

St Mary the Virgin Church, Salford Bat Management Plan

Prepared for Natural England Bats in Churches Project

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Prepared by: 
Simon Parker
Principal Consultant
29/10/2021

Checked and Approved 

for Issue by:
Gareth Blockley
Principal Consultant
30/10/2021

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1 INTRODUCTION

1.1 Purpose of Document

This Bat Management Plan has been completed in connection with the Natural England Bats in Churches Project, which was set up to help address issues relating to bats within Church buildings. The plan relates to St Mary the Virgin Church in Salford, Bedfordshire, MK17 8BB (OS Grid Reference SP 93584 39093). The location of the Church is shown in *Figures 1* and *2*.

At present the Church is used for weekly services, however the presence of bats at their current levels is creating droppings in volumes that cannot be managed by the number of volunteers available. This means that services are currently being held in the Chancel, with a tarpaulin screen separating the Chancel from the Nave to prevent bats having access into this area of the Church. The Parishioners have made bespoke cloth covers for the existing pews and sheets have been placed over the remaining monuments and font, the result of this is a Church which appears to be in hibernation.

The Bats in Churches Project were contacted by members of the Church community to attempt to find some way of managing the bats within in the building so that their presence causes less of an impact in terms of cleaning burdens and damage to the interior.

Survey visits completed by Turnstone Ecology Ltd consisted of a Preliminary Roost Assessment (PRA) and Bat Activity Surveys (three dusk emergence and one dawn return), which have allowed a current assessment of activity levels at the Church. Previously Natural England Volunteer Bat Roost Visits and visits by Bedfordshire Bat Group have been completed, with four recorded visits taking place between 1987 and 2018.

The initial site visit by Turnstone Ecology was carried out on 29th April 2021, with dusk surveys then completed on 16th June, 12th July and 9th August 2021 and a single dawn survey followed the July survey.

This report details the survey and assessment methodology and the results of a desk-based study and on-site surveys. It also provides a selection of management proposals to reduce or mitigate the impacts of bats within the Church.

Acknowledgements

We would like to extend our heartfelt gratitude to Cilla Pumfrey and Maurice Rust of the PCC along with Bob Cornes and the volunteers from Bedfordshire Bat Group for their time and assistance with the project, all your efforts are hugely appreciated.

Figure 1. Location of Church

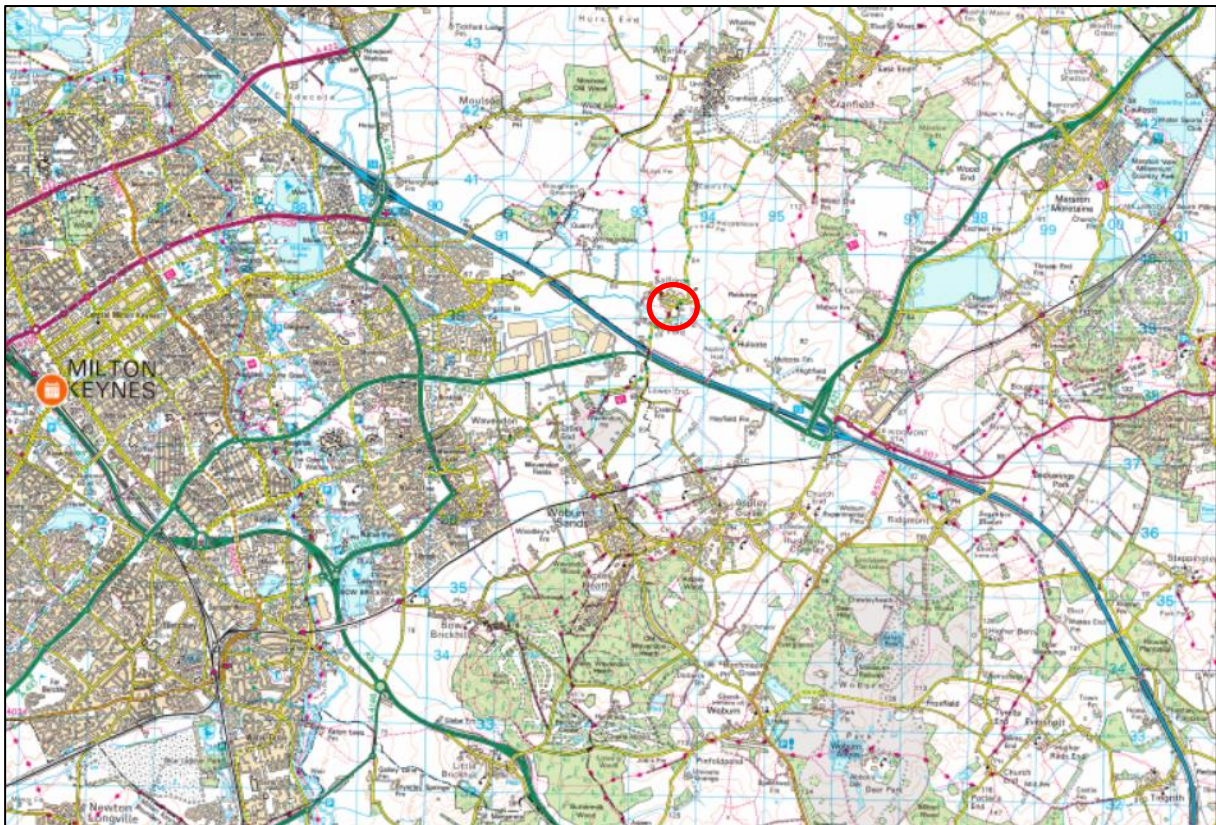
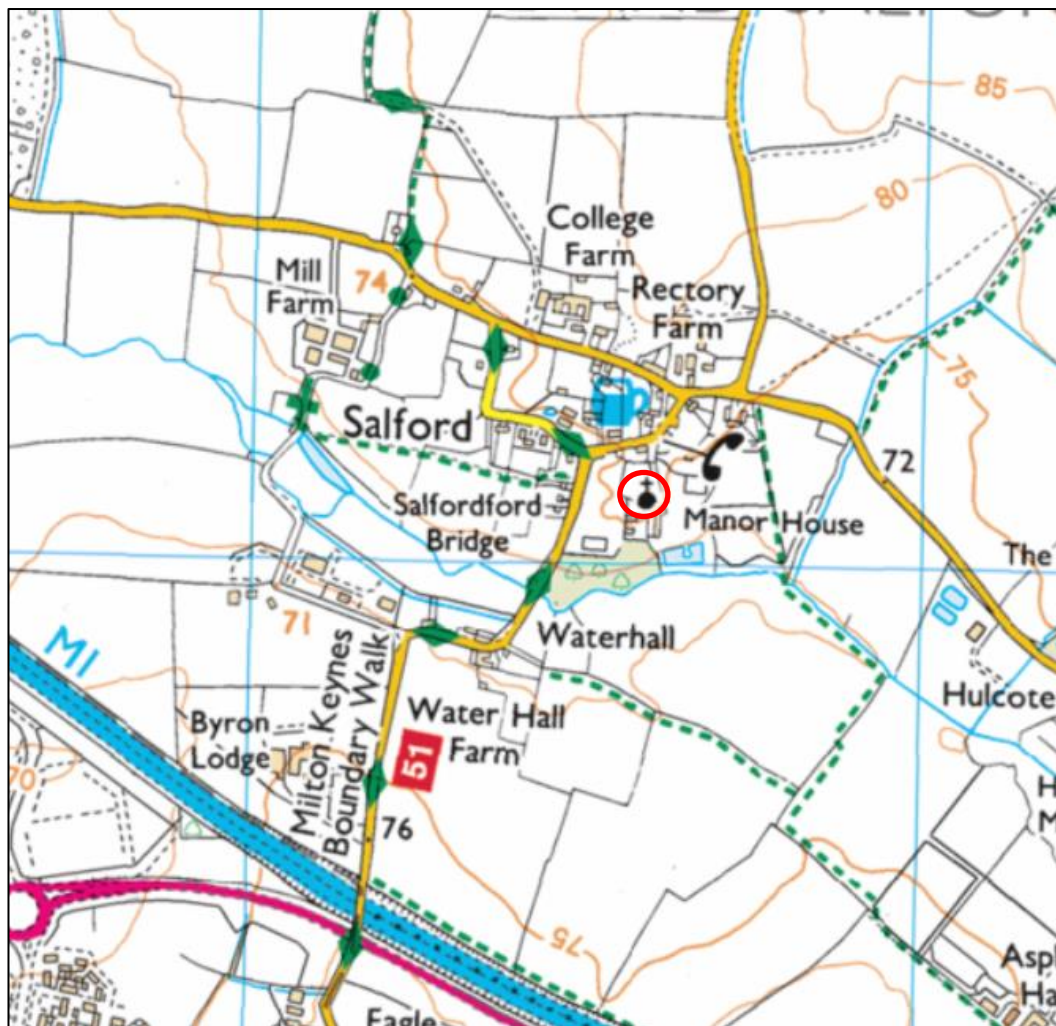


