



Julian's Park, Buntingford, Herts

Ecology Report

Produced for Mr T Millward

By Applied Ecology Ltd

September 2023

Document information:

Version	Date	Version Details	Prepared by	Checked by	Approved by
1.0	15 September 2023	Final	DP	DP	DP

Prepared for: Mr T Millward
Title: Julian's Park, Buntingford, Herts – Ecology Report
Project number: AEL2174
Document version: 1.0
Document status: Final
Document date: 15 September 2023

APPLIED ECOLOGY LTD

St John's Innovation Centre
Cowley Road
Cambridge
CB4 0WS

Tel: 01223 422 116
Email: info@appliedecology.co.uk

Contents

1	Introduction	1
	Background	1
	Legislation and Planning Policy	1
2	Survey Approach	5
	Pre-existing Biological Data	5
	Habitats and Plants	5
	Fauna	5
3	Results	8
	Pre-existing Biological Data	8
	Faunal species	8
4	Development Implications and Recommendations	20
	Development Implications	20
	Recommendations	20
	Appendix 1	22
	Bat survey set-up	22
	Appendix 2	23
	Bat Survey Findings	23
	Appendix 3	24
	eDNA results	24



This page is intentionally blank.



1 Introduction

Background

- 1.1 In June 2023 Applied Ecology Ltd (AEL) was commissioned by Kay Pilsbury Thomas Architects on behalf of landowner Mr T Millward to complete an ecology assessment to inform and support proposals to restore and refurbish existing buildings within Julian's Park, Rushden, Buntingford, Herts, SG9 0TD ("the Site"). A map showing the location of the Site is provided in **Figure 1.1**.
- 1.2 This report provides details of relevant faunal surveys (great crested newt and roosting bats) completed between 15 June and 24 August 2023 to assess use of the Site by protected species.

Legislation and Planning Policy

Legislation

- 1.3 The Wildlife and Countryside Act 1981 (as amended) provides the main legal framework for nature conservation and species protection in the UK. The Site of Special Scientific Interest (SSSI) is the main statutory nature conservation designation in the UK. Such sites are notable for their plants, or animals, or habitats, their geology or landforms, or a combination of these. Natural England is the key statutory agency in England for advising Government, and for acting as the Government's agent in the delivery of statutory nature conservation designations.
- 1.4 Designation of a SSSI is a legal process, by which sites are notified under the Wildlife and Countryside Act 1981. The 1981 Act makes provision for the protection of sites from the effects of changes in land management, and owners and occupiers receive formal notification specifying why the land is of special scientific interest, and listing any operations likely to damage the special interest.
- 1.5 The Countryside and Rights of Way Act 2000, and The Natural Environment and Rural Communities (NERC) Act 2006, provide supplementary protected species legislation. Specific protection for badgers *Meles meles* is provided by the Protection of Badgers Act 1992.

Habitats and Species of Principal Importance in England

- 1.6 The Natural Environment and Rural Communities (NERC) Act came into force on 1 October 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with Natural England, as required by the Act.
- 1.7 The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.



Habitats of Principal Importance

- 1.8 Fifty-six habitats of principal importance are included on the S41 list. These are all the habitats in England that were identified as requiring action in the UK Biodiversity Action Plan (UK BAP) and continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework. They include terrestrial habitats such as upland hay meadows to lowland mixed deciduous woodland, and freshwater and marine habitats such as ponds and sub-tidal sands and gravels.

Species of Principal Importance

- 1.9 There are 943 species of principal importance included on the S41 list. These are the species found in England which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. In addition, the hen harrier *Circus cyaneus* has also been included on the list because without continued conservation action it is unlikely that the hen harrier population will increase from its current very low levels in England.
- 1.10 In accordance with Section 41(4) the Secretary of State will, in consultation with Natural England, keep this list under review and will publish a revised list if necessary.

National Planning Policy Framework

- 1.11 The National Planning Policy Framework (NPPF) was published in March 2012 (and replaced previous planning policy guidance (PPS 9) on biodiversity. The NPPF was updated in July 2018, February 2019, and in July 2021, and states the following in relation to biodiversity and planning:
- 1.12 *“When determining planning applications, local planning authorities should apply the following principles:*
- *if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
 - *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*
 - *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.*
- 1.13 *The following should be given the same protection as habitats sites:*



- *potential Special Protection Areas and possible Special Areas of Conservation;*
- *listed or proposed Ramsar sites; and*
- *sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.*

1.14 The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other projects) unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site."



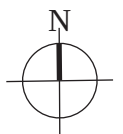
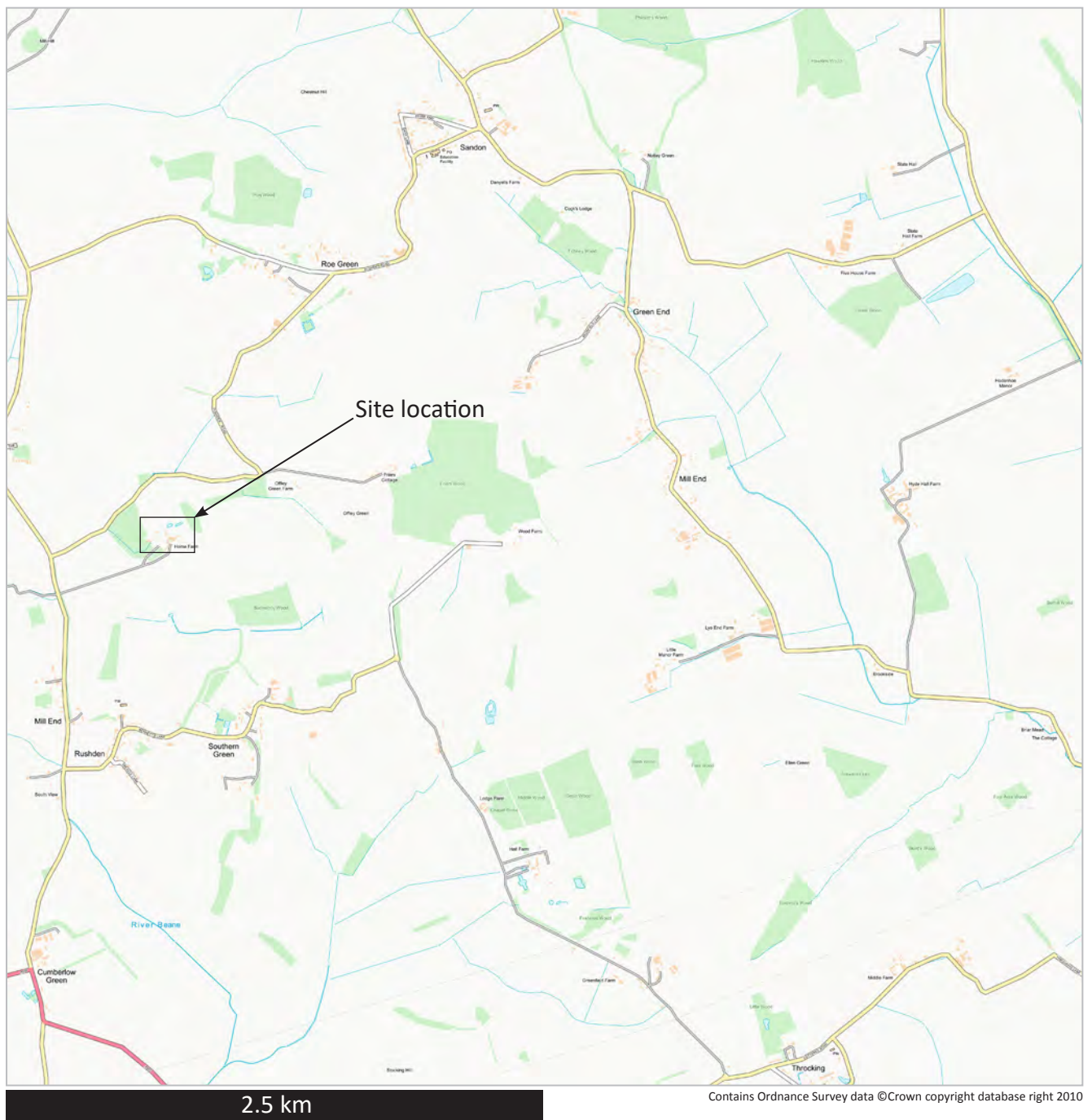


Figure 1.1
Site location



2 Survey Approach

Pre-existing Biological Data

- 2.1 A review of the government's MAGIC¹ online mapping tool was also completed to ascertain information on statutory wildlife sites, ancient woodland and granted European Protected Species (EPS) mitigation licences close to the Site.
- 2.2 The Herts Environmental Records Centre was commissioned by AEL to complete a biological records search for the site and a surrounding 1 km search area.

Habitats and Plants

- 2.3 The development proposals will not result in the loss or damage of any semi-natural habitats of biodiversity importance as they are focused on existing buildings and surrounding areas of sealed surface hard standing and garden habitats – amenity lawn and introduced (garden) shrub beds.
- 2.4 There are no trees or habitats of biodiversity importance located close to the proposed building refurbishment and demolition proposals, and no further survey or assessment of the habitats within the Site beyond assessing their potential to support protected wildlife has been completed.

Fauna

- 2.5 A general walkover ecology survey of the Site was completed on 15 June 2023 by Duncan Painter (DP) MCCIEM² in dry and bright weather conditions to search for evidence of protected species or species of nature conservation interest within or close to the Site. This was not a detailed survey for such species, but included noting the presence of habitats suitable to support specific protected species, and where seen, any evidence of presence such as droppings, mammal tracks and footprints, shelters (or nests/roosts), hair caught on fence-wire, foraging signs, and so on.
- 2.6 Information on the buildings within the Site that are to be subject to redevelopment or removal were provided by the project architects and has been used to focus survey efforts.

Bats

Preliminary bat roost assessment

- 2.7 A preliminary bat roost assessment (PBRA) of on-Site buildings was completed on 15 June 2023 by DP (an experienced and licenced bat worker).

¹ <http://www.magic.defra.gov.uk/MagicMap.aspx> accessed 07/12/2022.

² Holds three separate licences pertaining to bat survey: WML-CL18; WML-CL21; and WML-CL32 and has been a registered bat roost volunteer visitor for Natural England (WML-CL15). Holds class licences in relation to badger (WML-CL35) and great crested newt (WML-CL09 & WML-CL33), hazel dormouse (WML-CL10A), and native crayfish (WML-CL11).



