



**St Edmund's Church, Egleton**

**Bat Management Plan**

**November 2021**



B.A.T. Ecological | [www.bat-ecological.co.uk](http://www.bat-ecological.co.uk) | [info@bat-ecological.co.uk](mailto:info@bat-ecological.co.uk) | 07870 157022

## Report Information:

Report title: St Edmund's Church, Egleton – Bat Management Plan

Prepared by: Matt Cook BSc (Hons) MSc MCIEEM

Prepared for: The Bats in Churches Project

Issued on: 26 November 2021

Document reference: B.A.T.211101

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# Contents

Executive Summary.....	4
<b>1 Introduction .....</b>	<b>5</b>
1.1 Background.....	5
1.2 Church Location and Description.....	5
1.3 Statement of Heritage Significance.....	6
<b>2 Relevant Legislation.....</b>	<b>8</b>
<b>3 Bat Usage of the Church .....</b>	<b>10</b>
3.1 Previous Information .....	10
3.2 2021 Bat Surveys .....	10
<b>4 Evaluation .....</b>	<b>14</b>
4.1 Bat Survey Effort and Expertise .....	14
4.2 Stakeholder Consultation.....	14
4.3 Overall Evaluation.....	15
<b>5 Consideration of Bat Management Options .....</b>	<b>16</b>
5.1 Option 1: Exclusion .....	16
5.2 Option 2: Do Nothing.....	16
5.3 Option 3: Ceiling Repairs – The Preferred Bat Management Strategy.....	17
<b>6 BMP Objectives .....</b>	<b>18</b>
6.1 Objectives .....	18
6.2 Achieving the Objectives – Recommended Actions for St Edmund's .....	18
6.3 Criteria for Assessing Success .....	20
6.4 Recommended Programme.....	21
<b>7 Indicative Costings.....</b>	<b>22</b>
<b>8 References .....</b>	<b>23</b>
<b>9 Appendices .....</b>	<b>24</b>
9.1 Plan of 2021 Bat Survey Results at St Edmund's, Egleton.....	xxv
9.2 Additional Photographs .....	xxvi
9.3 B.A.T. Ecological 2021 Bat Survey Methods.....	xxvii

## Executive Summary

This report presents the Bat Management Plan (BMP) for St Edmund's Church in Egleton, Rutland.

As part of the [Bats in Churches Project](#) B.A.T. Ecological were commissioned by Natural England to produce this BMP following bat surveys of St Edmund's in 2021. The strategy presented within this BMP is also based on consultation with key stakeholders regarding bat impacts on the church and possible ways to reduce these. In addition, it considers recent research into mitigating the impacts from bats on churches and information on bat usage of the church provided by the local bat conservation group.

St Edmund's supports a large maternity colony of >1000 adult female soprano pipistrelles, which roost within the nave roof and egress and access the roost via the nave eaves. Soprano pipistrelles have roosted within St Edmund's in significant numbers for many years and until the last few years relatively few of them have accessed the church interior. Recently, however, part of the nave ceiling collapsed below the bat roost and more bats now frequent the inside of the church. The droppings and urine deposited by these bats cause significant issues for the congregation. This BMP therefore prescribes measures to reduce the impacts from the soprano pipistrelles inside St Edmund's.

Based on the information gathered to inform this report the recommended approach to bat management at St Edmund's is to repair, or ideally replace, the ceiling inside the nave to prevent bats from accessing the church interior from their roost in the nave roof. This strategy represents the most straightforward and cost-effective approach to both reducing the impacts from bats inside the church and maintaining the Favourable Conservation Status (FCS) of the large soprano pipistrelle colony.

A licence from Natural England would be mandatory to facilitate this work, to derogate the law that protects bats and their roosts. The ceiling repairs would need to be completed in accordance with a strict Method Statement and Work Schedule under this licence. The methods and programme would need to ensure that no bats were harmed during the work and that the bats were not left without a summer maternity roost at the church. Monitoring of the roost upon completion of the work would also be required.

There are three key objectives for the chosen approach to bat management at St Edmund's. The success or otherwise of the bat management and mitigation strategies can then be measured against these. Objective one is to continue to provide a long-term, suitable maternity roost for the soprano pipistrelles at St Edmund's. Objective two is to prevent soprano pipistrelles from accessing the church interior, as far as is reasonably achievable, to thereby reduce the adverse impacts from the bat droppings and urine. Objective three is then to monitor the status of the soprano pipistrelle roost at the church, and to respond appropriately where required, to ensure that the FCS of the local population of this species is maintained.

The actions intended to achieve the above objectives are proposed in section 6, as are the criteria for assessing success. The recommended programme for the work is also provided in section 6 and presented below. Indicative costings for the work are provided in section 7.

<u>Item</u>	<u>Timescale</u>	<u>Description</u>
1	Winter 2021-22	Application for Faculty or List B Archdeacon's licence (accompanied by BMP and indicative costings) by Architect.
2	Spring 2022	Appoint Ecologist. Licence application to Natural England.
3	Spring / Summer 2022	Contractor tendering and instruction. Installation of bat boxes by Ecologist.
4	September / October 2022	Licensed repairs / replacement of ceiling as directed by Ecologist and Architect.
5	Summer 2023	Post-intervention monitoring, year 1.
6	Summer 2024	Post-intervention monitoring, year 2 (and licence returns).

# 1 Introduction

## 1.1 Background

- 1.1.1 This report presents the Bat Management Plan (BMP) for St Edmund's Church, Egleton, Rutland, LE15 8AD, which is referred to hereafter as 'St Edmund's' or 'the church'.
- 1.1.2 This BMP is based on the findings of a detailed suite of bat surveys of St Edmund's completed by B.A.T. Ecological in 2021. B.A.T. Ecological were commissioned by Natural England to undertake the 2021 bat surveys of St Edmund's and produce this subsequent BMP as part of the [Bats in Churches \(BiC\) Project](#).
- 1.1.3 The strategy presented within this BMP is also based on consultation with key stakeholders regarding the bat impacts on the church and options to reduce these. In addition, it considers recent research into mitigating the impacts from bats on churches, and information on bat usage of the church provided by the local bat conservation group.
- 1.1.4 St Edmund's supports a large maternity colony of >1000 adult female soprano pipistrelles *Pipistrellus pygmaeus* at its peak. The bats roost within the nave roof and egress and access this roost via apertures along the external eaves on both the north and south elevations.
- 1.1.5 Soprano pipistrelles have roosted within St Edmund's in significant numbers for many years (Jenny Harris, Leicestershire and Rutland Bat Group (LRBG), *pers. comm.* May 2021) and until the last few years relatively few of them have accessed the church interior. Recently, however, part of the nave ceiling collapsed below the bat roost and more bats now frequent the inside of the church. The droppings and urine deposited by these bats cause significant issues for the congregation. This BMP prescribes measures to reduce the impacts from the soprano pipistrelles inside St Edmund's.
- 1.1.6 Any measures recommended within this BMP that will affect bats as European Protected Species (EPS) must be licensed appropriately by Natural England. Any bat management measures adopted at the church must ensure that there is no harm to any bats, and that the Favourable Conservation Status (FCS) of the local bat population of the species concerned will be maintained.
- 1.1.7 The law pertaining to bats is described in section 2. The findings of the bat surveys undertaken at St Edmund's in 2021 are provided in section 3. Section 4 evaluates the bat survey effort and stakeholder consultation, and the bat management options for St Edmund's are then considered in section 5. Section 6 presents the objectives of the recommended approach and the programme. Outline costings for the work are then presented in section 7. Section 8 comprises references. Section 9 (appendices) provides the 2021 bat survey results and methods, and additional photographs.

