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St Mary the Virgin, Wetherden Suffolk

DEFRA and Bats in Churches Project

19th October 2023

Site: St Mary the Virgin,

Wetherden, Suffolk, IP14 3LB

Grid reference: TM0085462780

BiC Class Licence: WML-CL32 **Site Reference:** B32RC006-5A

Licence Period: 01 March 2020 to 31 December 2023

Licence Monitoring: 2020 - 2023

Background

St Mary's the Virgin Church in Wetherden has been recorded as struggling with problems caused by the presence of a medium roost of Natterer's *Myotis nattereri* bats since 2007 when the issue was described as 'horrendous'. A marriage services at the church was interrupted due to bats. This resulted in all weddings at the time being stopped.

The church hosted a bat symposium in 2009 which included presentations by the Diocesan Advisory Committee for the Care of Churches, Church Building Council, Movement Against Bats in Churches, English Heritage, Suffolk Wildlife Trust and Natural England.

Following surveys carried out in 2019, it was concluded that St Mary's supported a medium population (30-50) of Natterer's bats together with small roosts of Serotine *Eptesicus serotinus*, Common pipistrelle *Pipistrellus pipistrellus* and occasional Soprano pipistrelle *Pipistrellus pygmaeus* (Appendix 1).

Through the Bats in Churches Project, the church community aimed to see the church return to a place of a worship after the difficulties of hosting community events and services as a result of the mess created by bats (faeces and urine).

Bats in Churches mitigation (2020) included creation of:

- boxed-in eaves along south wall of the chancel;
- two bespoke bat boxes on the eaves of the south aisle; and,
- sealing the parvis chamber to provide secure roost space and controlling bat access to the main body of the church.

The intervention included one year's habituation (2021).

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One-way exclusion was implemented over five days prior to the eaves' boxes being sealed under contract on 5th September 2021. The method used in 2021 was the insertion of Constantine exclusion devices in one chancel eave's box and one south aisle eave's box, located in the position of the primary emergence and re-entry points for bats into and out of the church.

Up to 50 *Myotis nattereri* and two *Pipistrellus pipistrellus* bats emerged inside the church on the evening of 2nd September 2021. The *Myotis nattereri* appeared to be roosting in the roof timbers in the upper south west corner of the chancel.

After an initial period of hesitancy, bats were seen to leave both access points and not return. By the 23:00hrs on the first night all but 7 *Myotis nattereri* appeared to have left the building. The chancel bat access exclusion device was removed following a period of inactivity. The access point was sealed by a piece of ply (cut to fit on the night). At the same time, a mist net was placed at the west end of the chancel where an archway gave access to the south aisle to exclude the small number of bats remaining. The archway appeared to be a significant flight corridor between the chancel and south aisle. Three *Myotis nattereri* (one female juvenile, two parous female adults) were caught, fur clipped and released outside the church.

By 00:00hr bat activity appeared to have declined to a maximum count of three; however, when finishing the survey, four additional *Myotis nattereri* bats appeared, leaving a total of seven bats still present. This raised the question of whether bats were returning inside the building. An external inspection of the south aisle confirmed the presence of two access points to the middle eaves box, and a third potential access point where lime mortar appeared to have fallen away.

Additional external inspections revealed a hole in the north aisle boxed eaves (extreme west end) together with areas of rotting boarding. Gaps around the door frame were noted and a small number of droppings found on the surface (possibly Pipistrellus species).

The attempted exclusion did not succeed. It appeared likely that bats were continuing to access the main body of the church due to missing mortar around south aisle eaves or failed sealing of the eaves bat boxes (see file note dated 6th September 2021) Or other unknown accesses'.

Bat droppings including possible *Eptesicus serotinus* were noted in the parvis (north west corner) near the main bat access (crack in wall).

Reports (winter/spring 2021/22) of bat droppings being present post exclusion from the church community indicated that the exclusion had not worked and that bats continued to access inside the main body of the church.

Two post-intervention monitoring surveys were carried in 2022 with the objective of identifying how bats were accessing the inside of the church. It was intended that the first

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survey would be used to re-install one-way Constantine exclusion measures prior to the maternity period, should sufficient evidence of bat access points be observed. However, insufficient numbers of bats emerging from the building observed did not allow this action to take place. The second survey was used to target the peak post-maternity period and maximise the opportunity to identify bat access points.