- 2.8 The inspection of the building and trees to assess their roosting use/suitability for bats can be conducted at any time of year, according to the best practice survey guidance (Collins, 2016³). However, finding evidence of bats (e.g., their droppings) on external surfaces that are unprotected from rainfall may be restricted if undertaken outside the main bat active season (May to September) and/or after periods of wet weather. Bat droppings inside buildings may also quickly disintegrate in damp conditions.
- 2.9 The on-Site buildings were surveyed externally and internally using binoculars and torches, as necessary, to search for evidence of bats. Evidence of bats that was searched for included live and dead bats (e.g., roosting in external building cracks and crevices), bat droppings stuck to walls and other exposed surfaces and staining (caused by bat fur oils and/or urine spots).
- 2.10 The buildings that were surveyed are depicted on **Figure 2.1**.
- 2.11 The suitability of the buildings and trees for roosting bats was classified according to the categories and descriptions defined by Collins (2016) for roosting habitats, as summarised in **Table 2.1**.

Table 2.1: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the present of habitat features within the landscape, to be applied using professional judgement (after Collins, 2016).

Suitability	Description of roosting habitat
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A tree of sufficient size and age to contain Potential Roost Features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Bat Roost Emergence Survey

- 2.12 In accordance with Collins 2016, bat roost emergence surveys of buildings identified by the PBRA with bat roost suitability was completed by a team of between two and five bat surveyors led by DP on 20 & 25 July and 23 & 24 August 2023. Buildings with no (negligible) bat roost suitability, or buildings with no immediate work refurbishment proposals were not subject to follow-up bat activity survey.
- 2.13 The surveys were planned and set-up by DP using the following survey equipment:
- Hand-held Pettersson D230 electronic bat detectors with ear-phones set in frequency division mode (between 2 and 5 detectors);
 - Time synchronised tripod mounted Anabat Express electronic bat detectors (between 10 and 16 detectors); and
 - Tripod mounted FLIR thermal video camera (between 4 and 6 cameras).

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



- 2.14 The survey set-up for each is as shown in **Appendix 1**, and was completed in accordance with the previously cited best practice survey guidance.
- 2.15 The tripod-mounted Anabat Express electronic bat detectors were set-up around / within the buildings being surveyed to record bat calls from the start to the end of each survey. All bat calls recorded by the detectors were analysed on a PC using Analook software and were identified to the highest practical taxonomic level in accordance with Russ 2012⁴.
- 2.16 The manned thermal cameras were set to record radiometric video data at 30 frames per second, and were used by the surveyors to provide a live view of the building throughout the survey via a laptop computer screen. Camera field of views and bat detection distances are provided in **Appendix 1** for each survey. The cameras were set up to record from 15 minutes before sunset to the end for the survey at 90 minutes after sunset. Video footage was checked the following day by DP against bat sightings and bat call recordings using FLIR Tools+ software. The cameras allowed accurate bat roost locations to be identified as 100% visual acuity was possible throughout each survey.
- 2.17 The unmanned thermal cameras were set-up to film MPEG video from 30 minutes before sunset and were checked for bat emergences the following day by DP.

Survey limitations

- 2.18 The bat roost emergence surveys were all completed during the main 2023 bat activity period at a time when bats were active and weather conditions were suitable for bats to be active throughout each survey⁵. The surveys were, therefore, not subject to any obvious limitations.

Great crested newt

- 2.19 In advance of the survey the 1:25,000 scale Ordnance Survey map was checked and online aerial photos inspected to identify any ponds within 250 m of the Site that could potentially support breeding populations of the legally protected amphibian great crested newt *Triturus cristatus* (GCN).
- 2.20 Two ponds shown to occur within 250 m of the site, they are both within the Site and were subject to a visual inspection on 15 June 2023. One of the ponds was dry and the other appeared to hold permanent standing water.
- 2.21 On 30 June 2023 the pond that held permanent standing water within the Site was subject to an eDNA survey using an ADAS eDNA test kit by DP to establish the presence or absence of GCN from the pond.

⁴ Russ, J (2012) *British Bat Calls – A Guide to Species Identification*. Pelagic Publishing

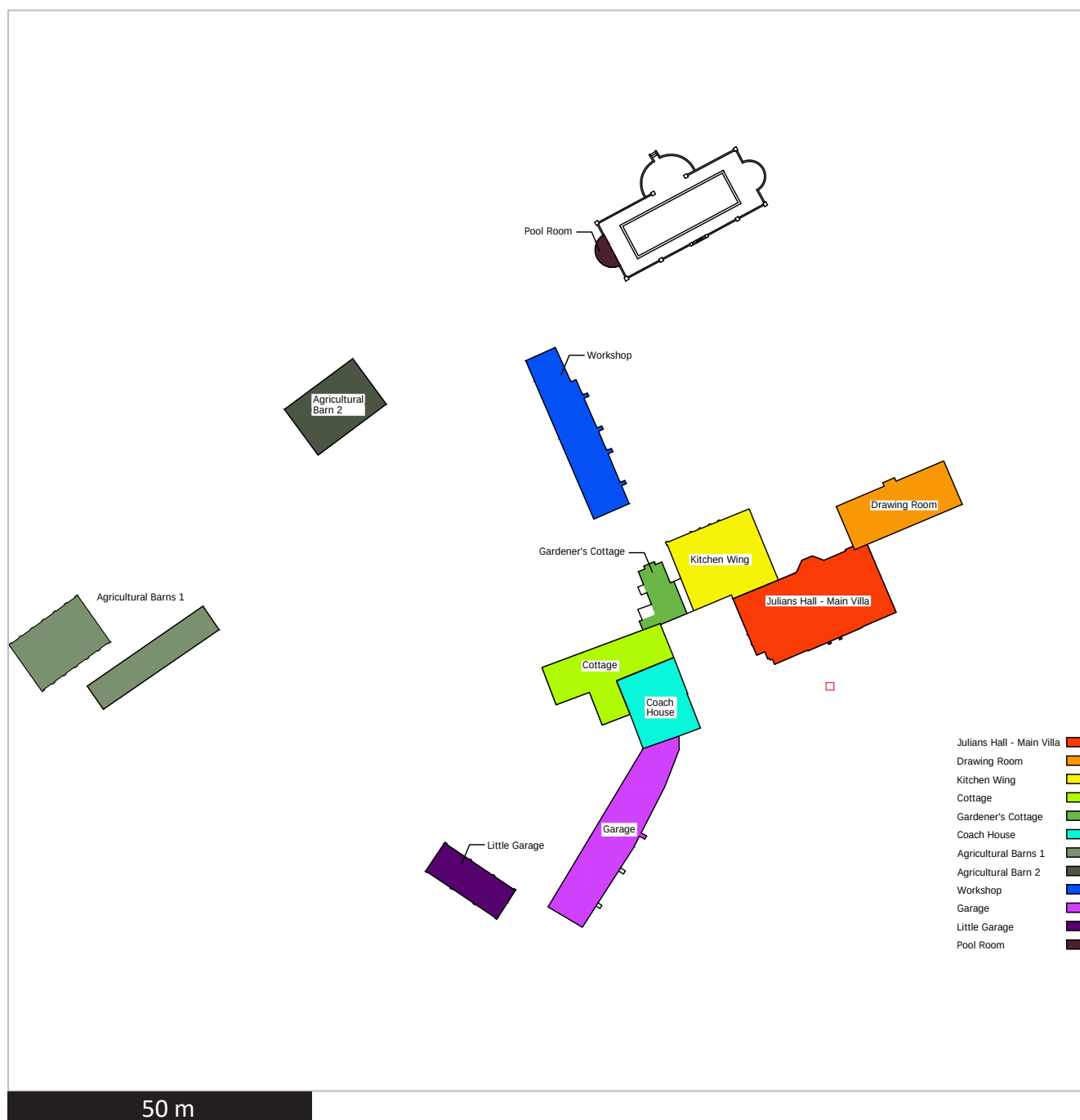
⁵ 20 July 2023: average air temperature 16.5°C (start) 16.3°C (end), still, no rain, 100% cloud cover (start).

25 July 2023: average air temperature 16.5°C (start) 15.8°C (end), light air, no rain, 75% cloud cover (start).

23 August 2023: average air temperature 21.3°C (start) 19.8°C (end), still/light air, no rain, 10% cloud cover (start).

24 August 2023: average air temperature 20.3°C (start) 18.8°C (end), light breeze, no rain, 100% cloud cover (start).





Julian's Park, Buntingford
Figure 2.1: Buildings

3 Results

Pre-existing Biological Data

Protected sites

- 3.1 The site is not covered by any statutory wildlife site designation, and the nearest statutorily designated wildlife site is called **Blagrove Common Site of Special Scientific Interest (SSSI)** which is located 1.9 km to the north-east of the Site. Blagrove Common SSSI is a 5.04 ha area of unimproved marshy grassland that supports several orchid species. Julian's Park is located within an outer Natural England (NE) development impact risk zone around Blagrove Common SSSI, but only large scale development that could result in changes in air quality are considered to constitute a potential threat to the SSSI, and the proposals to refurbish the buildings at Julian's Park would not be considered a risk to the SSSI.

- 3.2 **Herts Environmental Records Centre data – to be completed**

Faunal species

Bats

- 3.3 The buildings within Julian's Park are located within a landscape that is of high value to bats close open water and blocks of broadleaved woodland that are connected by mature tree lines, semi-improved pasture grassland and hedges.

Preliminary Bat Roost Assessment

- 3.4 The buildings that were subject to PBRA are named on **Figure 2.1** and are discussed in turn below.

Agricultural Barns 1

- 3.5 Buildings with no bat roost features or evidence of bats.
- 3.6 Buildings of **negligible bat roost suitability** that could be removed/renovated without restriction in relation to bats.





Agricultural Barn 2

- 3.7 Building with no bat roost features or evidence of bats.
- 3.8 Building of **negligible bat roost suitability** that could be removed/renovated without restriction in relation to bats.



Pool Room

- 3.9 Brick built semi-circular structure with flat roof and gaps between timber soffits and walls with one pipistrelle bat dropping stuck to brick work below soffit gap.
- 3.10 A building of **moderate bat roost suitability** requiring two separate bat activity surveys to assess bat roosting use.





Workshop

- 3.11 Building with no obvious bat roost features or evidence of bats
- 3.12 Building of **negligible bat roost suitability** that could be removed/renovated without restriction in relation to bats.



Gardener's Cottage

- 3.13 Building surveyed externally (internal access not possible). Brick building with two parallel pitched slate and clay tile covered pitched gable ended roofs. No evidence of bats on external surfaces but some mortar gaps in brickwork, lead flashing gaps, gaps between timber work in external walls and adjoining brickwork, and gaps under clay tiles.
- 3.14 Given the complete absence of external bat evidence the building was assessed as possessing **low bat roost suitability** requiring a single bat activity surveys to assess bat roosting use.