## 1.2 Church Location and Description

- 1.2.1 The central Ordnance Survey Grid Reference (OSGR) of St Edmund's is SK 87593 07541 and it is located here: <https://goo.gl/maps/WSwdSH1xEaiVqo4j8>.
- 1.2.2 St Edmund's is situated on Church Road in Egleton. Egleton is a rural village in the county of Rutland, England, at the western end of Rutland Water. It is <2 km to the south-east of the market town of Oakham. St Edmund's is within the Church of England Oakham Benefice and the Diocese of Peterborough.
- 1.2.3 Photograph 1.2.1 shows St Edmund's viewed facing north-west from Church Road.

Photograph 1.2.1: St Edmund's Church, Egleton, viewed facing north-west from Church Road.



- 1.2.4 St Edmund's comprises a clerestoried nave, a tower with a spire adjoining the western end of the nave, a chancel adjoining the eastern end of the nave, and a south porch. The church has no aisles although there is evidence to suggest that a north aisle was once present as remnants of an arcade (now infilled with ashlar) are present within the nave north wall.
- 1.2.5 St Edmund's is constructed from local coursed ironstone rubble and ashlar with sandstone dressings. The shallow-pitched roofs of the nave, chancel, and south porch are covered with lead. This roofs of the nave and south porch are not parapeted, and the wall plate and some rafters are therefore visible along the eaves behind the guttering. The roof of the chancel is finished with a parapet wall and therefore the roof timbers are not visible.
- 1.2.6 Inside St Edmund's the walls are plastered, and the floors are paved with stone flags with some tiles laid in the chancel. The church has a plaster ceiling with the timber wall plates, purlins, ridge, and tie-beams all visible. There are several rows of fixed pews inside the church.
- 1.2.7 The churchyard of St Edmund's supports several mature trees around its periphery, including several limes *Tilia spp.* along the southern boundary and a large ash *Fraxinus excelsior* in the north-east corner. To the south and east of the churchyard is the village of Egleton; to the north and west of the churchyard is countryside and the Rutland Water lagoons.

### **1.3 Statement of Heritage Significance**

- 1.3.1 St Edmund's is a Grade I listed building dating mainly back to C12 and C14, with extensive re-windowing and re-roofing completed in C15 and further additions in C18. The church was then restored in 1872-73.
- 1.3.2 As part of the initial phases of the BiC Project a Statement of Significance (SoS) was prepared in respect of the heritage importance of each project church and the impact upon it from bat activity. The following comprises the executive summary from the BiC SoS for St Edmund's (authored by Neil Burton) in June 2020:

*“The church is of high architectural, historical and archaeological significance and is listed Grade I. It dates mainly from the twelfth and fourteenth centuries, with extensive re-windowing and re-roofing in the fifteenth century and additions in the eighteenth century which include the spire. Many of the furnishings date from the restoration of 1872-3, but some older items survive. The principal features of interest are the carved Norman stonework of the south doorway and chancel arch, both of which are of exceptional significance.*

*There is no ecologist's report at the time of writing. Evidence of the impact of bats is widespread, with droppings scattered over the plastered walls, including the painted Royal Arms over the chancel arch, and staining on the timber furnishings. It is understood that bats are thought to enter the church under the south wall plate of the nave roof. The church community currently consists of a small number of older people who are not hostile to bats but feel 'under siege' and struggle to maintain the building. Mitigation measures might include providing bat boxes between the rafters, blocking other entry points and providing alternative roosting sites outside the church”.*

- 1.3.3 Refer to the Statement of Significance (BiC Project, June 2020) for more detail including on any items of special heritage importance at the church.

## 2 Relevant Legislation

- 2.1.1 The following is intended only as a guide to the legislation relating to bats. It does not purport to give legal advice and the Acts should be referred to directly for the precise legal wording.
- 2.1.2 All bats and their roosts are protected in England and Wales via the Conservation of Habitats and Species Regulations 2017 (as amended, including by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) which are commonly referred to as the 'Habitats Regulations'. Bats and their roosts are also protected in the UK under the Wildlife and Countryside Act 1981 (as amended), which was reinforced in England and Wales by the Countryside and Rights of Way Act 2000.
- 2.1.3 In combination, the above legislation makes it an offence to:
- Deliberately capture, injure, or kill a bat.
  - Deliberately disturb any bat; in particular, any disturbance which is likely to (i) impair a bats' ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.
  - To be in possession or control of any live or dead bat or any part of, or anything derived from a bat.
  - Damage or destroy a breeding site or resting place of a bat.
  - Intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection.
  - Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection.
- 2.1.4 The term 'roost' is not used in the above legislation, however, a site that a bat uses for breeding, resting, shelter or protection is called a roost in ecological terms. Bats tend to re-use the same roost sites and sometimes over many years but may not always be in residence. Current legal opinion is that a roost is protected irrespective of whether the bats are present.
- 2.1.5 *Damaging or destroying* a place used by a bat for breeding or resting anywhere in the UK is an *absolute offence carrying strict liability* under the Habitats Regulations. This means that no element of intent, reckless, or deliberate action needs to be evidenced to establish guilt; the prosecution only needs to demonstrate that the accused performed the prohibited act.
- 2.1.6 Where an activity will result in any destruction, damage, or obstruction of any bat roost, whether occupied or not, or it risks harming or disturbing bats, then a licence is required from the Statutory Nature Conservation Body (e.g., Natural England) to derogate the law to facilitate this activity.
- 2.1.7 In determining whether to grant a licence for an activity affecting a European Protected Species (EPS) Natural England must apply the requirements of Regulation 53 of the Habitats Regulations, and, in particular, the following three tests set out in sub-paragraphs (2)(e), (9)(a) and (9)(b):
1. Regulation 53(2)(e) states that: a licence can [only] be granted for the purposes of "*preserving public health or public safety or other imperative reasons of overriding*



*public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”.*

2. Regulation 53(9)(a) states that the appropriate authority shall not grant a licence unless they are satisfied “*that there is no satisfactory alternative*” to the proposed actions; and,
3. Regulation 53(9)(b) states that the appropriate authority shall not grant a licence unless they are satisfied “*that 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*”.

