

M3 Junction 9 Improvement

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6.3 Environmental Statement Appendix 8.1r - Bat Survey Report 2020

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6.3 ENVIRONMENTAL STATEMENT- APPENDIX 8.1r: BAT SURVEY REPORT 2020

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M3 Junction 9 Improvement

Bat Survey Report

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On behalf of Highways England



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1 Introduction

1.1 Background

- 1.1.1 Stantec UK has been commissioned by Volker Fitzpatrick to undertake bat surveys in relation to the M3 Junction 9 Improvement scheme. The footprint of the proposed scheme will be referred to 'the Site' throughout this report.
- 1.1.2 The Site is located to the north-east of Winchester and includes proposed improvements to Junction 9 of the M3 and the A34 around an approximate central grid reference of SU496308.
- 1.1.3 This report presents the results of the following bat surveys:
 - bat emergence surveys of two road bridges, Kingsworthy Bridge and Itchen Bridge, which fall within the footprint of the M3 Junction 9 Improvement scheme
 - update bat activity surveys using static bat detectors within the Site and surrounding area
- 1.1.4 The survey locations for the bat emergence surveys consists of the two road bridges that carry the A34 over the River Itchen at Grid References SU 4934 3145 and SU 4938 3147. The survey area for the update bat activity survey included six monitoring locations within and adjacent to the Site. The survey locations are shown on **Figure 1 Bat Survey Locations**.

1.2 Project Description

- 1.2.1 M3 Junction 9 is a key transport interchange which connects South Hampshire and the wider sub-region, with London via the M3 and the Midlands/North via the A34. A significant volume of traffic currently uses the grade separated, partially signalised gyratory (approximately 6,000 vehicles per hour during the peak periods) which acts as a bottleneck on the local highway network and causes significant delay throughout the day.
- 1.2.2 Highways England is looking to reconfigure the junction to improve the situation for vehicle traffic and non-motorised users.

1.3 Context

- 1.3.1 An Environmental Impact Assessment Scoping Report was produced by Highways England in January 2019 (Highways England, 2019), accompanied by a number of preliminary ecological surveys, including a Preliminary Bat Roost Assessment survey (Highways England, 2018) and Bat Activity Survey (Highways England, 2017), carried out in 2017 by WSP.
- 1.3.2 In order to inform the ongoing design of the scheme, and an assessment of impacts to biodiversity receptors to be reported within an Environmental Statement, the need for additional ecological surveys was identified following a review of the reports and design information available. This report provides the findings of bat emergence surveys of Kingsworthy Bridge and Itchen Bridge, and update bat activity surveys using static bat detectors carried out during 2020, with a brief evaluation and recommended next steps to inform the detailed design and mitigation strategy for the proposed works.
- 1.3.3 During the 2017 surveys the Itchen Bridge and Kingsworthy Bridge were identified as having moderate potential for roosting bats. In the 2017 report the Itchen Bridge and Kingsworthy Bridge were referred to as B8 and B9, respectively. For consistency with previous reports, the bridges surveyed during 2020 have been referred to in the same way. During the 2017 surveys the static bat detector locations were numbered 1 to 6. For consistency with previous reports, the static detector locations were the same as those used during the 2017 surveys and are referred to in the same way.



1.4 Aim and Scope of the 2020 Surveys

- 1.4.1 The aim of the 2020 surveys was to:
 - establish presence/likely absence of roosting bats in Itchen Bridge (B8) and Kingsworthy Bridge (B9) as well as collecting information about bat species and activity in the area immediately surrounding the bridges (gathered during the surveys)
 - update and augment bat activity surveys undertaken in 2017 to provide an indication of bat species and activity in the wider Survey Area and to update the baseline data collected in 2017
- 1.4.2 The scope of the survey comprised:
 - A review of the 2017 Preliminary Bat Roost Assessment Survey Report and Bat Activity Survey Report
 - Bat Emergence Surveys of Itchen Bridge (B8) and Kingsworthy Bridge (B9)
 - Static bat detector monitoring at six locations