A further exclusion period was attempted early September 2022. The external elevation of the south aisle roof, where the lead roof overlays eaves boards that sit in front of the brick-and-flint wall were inspected with torches and an endoscope. Examination revealed that areas of lime and hair mortar had locally fallen to create numerous gaps between the eaves board and stonework. Some eaves board beading was unattached.

Following inspection of the cavities and behind the external south aisle eaves boarding, where not associated with the two bat boxes, were temporary filled using Rockwool insulation. In one location, untreated seasoned oak was affixed with screws.

A Constantine exclusion device (one-way plastic bags) was re-fitted to the bat access points on the south aisle to allow bats to safely leave the building over a two-night period. Following this period, the one-way closure, previously glued in place, was affixed with an oak baton and screws.

Constant but low numbers of Natterer's bats together with an individual Serotine, Common pipistrelle and Brown long-eared *Plecotus auritus* bats appeared to be present inside the church. The Natterer's bats were roosting in the roof timbers in the upper south west corner of the chancel. Observation indicated a possible Brown long-eared bat roost at the apex of the nave at the east end.

Mist nets were placed at the west end of the chancel where an archway gave access to the south aisle, to facilitate exclusion given the low number of bats present.

Following the Post-Mitigation Monitoring (PMM) surveys of the 5th and 6th September 2022, it is clear that Natterer's bats continue to use the inside of the church. Small numbers of both Common pipistrelle and Serotines bat are also present. It appeared, despite reclosing the bat box and infilling cavities with Rockwall insulation, that bats continued to gain access via and/or around the middle eaves bat box.

A more detailed investigation and corrections of faults were recommended for completion in 2023. These were carried out in late September 2023 following two dusk emergence surveys undertaken on the 5th July and 9th August 2023.

An additional dusk survey was carried out on the evening of 25th September 2023, prior to carrying out investigation and remedial works on the western south aisle eaves roost box where bats had been observed internally exiting the building.

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Table 1. Summary of bat use of intervention measures.

Location	Measure
Chancel South	Only occasional bats seen emerging over 2021 and 2022 survey period.
Eaves Box	Birds are nesting in bat access point.
South Aisle Bat	Internal endoscopic investigation saw no bat droppings evident,
Box 1	however access was very limited.
South Aisle Bat	Internal endoscopic investigation saw abundant bat droppings; however,
Box 2	gaps in closed-up bat access point and along internal eaves level would indicate bats are getting both through and around this bat box.
Parvis Roof	Serotine droppings abundant with other mixed droppings including
	Natterer's bat.
Lead Flashing	No sign of use by bats.

Limitations

Ecological assessments can be used to draw conclusions as to the presence or likely absence of species (animals and plants), population size, and use of the site by animals.

Any ecological survey is a snapshot in time and should not be regarded as definitive nor complete.

The preparation of mitigation strategies, consultation exercise and submission of any licence applications cannot be relied upon until approved (licensed) in writing by the Statutory Nature Conservation Organisation. Allowance must be made for both programme and financial change to projects as a result of application failure, amendment, or refusal.

Every professional effort and due diligence have been applied to provide an accurate ecological assessment of the site at the time of the preparation of this report, but no liability can be assumed for omissions, or subsequent changes to design and development. Additional works should be anticipated as surveys and proposals for the site progress.

No responsibility will be accepted for any use of or reliance on the contents of this report by any third party. No responsibility will be accepted for changes or alterations made to this report following submission to Bernwood Ecology client.

Bernwood Ecology, its employees and associates reserve the right to report on any incidents or actions [deliberate or reckless] that result in a breach of licence conditions or are in contravention of existing legislation.

BiC Class Licence Monitoring

Bernwood Ecology have undertaken post-development monitoring for bat activity at St Mary's Church, Wetherden in 2022 and 2023.

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The purpose of this monitoring is to evaluate the effects of excluding the population (Natterer's maternity roost, and small roosts Common pipistrelle, Soprano pipistrelle, Serotine and Brown long-eared bats) previously occupying the church.

The Bats in Church Class Licence (C. Damant B32RC006, Site Reference B32RC006-5B) requires further monitoring (two activity surveys) funded by the Bats in Churches Project to take place in 2024.

Additional monitoring in the form of evaluating the success of the interventions on the church community and the church is also required.

