitigation measures are considered necessary for bats in support of these development proposals. Precautionary measures that should be put in place have been set out in section 5.3. |



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1 INTRODUCTION

1.1 Background

The Amberley Museum and Heritage Centre, owners of The Amberley Museum intend to undertake work to restore some of the buildings at the site.

The full address for the site is Amberley Museum, New Barn Road, Amberley, West Sussex, BN18 9LT. The central National Grid Reference for this site is TQ 0278 1194

An initial bat scoping assessment and Preliminary Ecological Appraisal (PEA) for the site was undertaken by Verdant Ecology in September 2022, during which it was concluded that the bagging shed at Amberley museum had a moderate suitability to support roosting bats¹.

In accordance with current best practice guidelines², two emergence surveys were recommended to determine the presence of roosting bats and evaluate the conservation importance of the site for bats.

1.2 Purpose of the Report

In accordance with recommendations, bat emergence surveys were carried out by The Ecology Co-op between June and July 2023 led by Paul Whitby, a full member of the Chartered Institute of Ecology and Environmental Management and licensed bat surveyor (class 2 license).

The purpose of this survey work was to determine presence of roosting bats and where necessary prescribe further surveys where necessary and/or appropriate mitigation advice, further to proposals including the replacement of old weatherboarding, corrugated metal sheet roofing and the dismantling and removal of a shipping container inside the building.

This survey and report was carried out at the request of Katrina Burton.

2 LEGAL PROTECTION

Details of legislation and legal protection afforded to all species of British bats are given in Appendix 1.

The results of this survey will be used to determine the need for an appropriate mitigation strategy to ensure compliance with UK and EU wildlife legislation.

3 METHODOLOGY

Two emergence surveys were undertaken on the 13th June and the 13th July 2023, using the methodology set out in the best practice guidelines prepared by the Bat Conservation Trust.

¹ Verdant Ecology (2022) Preliminary Ecological Appraisal – The Bagging Shed at Amberley Museum.

² Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). Bat Conservation Trust, London.



The surveys focused upon the weather boarding around the building, using two surveyors positioned according to Figures 1 and 2. From these positions, surveyors could see all features potentially suitable for roosting bats that were identified during the initial bat scoping survey, particularly the weatherboarding and potential access points to the building from the open side on the eastern face.

The surveyors recorded any bat activity on or around the potential roosting entry/exit features identified during the scoping survey, using full spectrum handheld bat detectors to identify species through call frequencies. The bat calls were logged and recorded as sonograms for later confirmation of species where necessary.

The following equipment was used to support this survey:

- 3 x Echometer Touch 2 Pro detectors with Apple recording devices.
- 1 x SiOnyx Black night vision camera paired with a surveyor
- 1 x Canon XA 20 Night vision camera
- 1 x infra-red Flood lamp and two Infra red torches with focussed beams.