2 Methods

2.1 Desk Study

2.1.1 The 2018 Preliminary Bat Roost Assessment Report and 2017 Bat Activity Survey Report were reviewed.

2.2 Field Survey

Bat Emergence Surveys

- 2.2.1 To determine whether roosting bats were present or likely absent from Itchen Bridge (B8) and Kingsworthy Bridge (B9) bat emergence surveys were carried out of each bridge. The locations of the bridges surveyed are shown on **Figure 1**. The survey of Bridge B8 was carried out on 20th August 2020 and the survey of Bridge B9 was carried out on 25th August 2020.
- 2.2.2 The surveys were completed in line with current good practice guidance (Collins, 2016) and were carried out under suitable weather conditions. Weather conditions were recorded at the start and end of each survey.
- 2.2.3 Each bridge was subject to one dusk emergence survey during the recommended season for bat surveys (between May and September with at least one survey between May and August). The surveys aimed to determine usage, species present and to identify entrance and exit points for bats. Each survey was carried out by two surveyors positioned either side of the bridge on the footpath on the south bank of the river. Surveyors were equipped with bat detectors/recorders, with calls analysed to confirm species identification following the surveys. During the surveys, when a bat was detected it was identified with its position and activity marked on a field base plan. The time and position of each bat was recorded along with its direction of flight (light permitting) and whether the bat was emerging, foraging or commuting.
- 2.2.4 An infra-red camera was also used during the survey of Bridge B8 to supplement the data collected by the surveyors.

Static Detector Monitoring

- 2.2.5 Static detectors (Anabat Express Detectors) were used to monitor bat activity at 6 locations within the Survey Area to update and augment data collected during the 2017 surveys. The locations were the same locations as those subject to survey during 2017. The monitoring locations are shown on **Figure 1**.
- 2.2.6 At each location the detectors were set to monitor activity for a minimum of five nights during the months of August and September. Each detector was set to record from one hour before sunset to one hour after sunrise on each night.
- 2.2.7 Bat calls recorded were subsequently analysed using Analook W software for species identification.

2.3 Personnel

2.3.1 The surveys were undertaken by Alison Johnson BSc MSc MCIEEM CEnv, with assistance from Richard Law, Jon Crewe and Rob Lawrence. Alison has over eighteen years of commercial ecological experience and all the surveyors have extensive experience of conducting many protected species surveys, including bat surveys. Alison, Richard and Jon are all registered under Natural England's Class Licence for Bat Survey.



2.4 Limitations

Bat Emergence Surveys

- 2.4.1 The bat emergence surveys were conducted during the season recommended in the current good practice guidance (Collins, 2016) and under suitable weather conditions.
- 2.4.2 Safe access for the bat emergence surveys was restricted to the footpath running along the southern bank of the River Itchen as it was not possible to gain safe access to the northern river bank at night or to position surveyors safely in the watercourse due to deep and fast flowing water. Visibility for the surveys was therefore restricted to the southern half of each of the bridges. Whilst this allowed for bat activity around the bridge to be recorded and for emergence of bats to be recorded in the sections that could be viewed, emergence from the northern side of each of the bridges or from around the central pier of each of the bridges cannot be ruled out. Due to these limitations, it was not possible to establish likely absence of roosting bats from the bridges and a precautionary approach has been adopted in interpreting the results of the surveys.
- 2.4.3 Bridges B8 and B9 both cross the River Itchen where the water is deep and fast flowing. As such it was not possible to carry out detailed inspections of Bridges B8 or B9 by foot to search for potential roosting features or evidence of bats.
- 2.4.4 At the time of the surveys, the detailed design was under consideration and it was unknown whether the bridges would be affected by the proposed works. Due to the health and safety issues associated with access to the bridges for detailed inspection and further emergence surveys, it was decided that further surveys would only be carried out once the design was sufficiently progressed to determine whether there would be potential impacts, ensuring that the survey effort would be proportional to the potential impacts, bearing in mind the health and safety constraints.
- 2.4.5 For this reason, only one dusk emergence survey was carried out of each bridge, allowing an indication of bat activity and likelihood of roosting bats, but insufficient to establish presence or likely absence of roosting bats.

Static Detector Surveys

- 2.4.6 The static detector surveys were conducted during the season recommended in the current good practice guidance (Collins, 2016) and under suitable weather conditions.
- 2.4.7 Equipment malfunctions and access restrictions resulted in a lack of data for two of the locations during August and for three of the locations during September. These locations were therefore subject to five nights of monitoring during October. In the analysis of the results from the static detector monitoring it is therefore not possible to draw direct comparisons in activity levels between the different locations. However, the data do provide confirmation of the species present and activity levels at each location for the periods monitored and taken together with the data from the 2017 surveys, they allow an evaluation of the Survey Area for bats to be made and provide information to inform an assessment of potential impacts.
- 2.4.8 The details of the limitations to the static detector surveys were as follows:
 - Access was not permitted to location 4 during August and although access was permitted in September, an equipment malfunction resulted in no data being collected from Location 4 in September. The static detector was re-deployed at this location for five nights in October. Location 4 is not located within the Site, but approximately 100m to the west.