- 2.1.8 These three tests are commonly referred to as the ‘purpose test’, the ‘NSA test’ and the ‘FCS test’ respectively.
- 2.1.9 Note that the original legislation which provides the framework for licensing in respect of bats was transposed from European Union (EU) directives, and as such bats continue to be referred to EPS despite the UK’s withdrawal from the EU.
- 2.1.10 There are two approaches to licensing work in places of worship that will affect bats and would otherwise be illegal: a ‘normal’ [EPS Mitigation Licence \(EPSML\)](#), or the Bats in Churches Class Licence (BiCCL).
- 2.1.11 The BiCCL is a unique licence designed to help suitably qualified, experienced, and trained bat ecologists (Registered Consultants) to manage the adverse effects of bat activity on places of worship (only). Issued under the Habitats Regulations, this licence permits Registered Consultants (only) to disturb and capture bats, and damage and destroy resting places and breeding sites using a range of management techniques to reduce the negative impacts of bat populations using places of worship, and to carry out necessary repair works. The use of the licence is subject to:
- Surveying to required standards to inform baseline information about bat populations using the registered site, including species, numbers, roost types, times of year the roost is in use and access points, and to inform long-term monitoring requirements;
  - All necessary permissions and consents being in place prior to applying to register a site unless exceptional circumstances apply;
  - Registration of the site and written confirmation from Natural England that works may proceed; and,
  - Submission of annual reports of licensed activities and monitoring by 15 January each year, and submission of records to the relevant Local Records Centre annually.
- 2.1.12 Registered Consultants must implement management measures to safeguard bats and ensure that the ecological function of the site is maintained for the registration period. Natural England make an assessment of each annual report to ensure compliance with the ecological approach set out in the authorised site registration form, and, where necessary, Registered Consultants must adapt management and monitoring measures.

## 3 Bat Usage of the Church

### 3.1 Previous Information

3.1.1 Soprano pipistrelles have roosted within St Edmund's in significant numbers for many years. Jenny Harris (LRBG) undertakes two counts of the bats in June of most years for the Bat Conservation Trust National Bat Monitoring Programme. The number of adult female soprano pipistrelles recorded emerging from St Edmund's in the annual pre-partum period has exceeded 1000 animals in several recent years and over 1100 bats were recorded emerging from the church in June 2020. This makes this bat roost one of the largest in England.

### 3.2 2021 Bat Surveys

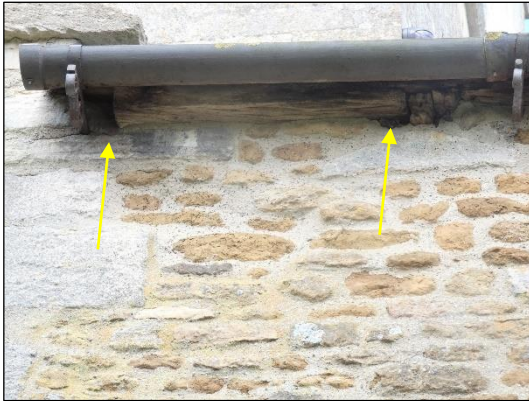
3.2.1 Appendix 9.1 provides a plan of the key findings from the suite of professional bat surveys undertaken by B.A.T. Ecological at St Edmund's in 2021.

3.2.2 The 2021 bat surveys confirmed that St Edmund's supports a large maternity colony of >1000 adult female soprano pipistrelles, which roost within the nave roof and egress and access this roost via apertures along the external eaves on both the north and south elevations. Photographs 3.2.1 to 3.2.6 show the locations of the main roost access / egress features.

Photograph 3.2.1: There are two main features on the southern elevation of the church used by the soprano pipistrelles to exit the roost in the nave roof. These are shown by the two arrows below. Close-up views of these features are shown in photographs 3.2.2 and 3.2.3 respectively. Table 3.2.1 shows the numbers of bats using each feature on each dusk emergence survey completed in 2021.



Photograph 3.2.2: Close-up view of the features shown by the yellow arrow in photograph 3.2.1 above. Of these two gaps below the wall plate the soprano pipistrelles predominantly use the one on the left, at the south-west corner of the nave.



Photograph 3.2.3: Close-up view of feature 2 shown by the blue arrow in photograph 3.2.1 above. Of the features used by the soprano pipistrelles to access and egress the nave more bats use this than the others – see Table 3.2.1.



Photograph 3.2.4: There are two features used by the soprano pipistrelles on the northern elevation of the church to exit the roost in the nave roof. These are shown by the two arrows below. Close-up views of these features are shown in photographs 3.2.5 and 3.2.6 respectively. Table 3.2.1 shows the numbers of bats using each feature on each dusk emergence survey completed in 2021.



Photograph 3.2.5: Close-up view of feature 3 on the northern elevation of the church shown by the red arrow in photograph 3.2.4 above.



Photograph 3.2.6: Close-up view of feature 4 on the northern elevation of the church shown by the green arrow in photograph 3.2.4 above.



3.2.3 Table 3.2.1 shows the numbers of soprano pipistrelles recorded emerging from the features described above on the 2021 dusk emergence surveys at St Edmund's, as well as the total count for each survey.

Table 3.2.1: Numbers of soprano pipistrelles recorded using each of the features described above on the 2021 emergence surveys of St Edmund's. Total count of emerging soprano pipistrelles is also shown.

Date	Feature 1	Feature 2	Feature 3	Feature 4	Total Count
3 June	372	388	257*		1017
4 August	240	284	7	32	563
31 August	136	208	1	2	347

*\*The count of these two features on the northern elevation was combined on the first survey although most bats using this elevation exited the church via feature 4.*

3.2.4 The early June pre-partum count comprised only adult bats and so the number of bats recorded on this survey (c.1000) at St Edmund's is assumed to be the current baseline number of adult female soprano pipistrelles in the colony.

3.2.5 It is unclear why fewer bats were recorded emerging from the roost on the August surveys. Bats may have dispersed from the St Edmund's roost due to hot weather in late July, which meant that conditions inside the roost would have been very hot. In addition, or alternatively, bats may have roosted elsewhere because there was not enough space within the church roost for all the adult bats and their offspring once pups were born in late June / early July.

3.2.6 It is understood that until the last few years relatively few soprano pipistrelles accessed the church interior. Recently, however, part of the nave ceiling collapsed below the bat roost and more bats now frequent the inside of the church via this hole, which can be seen in photographs 3.2.7 and 3.2.8.

Photograph 3.2.7: The location of the hole in the nave ceiling is shown by the red arrow.



Photograph 3.2.8: Close-up view of the partially collapsed ceiling in the nave roof in the location shown by the red arrow in photograph 3.2.7. Bats that access the church interior predominantly do so via this hole in the ceiling. Many of these bats are then unable to return to the roost or exit the church via an alternative route.