Figure 2. Location of Church within Salford Village



1.2 Background to the Bat in Churches Project

The following excerpt is taken from the Project documentation;

The Bats in Churches project is a pioneering endeavour to empower church communities to co-exist with their resident bats. It is a unique cross-sectoral partnership of organisations with distinctive priorities, led by Natural England, and involving the Church of England, the Bat Conservation Trust, the Churches Conservation Trust and Historic England. Lasting five years (2019 – 2023), the project is largely funded by the National Lottery Heritage Fund after a successful development phase.

England's bat populations are robustly protected under the Wildlife and Countryside Act 1981 and other legislation. Nonetheless, bat populations have declined as a result of agricultural intensification and conversion of old buildings such as barns. With the loss of veteran trees and old buildings churches have become an increasingly important roosting sites for bats. Unlike in dwellings, where bats and people are separated, the architecture of churches means that churches can suffer from bat faeces and

urine, smell, and damage to church fabric. This places a great burden on congregations and clergy and threatens the use and preservation of the church.

Many churches are not only places of worship but also act as important community hubs hosting a range of activities, from shops and post offices to concerts and crèches. They provide safe places for youth groups, asylum seekers, food banks and credit unions. In rural areas they are often the only open public building left in a neighbourhood. They are an important part of our local and national heritage. 78% of Church of England Churches are listed and 100% of churches belonging to the Churches Conservation Trust are listed as buildings of historical significance. They also contain unique, historical artefacts, which may be nationally important and irreplaceable.

Working with 108 Grade I, Grade II and Grade II* churches across England the Bats in Churches project aims to transform support for the church communities, caring for nationally historic churches, which contain protected bat roosts. The Bats in Churches project will:

- Work collaboratively to find practical solutions in the most severely affected churches in England to reduce the physical and social impacts of bats without causing them harm.
- Engage new and existing audiences in the appreciation and understanding of the built and natural heritage of churches.
- Build a sustainable network of skilled volunteers willing to support churches with bats.
- Facilitate positive communication between bat and church groups to help each understand the issues involved and find collaborative solutions.
- Address the national shortage of specialist advice by enhancing networking and skills in the professional sector to implement bat management solutions in churches.
- Improve the available scientific data on how bats use churches and the prevalence of bats in English churches.

1.3 St Mary the Virgin Church

St Mary the Virgin Church is a Grade I listed Church, the building is largely 13th century but with an open bellcote which was added during the Victorian era. The Church comprises an open Porch, Nave, South Aisle, Chancel and Vestry. The Nave roof is lined with sarking boards with exposed supports throughout, in some places there are obvious gaps into the wooden mortise joints along with gaps between the terminal rafters and Chancel arch wall. The South Aisle also has gaps into mortise joints and gaps between the Arcade wall and wall plate. The Chancel has some exposed wood but no gaps suitable for bats, the roof here is lined with lath and plaster. At present the Nave is more or less unused, due to the levels of bat presence - along with the expense of heating the larger space, meaning ceremonies and services are currently held within the Chancel. To exclude bats from the Chancel a temporary screen constructed from agricultural tarpaulin and wooden framing was erected at the Chancel/Nave arch approximately 10 years ago. This has a significant visual impact to the interior of

the Church and although it can be removed to accommodate larger services this is a laborious process requiring multiple people and temporary scaffolding.

The Church grounds extend to an area of approximately 0.29ha around the Church building and contain a number of mature trees, a Lychgate and graveyard. There are large residential properties to the east and south, with the village centre immediately to the north. In the wider surrounds are gardens, horse paddocks and small areas of woodland.

2 METHODS

2.1 Desk-based Study

Information relating to designated sites, sites where European Protected Species (EPS) Licences have been granted between 2009 and 2019 and historic records of protected species within 2 km of the proposed development site will have been obtained from Magic (www.magic.gov.uk) and other freely available information on the internet, such as planning portals and species distribution maps.

Any species-specific historic records are detailed within the relevant species accounts in the *Results* section.

2.2 Preliminary Roost Assessment

The PRA Survey was carried out by Simon Parker and Tristan Evans of Turnstone Ecology. Simon holds a Natural England Class Licence and the Bats in Churches Class Licence (2015-14470-CLS-CLS and B32-RC024 respectively) and Tristan holds the Natural England Class Licence (2016-22374-CLS-CLS), for the disturbance of bats for all counties of England.

A detailed inspection was made of the exterior and interior of the Church for any evidence of bat use, such as live or dead bats, droppings, scratch marks, staining and prey remains, and in some cases the absence of cobwebs around potential entry points.

Features identified as possible bat access points or potential roosting locations were thoroughly searched where possible, using powerful torches and binoculars to facilitate the process. An endoscope and ladders were also used to enable more detailed inspection of cracks and crevices as far as access allowed.

Prior to the initial inspection the Church Nave had not been cleaned since 26th September 2020, meaning accumulations of droppings since this point would have been obvious.

Prior to each activity survey the Church was re-checked, with the levels of fresh evidence reassessed. The Nave was cleaned within a week of each activity survey meaning there was accumulated bat evidence (droppings/urine staining) from approximately three weeks on each occasion.

2.3 Activity Surveys

Based on the Bats in Churches best practice guidelines, four activity surveys were undertaken, with three dusk emergence surveys (16th June, 12th July and 9th August 2021) and one dawn return survey (13th July 2021). The surveys were undertaken in a range of weather conditions which allowed for variation in the behaviour of bats inside and outside the Church to be observed.

Each activity survey was completed by members of staff from Turnstone Ecology along with volunteers from Bedfordshire Bat Group, with a minimum of eight personnel present for each dusk survey and seven for the dawn (*Figure 3*). Evening emergence and dawn return surveys are the primary methods for locating roosts and entry/exit points in buildings or built structures, as bats are not always found by internal and external inspection surveys (*e.g.*, if the bats roost in areas that cannot be searched and/or leave little or no visible trace). These surveys can also give a reasonable estimate of the number of bats present – the use of thermal or infra-red cameras can help determine more accurate roost counts.