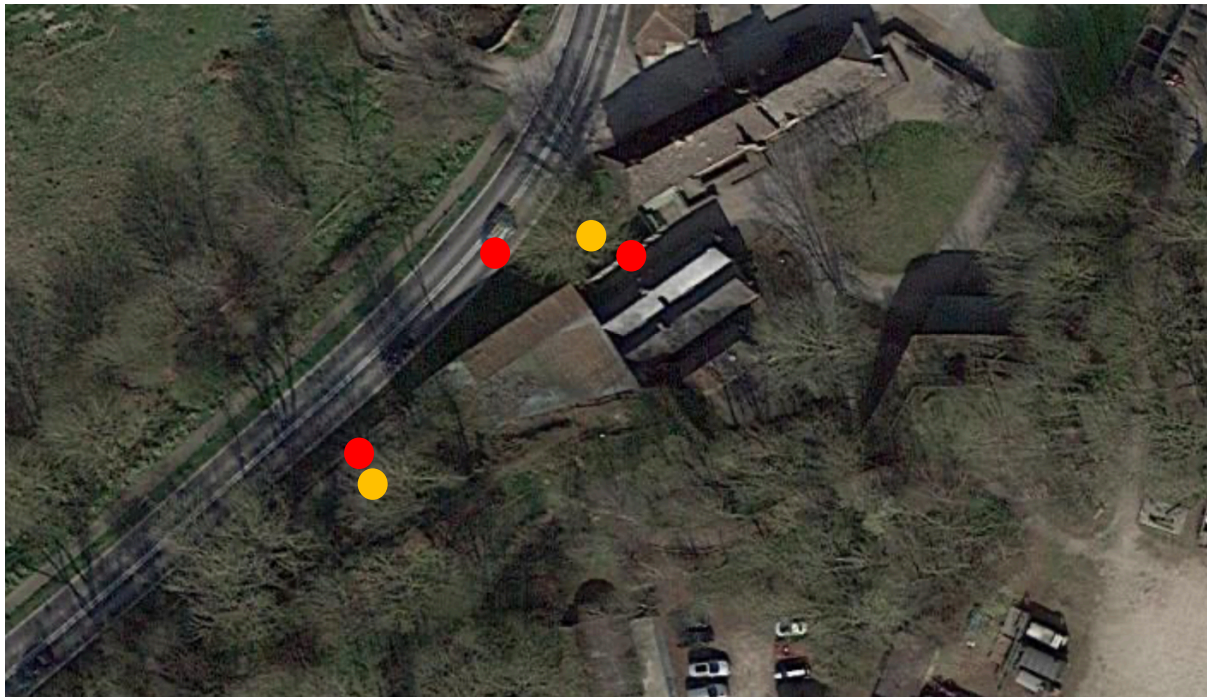


Figure 1. An aerial image of the site, showing the positions of surveyors (red dots) and night-vision cameras (orange dots) on the 13th June. Images produced courtesy of Google maps (map data ©2023 Google).

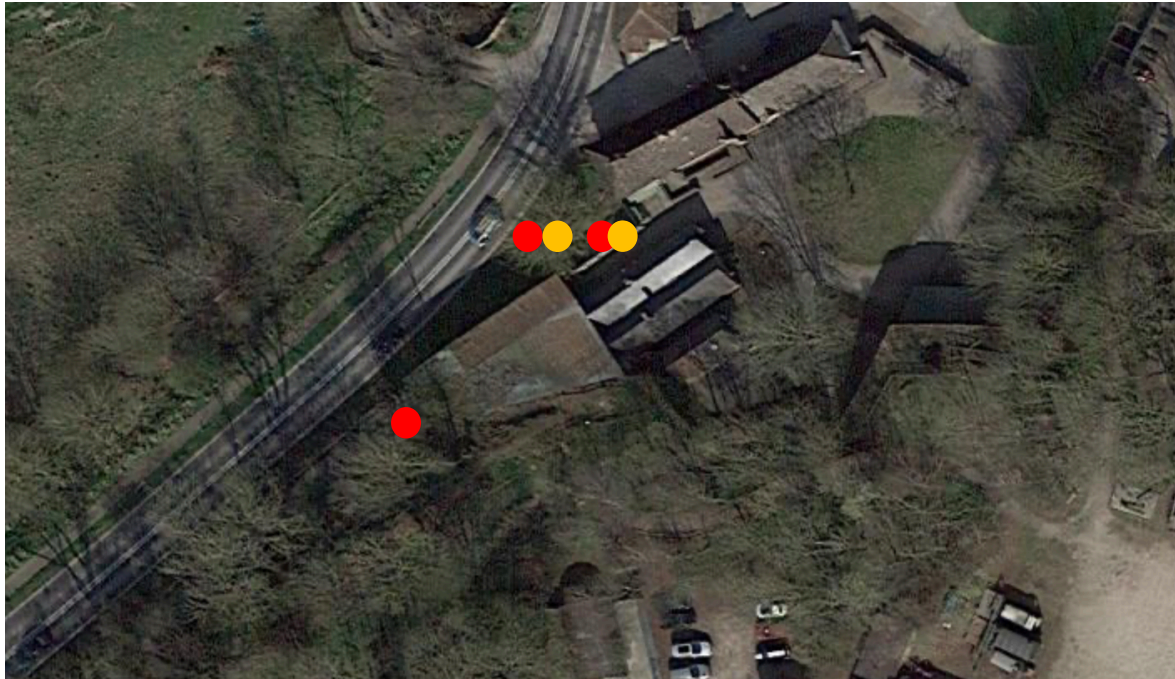


Figure 2. An aerial image of the site, showing the positions of surveyors (red dots) and night-vision cameras (orange dots) during the second survey on the 13th July. Image produced courtesy of Google maps (map data ©2023 Google).

3.1 Limitations to Emergence Surveys

In accordance with best practice guidelines, each survey visit was undertaken during the peak period in bat activity and during good weather conditions. The results presented here are therefore considered to be an accurate representation of the general use of the property by roosting bats.

Nevertheless, bats can use roosting features intermittently throughout the year and may be present in larger or smaller numbers depending on their breeding cycle, weather conditions, and in response to disturbance. These surveys record the emergence of bats at the time of the survey visits and therefore only provide a snapshot of bat roosting activity at the site at that time. Bats may be present at other times and the results should therefore be viewed with caution.