Licence Monitoring Methodology

Favourable Conservation Status and Continued Ecological Functionality
Objective: the continued presence of a Natterer's bat roost either using the pre-existing roost features or the mitigation features; and the continued presence of low numbers of serotine, brown long-eared bat common & soprano pipistrelle in church using mitigation features and or naturally present features.

The FCS/ CEF has been monitored since 2022 through yearly activity surveys (one prematernity and one post-maternity) using remote bat detectors, infrared cameras and thermal imaging scopes for support.

PCC Interview

A questionnaire was emailed to the PCC of St Mary's Church in January 2022, concerning the views of the community regarding the use of St Mary's by bats over the course of 2021. The PCC were asked to indicate the views of the community regarding ongoing damage to fabric and monuments of the church, using a scale of 0-3. The PCC gave a score of '3', indicating 'Moderate / high concentrations of bat droppings indicating continued access of bats to the inside of the public open space of church and the continued presence of bat maternity roost(s) being present inside the church'. The PCC stated that the attempted interventions had not reduced any disruption to the church's mission of delivering services, weddings, funerals and community usage, and that the community felt frustrated and distressed.

A second questionnaire was emailed to the PCC of St Mary's Church in October 2022. The PCC again gave a score of '3'. Unfortunately, at this time the interventions have not resulted in a reduction or resolution of the issues relating to ongoing damage to the monuments and fabrics of the church. It was stated that the interventions have now reduced the disruption to weddings and community events held at the church but have not reduced any disruption to services and funerals being held. The PCC indicated that the burden of cleaning up mess as a result of bat activity within the church has not been reduced or resolved, and that the community of St Mary's church feel frustrated and disappointed by the continued significant presence of bats within the building.

In August 2023, the PCC was emailed a third questionnaire where the PCC again scored the accumulation of bat droppings as '3', indicating no change in the ongoing damage and

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discontentment since 2022. There has not been disruption to services, weddings and funerals due to the efforts of the small cleaning team, but the church is not often used for community events due to the cleaning burden.

Bat Surveys

2019

Three dusk emergence and one dawn re-entry surveys were undertaken in 2019.

2020

Two dusk emergence surveys were undertaken in 2020.

2021

Four dusk emergence surveys were undertaken in 2021, of which three were combined with attempted exclusion of bats from the church.

2022

Four dusk emergence surveys, as well as mist-netting within the chancel of the church were undertaken in 2022.

2023

Three dusk emergence surveys were undertaken in 2023, as well as mist-netting within the chancel of the church were undertaken in 2022. (Appendices 2-4).

Effectiveness of Interventions

The implemented interventions do not appear to have worked despite efforts to identify and rectify issues around bats accessing the internal building of the church in 2022.

Inspection of the south aisle bat box to identify how the bats are bypassing the box and accessing the main body of the church found:

- that the previous external bat access point had been obstructed;
- the presence of bat droppings (3 size classes consistent with medium (*Myotis* spp), large sized (Serotines) and small (pipistrellus) and confirmed bat were able to and did access the internal bat box space;
- two small gaps on the internal wall of the bat box were identified by awkward finger tip searching. These were firmly blocked by jamming and compacting rockwool in the cavities (inaccessible for hand tools);
- additionally bat droppings were noted on top of the principal and secondary rafters, with spacers on the top of the rafters appearing to provide sufficient space for bats.
 These were filled with compacted rockwool prior to replacing roof boards below lead and all gaps between boarding were also filled before the lead was re fitted; and
- a new external bat access point to the bat box was created by removing parts of a clay brick.

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While on the south aisle roof opportunity was taken to endoscopically investigate the previously identified high level bat emergence point at the western end of the nave. The endoscope was able to penetrate through to the internal nave space through a cavity between an exposed beam end and the wall. The cavity was infilled with compacted rockwool.

The lime mortar along eaves boarding showed further signs of deterioration since September 2022 although much of the previously fitted rockwool was still present, albeit showing signs of wear.

It is recommended that lime mortar is applied to the eaves of the church, including those were rockwool has been temporarily applied to reduce bat access points as far as possible. The works are to be supervised by the licence named ecologist or appointed person familiar with the project to;

- 1. ensure that the main bat access points to bat boxes are not blocked
- 2. ensure that all other, non bat access points, are securely remedied

The Parvis void showed signs (droppings) of consistent use by Serotines, medium Myotis (assumed Natterer's) and Pipistrellus species. The bat access point (crack in wall with external small cavity) showed use with abundant droppings present. The bulb of the external floodlight had been previously removed which is notable in the evidence of abundant droppings being present.