The surveyors used Wildlife Acoustic EM Touch 2 Pro, Batbox Duet and Batbox Baton XD Bat Detectors and noted information on time, species and behaviour on to survey forms. Bat calls were continually recorded for the duration of the survey to ensure all bat activity was saved. Audio tracks were downloaded and assessed using the appropriate software to confirm the identity of bats noted during the survey. In addition to the manned survey locations, three Canon XA infra-red cameras were used along with a single Pulsar Axion thermal imaging camera (*Figure 4*). The night vision systems allowed the interior of the Church and the main exit points to be surveyed without the need for additional lighting and as such give an undisturbed view of the behaviour of the bats.

All parts of the Church were covered during the survey with the surveyors able to position themselves so any activity could be clearly observed, either in person or with infra-red/thermal cameras. General activity around the site could also be recorded from the surveyor locations, for example the direction bats flew when leaving the site to forage in the wider countryside.

Figure 3. Location of surveyors around the Church blue stars dusk, green squares dawn

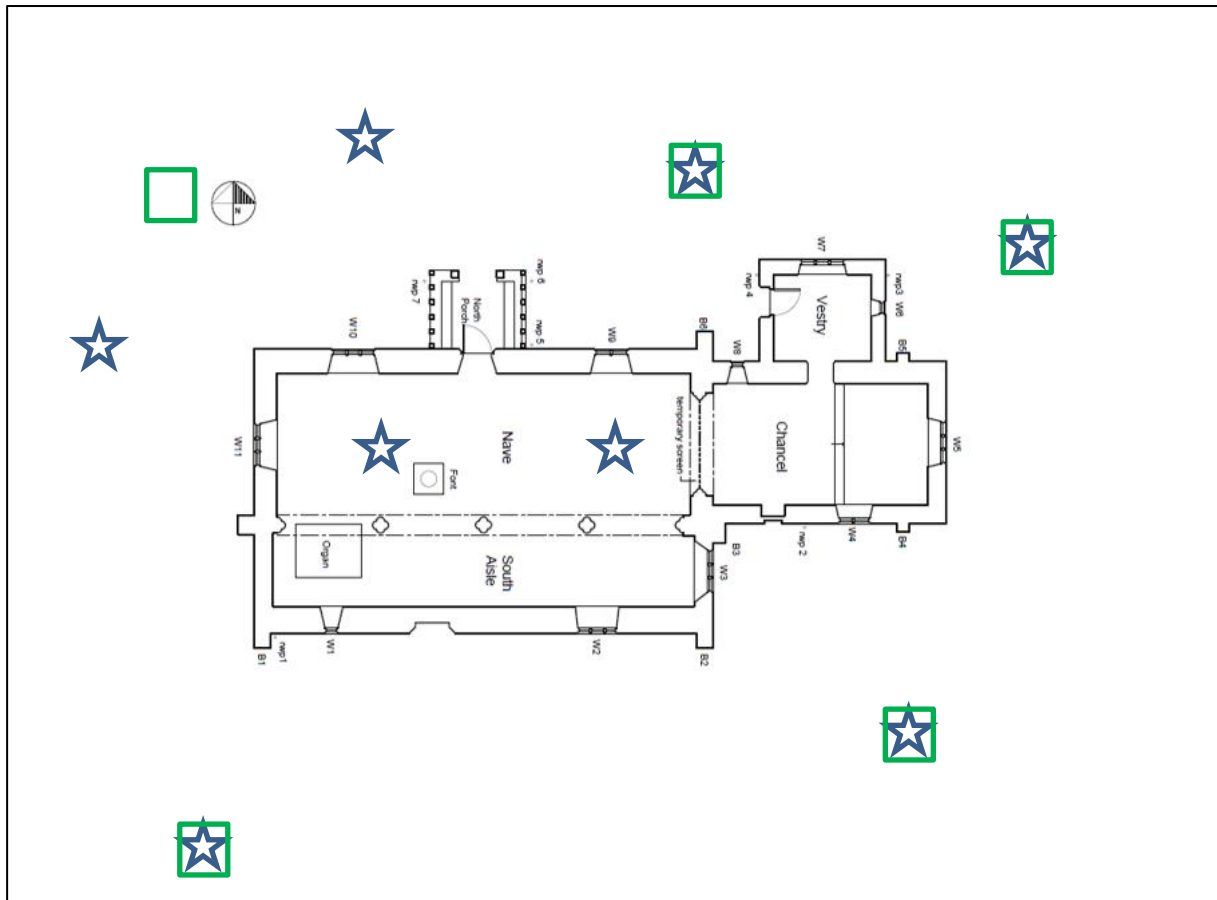


Figure 4. Location of cameras around the Church – red = Infrared, blue = Thermal

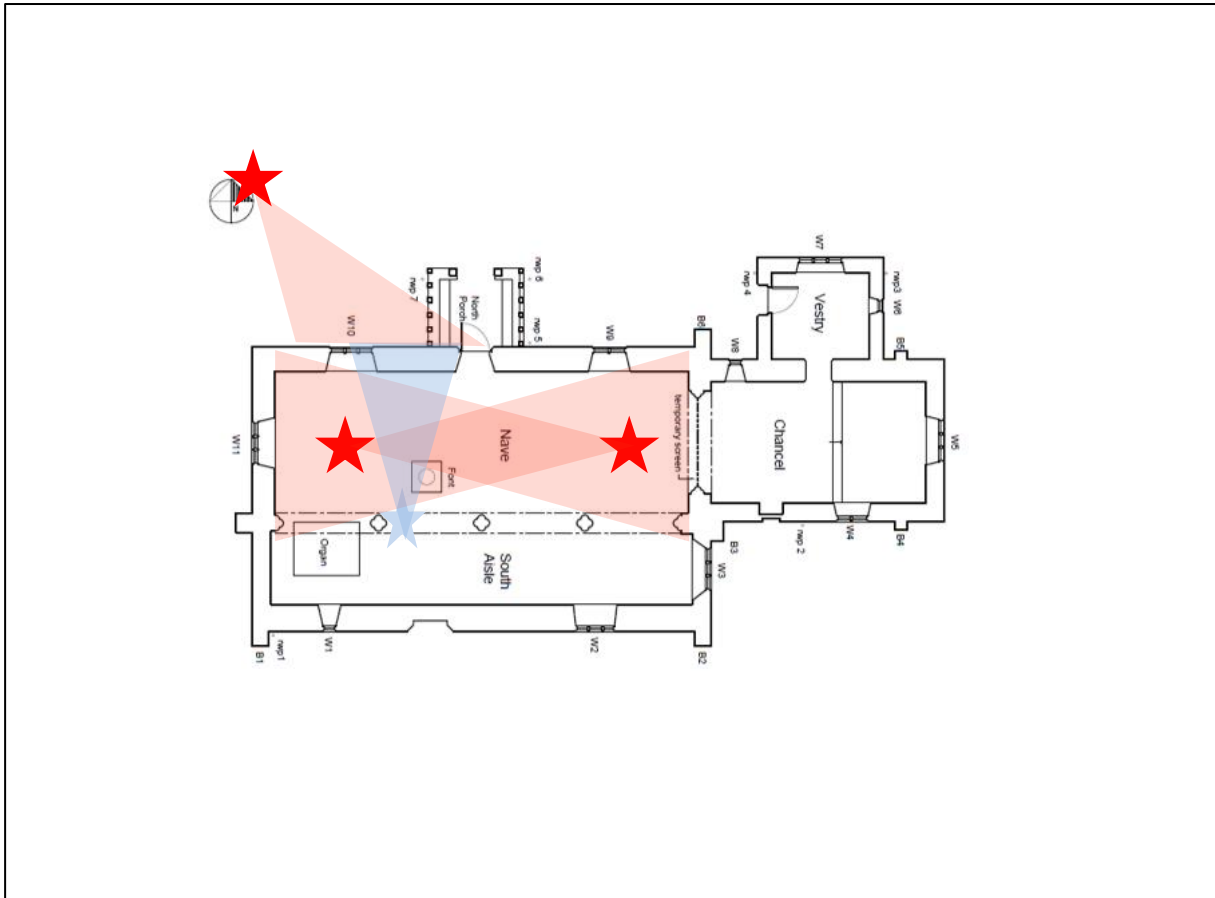


Table 1. Activity Survey timings and conditions

	Dusk Survey 16/06/2021		Dusk Survey 12/07/2021		Dawn Survey 13/07/2021		Dusk Survey 09/08/2021	
	Start	End	Start	End	Start	End	Start	End
Time	21:10	23:15	21:10	23:10	03:30	04:58	20:30	23:15
Temp (°C)	22	20	18.3	16.6	13	14	14.3	13.7
Wind (Beaufort)	0	0	0	0	1	1	0	0
Cloud (Octas)	8	8	8	6	1	1	8	8
Precipitation	Light rain near start of survey		None		None		Rain at approx. 60 mins for 15 mins	
Sunset/rise	21:24		21:19		04:58		20:45	

3 RESULTS

3.1 Desk Study

3.1.1 Designated Sites

There are no statutory designated sites with bats in the citation within 5km of the proposed development site.

3.1.2 European Protected Species Licence Sites

The proposed development site is located within 5 km of the following five sites that have obtained Natural England EPS mitigation licences between 2009 and 2019:

- 2016-21294-EPS-MIT was issued in 2016 at a site 2.5 km southwest of the Church site for the damage/destruction of resting places of Common Pipistrelle (*Pipistrellus pipistrellus*).
- 2015-9837-EPS-MIT was issued in 2015 at a site 3.4 km southeast of the Church site and was for the destruction of resting places of Common Pipistrelle and Brown Long-eared Bats (*Plecotus auritus*).
- 2014-4325-EPS-BDX was issued in 2014 at a site 3.4 km south of the Church site and was for the destruction of breeding places of Common Pipistrelle and Soprano Pipistrelle (*Pipistrellus pygmaeus*).
- 2015-9585-EPS-MIT was issued in 2015 at a site 4.3 km south of the Church site for the destruction of a resting places of Common Pipistrelle and Brown Long-eared Bats.
- 2014-3521-EPS-MIT was issued in 2014 at a site 4.8 km south of the Church site and was for the destruction of breeding places of Common Pipistrelle.

3.1.3 Previous Surveys at the Church Site

The Church site has been subject to a number of visits prior to 2021, with representatives from Bedfordshire Bat Group and Natural England's Volunteer Bat Roost Visitor (VBRV) scheme carrying out inspections in:

- 1987 - finding evidence of Pipistrelles and Brown Long-eared Bats
- 1999 - finding evidence of Pipistrelles and Brown Long-eared Bats
- 2005 - finding evidence of Natterer's Bats and Brown Long-eared Bats
- 2018 – finding evidence of Pipistrelles and Myotis species bats