Visibility of the southern face of the building was not possible, though this is not considered an impediment given where the presence of potential suitable roost features where identified.

4 RESULTS

4.1 Bat Emergence Surveys

4.1.1 Survey Conditions

The dates, times, weather conditions, temperatures and personnel for each survey visit are presented in Table 1 below:



Table 1. Details of surveys undertaken, timings weather conditions and personnel.

| Date | Survey start time/end time | Temp. degrees centigrade, weather conditions throughout survey | Surveyors |
|----------------------------|---|---|---|
| 13 th June 2023 | Start time: 20:45 Sunset: 21:16 End time: 22:46 | Max/min temp: 25–19.5°C. 0% cloud cover and light breeze (BF1). | Briony Hill Kate Lewis Aidan Bird |
| 13 th July 2023 | Start time: 19:45 Sunset: 21:12 End time: 21:35 | Max/min temp: 17–15°C. 50% cloud cover and light air (BF1), dry. | Paul Whitby Ben Small Charlotte Hammond |

4.1.2 Bat Emergence Results

The following descriptions summarise bat activity and emergence from the building for each survey visit.

- 13th June 2023

General bat activity was relatively modest. No bat emergences were identified by the surveyors throughout the survey and the night-vision cameras did not identify any emerging bats on review. First activity was by a common pipistrelle *Pipistrellus pipistrellus* bat at 21:43 followed by single passes by noctule *Nyctalus noctule*, brown long-eared *Plecotus auratus* and serotine *Eptesicus serotinus* bats along with a small number of further common pipistrelle bats,

- 13th July 2023

General bat activity was again quite modest, with the majority of recorded passes by common and soprano pipistrelle bats, though passes by a myotis *Myotis sp.* bat and a serotine bat were also recorded. The majority of activity recorded was by common pipistrelle bats, passing along the edge of the woodland situated on the southern side of the bagging shed, with passes over the top of the bagging shed. From around 21:30 some activity included foraging within the courtyard space on the eastern side of the bagging shed and some common pipistrelle bats were observed flying briefly into the open side of the bagging shed and back out.

No bat emergence from the building was identified by the surveyors, or from the night-vision cameras on review. All bat activity by common pipistrelle bats flying into the open side of the building was carefully checked from a camera pointing directly at this face of the building.



Figure 3. Darkest point images taken from the Sony XA 20 (left image) Sionyx Black camera (right image).



5 IMPACT ASSESSMENT AND MITIGATION RECOMMENDATIONS

5.1 Interpretation of Findings

No bats were identified emerging from the bagging shed following the two emergence surveys undertaken. This indicates the likely absence of bat roosts, though it is difficult to exclude the possibility that buildings such as this that offer shelter may not be used infrequently by some species as night-roosts or as feeding perches. As the proposals at the bagging shed will not result in the loss of this sheltered space, the significance of any impacts in the event that such a roost has been missed would be very low. An EPS license is not required for the proposals at the bagging shed to proceed and precautionary mitigation is set out below that will help ensure that the risks to bats are negligible.

5.2 Precautionary Approach

As no bats have been identified emerging from or entering roosts on any of the surveys, it is considered highly unlikely that the features identified in the bat scoping survey are regularly used by roosting bats. However, the highly transitory nature of many bat species means that it is not possible to completely dismiss the possibility that potentially suitable features may be used infrequently. As a precautionary measure, the following mitigation should be put in place:

- in advance of demolition/building works, the feature should be inspected by a qualified ecologist for the presence of bats. In the unlikely event that bats or evidence of bats are found at this stage, the potential for impacts and need for EPS licencing will be reassessed;
- the identified potential roost features shall be subject to hand stripping under the supervision of an ecologist where necessary to facilitate the work.

5.3 Outline Mitigation Measures

The use of artificial lighting inappropriately can result in significant disturbance to bats and activity on the eastern side of the bagging shed, including pipistrelle bats flying into and out of the open side of the bagging shed. If any new lighting is proposed, then the detailed design should include a lighting scheme that minimises these impacts by following the Bat Conservation Trust's guidance on lighting, reproduced in Appendix 2 of this report.

5.4 Conclusions

The proposals for the bagging shed at Amberley museum are highly unlikely to impact roosting bats, based upon the findings of the emergence surveys undertaken by the Ecology Co-op. Appropriate precautionary mitigation has been set out in Section 5.2 that will help further ensure that the risk of these proposals impacting bats will be minimised. The need to minimise artificial lighting at the site has been set out in section 5.3 and should any new lighting be proposed, this must strictly follow the guidance set out in Appendix 2 of this document.

Should you need any further advice on the information provided above, please do not hesitate to contact The Ecology Co-op.