*Kitchen Wing*

- 3.15 Brick built clay tiled double hipped pitched roof. With a small number of butterfly and moth bat feeding remains in internal derelict rooms on north side of building. No evidence of bats on external surfaces. Gaps under lifted clay roof tiles.
- 3.16 A building of **low bat roost suitability** requiring a single bat activity surveys to assess bat roosting use.





Drawing Room

- 3.17 Stone building with half-pitched flat roof with pitches covered in clay tiles. No evidence of bats on or inside building. Roof pitches covered in clay tiles with few gaps and crevices between tiles and flashings.
- 3.18 Building of **low bat roost suitability** that would need to be subject to a single bat activity survey in the event that work to the roof is planned. It is understood that no work is proposed in the immediate future to the Drawing Room roof, and follow-up bat activity survey of this building has not been completed as part of the current survey.





Julian's Hall – Main Villa

- 3.19 A large stone building with bell tower, and a half-pitched flat roof with clay tile faces. Hipped clay tiled roof extension on west side of the building
- 3.20 Gaps below clay tiles, gaps below flashings, gaps in stonework next to some window frames.
- 3.21 No large internal roof spaces.
- 3.22 No evidence of bats on the exterior of the building.
- 3.23 A building of **low bat roost suitability** requiring a single bat activity surveys to assess bat roosting use.





Julian's Hall – Cellar

- 3.24 Extensive cellar below the Main Villa with confirmed day roost of two Daubenton's bats *Myotis daubentonii* (one dead Daubenton's bat also present on the wall next to the two live bats). A few bat droppings on the floor of the cellar, but no evidence to suggest the presence of a large or important roost. Bat access in and out of the cellar appeared to be via a horizontal gap over the external cellar access door leading to steps up to ground garden level on north side of the building.
- 3.25 A confirmed bat roost of **moderate bat roost suitability**.
- 3.26 The cellar is also likely to be used by hibernating bats in the winter.
- 3.27 No works proposed to the cellar and therefore no follow-up bat activity survey work completed as part of this assessment.





Cottage

- 3.28 A brick built building with a half-hipped clay tiled roof with single storey flat roofed brick extensions. No internal survey access possible during survey.
- 3.29 Mortar gaps in external brickwork, gaps under clay roof tiles.
- 3.30 No evidence of bats on external surfaces.
- 3.31 A building of **low bat roost suitability** requiring a single bat activity surveys to assess bat roosting use.





Coach House

- 3.32 Brick built hipped clay tiled roof with dormers.
- 3.33 Gaps under clay roof tiles, mortar gaps in brickwork, holes in brickwork.
- 3.34 No evidence of bats present on external surfaces.
- 3.35 A building of **low bat roost suitability** requiring a single bat activity surveys to assess bat roosting use.



Garage

- 3.36 Brick built garage with timber roof trusses and a shallow pitched roof with west pitch covered in cement sheets, and east face covered by clay tiles. Northern end of the building attached to the east side of coach house with a walk through section.
- 3.37 Doors and window openings along west side open. West side of the garage completely obscured by shrubs and other vegetation.
- 3.38 One nesting barn swallow on roof trusses.
- 3.39 Scattered mixed age and size bat droppings on floor of garage below ridge – circa 50 in total indicating presence of bat roost inside roof structure, and probable bat foraging inside the garage.



- 3.40 A building of **moderate bat roost suitability** requiring two separate bat activity surveys to assess bat roosting use.



Little Garage

- 3.41 A brick built pitched roof garage with unlined cement sheet roof covering.
- 3.42 No evidence of bats present internally or externally, and no obvious potential bat roost features.
- 3.43 A building of **negligible bat roost suitability** that could be removed or renovated without restriction in relation to bats.





Bat Roost Emergence Survey

- 3.44 A summary of the bat roost emergence findings are provided in **Table 3.1** below with visual depictions of roost exit locations in **Appendix 2**.
- 3.45 The bat activity surveys have confirmed the presence of a maternity roost of common pipistrelle bats in the roof of the Gardener's Cottage with a maximum count of 44 bats emerging from gaps between timber and brickwork on the west facing gable end on 20 July. The roost appeared to disperse towards the end of July with only 13 common pipistrelle bats emerging from the same location on 25 July, followed by a single common pipistrelle emergence on 23 August.
- 3.46 Three day roosting common pipistrelle bats emerged from below clay tiles on the west facing hipped roof side extension on of the Main Villa on 20 July, with bat numbers in the same roost site increasing to 11 common pipistrelle bats on 23 August. During the same survey on 23 August, 9 common pipistrelles emerged from a roof tile lift and brick holes and mortar gaps on the west side of the Coach House. It is possible that the Gardener's Cottage maternity roost switched roost sites after the initial survey on the 20 July with the Main Villa hipped roof side extension and Coach House providing a transitory roost function for bats from the Gardener's Cottage roost.
- 3.47 Small day roosts of common pipistrelle bats were also recorded in the Pool Room building soffit (maximum 3 bats) and the garage (1 bat from the ridge).
- 3.48 Day roosting brown long-eared bats were recorded in small numbers (between 1 and 3 bats) in the roof of the Kitchen Wing, Garage roof timbers, and external wall of the Cottage.
- 3.49 Finally, a single natterer's bat was confirmed day roosting behind a roof timber in the roof of the Garage. The natterer's bat roosting in the garage was recorded on two separate occasions and flew out of the open doorway on the northside of the building immediately after emerging from a roof timber gap. The brown long-eared bats roosting in the garage spent considerable time foraging, resting and preening on internal roof timbers in the garage before leaving the building, and moved between the walkthrough garage section at the northern end of the building via a gable apex gap at the top of the garage doors at the north end of the building.



Table 3.1: Summary of bat emergences over four surveys in July and August 2023

Building	Bat emergences by survey date (see Appendix 2 for roost exit locations)			
	20 July	25 July	23 August	24 August
Pool Room	Not surveyed	3 common pipistrelle bats	No bats emerged	Not surveyed
Gardeners' Cottage	44 common pipistrelle bats	13 common pipistrelle bats	1 common pipistrelle bat	Not surveyed
Kitchen Wing	3 brown long-eared bats	No bats emerged	Not surveyed	No bats emerged
Main Villa	3 common pipistrelle bats	Not surveyed	11 common pipistrelle bats	9 common pipistrelle bats
Cottage	1 brown long-eared bat	Not surveyed	No bats emerged	Not surveyed
Coach House	1 common pipistrelle	Not surveyed	9 common pipistrelle bats	Not surveyed
Garage	Not surveyed	3 brown long-eared bats & 1 natterers bat	3 brown long-eared bats; 1 natterers & 1 common pipistrelle	1 brown long-eared bat

Birds

- 3.50 The shrubs within the Site are likely to be used by small numbers of individual garden birds for nesting purposes but the Site is unlikely to support a breeding bird assemblage of ornithological importance.
- 3.51 A pair of barn swallow were nesting in the garage over the course of the bat activity surveys.
- 3.52 No evidence of barn or little owl nesting or roosting was recorded in any of the outbuildings. However, tawny owl was heard regularly during the bat surveys and appears likely to be nesting in nearby woodland.

Great crested newt

- 3.53 The ADAS eDNA water sample taken from the pond returned a negative result for the presence of great crested newt eDNA confirming GCN absence from the waterbody – see **Appendix 3** for results sheet.
- 3.54 Given the negative eDNA result the Site can be considered not to support GCN.

Badger

- 3.55 No evidence of badger was present within the Site.



4 Development Implications and Recommendations

Development Implications

- 4.1 Refurbishment and redevelopment of buildings within the Site could result in adverse impacts on roosting bats, and work to any building with confirmed bat roost presence would need to be planned and implemented to minimise harm to bats, and to ensure that any potential damage, disturbance, blocking or removal of bat roosts is completed lawfully i.e. under the auspices of a Natural England bat mitigation licence.
- 4.2 Any construction related work that has a direct impact on any of the seven buildings with confirmed bat roost presence (see Table 3.1) would need to be carefully planned and where work is considered likely to harm bats, completed under the auspices of a bat mitigation licence with appropriate bat mitigation and compensation provided.

Recommendations

Bats

- 4.3 Construction work that could directly or indirectly disturb / damage the Gardener's Cottage maternity roost should be completed outside of the maternity period of May-September, and would need to be designed and planned to retain the roost in the same location, and for the use of a traditional 1F felt with respect to re-roofing.
- 4.4 Works to re-roof other buildings with confirmed bat roost presence should be completed using a traditional 1F felt and not a breathable membrane, with allowances made for the use of bat access slates/tiles to maintain bat roost access in similar locations.
- 4.5 Bat roosts in brickwork on the Coach House and Gardener's Cottage could also be adversely impacted by repointing / brick replacement, and provision of integrated brick faced bat boxes in locations where bats are roosting will need to be considered as part of the overall bat mitigation strategy.
- 4.6 Works to the garage building will also need to consider bats – retaining roosts in situ if possible.
- 4.7 Future, currently unplanned work to building areas not considered fully by the bat activity surveys – namely the Cellar of the Main Villa and the Drawing Room roof will also need to be informed by follow-up bat survey.

Mitigation

Bats

- 4.8 A bat roost mitigation and compensation strategy should be developed based on redevelopment proposals for Julian's Park that can be used to inform a bat licence application. The strategy should clearly identify all potential adverse impacts of the proposals on bats (roost loss, disturbance, and timing issues), and set out a strategy for



timing work as necessary to avoid impacts on the maternity roost, and bat mitigation and roost compensation (be it retaining roosts where possible or new roost provision). Consideration could also be given to converting the internal roof area one of the pitched roofed agricultural building (agricultural barn 2 for example) into a bat loft as a biodiversity enhancement measure.

Nesting birds

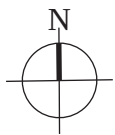
- 4.9 Building demolition and habitat removal should take place outside of the bird nesting period in the months of September to February or following confirmation that cover habitats are free of nesting birds and their dependent young at other times.
- 4.10 Consideration should be given for the provision of alternative swallow nesting areas inside outbuildings the event that the garage is to be made inaccessible to swallows in the long-term.