3.2 Building Description

St Mary the Virgin Church is a Grade I listed Church which was mostly constructed in the 13th century but with an open Bellcote which was added during the Victorian era, and a Vestry that was added in the late 19th/early 20th centuries. The Church comprises an open Porch, Nave, South Aisle, Chancel and

Vestry. The walls are solid stone throughout with the interior of the Church plastered and painted but the exterior having exposed stonework on all walls. The Nave roof is approximately 8m in height and is lined with sarking boards with exposed supports throughout. In some places there are obvious gaps into the wooden mortise joints along with gaps between the terminal rafters and Chancel arch wall. The South Aisle also has gaps into mortise joints and gaps between the Arcade wall and wall plate. The Chancel roof height is lower, at approximately 6m, the roof is lined with lath and plaster with exposed rafters but no gaps suitable for bats.

Externally the Church roof is a combination of clay tiles over the Vestry and Porch, and larger concrete tiles over the Nave. The Bellcote has a wooden frame and a covering of small slates. The Porch also has an open wooden frame with several open mortise joints

Plates 1-6 show the exterior of the Church while *Plates 7-9* show the interior.

Plate 1. Showing northern aspect of Church, with Porch and Vestry visible



Plate 2. Showing western aspect of Church with Bellcote visible



Plate 3. Showing western half of southern aspect of Church



Plate 4. Showing eastern half of southern aspect of Church, including Vestry



Plate 5. Showing eastern aspect of Church



Plate 6. Showing eastern aspect of Church and northern aspect of Vestry



Plate 7. Showing interior of Nave looking west toward Bellcote



Plate 8. Showing interior of Nave looking east toward Chancel



Plate 9. Showing interior of Chancel looking east



3.3 Preliminary Roost Assessment

The interior and exterior of the Church were surveyed by Turnstone Ecology on 28th April 2021, during this survey two Common and two Soprano Pipistrelles were found roosting within the Porch. Both Soprano Pipistrelles were found within open mortise joints on the northern aspect and both Common Pipistrelles were found roosting above the stone archway above the main entrance door. Other open mortise joints suitable for roosting bats were identified around the Porch and droppings consistent with Pipistrelle species were found on the wooden frame.

Internally, the Pews within the Nave have been covered with white cotton sheeting to prevent damage from bat droppings/urine. At the time of the initial inspection there were 100's of scattered droppings consistent with Natterer's Bats and Pipistrelle species bats over these with more noticeable accumulations of droppings noted on the northern areas (*Figure 5*). A significant accumulation (>1000) of droppings consistent with Natterer's Bats was noted in the centre of the floor toward the eastern end of the Nave (*Figure 5, Location 2*). A smaller accumulation of droppings, along with urine staining was found below the Arcade archways between the Nave and South Aisle (*Figure 5, Location 3*). In addition to the droppings found on the floor of the Nave a large number of droppings were found on the walls in four locations (*Figure 5, Locations 1, 4, 5 & 6*) around potential roost or entry/exit locations. *Plates 10-14* show the evidence on the floor and walls.

No evidence of bats was identified within the Chancel or Vestry.

Figure 5. Showing locations of accumulated droppings and Pipistrelle bats found at the Church on 28th April 2021. Orange shapes signify accumulations of droppings