- Equipment malfunctions at Location 2 resulted in no data being collected for August or September. The static detector was re-deployed at this location for five nights in October.
- Equipment malfunctions at Location 6 resulted in 2 nights of data being collected for August. The static detector was re-deployed at this location for five nights in October.

Species Identification

- 2.4.9 During any bat survey, there is likely to be a bias towards bats with louder calls, with certain quieter bat species likely to be under-recorded (such as *plecotus* species). Also, bats that fly higher may also be under-recorded or missed by surveyors positioned on the ground. Bats do not always emit echolocation calls, particularly when emerging from roosts, resulting in difficulties with species identification.
- 2.4.10 It is not possible to identify certain groups to species level using bat detectors or sound analysis, such as *myotis* species or *plecotus* species and others can be difficult to distinguish due to similar calls with overlapping frequencies, such as *nyctalus* species. Common and soprano pipistrelle bats have both been known to echolocate at 50kHz therefore it is not possible to assign calls at 50kHz to either species. In the results tables any bats emitting calls at 50kHz are referred to as common/soprano pipistrelle. Wherever possible bats have been identified to species level.



3 Results

3.1 Desk Study

- 3.1.1 The 2017 Preliminary Bat Roost Assessment Survey included the results of a desk study, which identified seven species of bat within 5km of the Site (Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri*, noctule bat *Nyctalus noctula*, brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and serotine *Eptesicus serotinus*), but no records from within the Site. The survey identified habitats suitable for bats, including Itchen Bridge (B8) and Kingsworthy Bridge (B9) as having moderate potential for roosting bats. The report recommended that further survey should be considered if these bridges were due to be affected by the proposed works. The inspections of Bridges B8 and B9 were carried out on foot and the report notes that full inspections of Bridges B8 and B9 were not possible due to the inaccessibility of one or other sides of the watercourse.
- 3.1.2 The 2017 Bat Activity Surveys included walked transects and static detector surveys and concluded that in general the Survey Area supports a fairly typical assemblage of widespread bat species, with the exception of rarer species (such as greater horseshoe *Rhinolophus ferrumequinum* and barbastelle *Barbastella barbastellus*). The static detector surveys identified high levels of *Myotis* activity from an area that was due to be affected by the proposed works, in the north-western and south-eastern sections of the Site. The static detectors indicated that much of the foraging activity was concentrated in and around the fields to the centre of the Site, between the A34 and M3 to the south of the River Itchen and also identified the River Itchen as being likely to offer foraging habitat for a range of bat species.

3.2 Field Survey

Bat Emergence Surveys

3.2.1 The results of the emergence surveys are provided below and a summary of survey dates, times and weather conditions is provided in Table 3.1.

Table 3.1 Dusk Emergence Surve	/ Dates,	limes and	Weather	Conditions
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Location	Date	Times	Weather Conditions
Itchen Bridge (B8)	20/8/20	Start: 20.00	Start Temp: 20.7°C
		End: 21.45	End Temp: 18°C
		Sunset: 20.15	Cloudy, Still, Dry
Kingsworthy	25/8/20	Start: 19.50	Start Temp: 18°C
Bridge (B9)		End: 21.35	End Temp: 16.5°C
		Sunset: 20.05	Cloudy, light breeze, light rain shower between 20.04 and 20.07, otherwise dry conditions

Itchen Bridge (B8)

3.2.2 A dusk bat emergence survey of bridge B8 was carried out on 20th August 2020. Surveyors were located at the western and eastern ends of the bridge on the footpath on the south bank of the river. An infra-red camera was positioned at the eastern end of the bridge on the south



- bank, pointing towards the underside of the bridge deck (south of the central pier) and the southern side of the central pier.
- 3.2.3 During the survey the following species were detected: common pipistrelle, soprano pipistrelle, noctule and *Myotis* sp.
- 3.2.4 The first noctule call was heard at 20.29 (14 minutes after sunset) and the first soprano pipistrelle call was heard at 20.38 (23 minutes after sunset). The first bats observed during the survey were soprano pipistrelle bats seen and heard foraging over the river to the north and west of the bridge at 20.38 and 20.40 (23 and 25 minutes after sunset) followed by constant high levels of activity beneath and around the western and eastern ends of the bridge during the rest of the survey, including constant foraging from soprano pipistrelles and *Myotis* species throughout the survey, occasional social calls from soprano pipistrelles, occasional noctule passes and one common pipistrelle pass.
- 3.2.5 On the infra-red camera footage a bat was seen flying from west to east under the bridge at 20.30 (15 minutes after sunset, no echolocation was recorded at that time so species is unconfirmed) and at 20.35 (20 minutes after sunset) a bat was seen flying from east to west under the bridge (identified as Daubenton's bat from subsequent call analysis and observation of behaviour from the video) followed by constant high levels of activity beneath the bridge.
- 3.2.6 Although no bats were seen emerging from or re-entering the bridge during the survey or recorded on the infra-red camera footage viewed following the survey, the observations and recordings close to sunset are around the typical emergence times for each of the species detected and so may indicate that a roost is present in the bridge or close by. From observations of the behaviour of the majority of the *myotis* bats seen (foraging close to the water surface), it is considered likely that these are Daubenton's bats, but it is also considered likely that more that one *Myotis* species was present during the survey.