Appendix 1

Bat survey set-up





20 m

Key



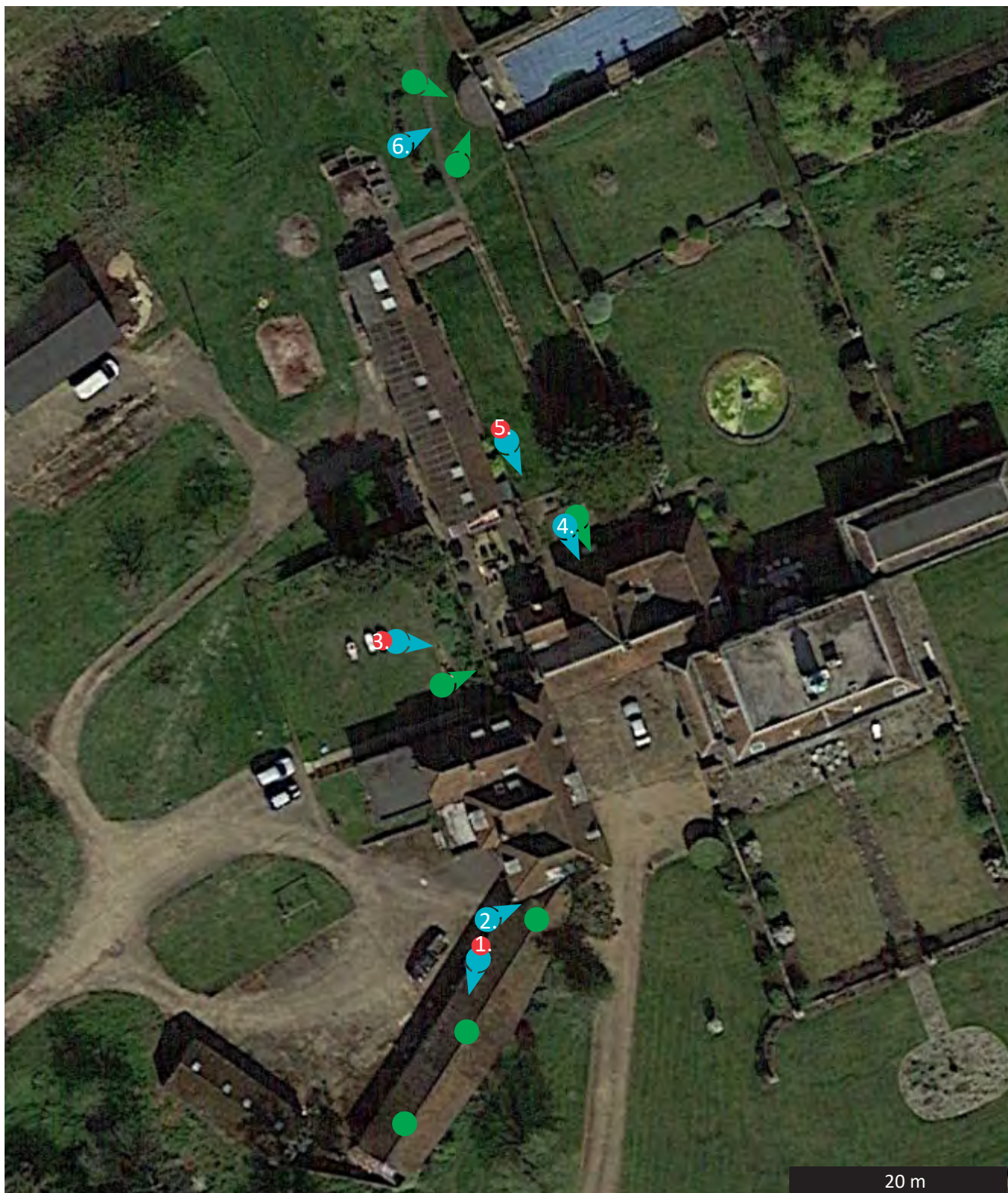
Tripod mounted time synchronised Anabat Express electronic bat detector - arrow shows direction of microphone



Bat surveyor equipped with hand-held Petterson D230 electronic bat detector with ear phones



Tripod mounted FLIR thermal camera - camera fields of view and bat in flight detection distances reported separately



Key



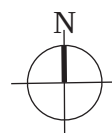
Tripod mounted time synchronised Anabat Express electronic bat detector - arrow shows direction of microphone - microphone vertical towards ridge when no arrow shown



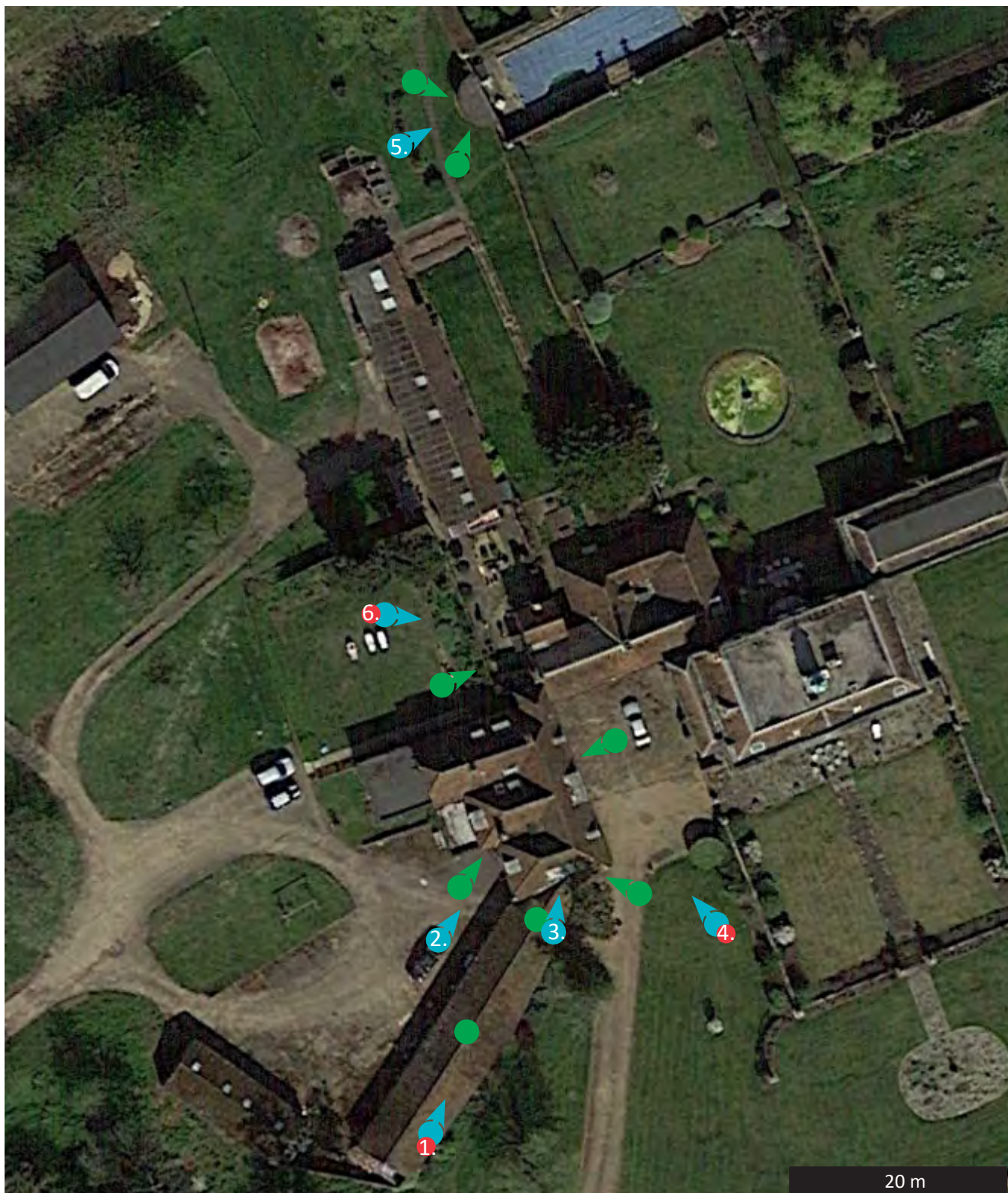
Bat surveyor equipped with hand-held Pettersson D230 electronic bat detector with ear phones



Tripod mounted FLIR thermal camera - camera fields of view and bat in flight detection distances: reported separately



Bat roost emergence survey set up 25 July 2023



Key



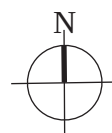
Tripod mounted time synchronised Anabat Express electronic bat detector - arrow shows direction of microphone - microphone vertical towards ridge when no arrow shown



Bat surveyor equipped with hand-held Pettersson D230 electronic bat detector with ear phones



Tripod mounted FLIR thermal camera - camera fields of view and bat in flight detection distances: reported separately



Bat roost emergence survey set up 24 August 2023



Key



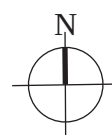
Tripod mounted time synchronised Anabat Express electronic bat detector - arrow shows direction of microphone - microphone vertical towards ridge when no arrow shown



Bat surveyor equipped with hand-held Pettersson D230 electronic bat detector with ear phones



Tripod mounted FLIR thermal camera - camera fields of view and bat in flight detection distances: reported separately



Bat roost emergence survey set up 24 August 2023



FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 38 m from furthest point of building



FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 43 m from furthest point of building



FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 30 m from furthest point of building



FLIR T860 (640 x 480 pixel resolution) with 42 degree lens = bat in flight detection distance of 66 m.
Camera located 25 m from furthest point of building