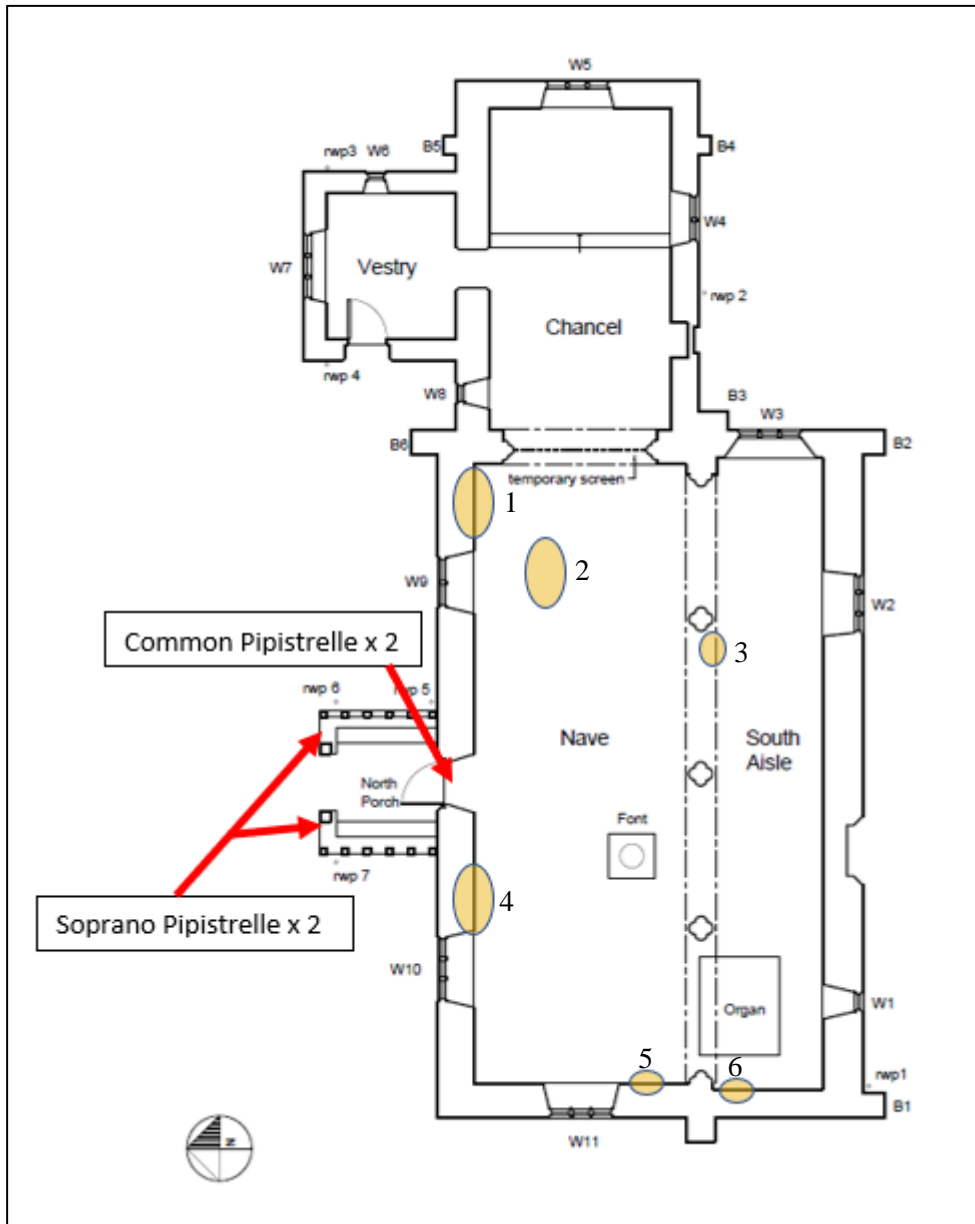


Plate 10. Showing droppings on wall at Location 1 (Figure 5)



Plate 11. Showing droppings on floor at Location 2 (Figure 5)



Plate 12. Showing droppings on wall at Location 3 (Figure 5)

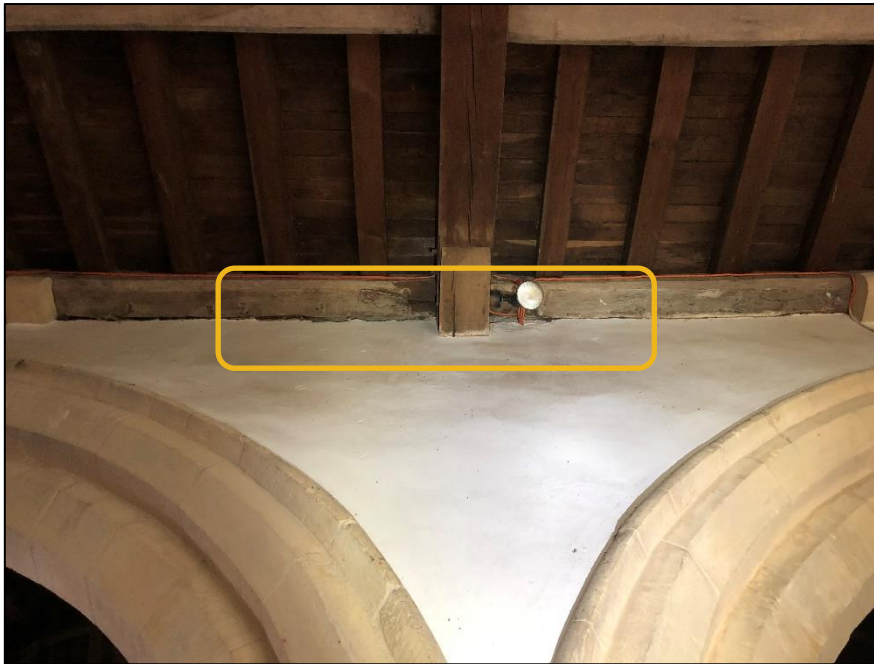


Plate 13. Showing droppings on wall at Location 4 (Figure 5)



Plate 14. Showing droppings on wall at Location 6 (Figure 5)



3.4 Activity Surveys

Activity surveys were completed in June, July and August, *Tables 2–5* show the results of the surveys and *Plates 15-18* show details of the observed activity.

3.4.1 Emergence Survey 16th June 2021

Table 2 – Results of 16th June Evening Emergence Survey

Time	Species	Activity	Location
20:45	Common Pipistrelle	Single bat roosting in gap	Arcade arch wall top in Aisle (<i>Figure 5 Location 3</i>)
21:42	Common Pipistrelle	Up to three individuals emerged inside Nave and flew internally before exiting the Church at walltop	<i>Plate 10 and Plate 15 Location A</i>
21:50	Common Pipistrelle	Two individuals emerged from tiles on Vestry	<i>Plate 15 Location B</i>

21:48 – 22:37	Natterer’s Bat	Up to 31 bats emerging internally before exiting the Church over a 20 minute period	Roosting at eastern end of Nave (<i>Plate 16</i>), and emerging <i>Plate 13</i> and <i>Plate 17 Location C</i>
23:15	Natterer’s Bat	Individual roosting in gap	Arcade arch wall top in Aisle (<i>Figure 5 Location 3</i>)