Licence Obligations

The site registration period is from 1st March 2020 until December 2024.

Table 2. 2024 Survey requirements as set out in licence registration (section 41 project plan).

Item	Year	Details
6.	2024	Dusk emergence survey x2 (1 pre, 1 post maternity)

A licence return form must be completed and sent this to Natural England (BatsinChurchesCL@naturalengland.org.uk) by 15th January in each year of site registration, to report on the previous calendar year.

A final licence return must be sent to Natural England within 4 weeks of the end of the site registration period. The site registration period is expected to be from 1st March 2020 until December 2024.

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Recommendations

It is recommended that;

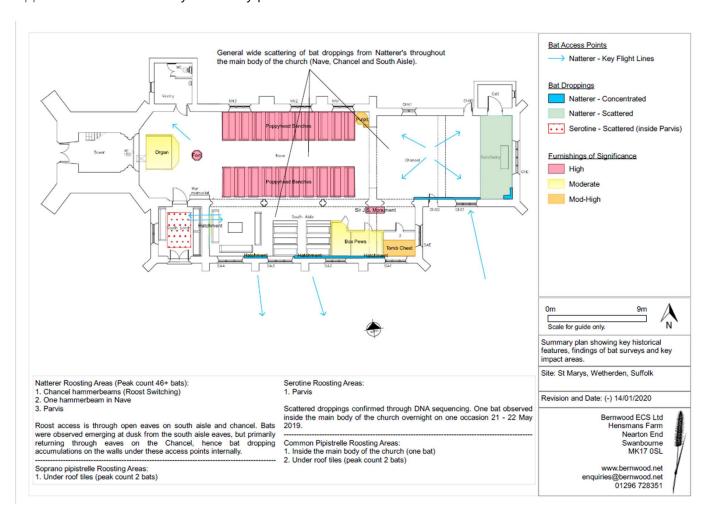
- Lime mortar is applied to the eaves of the church, including those areas were
 rockwool has been temporarily applied to reduce bat access points as far as possible.
 The works are to be supervised by the licence named ecologist or appointed person
 familiar with the project to;
 - a. ensure that the main bat access points to bat boxes are not blocked
 - b. ensure that all other, non bat access points, are securely remedied
- 2. While on the south aisle roof opportunity is taken to endoscopically investigate the previously identified high level bat emergence point at the western end of the nave. The endoscope was able to penetrate through to the internal nave space through a cavity between an exposed beam end and the wall. The cavity was infilled with compacted rockwool.
- 3. PCC representative to record weekly quantity and locations of droppings from 1st October 31st October 2023 and 1st May 30th June 2024 to assist with assessing effectiveness of 2023 exclusion work and interventions.
- 4. Two dusk emergence surveys will be carried out for an additional year (2024).

Report Information

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Appendix 1. 2019 bat surveys summary plan.



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Appendix 2. Bat emergence surveys undertaken.

Year	Date	Survey Type	Emergence/ Re-entry Survey Number	Surveyor Initials
2019	21/05	Dusk	1	CD/GR/CW/MG/JC
	22/05	Dusk	2	CD/LW/DS
	01/07	Dusk	3	CD/JC/MG/CW/SL
	20/08	Dusk	4	CD/CW/JC/LW
2020	29/6	Dusk	1	MHE
	10/8	Dusk	2	МНЕ
2021	8/6	Dusk	1	CD/CW/GR/MG
	2/9	Dusk/Exclusion	2	CD/CW/+1
	3/9	Dusk/Exclusion	3	CD/CW

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Year	Date	Survey Type	Emergence/ Re-entry Survey Number	Surveyor Initials
2021	8/9	Dusk/Exclusion	4	CD/CW
2022	16/05	Dusk	1	CD/CW/JW/LW
	12/07	Dusk	2	CD/CW
	05/09	Dusk/ Mist-netting	3	CD/CW/JB
	06/09	Dusk/ Mist-netting	4	CD/CW/JB
2023	05/07	Dusk	1	CW/DS/HE/LT
	09/08	Dusk	2	CD/CW/HE/AG
	25/09	Dusk – midnight	3	CD/CW
	26/09	Dusk – midnight (+mist netting)	4	CD/CW

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Appendix 3. Summary of bat activity surveys.