- 3.2.7 Relatively few bats (<10) were recorded inside the church on both the first survey visit on 3-4 June and the last survey on 31 August. However, over 30 bats were recorded emerging from the hole in the ceiling into the church at dusk on 4 August. It is possible that more bats emerged from this hole into the church interior in early August because these were recently volant and inexperienced juvenile animals.
- 3.2.8 The church reported that 18 juvenile soprano pipistrelles were grounded inside the church on 21 July during a spell of very hot weather, of which 13 died. Low numbers of dead bats inside the church have been reported in several recent summers. Since the ceiling partially collapsed the gap between the external roof covering and the ceiling has been blocked with polythene. It appears that bats can crawl around this to emerge inside the church, however, they cannot necessarily return to the roost via the same route nor find an alternative way out of the church.
- 3.2.9 In addition to the hole in the ceiling described and shown above, a low number of soprano pipistrelles also occasionally access the church interior via a few small gaps along the wall plates of the nave roof; for example, along the southern elevation as shown by the arrows in photograph 3.2.9 and photograph 9.2.2 in the appendix. These small gaps presumably lead to the roost above the nave ceiling.

Photograph 3.2.9: A low number of bats access and egress gaps along the wall plates inside the church; for example, in the locations along the southern elevation shown by the two blue arrows.



- 3.2.10 In addition to the features that are known to be used by bats from surveys at the church there may be other building features of importance to roosting or hibernating individuals.

## 4 Evaluation

### 4.1 Bat Survey Effort and Expertise

- 4.1.1 The suite of bat surveys undertaken by B.A.T. Ecological at St Edmund's in 2021 was completed in accordance with current best practice guidance in respect of professional bat surveys generally – see Collins (ed.) 2016 - and those of churches – see BiCCL Annex B '*Minimum Survey Standards for Site Registration*'.
- 4.1.2 This BMP has been authored by Matt Cook BSc (Hons) MSc MCIEEM, who also led the 2021 bat surveys of St Edmund's. Matt is a BiCCL Registered Consultant (RC) with Natural England – licence reference B32RC004. See appendix 9.3 for more information on Matt's experience.

### 4.2 Stakeholder Consultation

- 4.2.1 The following provides a timeline of St Edmund's involvement with the BiC Project.
- **26 September 2019** – Initial church visit by BiC Project Engagement Officer Rose Riddell (RR).
  - **21 November 2019** – St Edmund's formally invited (by letter) to join the project by Michael Costello, Natural England BiC Project Manager.
  - **31 January 2020** - BiC Bat Roost Report Form completed with input from Church Warden Sue Boulton (SB), now resigned.
  - **17 March 2020** – Latest Quinquennial Inspection Report produced by Stephanie Norris (SN) Architects.
  - **18 June 2020** – Statement of Heritage Significance visit by Neil Burton.
  - **16 December 2020** – Church Project Plan produced by RR.
  - **25 January to 16 February 2021** – Natural England tender period for bat survey and consultancy work at St Edmund's and 24 other BiC churches.
  - **2 March 2021** – B.A.T. Ecological awarded contract to undertake bat surveys and produce BMP for St Edmund's. Contract award accepted 4 March.
  - **7 April 2021** - Initial meeting between B.A.T. Ecological (Matt Cook, MC), Church Wardens SB and Keith Starling, church architect (SN). and RR. The achieved objectives of this meeting were for the bat ecologist to acquire a good understanding of the church heritage, the preferences of the church representatives and architect in respect of bat mitigation measures, and to provide information to the church about the next steps and overall aims in respect of these. RR also explained what support would be available from the BiC Project.
  - **April to September 2021** – Suite of bat surveys undertaken by B.A.T. Ecological.
  - **11 June 2021** – Email from MC to SB, RR, KS, and SN outlining the likely approach to reducing the impacts from bats inside St Edmund's based on the initial surveys. Principally, this approach would be to repair the hole in the nave ceiling and block any small gaps along the nave architrave to prevent bats accessing the church interior, which should be undertaken in the autumn or spring (when bats are not breeding or hibernating) under licence from Natural England.
  - **6 August 2021** – Dawn bat swarming event at the church hosted by MC with LRBG.
  - **31 August 2021** – Dusk bat count event at the church hosted by MC with LRBG.
  - **31 August 2021** – Follow-up email from MC to RR and KS confirming the above

approach upon completion of the suite of bat surveys.

- **26 October 2021** – Indicative capital costings for repairs of ceiling provided by SN.

4.2.2 In addition to the above, informal discussions regarding the bat interest at St Edmund's have been ongoing (via email and onsite) with Jenny Harris of LRBG, who has been very helpful in providing information on bat usage of the church.

### **4.3 Overall Evaluation**

4.3.1 Overall, it is considered that the level of bat survey effort and expertise, stakeholder consultation, and reference to relevant research involved at St Edmund's provides a robust platform for the recommendations contained within this report. Every effort has been made to provide a comprehensive ecological appraisal and appropriate recommendations in the context of the commissioned scope of works and the overall aims of the BiC Project.

4.3.2 Notwithstanding the above, however, it remains important to note that it is impossible to completely characterise or predict the natural environment as wild animals are inherently unpredictable, all habitats are subject to change, and species may colonise or vacate areas for a variety of reasons after surveys have taken place or mitigation has been implemented.

## 5 Consideration of Bat Management Options

### 5.1 Option 1: Exclusion

- 5.1.1 Zeale *et al.* (2014, 2016) and Stone *et al.* (2015) used population modelling to predict the impacts of exclusion on colonies of soprano pipistrelles when researching strategies to mitigate the impacts on churches from this species. These studies found that, following exclusion, a soprano pipistrelle colony may be able to relocate to a new colony roost quickly and without an obvious short-term impact on behaviour or welfare, however, this was critically dependent on the availability of suitable alternative roost sites, which may be unknown.
- 5.1.2 Population modelling undertaken by Zeale *et al.* (2014, 2016) and Stone *et al.* (2015) also suggested that while a reduction in productivity following an exclusion would have less of an effect on a soprano pipistrelle colony than any reduction in survival rates, the latter could have a negative impact on population growth. The effect of exclusion on the FCS of soprano pipistrelles would therefore be uncertain without any research into its long-term impacts on both survival and productivity.
- 5.1.3 There is only one known study to have examined the demographic consequence of roost exclusion on any bat species – the big brown bat *Eptesicus fuscus* in Canada. Brigham & Fenton (1986) showed that despite individuals of this species relocating to roosts nearby, mean litter size was significantly lower (56% reduction) following exclusion ( $0.86 \pm 0.30$  at control sites;  $0.38 \pm 0.30$  following exclusion). Zeale *et al.* (2014, 2016) concluded that a change of similar magnitude could have profound consequences for soprano pipistrelle populations in England.
- 5.1.4 Based on the above research it can be concluded that excluding >1000 soprano pipistrelles from St Edmund's would have a significant adverse effect on this large colony and the effect of any exclusion could adversely affect the FCS of the local population.
- 5.1.5 On this basis, from a legal perspective alone Natural England cannot issue a licence to exclude the bats from St Edmund's because the NSA and FCS tests of Regulation 53 of the Habitats Regulations could not be satisfied by such an action – see section 2
- 5.1.6 Notwithstanding the above, exclusion would be against the spirit of the BIC Project and its principal aim “to transform support for church communities with nationally important historic churches with protected bat roosts ..... to create a sustainable partnership that will safeguard a future for bats, historic places of worship and for the people who use them”.
- 5.1.7 It is also understood that the church representatives of St Edmund's have no desire to exclude the bats from the church, having stated in the 2020 Bat Roost Report Form that their main desire is “a church interior free from bat droppings, [the] smell of urine, and ridding [the] church of dead bats” rather than exclusion.
- 5.1.8 Finally, in practical terms, it can be very difficult to exclude a large colony of small bats from a large old church, which they are likely to have used every year for decades, and where there are many apertures that provide potential roost and roost access opportunities.
- 5.1.9 Based on the above ethical, legal, and practical reasons the soprano pipistrelles cannot be excluded from St Edmund's and as such the colony will be retained at the church. Measures can be implemented, however, to significantly reduce the impacts from bats inside.