Kingsworthy Bridge (B9)

- 3.2.7 A dusk bat emergence survey of bridge B9 was carried out on 25th August 2020. Surveyors were located at the western and eastern ends of the bridge on the footpath on the south bank of the river.
- 3.2.8 During the survey the following species were detected: common pipistrelle, soprano pipistrelle and *Myotis* sp.
- 3.2.9 The first *Myotis* sp. call was heard at 19.50 (15 minutes before sunset) and the bat was also seen foraging under the bridge. From observation of the bats behaviour it was identified as a Daubenton's bat. A second Daubenton's bat was seen and heard foraging under the bridge at 19.53 (12 minutes before sunset) and a third was seen and heard at 19.55 (11 minutes before sunset). Constant foraging from Daubenton's bats continued for the rest of the survey.
- 3.2.10 The first soprano pipistrelle call was heard at 20.25 (15 minutes after sunset) and five soprano pipistrelles were observed and heard flying out from under the western end of the bridge at this time. From observation of their behaviour it was considered likely that they emerged from a roost within the bridge structure, although the exact point of exit could not be seen. Constant foraging from soprano pipistrelle bats continued for the rest of the survey. Occasional passes by common pipistrelle bats were also heard between 20.53 and 21.32.
- 3.2.11 Although no bats were seen emerging from or re-entering the bridge during the survey, the observations and recordings before and soon after sunset are around the typical emergence times for each of the species detected and so indicate that a roost is likely to be present in the bridge.



Static Detector Surveys

- 3.2.12 **Tables 3.2** and **Table 3.3** summarise the data collected from the static bat detector monitoring surveys.
- 3.2.13 Of those that could be identified to species level, a total of seven species of bat were recorded: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Leisler's, serotine and barbastelle. In addition, calls of *Myotis* species, *Nyctalus* species and *Plecotus* species were recorded. Some pipistrelle bats echolocating at 50kHz were recorded and are categorised as common/soprano pipistrelle.
- 3.2.14 A total of 2,394 bat passes were recorded by the detectors during the survey. The most commonly recorded species was soprano pipistrelle (52.5% of all passes), followed by common pipistrelle (18.7%) and then *Myotis* sp (14.1%).
- 3.2.15 Over the period monitored for each location, the highest activity was recorded at Location 4 with the highest number of bat passes recorded (1,400) and the highest overall average number of bat passes per night (280). This consisted largely of soprano pipistrelle (average of 224 passes per night) and *Myotis* sp. (average of 54.6 passes per night) and is notable for this reason.
- 3.2.16 Rare species detected during the surveys include Nathusius' pipistrelle and barbastelle. Two passes by Nathusius' pipistrelle were recorded at Location 2 and 32 passes by barbastelle were recorded in total, with the highest number of passes recorded at Location 2 (24 passes).
- 3.2.17 Uncommon species detected during the surveys include noctule being recorded at all locations (158 passes or 6.6 %in total, most frequently recorded at Location 5), Leisler's (14 passes, or 0.6%, most frequently recorded at Location 1) and serotine (17 passes or 0.7%, most frequently recorded at Location 5).

Table 3.2 Bat Passes Recorded per Location Per Species

		Number (Total number of	Percentage of passes per				
	1	2	3	4	5	6	passes	species
Species	(10)	(5)	(10)	(5)	(10)	(7)	per species	
Common Pipistrelle	44	35	107	5	245	12	448	18.7
Soprano Pipistrelle	9	3	4	1120	117	5	1258	52.5
Nathusius' Pipistrelle	0	2	0	0	0	0	2	0.1
Common/Soprano Pipistrelle	1	0	23	1	7	0	32	1.3
Noctule	34	1	31	1	89	2	158	6.6
Leisler's	9	0	0	0	4	1	14	0.6
Nyctalus sp.	4	0	5	0	1	1	11	0.5
Serotine	4	0	6	0	7	0	17	0.7
Plecotus sp.	4	0	40	0	36	5	85	3.6