Year	Date	Summary
2019	21/05 Dusk	Common pipistrelle (3/4) noted early in survey. Natterer's roost (three separate points) of hammerbeam timbers above the altar with evidence of roost switching during emergence (thermal imaging). An additional hot spot (thermal imaging) noted on a hammer beam in front of the organ (west end of the nave), possibly pipistrelle roost. Both Common pipistrelle and Natterer's bats emerged from multiple points of the eaves on the south side of the south aisle. A single Serotine was recorded inside the church during the middle of the night through to early dawn, however no dusk emergence or dawn re-entry was recorded. No emergence noted from the north side of the church.
	22/05 Dawn	21 Natterer's bats entering the church where the south aisle abuts the chancel. A single Common pipistrelle entered the church on the south side of the south aisle. Natterer's dawn swarming and entering (no count) on the south side. Single Common and possible Soprano pipistrelle entered the eaves on the north side of the nave.
	01/07 Dusk	Natterer's emergence from three roost points of hammer beams of the chancel above the altar. 46+ Natterer's emerged from the south side of the south aisle (multiple access points). Common pipistrelle emergence from where the south aisle abuts the chancel. Single Common pipistrelle emerged from the eaves, north side. Serotine heard.

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Year	Date	Summary
2019	20/08 Dusk	Natterer's roost in hammerbeam timbers above the altar. 13+ Natterer's emerged from south side of south aisle with Natterer's re-entering from 21:20, some 1 hr and 20 minutes after sunset. 17+ Natterer's emerged from where south aisle abuts chancel. Possible single Common pipistrelle emergence from porch (south side).
2020	29/06 Dusk	Note: Scaffold restricted both external and internal visual observations and reliable emergence counts. Natterer's bat continued to use both bat access points previously noted with bat droppings records by church warden recording use consistent with previous years. Peak count is therefore estimated only. Based on droppings records (CW 29/6/2020) indicated roost points in hammer beams broadly consistent with previous years.
	10/08 Dusk	Single Serotine recorded inside church Common pipistrelle emergence (2) from north side of nave. New roost point (emergence 5-7) identified (external, south west corner of nave)

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2021	08/06 Dusk	Natterer's roost was present during 2021 peak maternity period to allow for a period of bat habituation to the mitigation measures. The bats continued to use internal area of church using previous bat access points. Peak count 50.
	02/09 Dusk	Exclusion On 2 nd September the 2-way bat access points were
	03/09 Dusk	closed (one way excluder) following emergence survey. After the main emergence a small number of bats
	08/09 Dusk	remained inside the church and mist nets were used to catch the final 3 bats (Natterers) flying around internally. Following the capture effort, it became obvious that a small number of bats returned to the internal area of the church.
		The exercise was repeated on the evenings of 3 rd September (a total of five female Natterer's (3 in mist nets and two in hand net) were caught (3 adults and 2 juveniles) and released externally) and 8 th September (four Natterer's and three Brown long-eared). Small numbers of bats were observed to remain inside the church despite capture effort. It was therefore concluded that bats found an alternative means of access the church.
2022	16/05 Dusk	Generally low numbers of bats with no emergence observed. Bat droppings evident inside church.

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Year	Date	Summary
2022	12/07 Dusk	Bat droppings (probably Natterer's) were concentrated at the north west end of the nave, together with localised areas on choir pews. Bat droppings were also observed on the external corner of the chancel wall/south aisle below eaves level (access point to the chancel eaves box).
		Endoscopic examination of middle eaves box found bat droppings present inside but not at significant levels that would indicate maternity use by Natterer's.
		An inspection of the Parvis void showed concentration of mixed bat dropping consistent with both Serotine and Natterer's bat.
		Two+ Common pipistrelle at the apex of the nave roof at the west end against the west wall.
		Approximately 20+ Natterer's utilising two roost points within the church, one at east end of chancel in central mortice joint, the other on the north side of the nave at the west end using mortice joint in hammerbeam.
		Natterer's bats seen flying outside the south chancel at eaves level however a review of video footage showed no sign of emergence.
		One Serotine was observed emerging from the corner of Parvis west wall where it meets the nave. One Serotine was seen flying inside the church.