### 5.2 Option 2: Do Nothing



- 5.2.1 Balancing the need to protect churches and bats - our cultural and our natural heritage - is very challenging. Conserving the bat colonies that occupy churches is important because the bats may not have any alternative suitable roost sites and the loss of an important roost could significantly harm bat populations that are already threatened. At the same time, however, churches are often very important buildings historically and culturally, and they can suffer significant negative effects from colonies of bats. St Edmund's is an important community hub within Egleton but church activities are constrained by the mess deposited by the bats. The upkeep of an old church without bats is already difficult, and the mess left by bats places an added burden on those that clean and use it.
- 5.2.2 The 2020 BiC SoS (Neil Burton) for St Edmund's made the following statement regarding the impacts from bats on this building:
- "... evidence of the impact of bat droppings and urine is widespread, with droppings scattered over the plastered walls, including the painted Royal Arms over the chancel arch, and staining on the timber furnishings. It is understood that bats enter the church under the south wall plate of the nave roof. The church community currently consists of a small number of elderly people who are not hostile to bats but feel 'under siege' and struggle to maintain the building. There have always been bats but their numbers and impact have apparently increased significantly in the last eight or nine years".*
- 5.2.3 The principal recommendation provided within the main text of that SoS report (Burton, 2020) is as follows:
- "It is evident that bats are having an impact on fabric, furnishings and finishes of high significance, as well as making the building difficult to use. Short-term remedial measures could include covering the most vulnerable items but it seems likely that consideration will need to be given to the blocking of bat entry points and providing bat boxes between the rafters, along with consideration of alternative roosting sites outside the church. A survey is required to confirm species, roost locations and access points and to inform plans for mitigation".*
- 5.2.4 Based on the above, and the wider context and principle aim of the BiC Project, the representatives of St Edmund's feel that it is not appropriate to 'do nothing' at the church in respect of the impacts from the bats. As such, this option was presumably rejected prior to B.A.T. Ecological being instructed by Natural England.

### **5.3 Option 3: Ceiling Repairs – The Preferred Bat Management Strategy**

- 5.3.1 The final bat management option for St Edmund's comprises the recommended course of action – the ceiling inside the church should be repaired, or ideally replaced entirely, to prevent bats from accessing the church interior from their roost in the nave roof.
- 5.3.2 This strategy represents the most straightforward and cost-effective approach to both reducing the impacts from bats inside the church and maintaining the FCS of the large soprano pipistrelle colony.
- 5.3.3 A licence from Natural England – see section 2 - would be mandatory to facilitate the above work, to derogate the law that protects bats and their roosts. The ceiling repairs would need to be completed in accordance with a strict Method Statement and Work Schedule under this licence, as outlined in section 6.4. The methods and programme would need to ensure that no bats were harmed during the work and that the bats were not left without a summer maternity roost at the church. Monitoring of the roost upon completion of the work would also be required.

## 6 BMP Objectives

### 6.1 Objectives

6.1.1 Based on the information that has been gathered at St Edmund's there are three key bat management objectives for the chosen approach, which are provided below. The success (or otherwise) of the bat management strategy can then be measured against these objectives.

#### Objective 1

6.1.2 To provide a long-term, suitable maternity roost for the soprano pipistrelles at St Edmund's.

#### Objective 2

6.1.3 To prevent soprano pipistrelles from accessing the church interior, as far as is reasonably achievable, to thereby reduce the adverse impacts on the church from the bat droppings and urine.

#### Objective 3

6.1.4 To monitor the status of the soprano pipistrelle roost at the church, and to respond appropriately where required, to ensure that the FCS of the local population of this species is maintained.

### 6.2 Achieving the Objectives – Recommended Actions for St Edmund's

#### Objective 1

6.2.1 Section 6.4 provides a recommended programme for the ceiling repairs at St Edmund's in respect of the bats and section 7 provides indicative associated costings.

6.2.2 Stephanie Norris of Stephanie Norris Architects Ltd. has provided indicative costs for the capital work and professional fees associated with the ceiling repairs at St Edmund's. Indicative costs for the licensed bat mitigation work have been provided by B.A.T. Ecological.

6.2.3 Faculty consent (or similar formal approval) for the proposed work will need to be sought from the Diocesan Advisory Committee (DAC) for the Care of Churches (in Peterborough) ahead of any application to Natural England for a bat mitigation licence.

6.2.4 Upon receipt of Faculty a licence can be sought from Natural England to facilitate the proposed work on the ceiling in respect of bats. Note the following in respect of this licence application:

- The soprano pipistrelles cannot be left without a maternity roost in the church during the period of May to August (incl.). This means that any work on the ceiling or roof must both commence *and* be completed outside this summer period.
- Furthermore, it is also recommended that the work avoids the period when low numbers of bats may be hibernating in the church in the winter months of December, January, and February. Licences issued by Natural England rarely allow the disturbance of hibernating bats.
- The optimal period for undertaking the proposed work at St Edmunds is September and October in any year. Work can continue potentially continue into November, if required, subject to suitably mild (>8°C) and dry weather conditions.
- A sub-optimal but potentially still allowable period for undertaking the proposed work at St Edmunds is March and April in any year. Note, however, that any work completed within this period must ensure that the breeding bats have a maternity roost site available to them before May. Work in this Spring period will also be subject to weather constraints i.e., bats are likely to be considered as 'hibernating' on cold (<8°C) and / or wet days and as such disturbance must be avoided.
- The work could be completed via either an EPSML or a BiCCL – see section 2. A Named Ecologist would need to be appointed by the Licensee for an EPSML, whereas a Registered

Consultant (RC) would work alongside a Licensee for a BiCCL. Typically, an EPSML is more costly to collate and acquire than a BiCCL. Natural England can also take up to 60 working days to process an EPSML application whereas a BiCCL application is usually turned around within c.30 days. On the above basis it is recommended that the work at St Edmund's is completed via a BiCCL.