Julian's Park, Buntingford

FLIR T860 field of view 4

20 July 2023

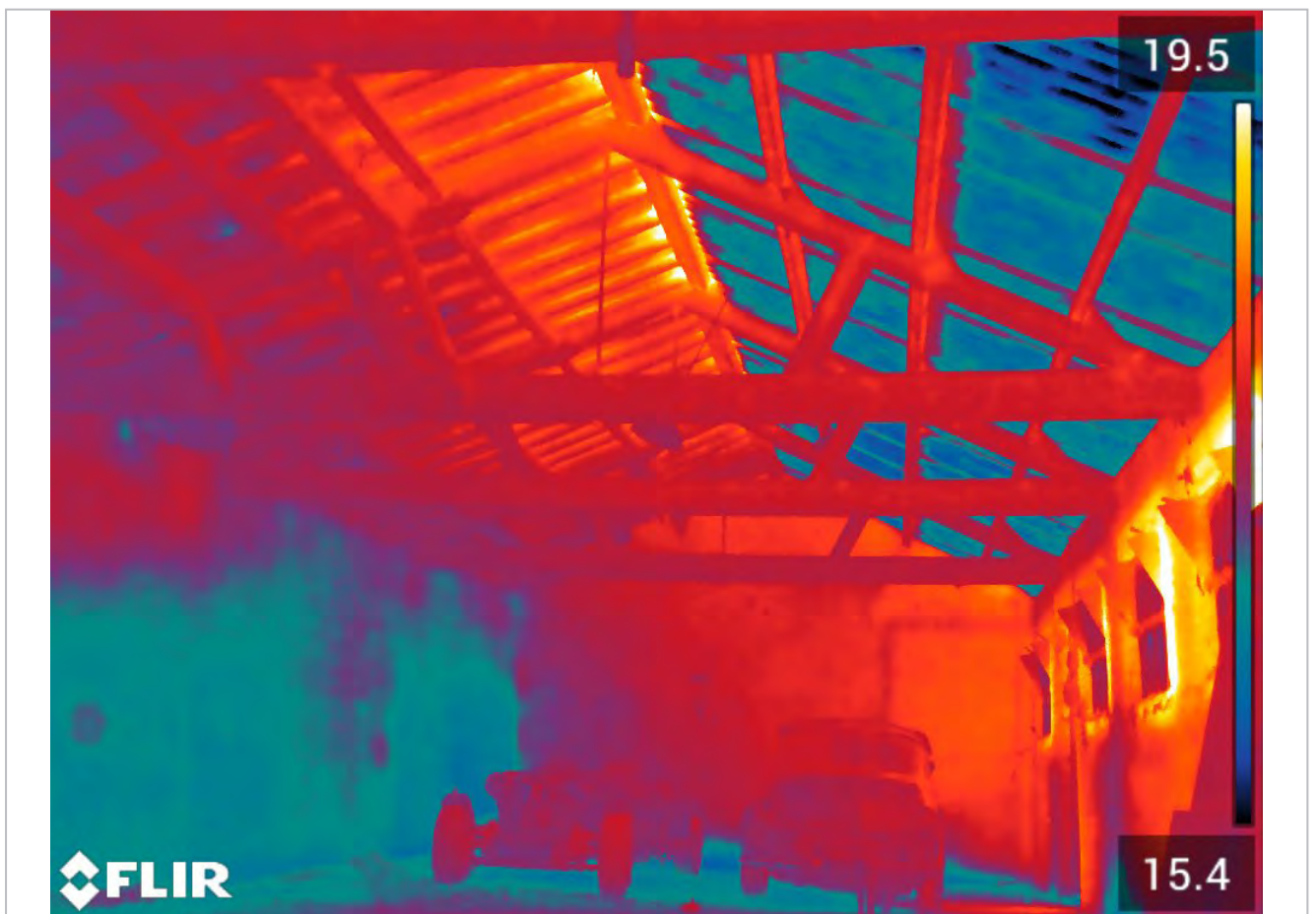




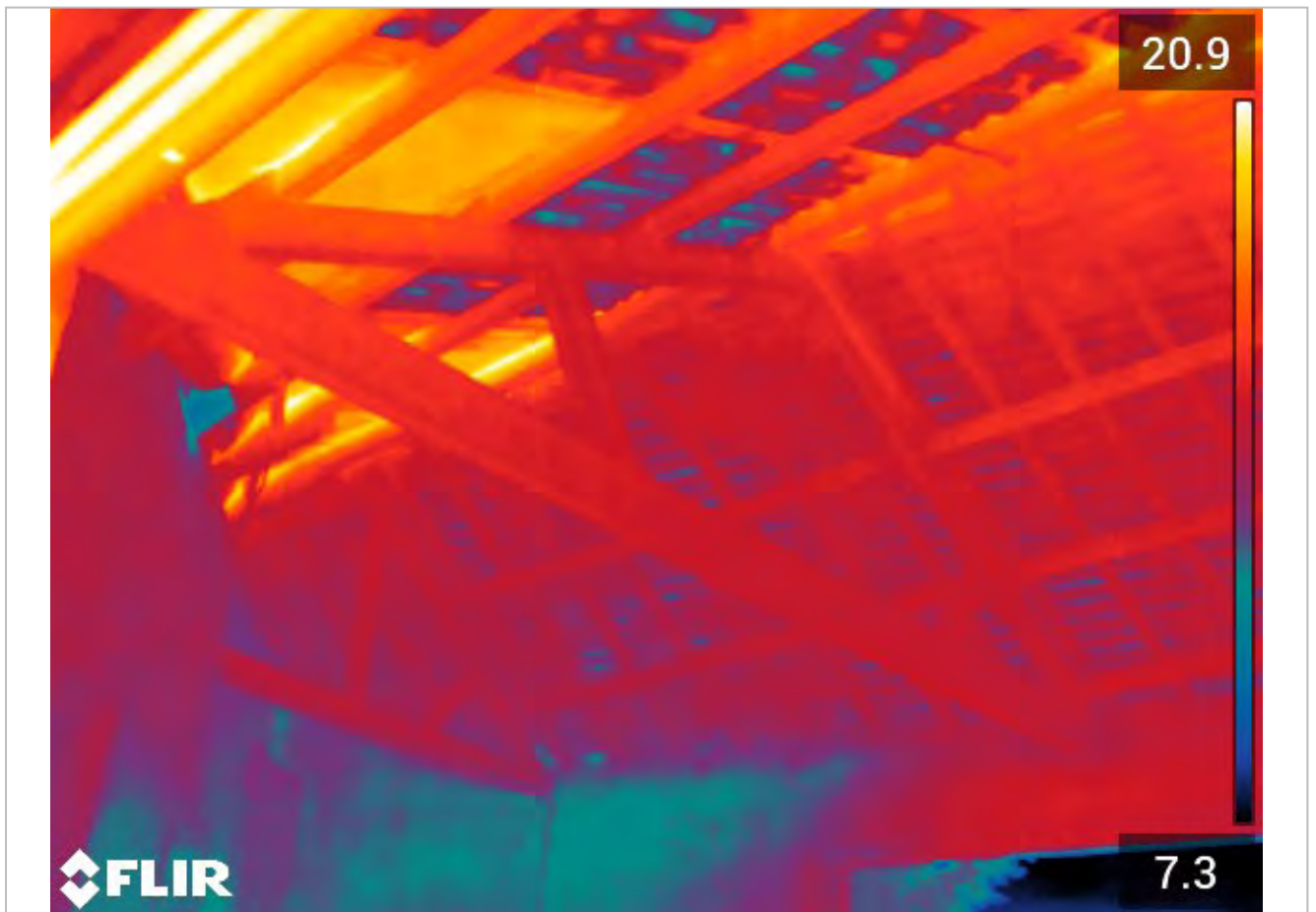
FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 30 m from furthest point of building



FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 32 m from furthest point of building



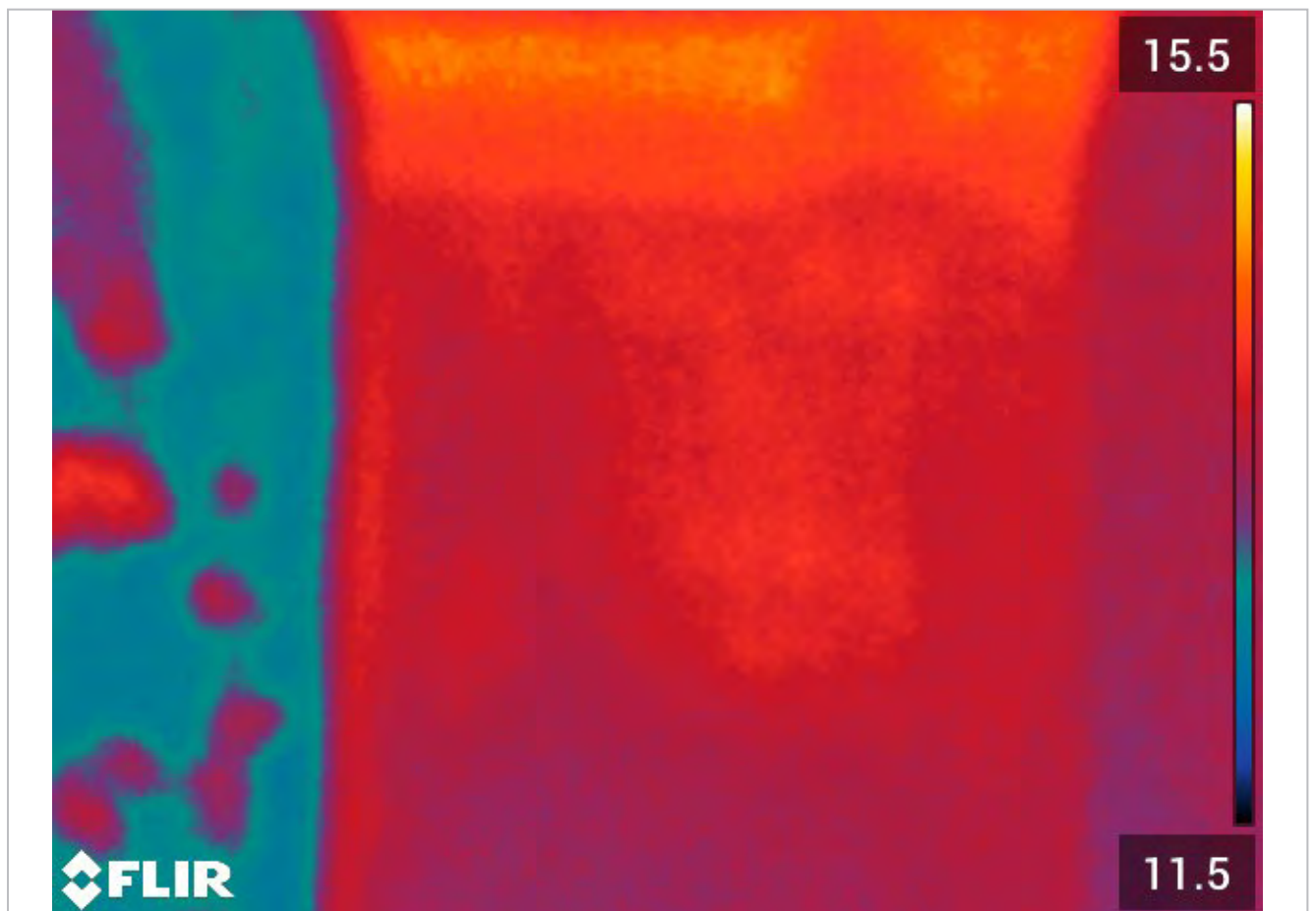
FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 21 m from furthest point of building



FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 6 m from furthest point of building