Plate 15. Showing emergence locations for Common Pipistrelle 16th June 2021

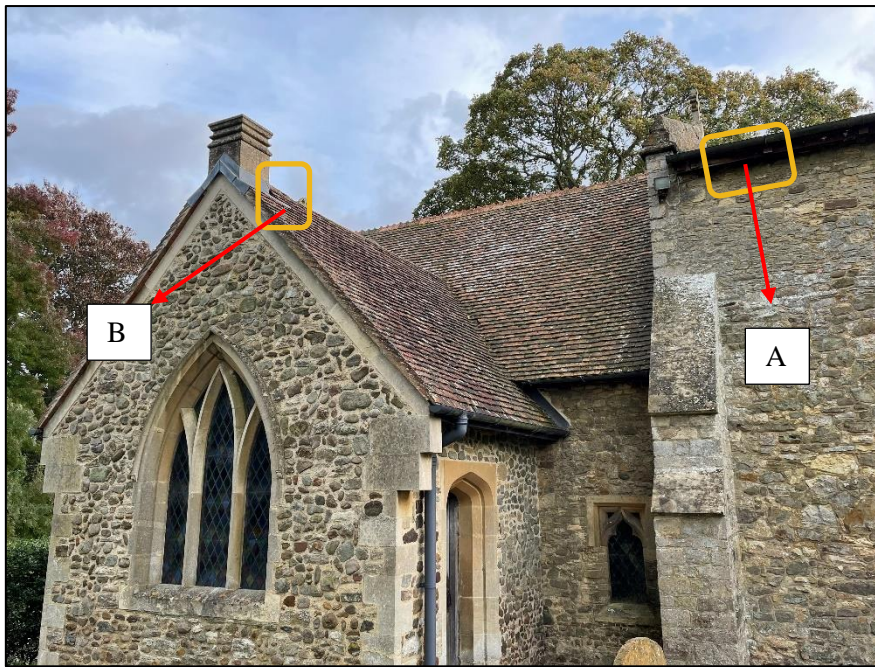


Plate 16. Showing roost locations for Natterer's Bats 16th June 2021



Plate 17. Showing emergence location for Natterer's Bats 16th June 2021

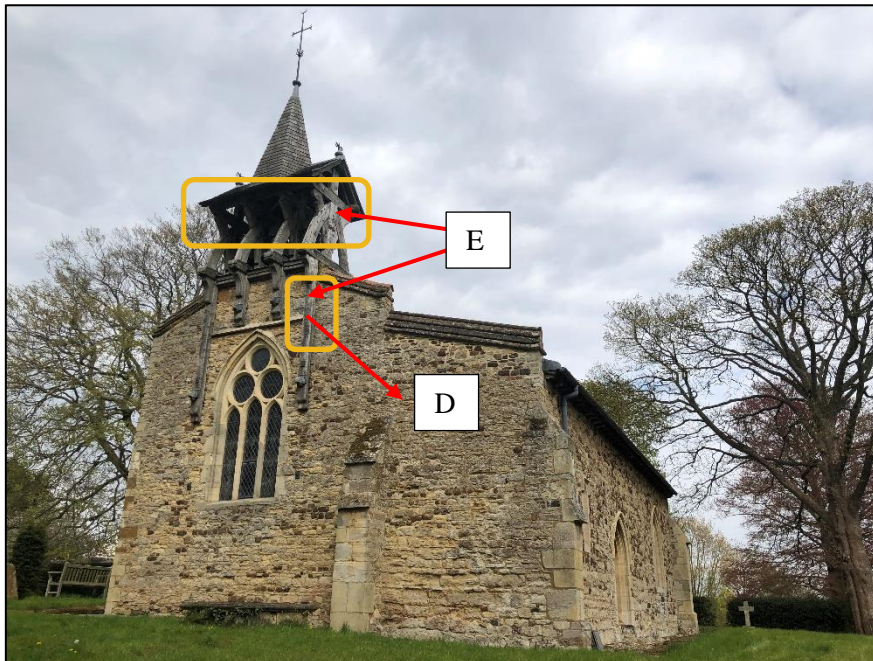


3.4.2 Emergence Survey 12th July 2021

Table 3 – Results of 12th July Evening Emergence Survey

Time	Species	Activity	Location
21:15	Natterer's Bat	Flying internally after emerging from roof	Plate 16
21:28	Common Pipistrelle	Individual emerged from around wood on Bellcote supports	Plate 18 Location D
21:33	Common Pipistrelle	Individual emerged from tiles on Vestry	Plate 15 Location B
21:44	Natterer's Bat	Two individuals emerged from walltop	Plate 15 Location A
22:00-22:43	Natterer's Bats	Between 31-33 individuals emerged from walltop	Plate 17 Location C

Plate 18. Showing emergence location for Common Pipistrelle 12th July 2021 and return location for Common Pipistrelle 13th July 2021



3.4.3 Dawn Return Survey 13th July 2021

Table 4 – Results of 13th July Dawn Return Survey

Time	Species	Activity	Location
03:15-04:15	Natterer's Bats	Swarming around entry location. Impossible to count exact number but estimated to be between 20-30 individuals	<i>Plate 17 Location C</i>
04:09-04:45	Common Pipistrelle	Three individuals returning to roost in wooden frame of Bellcote	<i>Plate 17 Location E</i>
04:18	Common Pipistrelle	Individual returned to roost in Vestry roof	<i>Plate 15 Location B</i>

3.4.4 Emergence Survey 8th August 2021

Table 5 – Results of 8th August Evening Emergence Survey

Time	Species	Activity	Location
21:03	Common Pipistrelle	Two individuals flying within the Church, thought to have emerged in the South Aisle	N/A
21:15	Natterer's Bats	First bats flying internally having emerged from eastern end of Nave	<i>Plate 16</i>
21:22	Natterer's Bats	Two individuals emerge from walltop on northern wall at eastern end of Nave	<i>Plate 15 Location A</i>
21:18-21:29	Natterer's Bats	Between 30-36 bats emerged from the walltop on northern wall at western end of Nave. Count made difficult by rain driving bats back into the Church soon after emerging	<i>Plate 17 Location C</i>

3.4.5 Results Summary

The surveys completed in Summer 2021 have found that the Church is used by between 30-36 adult Natterer's Bats that roost within the Nave and up to five individual Common Pipistrelles that roost in a variety of locations between the Vestry roof tiles, the Arcade arch wall top, the Nave roof and around the wooden frames of the Porch and Bellcote. The Natterer's roost is considered to be a maternity colony, whilst the Pipistrelle roosts are likely to be individual bats only. Accumulations of droppings were not found in other locations within the Church during our survey period which suggests that the main roost location stayed in the same area of the Nave.

4 EVALUATION

4.1 General

The survey results were input into the Mammal Society's analysis tool Countbat (<https://www.mammal.org.uk/countbat/>) which helps provide context when compared with other roosts of the same species. Based on the information in the Countbat database (which contains information on the size of 229 other roosts of Natterer's Bats) and data collected during 2021, the maternity roost of Natterer's Bats at St Mary the Virgin is considered to be of Moderate size and falls within the 44th percentile in the database.

The Church community feel that the bat presence within the Nave is severely impacting the useability of the Church building as a whole. The high cost of heating the Nave also limits the times of year that this part of the Church would be useable for services to the same time of year that bats are at their most active (May-October inclusive). The white tarpaulin screen serves two purposes, both excluding bats from the Chancel and retaining heat within that part of the Church however presence of the screen is seen as an unsightly, non-sustainable solution to these problems and so any work at the Church going forward should address these challenges in tandem.

The majority of the droppings within the Church building are from Natterer's Bats (larger droppings with a relatively coarse texture), the number of Pipistrelle type droppings found during the surveys was generally much lower and mostly restricted to the South Aisle. In order to reduce the impacts from Natterer's Bats within the Church, but maintain the favourable conservation status of this species, it is recommended to try to retain the roosts somewhere within the Church building. A range of possible actions to help are detailed below in Section 4.3

4.2 Impacts to Bats

Roosts of Common Pipistrelle and Natterer's Bat are present within the Church. Our surveys took place from Spring through Summer 2021 and found roosting bats on all visits to the Church. The construction type of the building (*i.e.*, thick solid stone walls with crevices) means it is likely that some bats hibernate here too. Any work that would directly impact known access points or roost locations will require a licence from Natural England before it can take place. Examples of impacts range from blocking/altering an access point to disturbing bats whilst in the roost using artificial lighting or ultrasonic devices. Any work should be timed to avoid the main maternity period (mid-May to August inclusive).

Common Pipistrelle are common bats in the United Kingdom with approximately 2,430,000 individuals estimated to be present. For the purpose of this project these species are considered to be common on a regional scale and in accordance with the Bat Mitigation Guidelines the requirement for mitigation for impacts to small day roosts of common species of bat, such as Common Pipistrelles includes;

- Timing constraints (works affecting roosting location to be done outside of November to March inclusive).

- More or less like-for-like replacement of roosting features.