- Once the licensed work onsite commences the Named Ecologist or RC would need to direct the work in respect of the bats and attend site regularly. The Named Ecologist or RC (or their suitably experienced representative) must be present during all work of higher risk to bats to minimise the likelihood that any are harmed or unnecessarily disturbed.
- At least three bat boxes suitable for soprano pipistrelles should be installed on trees within the grounds of St Edmund's prior to work commencing onsite, to provide alternative roost habitat for any bats that may need relocating by the Named Ecologist or RC during the licensed work.
- At least two years of monitoring will be required following completion of the licensed work – see Objective 3.

6.2.5 Full detail of the proposed bat mitigation strategy will need to be set out in the licence application to Natural England.

#### Objective 2

6.2.6 The proposed work on the church ceiling comprises the principal strategy intended to achieve Objective 2. The simultaneous aims of this approach are to stop bats from accessing and flying inside the church, which thereby prevents the negative impacts from their deposited droppings and urine, while providing a suitable roost with continuing ecological functionality for the soprano pipistrelles in the nave roof.

6.2.7 The success or otherwise of the proposed bat mitigation strategy in meeting Objective 2 will be evaluated in consultation with the regular church users at the end of the first and second summers following the proposed work on the ceiling; for example, by revisiting and updating the previous Bat Roost Report Form findings.

#### Objective 3

6.2.8 Robust monitoring at St Edmund's is imperative to allow a comprehensive appraisal of the success or otherwise of the bat management and mitigation strategies, and to establish whether the FCS of the local population of soprano pipistrelles is being maintained. Establishing this is essential because the law that usually protects the bats and their roosts will have been derogated under any licence on this basis.

6.2.9 The proposed bat mitigation measures at St Edmund's must also ensure that the primary ecological function of this church for the local populations of soprano pipistrelles is maintained. The current primary ecological function of the church for this species is to provide suitable conditions for a maternity roost of >1000 adult female bats and their young. The adult females congregate at St Edmund's in noticeable numbers in May, after the hibernation and spring flux periods, presumably because the church roost is warm, sizeable, and sheltered enough to allow them to give birth mid-summer and to rear their pups largely undisturbed. Once the juvenile bats are weaned and volant most of the soprano pipistrelles probably then disperse from the church through September and October. It is likely that low numbers of soprano pipistrelles also roost in some areas of the church in the autumn and / or spring. Low numbers of bats may also hibernate in it during the colder winter months.

6.2.10 Section 6.3 below provides the criteria for evaluating the success of the bat mitigation strategy. The recommended post-intervention monitoring strategy for St Edmund's should initially align with the survey effort of the baseline surveys – see appendix 9.3 – and annex B of the BiCCL i.e., one daytime inspection (by a licensed bat ecologist), three dusk emergence surveys, and one pre-dawn re-entry survey should be completed in the first summer post-intervention. This level of monitoring effort is

important to help establish whether there are any initial issues with the licensed work and the bat mitigation strategy.

- 6.2.11 The level of monitoring effort in the second summer will be dependent on the outcome of the monitoring in the first summer. If the first summer of monitoring determines that the bat mitigation strategy has been successful – see section 6.3 – then the level of monitoring in the second summer can be reduced to two dusk emergence surveys. If, however, the monitoring in the first summer determines that the bat mitigation strategy may have been unsuccessful, then monitoring in the second summer should align with that of the first summer.
- 6.2.12 Note that additional interventions may also be required during the monitoring as part of an adaptive management plan to be agreed with Natural England.
- 6.2.13 The monitoring in the first two summers post-intervention should be led by the Named Ecologist or RC. Beyond this, however, monitoring could be undertaken by volunteers from the local bat conservation group.

### 6.3 Criteria for Assessing Success

- 6.3.1 An initial favourable outcome for the bat management strategy at St Edmund's will comprise clear evidence that soprano pipistrelles have used the roost in the nave roof post-work.
- 6.3.2 Beyond this, using the findings of the 2021 B.A.T. Ecological bat surveys as a baseline, the following criteria will be used to evaluate whether it is likely that the FCS of the local population of soprano pipistrelles has been maintained following the licensed work.

#### Success

- 6.3.3 The bat management and mitigation strategies will be considered a success if the monitoring shows that 750 or more adult female soprano pipistrelles have used the church roost during the annual pre-partum period (i.e., before the end of June). This figure allows for a 25% reduction in the number of bats using the church since 2021. In this scenario it could reasonably be assumed that the roost could recover to its original size (>1000 adult females) and that this initial reduction in usage is at least partly due to natural population changes, such as an inclement spring leading to the late formation of maternity roosts, some bats not surviving the winter months, or bats naturally using alternative roosts (see Zeale *et al.*, 2014 and Stone *et al.*, 2015).

#### Partial Success

- 6.3.4 A sub-optimal but still acceptable outcome from the monitoring would comprise 500 adult female soprano pipistrelles using the church during the annual pre-partum period. This would comprise a noticeable 50% reduction in the size of the roost at St Edmund's, however, based on recent research (Zeale *et al.*, 2014 and Stone *et al.*, 2015) it could reasonably be assumed that the FCS of the local soprano pipistrelle population was still being maintained because some of the bats from the church colony may have opted for alternative suitable roosts nearby.

#### Failure

- 6.3.5 The bat management and mitigation strategy would be considered unsuccessful if no more than 250 soprano pipistrelles were recorded using the church during the licensed monitoring period. This would comprise at least a 75% reduction in the roost size. In such a scenario consultation with Natural England would be required, to agree whether an adaptive management strategy would be required. This may involve reversing some, or all, of the licensed interventions, and / or work to establish whether most of the colony had moved to a secure alternative nearby maternity roost, to determine whether FCS might have been maintained despite the apparent failure of the bat mitigation measures.
- 6.3.6 Importantly, success or otherwise will also be measured in terms of bat welfare. Any harm to, or the death of, a bat could reasonably be deemed as the failure of the proposed bat mitigation strategy.

## 6.4 Recommended Programme

6.4.1 Table 6.4.1 provides a recommended programme for the bat mitigation work at St Edmund's.

Table 6.4.1: Recommended programme for the bat mitigation work at St Edmund's.

<u>Item</u>	<u>Timescale</u>	<u>Description</u>
1	Winter 2021-22	Application for Faculty or List B Archdeacon's licence (accompanied by BMP and indicative costings) by Architect.
2	Spring 2022	Appoint Ecologist. Licence application to Natural England.
3	Spring / Summer 2022	Contractor tender and instruction. Installation of bat boxes by Ecologist.
4	September / October 2022	Licensed repairs / replacement of ceiling, as directed by Ecologist and Architect.
5	Summer 2023	Post-intervention monitoring, year 1.
6	Summer 2024	Post-intervention monitoring, year 2 (and licence returns).