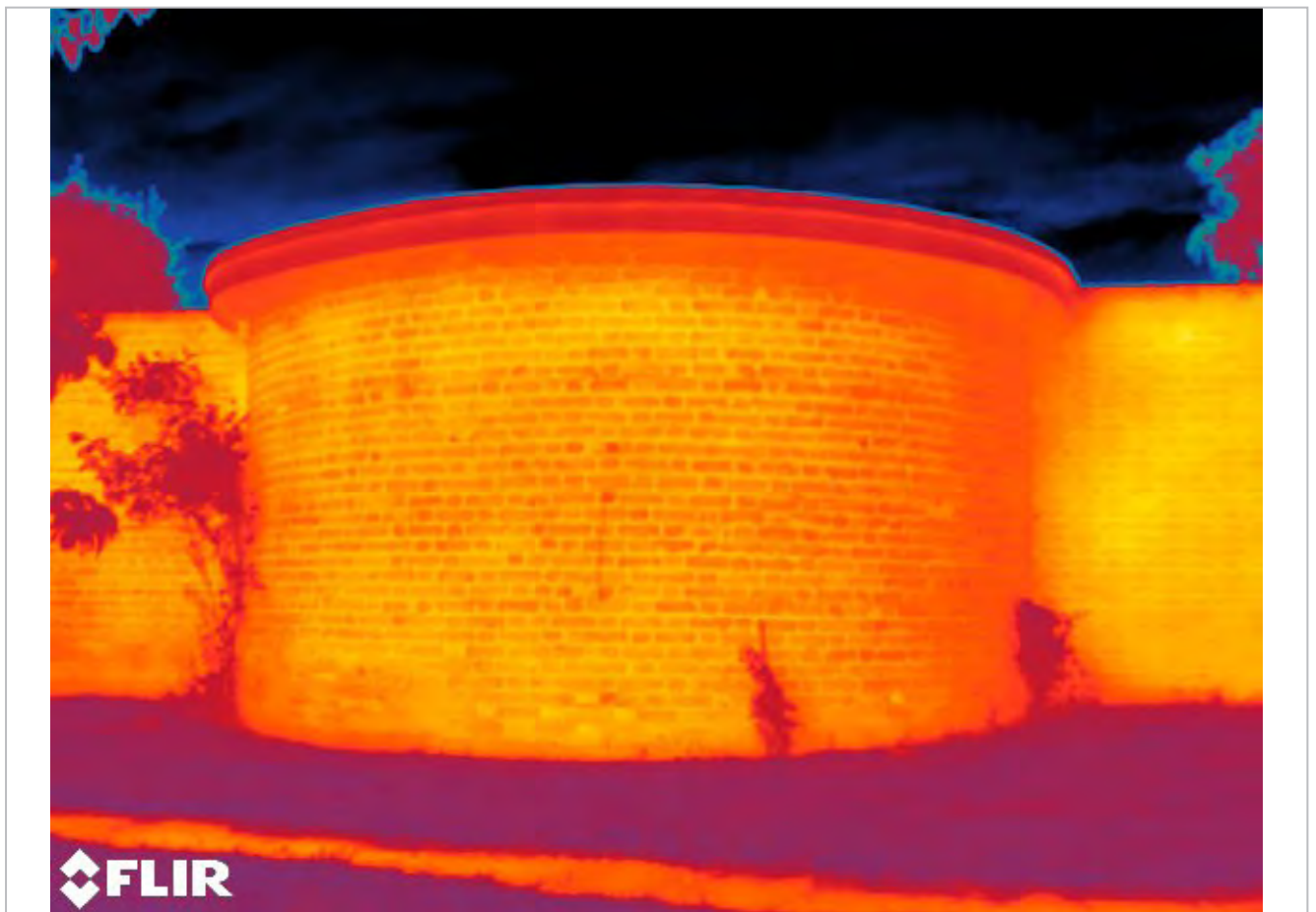
FLIR T860 (640 x 480 pixel resolution) with 42 degree lens = bat in flight detection distance of 66 m.
Camera located 19 m from furthest point of building



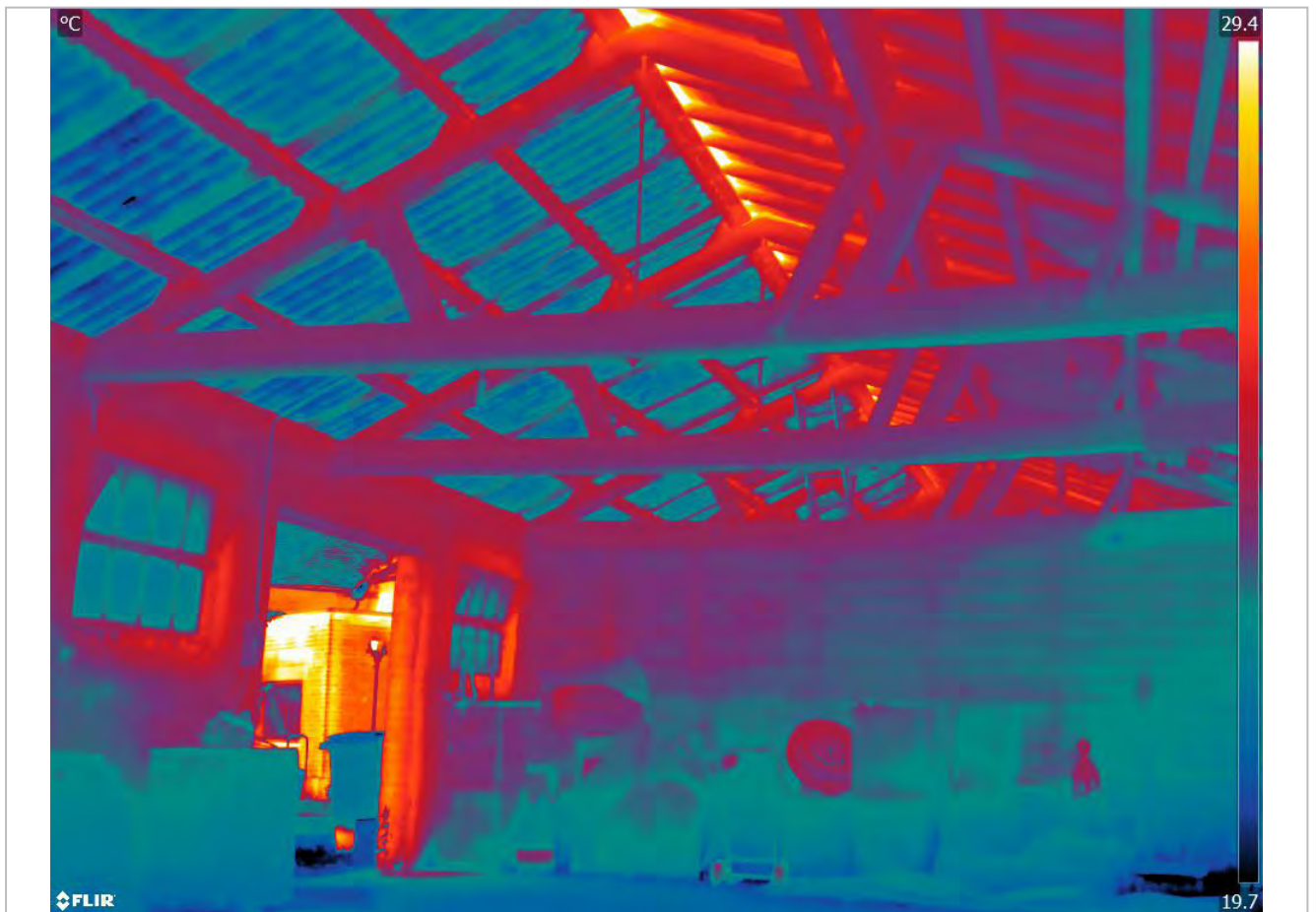
FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 3 m from furthest point of building



FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 30 m from furthest point of building



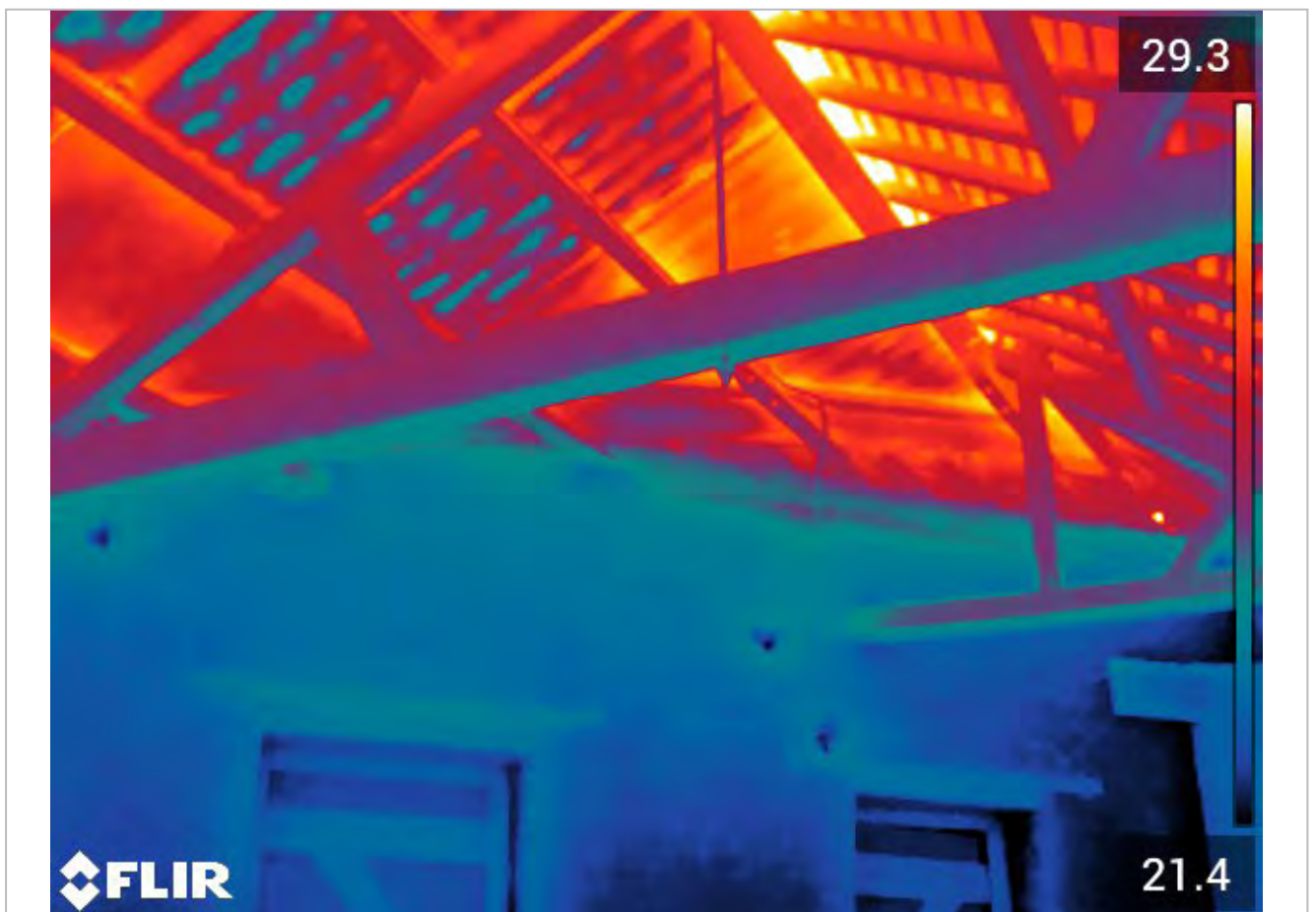
FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 7 m from furthest point of building