Natterer's Bats are found throughout most of the British Isles with an estimated population of 148,000 they are common in some regions of the UK. However for the purposes of this project the species are considered to be a rarer species on a regional scale. In accordance with the Bat Mitigation Guidelines the requirement for mitigation for works to a maternity roost of Natterer's Bats includes:

- Timing constraints (works affecting roosting location to be done outside of May to August inclusive);
- Retention or Like-for-like replacement of roosting features;
- No destruction of former roost or access points until replacement completed and usage demonstrated; and
- Monitoring for 2 years post-construction.

4.3 Possible Bat Management Measures

A range of possible management measures are presented below, in addition to the proposed measures a simple matrix is provided to show how the measure compares. The measures each include information on how long they would take to implement, the impact/burden to the Church, cost implications and the impact to bats. *Table 6* shows each management measure, *Table 7* shows how each potential outcome has been categorised with examples for each criterion and *Table 8* gives an overview of each management measure when assessed against each criterion.

Table 6. Proposed management measures

Measure	Positive	Negative
Do nothing	Bat roosts remain in situ Low/no cost	The burden of cleaning remains on volunteers and the Nave likely to remain out of use for services Some damage to flooring and monuments may still occur
Employ professional cleaner/cleaners	Bat roosts remain in situ Relatively low cost (c. £1k per year) Services could take place in either the Nave or Chancel	Burden of cleaning is present for lifetime of Church Some damage to flooring and monuments may still occur

Measure	Positive	Negative
<p>Do nothing in the Nave but replace the screen with glass and sliding/bifold doors</p>	<p>Bat roosts remain in situ Services can take place in the Chancel, but the rest of the Church is visible Easier to remove the separation if larger ceremonies are taking place</p>	<p>Burden of cleaning remains in the Nave and on the new screen Some damage to flooring and monuments may still occur Cost of the bespoke dividing structure (£10k+??)</p>
<p>Create a void within the Nave to enclose the main roosting location used by Natterer’s Bats but still provide sufficient space for the bats to fly and leave one of the two main access points in situ.</p>	<p>Vastly reduces the cleaning burden and the impacts bats are having within the body of the Church</p>	<p>Would require sensitive design and faculty approval and is severely impacting on the fabric of the Church Would need a full licence application under the Bats in Churches scheme Proof that bats use the new roost necessary before any access points can be permanently closed Until approved the roosts will continue to be present and require cleaning Very high cost estimation (£75k +?)</p>
<p>Create a void within the Chancel and try to move bats into this space</p>	<p>Moves the bats from the more sensitive part of the Church (Nave) into the less sensitive Chancel</p>	<p>Reduces the space available to bats by a significant factor, potentially to the point where it is not suitable Would need proof that it has worked before closing off the Nave access points permanently Potentially takes the Chancel away from being a viable space for services (and adding heating expenses for making Nave usable)</p>

Measure	Positive	Negative
Increase availability of roosting locations elsewhere – <i>i.e.</i> , bat boxes within adjacent woodland, building a roost structure in the Churchyard or enhancing loft spaces in surrounding properties	Takes bats out of the Church and reduces cleaning burden	Would need proof of use before any changes within the Church can be made permanent Needs landowner approval If converting loft spaces in a third party building it would need legal agreement and the additional cost of construction Likely expensive
Adding material “sails” at ceiling height within Nave to reduce bat droppings falling on to floor	Reduces cleaning burden Easily removable if needed to accommodate larger services Relatively low cost (£1k+?) Unlikely to require faculty or bat licence to carry out work	Untested so success rate unknown Needs to fit aesthetic of Church with sensitive design

Table 7. Management outcome criterion with ranking

	Low (1)	Medium (5)	High (10)
Time to implement	0 - 4 Weeks	1 – 12 Months	12 months - In perpetuity
Impact to Church community	Full use of all areas of the Church at any time	Chancel and Vestry used for day-to-day worship	Church unusable for day-to-day worship & services
Impact to Church building	No structural changes	Minor structural/permanent changes	Major structural/permanent changes
Maintenance burden on Church	None or standard cleaning measures	Monthly cleaning and clearing of protection measures	Weekly deep cleaning to protect the fabric of the Church and repair of monuments within Church building
Impact to bats	Roosts and access points remain in situ	Roosts remain in situ, access points altered	Roosts and access points altered
Cost	<£5,000	£5,001 - £20,000	>£20,000

Table 8. Overview of management measures assessed against Table 7 Criterion.

	Time to implement (months)	Impact to Church community	Impact to Church building	Maintenance burden on Church	Impact to bats	Cost
Do Nothing		Yellow	Green	Red	Green	Green
Employ Professional Cleaners	∞	Green	Green	Red	Green	Yellow
Replace Screen with Glass Divide	6-12 m	Yellow	Yellow	Yellow	Green	Yellow
Create a Void in the Nave	24 m	Green	Red	Green	Yellow	Red
Create a Void in the Chancel	24 m	Green	Red	Green	Red	Red
Create a Void in the South Aisle	24 m	Green	Red	Green	Red	Red
Increase Available Roosting Locations Outside of the Church	24 m	Yellow	Green	Yellow	Red	Red
Add Material “Sails” to the Interior of the Nave	6-12 m	Green	Yellow	Yellow	Green	Green

4.3.1 Do Nothing

The Do Nothing approach would essentially leave the Church building as it is. Bats could continue to roost within the Nave and services would be able to continue in the Chancel. This management measure has a low/zero initial cost, but the burdens of cleaning and maintenance would remain on the parishioners which is not considered sustainable.

4.3.2 Employ Professional Cleaners

If this approach was adopted bats could continue to use the Church as they do normally, and professional cleaners would clean the Church building more regularly than the volunteer parishioners currently are able to. At an hourly cost of £15 per hour, the Church could be cleaned twice monthly during the seven-month bat active period (assuming four hours per cleaning visit) for approximately £840 per year. This would require implementing every year in perpetuity so overall costs are relatively high.

4.3.3 Replace Screen with Glass Divide

Adding a glass divide which would afford views into the Nave from the Chancel is a desirable way of allowing parishioners to hold services in the Chancel (and thus have relatively lower heating costs) but to still see in the main body of the Church. Any such structure would also have the benefit of bi-fold doors so that the structure can be fully opened and remove the separation between the two areas. In terms of impacts to bats this would have negligible to no impact to the existing roost locations and as such would not require any kind of licence from Natural England. It would likely require a faculty

approval and the design should be sympathetic to the existing fabric of the Church. The cleaning burden within the Nave would still remain if the divide was the only action put in place. Estimated costs for the addition of a bespoke glass divide are between £7,500 and £12,500.

4.3.4 Create a Void in the Nave

Creating a void toward the eastern end of the Nave would allow the bat roosts used by Natterer's Bats to remain in place, and also allow for an enclosed flight space whilst retaining one of the access points that was observed being used during the surveys. With roosts and flight spaces contained it would significantly reduce the levels of bat droppings falling onto the Pews and Nave floor. The work to do this would require a licence from Natural England along with a faculty approval as it would result in significant changes to the fabric of the Church. Discussions on site between Isaac Pain and Maurice Rust of the Church, Adrian Ringrose of Stimpson, Walton and Bond Architects, Bob Cornes of Bedfordshire Bat Group and Simon Parker of Turnstone Ecology regarding the list of options available determined the creation of a void above the Nave as the currently most preferred option.