## 7 Indicative Costings

7.1.1 The indicative costings provided in Table 7.1.1 for the bat mitigation work at St Edmund's are based on the programme provided in Table 6.4.1. Costs provided are exclusive of VAT where applicable.

Table 7.1.1: Indicative costings for the bat mitigation work at St Edmund's.

Item / Order	Capital Work	Materials	Architects Fees	Ecologists Fees
1	N/A	N/A	£600-900	N/A
2	N/A	N/A	N/A	£1600 – EPSML or £800 - BiCCL
3	N/A	£250	£600	£450
4	£4,000 (including scaffolding)		£600	£2,000
5	N/A	N/A	N/A	£4,000
6	N/A	N/A	N/A	£2,000-£4,000

7.1.2 The costings provided above are indicative and actual costs may be more or less than these figures. It is recommended that a 20% contingency fund be set aside in addition to the costs above.

## 8 References

- Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edition)*. The Bat Conservation Trust, London.
- Packman, C.E., Zeale, M., Harris, S. and Jones, G. (2015) *Management of Bats in Churches – a pilot*. English Heritage Research Project: 6199.
- Packman (2016) *Wild Frontier Ecology – St Nicholas Church, Stanford on Avon, Northamptonshire – Bats in Churches Class Licence Trial*. Wild Frontier Ecology, Norfolk.
- Stone, E., Zeale, M.R.K., Newson, S.E., Browne, W.J., Harris, S. and Jones, G. (2015) *Managing Conflict between Bats and Humans: the response of soprano pipistrelles (*Pipistrellus pygmaeus*) to exclusion from roosts in houses*. PLoS One 10(8).
- Zeale, M.R., Stone, E., Bennitt, E., Newson, S., Parker, S., Haysom, K., Browne, W.J., Harris, S. and Jones, G. (2014) *Improving mitigation success where bats occupy houses and historic buildings, particularly churches*. Defra Research Project WM0322 Final Report.
- Zeale, M.R.K., Bennitt, E., Newson, S.E., Packman, C.E., Browne, W.J., Harris, S., Jones, G. and Stone, E. (2016) *Mitigating the Impact of Bats in Historic Churches: the response of Natterer's bats *Myotis nattereri* to artificial roosts and deterrence*. PLoS ONE 11(1): e0146782.

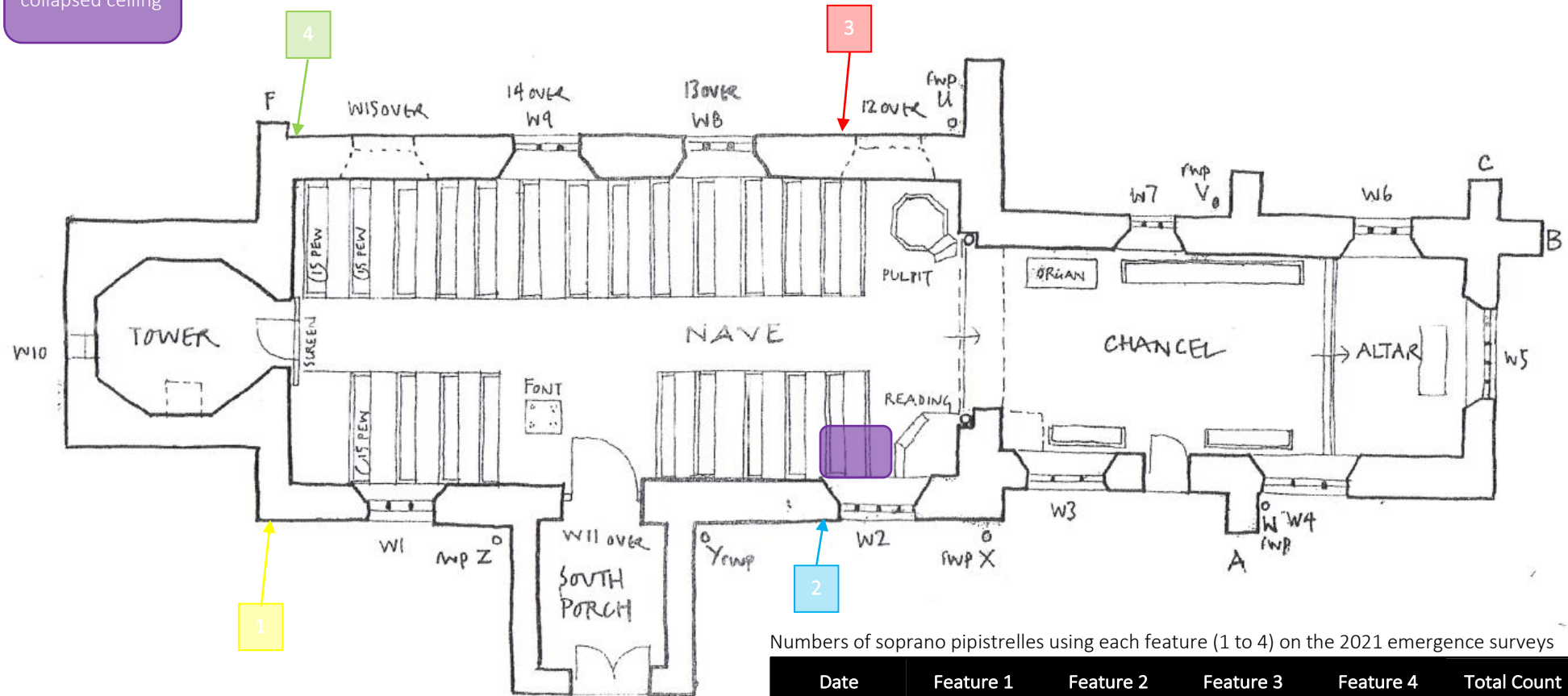
## **9 Appendices**



### 9.1 Plan of 2021 Bat Survey Results at St Edmund's, Egleton

Approx. area of collapsed ceiling

1 to 4 = locations of features used by the soprano pipistrelles to egress and access the maternity roost in the nave roof – see section 3.2



Numbers of soprano pipistrelles using each feature (1 to 4) on the 2021 emergence surveys

Date	Feature 1	Feature 2	Feature 3	Feature 4	Total Count
3 June	372	388	257*		1017
4 August	240	284	7	32	563
31 August	136	208	1	2	347

## 9.2 Additional Photographs

Photograph 9.2.1: St Edmund's at sunrise, viewed facing south-west from the north-east corner.



Photograph 9.2.2: Location of some small gaps used by bats to access the church interior. View facing east.



Photograph 9.2.3: Staining and pitting of the alabaster font at St Edmund's, likely caused by bat urine.



Photograph 9.2.4: View of the nave from the chancel.