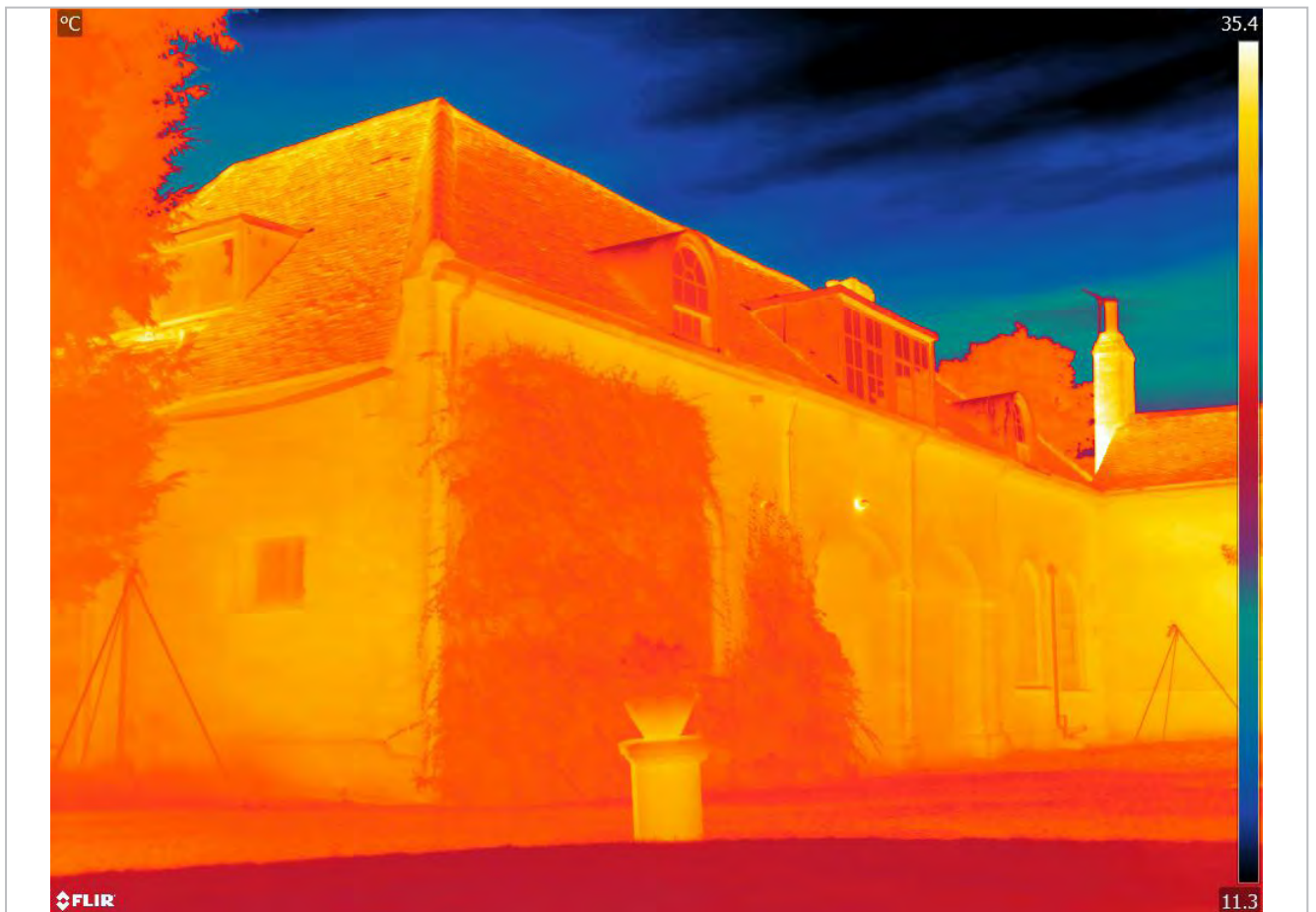
FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 20 m from furthest point of building



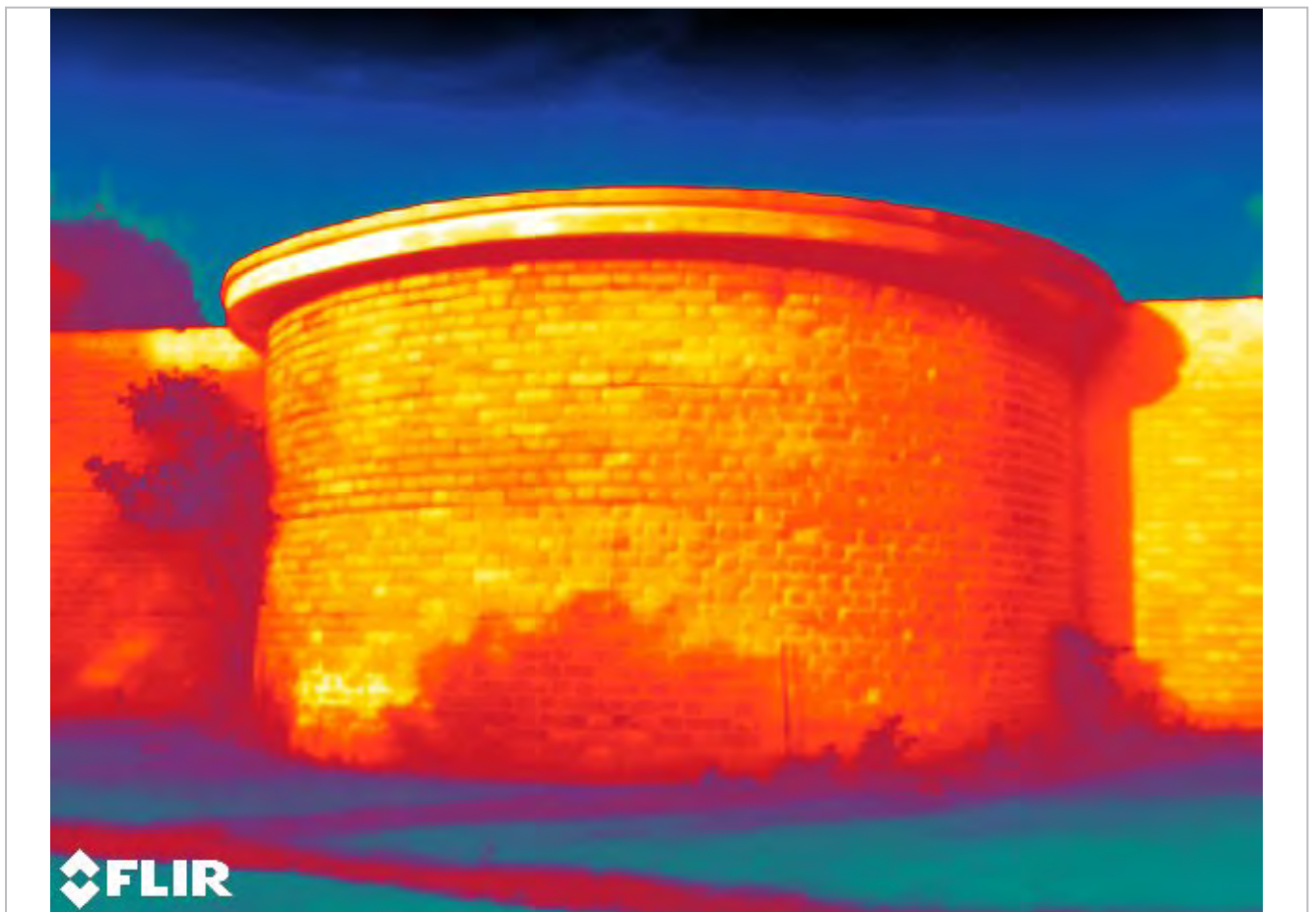
FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 19 m from furthest point of building



FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 11 m from furthest point of building