In order to achieve the desired outcomes of bats continuing to use the existing roosts and reduce the levels of bat evidence present within the Nave it would be necessary to show that any new structure being in place does not cause bats to abandon the Church all together. It is proposed therefore that any structure be temporary for the first active season of installation (April – November), being constructed of a heavy grade dark tarpaulin or equivalent. Within the void that is created additional roosting locations will be added in the form of false mortise joints mounted to existing beams or walls. It is anticipated that the space required would measure approximately 6 m x 5 m with an interior height of between 1.5-2m which would fill the space above the Chancel arch for the easternmost bay of the Nave. While the temporary structure is in place, the main access point (western end of northern wall), should be excluded using sponges – again so the procedure can be reversed if necessary. The other known access points will also be inspected and with the exception of the gap at the eastern end of the northern wall, will also be excluded using the same methods. Exclusion work and the installation of the temporary structure should be completed after the maternity colony has broken up (late October - November) but before April.

For the temporary structure to be deemed effective a minimum of 50% of the roost (15-18 Natterer's Bats) must continue to use the Nave whilst the structure is in place. The success will be monitored by at least three surveys carried out over the maternity period along with reviewing footage from internal Infrared cameras that should be mounted within the void. These surveys will also identify if bats have found any other ways into the Church or if any additional species are recorded using the site.

If the bats take to the new structure within the Nave work to remove the temporary structure can begin followed by the installation of a permanent structure. This would be constructed of wood and be made to be sympathetic to the design of the existing Church.

It is anticipated that it would take two years to go from the temporary structure to having a permanent void constructed. Over this time monitoring visits in the form of dusk/dawn activity surveys should also take place for the reasons stated above.

Costs for the installation of a void above the eastern end of the Nave are likely to be high, with an estimated breakdown of costs provided below in *Table 9*.

Table 9. Estimated breakdown of costs for creation of void within Nave

Permanent amendments to building	Estimated cost
Construction of replacement screen	£5,000.00
Exclusion at bell tower end	£1,500.00
Exclusion of main access point on northern wall	£1,500.00
Scaffolding internally (year 1)	£3,238.00
Scaffolding internally (year 2)	£3,238.00
Tarpaulin for temporary void	£400.00
Construction of temporary void	£800.00
Construction of new void at eastern end of Nave	£50,000.00
Additional false mortise joints	£250.00
Infrared CCTV at access point/internally in void	£600.00
Ecologist licence writing time	£960.00
Architect cost per hour	£91.67
Architect cost average if going to faculty	£3,500.00
BiCCL licence registration	£500.00
Licence return (year 1)	£300.00
Licence return (year 2)	£300.00
Ecologist time costs per hour (site visits and inspection during work)	£40.00
Travel (year 1)	£300.00
Travel (year 2)	£300.00
Dusk emergence surveys x 3 (year 1)	£3,480.00
Dawn survey (year 1)	£1,160.00
Dusk emergence surveys x 3 (year 2)	£3,480.00
Dawn survey (year 2)	£1,160.00
Cleaning costs during bat active period	£850.00
Faculty costs	£250.00
Estimated Total	£83,197.67

4.3.5 Create a Void in the Chancel

At present the tarpaulin screen separates the Nave from the Chancel and as such bats do not have access to this part of the Church along with the Vestry. The Chancel is a slightly more recent addition to the

Church and as such has a lower heritage value so changes in this part of the building may be less impactful to the fabric of the Church.

If a void were created above the Chancel, it would require a new access point be created either via the roof tiles of the Chancel or at the walltops, each of these are not areas the bats are currently using meaning it would need to be proved that bats are using the new access and roosts before any of the points in the Nave could be excluded permanently. Overall creating a void in the Chancel requires significant changes to bat roosts and to the fabric of the Church, with no guarantee the work would succeed. It would also introduce bats into the areas of the Church which are easier to clean and heat which may cause issues with the Church community.

Estimated costs for this are likely to be between £30,000 and £50,000 and this work would require a bat licence and faculty.

4.3.6 Create a Void in the South Aisle

Bats do currently use roosting locations within the South Aisle, albeit in low numbers and with no direct access point. The principal behind creating a void here would be similar to that detailed in Section 4.3.5, and it would move bats away from the more sensitive parts of the Church and provide them with an enclosed flight space. However as above there is the requirement to create new access points and prove that bats are using them before excluding the main entry/exit points at the Nave walltops.

Estimated costs for this are likely to be between £30,000 and £50,000 and this work would require a bat licence and faculty.

4.3.7 Increase Available Roosting Locations Outside of the Church

Doing this would provide roosting alternatives away from the Church building with the intention of moving the maternity colony to another location. It would require a large number of boxes to be placed in the adjacent woodland, or have a neighbouring property accept bats into their loft spaces or barns (with legal agreements in place). A third alternative would be to build an entirely separate structure specifically for bats.

None of the possible options are very likely to work and would take many years of survey effort and modifications to establish suitable roosting habitat elsewhere. As such this is not considered a feasible option.

4.3.8 Add Material “Sails” to the Interior of the Nave

By adding material shapes, tensioned between the walls of the Nave it may be possible to reduce the number of droppings falling to the floor and therefore reduce the amount of cleaning that is required. If larger pieces were added below the roosting locations and entry/exit points the sails could collect droppings on top to allow for easier cleaning at a later time. With a pulley system mounted on the walls it should be possible for any member of the Churchwardens to remove the sails with relative ease.

The low amount of impacts to the interior of the Church means it may be possible to do this work without needed faculty or a bat licence, meaning the work could take place sooner than most of the other options listed above. The estimated cost implications are also relatively low, with the sails estimated to cost between £1,000 and £2,000.

5 CONCLUSIONS AND FURTHER INFORMATION

At the time of writing from the above options to manage bats at St Mary the Virgin Church, the primary choice of Church representatives is the construction of a void within the Nave and the install a glass dividing screen between the Nave and Chancel. Despite the cost and permanent alterations to the fabric of the Church the construction of a void virtually eliminates the problems caused within the Church by bats.

Design iterations and communication with the PCC will be ongoing and any proposed work will require a fundraising effort before it can commence. If works are taking place more than two years after the 2021 surveys, *i.e.*, after 2023, then top up surveys are likely to be required so that the current levels of bat activity can be assessed and so any faculty or licence applications are based on the most up to date information.

6 LEGAL PROTECTION

This section briefly describes the legal protection afforded to the protected species referred to in this report. It is for information only and is not intended to be comprehensive or to replace specialised legal advice. It is not intended to replace the text of the legislation but summarises the salient points.

6.1 Bats

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

- intentionally kill, injure or take a bat;
- possess or control a bat;
- intentionally or recklessly damage, destroy or obstruct access to a bat roost; and
- intentionally or recklessly disturb a bat whilst it occupies a bat roost.

Bats are further protected as they are listed on *Schedule 2* of the *Conservation of Habitats and Species Regulations 2017* (as amended). This legislation makes it an offence to:

- deliberately capture, injure or kill a bat;
- deliberately disturb bats in such a way as to be likely to (a) impair their ability to: (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or b), to affect significantly the local distribution or abundance of the species to which they belong; and
- damage or destroy a breeding site or resting place of a bat; and
- possess, control, transport, sell, exchange a bat, or offer a bat for sale or exchange.

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

Where it is necessary to carry out an action that could result in an offence under the regulations protecting bats and their roosts it is possible to apply for Mitigation Licence from Natural England (NE) or Natural Resources Wales (NRW). Three tests must be satisfied before this licence (to permit otherwise prohibited acts) can be issued:

- licences may be granted to “preserve 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.”
- a licence may not be granted unless “there is no satisfactory alternative”.
- a licence, in respect of imperative reasons of overriding public interest (IROPI), cannot be issued unless the action proposed “will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range”.