Photograph 9.2.5: View of the chancel from the nave.



Photograph 9.2.6: The hole in the ceiling of the nave.



### 9.3 B.A.T. Ecological 2021 Bat Survey Methods

#### Daytime Bat Roost Assessments and Inspections

- 9.3.1 An initial bat roost assessment and inspection of the church was completed on 7 April 2021. The principle aims of this initial site visit were to assess the suitability of the various building features within the church for roosting and hibernating bats, and to undertake a search for evidence of bat presence, typically indicated by bat droppings, the remains of prey (such as discarded moth wings), characteristic staining from urine or fur, or the presence of live or dead bats. This site visit was also intended to facilitate planning of the nocturnal surveys in the summer of 2021.
- 9.3.2 Following on from the initial daytime assessment and inspection, the church interior was assessed again for the above evidence of bat activity prior to the three dusk emergence surveys – see below for dates – to help establish whether the areas of bat activity change through the summer.

#### Nocturnal Bat Surveys

- 9.3.3 Four nocturnal bat surveys – three dusk emergence surveys and one pre-dawn re-entry survey - were undertaken at St Edmund's in the summer of 2021. The main aims of these bat activity surveys were to determine the status of the bat roosts at the church and to identify the main areas of bat activity.
- 9.3.4 Each emergence and re-entry survey involved at least four suitably experienced surveyors watching and listening with bat detectors for any bats exiting from or entering the church, including at least one stationed inside the church on each survey. A minimum of four high-specification infrared cameras (and accompanying infrared illuminators) were used on each survey – see Equipment section for further detail.
- 9.3.5 Key information regarding possible bat roosts in the church were recorded by surveyors, such as any exit or entry points, roosting locations (suspected or confirmed), any notable flight-lines, times of bat activity, and the bat species concerned.
- 9.3.6 The nocturnal surveys were all undertaken within the optimum period for bat activity as stated in Collins (ed.) (2016), which is May through September. They were also undertaken within each of the required periods according to Natural England BiCCL criteria (Annex B).
- 9.3.7 Table 9.2.1 shows the dates and timings for each of the nocturnal surveys undertaken at St Edmund's in the summer of 2021. To allow for any early bat activity the emergence surveys all commenced at least 20 minutes before dusk and extended for at least 90 minutes post-sunset to maximise the likelihood of recording relevant soprano pipistrelle activity. Similarly, the re-entry survey commenced over two hours before dawn and extended until beyond sunrise to allow surveyors more opportunity to observe key bat activity.

Table 9.2.1: Survey dates and timings for each of the nocturnal surveys at St Edmund's in 2021.

Date	Sunset / Sunrise Time	Civil Twilight Starts / Ends	Survey Start Time	Survey End Time
3 June	21:19	22:07	20:40	22:50
4 June	04:42	03:54	02:20	05:00
4 August	20:49	21:30	20:25	22:50
31 August	19:52	20:28	19:30	21:45

- 9.3.8 The weather was conducive for bat activity on all of the nocturnal surveys as demonstrated by multiple bats being active in flight on each visit.

#### Equipment

- 9.3.9 Equipment used for the daytime assessments and inspections comprised a combination of the following: high-powered Cluson Clulite CB2 and Clu-Briter 1000 lumen torches, ≥450 lumen Lenser P7 LED hand-torches, close-focusing Nikon and Pentax binoculars, a Ridgid Seesnake CA-300 endoscope, an Apple iPad and Panasonic Lumix DC-FZ82 digital camera for photographs, and telescopic ladders for access at height.
- 9.3.10 High-specification infrared (IR) and thermal imaging (TI) equipment was used on all nocturnal surveys to support surveyor observations. These units comprised a FLIR Scion OTM266 thermal monocular, a Canon XA-30 camera illuminated by a Dedolight DLOBML-BI-IR Redzilla infrared on-board camera LED light head (860 to 960 nm), three Canon XA-11 cameras illuminated by the Dedolight DLOBML-BI-IR or Dedolight DLOBML-IR860 iRedzilla infrared on-board camera LED light heads, and a Panasonic HC-VX980 illuminated by an Evolva T20 infrared light and an infrared floodlight.
- 9.3.11 Bat detecting equipment used on the nocturnal bat activity surveys comprised a combination of the following FS or Time Expansion units (with Heterodyne audio): four Elekon Batlogger M's, an Anabat Scout, a Pettersson D240x, and two Wildlife Acoustics EMT Pro's.
- 9.3.12 Bat call analysis software used comprised the current versions of Wildlife Acoustics' Kaleidoscope Pro, Titley's Anabat Insight, Elekon BatExplorer, or Pettersson BatSound.
- 9.3.13 Two-way Baofeng radios were used by the surveyors on each survey to communicate relevant survey events.

#### Personnel

- 9.3.14 Matt Cook BSc (Hons) MSc MCIEEM led all of the 2021 bat surveys of St Edmund's. Matt is a BiCCL Registered Consultant (RC) with Natural England.
- 9.3.15 Matt has been a professional bat ecologist and consultant for >13 years. He has been licensed by Natural England to undertake bat surveys for >10 years and he has held the advanced (Level 2) BiCCL since its inception in 2017. In 2017 Matt also acquired the Natural England Bat Low Impact / Mitigation Class Licence. Matt has been licensed to undertake professional bat surveys to an advanced level in England (Class licence levels 3 and 4) since 2014 (licence references 2015-10167-CLS-CLS & 2015-10176-CLS-CLS).
- 9.3.16 During his time as a professional bat ecologist Matt has led innumerable bat surveys and managed many complex bat projects. He has been the Named Ecologist or RC on over 30 mitigation licenses issued by Natural England for development and renovation work affecting bat roosts of different species and conservation importance in various buildings and structures, including several with heritage listed status. Matt has also been Licensed and Accredited to catch and radio-tag bats on several major infrastructure schemes, and to act as a Lead Ecological Clerk of Works and Accredited Agent in respect of bats on these schemes.
- 9.3.1 Matt is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and is therefore bound by its professional Code of Conduct.
- 9.3.2 For the nocturnal surveys Matt was assisted by the following experienced bat surveyors:
- James Whiteford MSc CEcol - Natural England Level 2 Class Licence (2015-14621-CLS-CLS), c.12 years' relevant professional experience.
  - Amy Trewick BSc ACIEEM - Natural England Level 2 Class Licence (2018-37960-CLS-CLS), c.9 years' relevant professional experience.
  - Nikki Morton MSc ACIEEM - Natural England Level 1 Class Licence (2019-43123-CLS-CLS), c.5 years' relevant professional experience.
  - Nick Clayton – Natural England Level 2 Class Licence (2020-49905-CLS-CLS), c.3 years' relevant professional experience.
  - Chris Almond – c.4 years' relevant professional experience.
  - Katrina Caine - c.1 years' relevant professional experience.

**END OF REPORT**