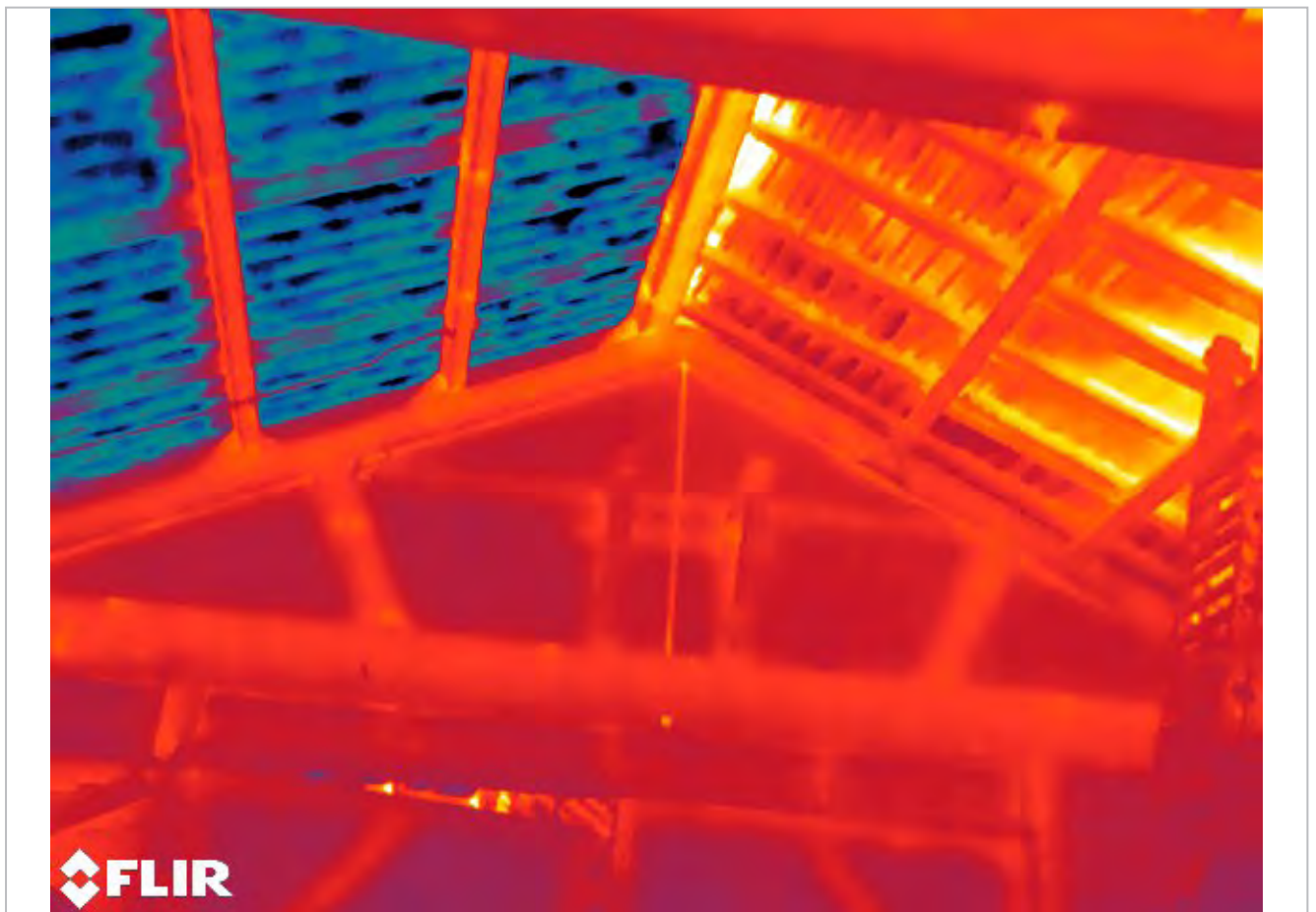
FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 35 m from furthest point of building



FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 7 m from furthest point of building



FLIR T860 (640 x 480 pixel resolution) with 42 degree lens = bat in flight detection distance of 66 m.
Camera located 19 m from furthest point of building



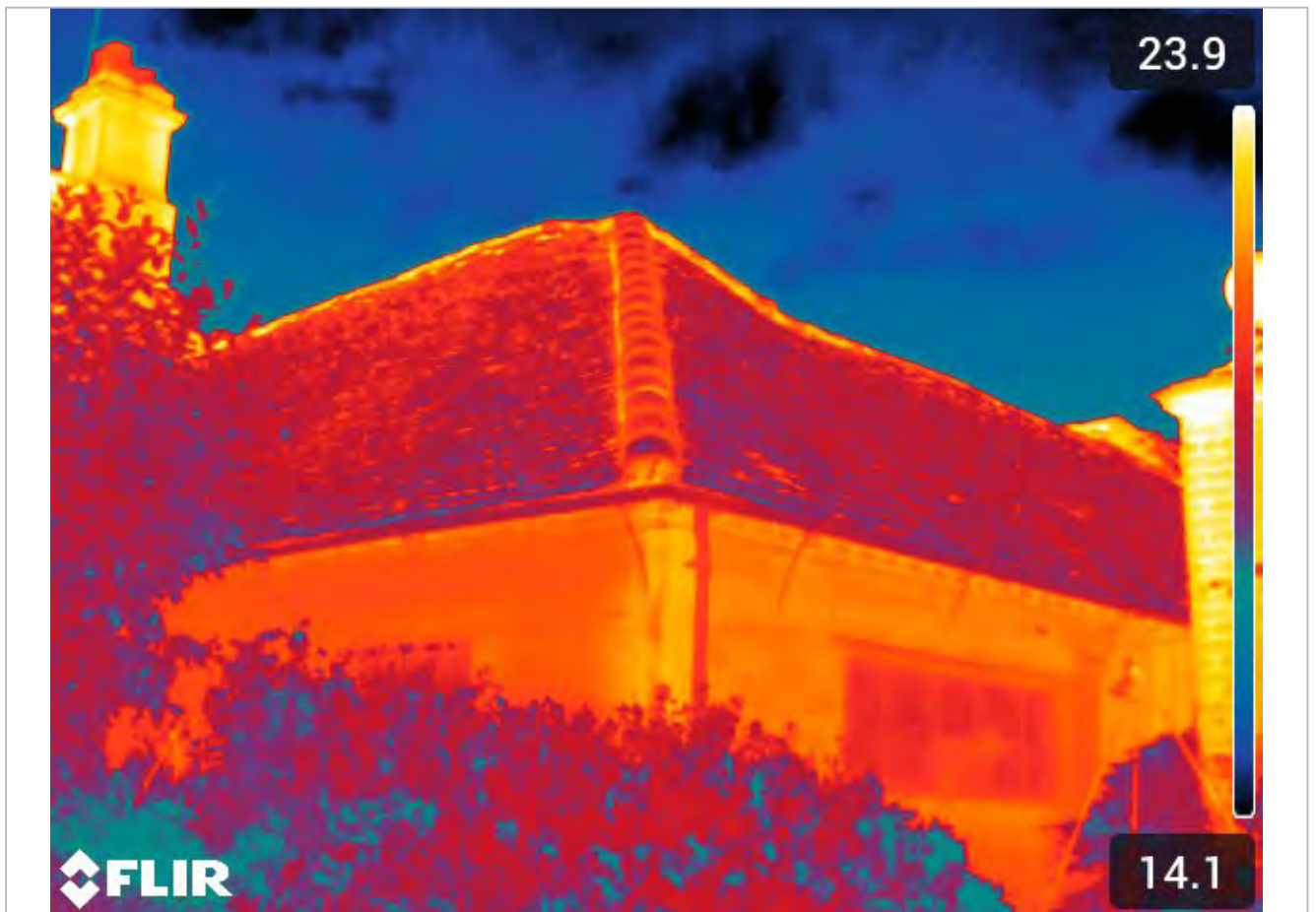
FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 5 m from furthest point of building



FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 28 m from furthest point of building



FLIR T1020 (1024 x 768 pixel resolution) with 45 degree lens = bat in flight detection distance of 104 m.
Camera located 28 m from furthest point of building

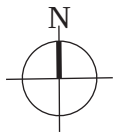


FLIR T540 (464 x 348 pixel resolution) with 42 degree lens = bat in flight detection distance of 51 m.
Camera located 15 m from furthest point of building

Appendix 2

Bat Survey Findings





20 m

20 July 2023

Sunset was at 21.08

1. Common pipistrelle bat (x41) emerged from verge between 21.17-21.59
2. Common pipistrelle bat (x1) emerged from verge @ 21.20
3. Common pipistrelle bat (x1) emerged from base of chimney @ 20.31
4. Common pipistrelle bat (x1) emerged from chimney brickwork @ 21.40
5. Brown long-eared bat (x3) emerged from ridge tile between 21.26-21.36
6. Common pipistrelle (x1) emerged from ridge tile @ 21.27
7. Common pipistrelle (x1) emerged from ridge tile @ 21.35
8. Common pipistrelle (x1) emerged from ridge tile @ 21.35
9. Common pipistrelle (x1) emerged from ridge tile @ 21.35
10. Brown long-eared bat (x1) emerged from wall @ 21.34





Key

Sunset was at 21.01

1,2 & 3. Common pipistrelle (x3) emerged from soffit @ 21.18, 21.28 and 21.29 respectively

4. Common pipistrelle (x12) emerged from verge gap between 21.02-21.36

5. Common pipistrelle (x1) emerged from verge @ 21.12

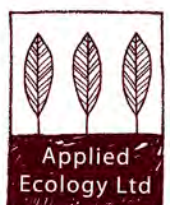
6. Brown long-eared bat (x1) emerged from roof w side @ 21.10

7. Brown long-eared bat (x1) emerged from ridge @ 21.11

8. Brown long-eared bat (x1) emerged from wall gap @ 21.23

9. Natterers bat (x1) emerged from unknown location @ 22.02

Bat roost emergence survey set up 25 July 2023





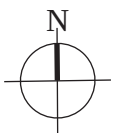
Key

1. Common pipistrelle bats (x11) emerged from different locations on roof from below tiles between 20.05-20.26
2. Common pipistrelle (x3) emerged from mortar gap in wall brickwork between 20.16-20.24
3. Common pipistrelle (x1) emerged from hole in brick wall @20.16
4. Common pipistrelle(x1) emerged from mortar gap in brickwork @20.21
5. Common pipistrelle (x3) emerged from roof tile near eave @ 20.20
6. Brown long-eared (x2) emerged from ridge @ 20.28
7. Brown long-eared (x1) emerged from timber near ridge @20.29
8. Common pipistrelle (x1) off ridge @ 20.28
9. Common pipistrelle (x1) off ridge tile @ 20.21
10. Common pipistrelle (x1) off roof tile @ 20.26
11. Natterers bat off roof timber inside @ 20.53
12. No bats off pool building



Key

1. Common pipistrelle bats (x9) emerged from six different roof tile/ ridge gaps between 20.17-20.24.
2. Brown long-eared bat (x1) emerged from interior roof @ 20.41 and continued to fly / perch / preen in the garage roof area until 20.59





Gardener's Cottage common pipistrelle bat maternity roost exit points (red arrow) - 41 bats out of circled arrow



Main Villa common pipistrelle bat roost exit points

Roost locations



Coach House common pipistrelle and brown long-eared bat roost exit points (red arrows)



Coach House common pipistrelle roost locations

Roost locations



Coach House brown long-eared bat exit point



Common pipistrelle bat common pipistrelle roost exit point

Roost locations





Kitchen Wing brown long-eared bat roost exit point



Pool Building common pipistrelle roost exit points

Roost locations





Garage - common pipistrelle, natterers bat, and brown long-eared bat roost locations



Gap above garage doors at east end of building used by brown long-eared bats to move between garage sections

Roost locations

Appendix 3

eDNA results



Client: Duncan Painter,
Applied Ecology



ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 229249
Email: Helen.Rees@adas.co.uk

www.adas.uk

Sample ID: ADAS-2402 Condition on Receipt: Good Volume: passed
Client Identifier: Julians Park Description: pond water sample
Date of Receipt: 03/07/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	07/07/2023
Degradation Control [§]	Within Limits	Real Time PCR	07/07/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	07/07/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	10/07/2023	Date of issue:	10/07/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