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Year	Date	Summary
2022	05/09-06/09	Site surveys for bats as well as mist netting within the chancel of the church.
		Constant but low numbers of Natterer's bats together with an individual Serotine, Common pipistrelle and Brown long-eared bats observed inside the church. Natterer's bats were found roosting in the roof timbers at in the upper south west corner of the chancel. Observation indicated a possible Brown long eared at the apex of the nave at the east end.
		Bat droppings including possible <i>Eptesicus serotinus</i> , <i>Myotis sp.</i> and <i>Pipistrellus</i> species were noted in the parvis (north west corner) near the main bat access (crack in wall).
		It was determined that Natterer's bats, as well as low numbers of Serotine and Pipistrelle species still use and had access to the church's interior. Bats were determined to be gaining access through cracks around the middle eaves bat box.
	05/09 Mist netting	1 adult male Natterer's bat
	06/09 Mist	3 adult female (Parous) Natterer's bat
	netting	2 adult male Natterer's bat
		3 adult male Brown long-eared bat
2023	05/07 Dusk	The Natterer's roost was present during 2023 peak pre maternity period; peak count 49.
		Common pipistrelle (1), Serotine (1), and Natterer's (4-5) bats were recorded inside the church, indicating that all three species still access and use the church interior.
		At least three Natterer's bats were observed entering a cavity left of Bat Box 2 (closed internally) above the picture in the south aisle. A bat was observed perched on the ridge beam by the organ, and droppings were found on the southeastern corner of the sanctuary and on the interior of the southern aisle's southern wall.

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Year	Date	Summary
2023	05/07 Dusk	One unidentified bat emerged from the south aisle roof tiles and two entered the timber roof panelling in the chancel. One Common pipistrelle and one Brown long-eared bat emerged from the timber panelling above the southern porch door, and one Natterer's bat emerged from the porch door. 18 Natterer's bats emerged from (and four re-entered) through southern aisle fascia. Three Natterer's bats emerged east of the sanctuary. Two Serotines emerged from different cavities in the southern aisle's western wall. From the main access point on the south aisle, 26 Natterer's bats (one re-entered) and one possible Brown long-eared bat were seen emerging.
	09/08 Dusk	Natterer's bat peak post maternity count: 27. One Serotine bat seen flying inside the chancel, one Brown long-eared was heard flying inside the church, and 4-6 Natterer's bats seen flying inside the nave. Two Serotines and a Natterer's bat emerged from the southern aisle's western wall; two Common pipistrelles displayed social behaviours in this area suggesting reentry. A second Natterer's emerged from the timber above the south porch door (one re-entered 45 minutes later). A possible Serotine and an unidentified bat possibly emerged from the porch door.
		~25 Natterer's and one unidentified bat emerged from a cavity adjacent to the Bat Box 2 access point in the southern aisle.

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Year	Date	Summary 10 who Next are 1/2 flying a within allowed and a viting within
2023	25/9	10 plus Natterer's flying within church and exiting via the western south aisle bat box location through fret work. Constantine exclusion fitted to external bat access once majority of bats had left via the bat access. Numbers in church initially reduced to five before no activity was noted at approximately 20:30. After an initial quite period of 45 minutes a further four bats noted flying inside church. Thermal imaging left in place monitoring internal bat exit point. Reviewing TI showed two bats leaving via the exit point a 02:00.
	26/09	While initially quite with no activity a common
	20/09	pipistrelle appeared inside the church at approximately an hour after sunset.
		This was followed by 2 Myotis species and a possible brown long-eared.
		Natterer's appeared to be chasing each other, in close proximity, consistent with behaviour observed at swarming sites (mating sites).
		Natterer's noted outside flying up to excluded bat access point trying to re enter.
		Bat noted flying and possible entering (under lead flashing?) around apex of chancel roof, east end, near pedestal (where a cross once stood) with lead flashing.
		Internal, Chancel: Bat, noted on thermal camera, to exit and return to void space behind timbers at east end (south side) of gable wall.

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Year	Date	Summary
2023	26/09	Mist netting:
		20:10 C pip M Adult swollen testis
		20:12 Natterer's F Adult (parous)
		20:22 Natterer's M YoY
		2 Natterer's chasing each other – not caught
		1 C pip – not caught
		22:57 Brown long-eared M Adult swollen testis
		22:57 Natterer's F Adult (parous)
		All bats released outside the church.
		No activity
		Constantine device removed and bat access point closed with rockwool

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Appendix 4. 2023 bat surveys summary plan.