APPENDIX 1 – LEGISLATION AND POLICY

All species of British bat are fully protected under the Wildlife and Countryside Act 1981 as amended through inclusion in Schedule V. All bat species in the UK are also included 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.

Bat species are afforded further protection by the Natural Environment and Rural Communities Act 2006.

Under the above legislation it is an offence to:

- kill, injure or take an individual;
- possess any part of an individual either alive or dead;
- intentionally or recklessly damage, destroy or obstruct access to any place or structure used by these species for shelter, rest, protection or breeding;
- intentionally or recklessly disturb these species whilst using any place of shelter or protection; or
- deliberate disturbance in such a way as to be likely to impair their ability to:
 - survive, to breed or reproduce, or to rear or nurture their young; or
 - in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - to affect significantly the local distribution or abundance of the species to which they belong;
- keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.

It is also an offence to set and use articles capable of catching, injuring or killing bats (for example a trap or poison), or knowingly cause or permit such an action. In the case all species of British bat there is also protection under Schedule 6 of The Wildlife and Countryside Act 1981 (as amended) relating specifically to trapping and direct pursuit of these species.

The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. In England, Natural England is the licensing Authority and, in order to grant a license, ensures that three statutory conditions (sometimes referred to as the ‘three derogation tests’) are met:

- a licence can be granted for the purposes of “preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment” (Regulation 53 (2) (e));
- a licence can only be granted if “there are no satisfactory alternatives” to the proposed action;
- a licence shall not be granted unless the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

A bat roost is defined as “any structure or place, which any wild bat uses for shelter or protection.” Bats tend to re-use the same roosts; therefore, legal opinion is guided by recent case law precedents, that a roost is protected whether or not the bats are present at the time. This can include all summer roosts, used for breeding, resting or sheltering and all winter roosts used for hibernating.



APPENDIX 2 – REDUCING IMPACTS OF ARTIFICIAL LIGHT

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts to other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness.

Guidelines issued by the Bat Conservation Trust³ should be referred to when designing the lighting scheme. Note that lighting designs in very sensitive areas should be created with consultation from an ecologist and using up-to-date bat activity data where possible. The guidance contains techniques that can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting key habitats and features altogether

There is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation; however, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species.

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results:

- dark buffers, illuminance limits and zonation;
- sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill;
- consideration of the design of the light and fittings, whereby the spread of light is minimised ensuring that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Consideration should be given to the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cat eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times;
- screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding;
- glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist and lighting professional determine there is a likely significant effect upon key bat habitat and features;
- creation of alternative valuable bat habitat on site, whereby additional or alternative bat flightpaths, commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost

³ Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



to the development;

- dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers

- *Design and pre-planning phase*; it may be necessary to demonstrate that the proposed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*; as a condition of planning, post-completion lighting surveys by a suitably qualified person should be undertaken and a report produced for the local planning authority to confirm compliance. Any form of non-compliance must be clearly reported, and remedial measures outlined. Ongoing monitoring may be necessary, especially for systems with automated lighting/dimming or physical screening solutions.

Lighting Fixture Specifications

The Bat Conservation Trust recommends the following specifications for lighting on developments to prevent disturbance:

- Lighting spectra: peak wavelength >550nm
- Colour temperature: <2700K (warm)
- Reduction in light intensity
- Minimal UV emitted
- Upward light ratio of 0% and good optical control

Further reading:

Buglife (2011) A review of the impact of artificial light on invertebrates.

Royal Commission on Environmental Pollution (2009) Artificial light in the environment. HMSO, London. Available at: <https://www.gov.uk/government/publications/artificial-light-in-the-environment>

Rich, C., Longcore, T., Eds. (2005) Ecological Consequences of Artificial Night Lighting. Island Press. ISBN 9781559631297.

CPRE (2014) Shedding Light: A survey of local authority approaches to lighting in England. Available at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

Planning Practice Guidance guidance (2014) When is light pollution relevant to planning? Available at: <https://www.gov.uk/guidance/light-pollution>

Institution of Lighting Professionals (2021) Guidance Notes for the Reduction of Obtrusive Light GN01:2011.



Available at: <https://www.theilp.org.uk/resources/free-resources/>

Voigt, C.C., Azam, C., Dekker, J., Ferguson, J., Fritze, M., Gazaryan, S., Hölker, F., Jones, G., Leader, N., Lewanzik, D. and Limpens, H., 2018. *Guidelines for consideration of bats in lighting projects*. Unep/Eurobats.

Available at:

https://cdn.bats.org.uk/uploads/pdf/Resources/EUROBATSGuidelines8_lightpollution.pdf?v=1542109376