<i>Myotis</i> sp.	0	3	12	273	35	14	337	14.1
Barbastelle	1	24	1	0	6	0	32	1.3
Total bats for each location	110	68	229	1400	547	40	2394	100
Average passes per night for each location	11	13.6	22.9	280	54.7	5.7		

Table 3. Average Number of Bat Passes Per Species Per Night Per Location

	Average number of Bat Passes per night per Location (and number of nights recorded)										
	1	1 2 3 4 5 6									
Species	(10)	(5)	(10)	(5)	(10)	(7)					
Common Pipistrelle	4.4	7	10.7	1	24.5	1.7					
Soprano Pipistrelle	0.9	0.6	0.4	224	11.7	0.7					
Nathusius' Pipistrelle	0	0.4	0	0	0	0					
Common/Soprano Pipistrelle	0.1	0	2.3	0.2	0.7	0					
Noctule	3.4	0.2	3.1	0.2	8.9	0.3					
Leisler's	0.9	0	0	0	0.4	0.1					
Nyctalus sp.	0.4	0	0.5	0	0.1	0.1					
Serotine	0.4	0	0.6	0	0.7	0					
Plecotus sp.	0.4	0	4	0	3.6	0.7					
Myotis sp.	0	0.6	1.2	54.6	3.5	2					
Barbastelle	0.1	4.8	0.1	0	0.6	0					



4 Evaluation and Recommendations

Bat Emergence Surveys

- 4.1.1 Although no bats were seen emerging from or re-entering Itchen Bridge and Kingsworthy Bridge during the surveys, the observations and recordings before and soon after sunset are around the typical emergence times for each of the species detected and so may indicate that a roost is present in one or both of the bridges or close by.
- 4.1.2 Current good practice guidance recommends that two surveys be carried out within the appropriate season for survey for structures identified as having moderate potential for roosting bats in order to confirm presence/likely absence. In this case, one survey has been carried out so far. One survey can be useful in confirming presence, but the outcome of one survey of a structure with moderate potential for roosting bats cannot confirm likely absence. In addition, when taking account of the limitations of the survey as described above, the results should be treated with caution and used to give an indication as to whether the bridges are likely to contain roosting bats, but the limitations mean that presence or likely absence could not be established.
- 4.1.3 As the bridges remain suitable and are located in high quality foraging and commuting habitat for bats, a precautionary approach has been taken in assuming that bats are likely to be roosting in Itchen Bridge and Kingsworthy Bridge.
- 4.1.4 As the detailed design is still under consideration, it is recommended that further survey be carried out during spring and summary 2021 once it is known how the bridges will be affected by the works. The further survey should include a detailed inspection of the bridges, including access to both sides of the river, the central pier of the bridges and to the underside of the deck of each bridge, followed by further bat dusk emergence and/or dawn re-entry surveys. Emergence and re-entry surveys can be undertaken between May and August inclusive, although up to three surveys are likely to be required, spread across this survey period.
- 4.1.5 Due to the size of the bridges and dark conditions underneath the bridges, the use of infra-red cameras focused on features identified during the inspections is also recommended to supplement the data collected by surveyors.

Static Detector Surveys

- 4.1.6 The surveys detected a similar species composition to the surveys carried out in 2017, with the exception being that lesser horseshoe bat was recorded in 2017, but not recorded in 2020 and Nathusius' pipistrelle was not recorded in 2017, but was recorded in 2020. Rare and uncommon species recorded during both surveys include barbaselle, noctule, Leisler's, and serotine and in addition to these Nathusius' pipistrelle in 2020 and greater horseshoe in 2017. The most commonly recorded species during both surveys was soprano pipistrelle.
- 4.1.7 As with the surveys in 2017, high levels of *Myotis* species activity were recorded, although during the 2020 monitoring the majority of this activity was recorded at Location 4, rather than Location 3, which recorded the highest levels in 2017.
- 4.1.8 It should be noted that the data in this report presents data from a monitoring period towards the latter part of the 2020 season for bat activity and supplements the data gathered in 2017, which covered the period from June to mid October 2017. Once further design information is available, the results of this survey and the 2017 data should be considered together to carry out an impact assessment for the proposed scheme, once habitats to be affected are identified.
- 4.1.9 It is recommended that the proposed works avoid habitats where high levels of bat activity have been recorded or key habitat features that may be used by commuting or foraging bats



(such as tree lines, hedgerows, woodlands, river corridors), particularly those confirmed or likely to be used by rare or uncommon species, if possible.

4.1.10 If this is not possible, a detailed mitigation plan will be required prior to commencement of works



5 References

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

Highways England (2017) M3 Junction 9 Improvement Scheme - Bat Activity Survey Report.

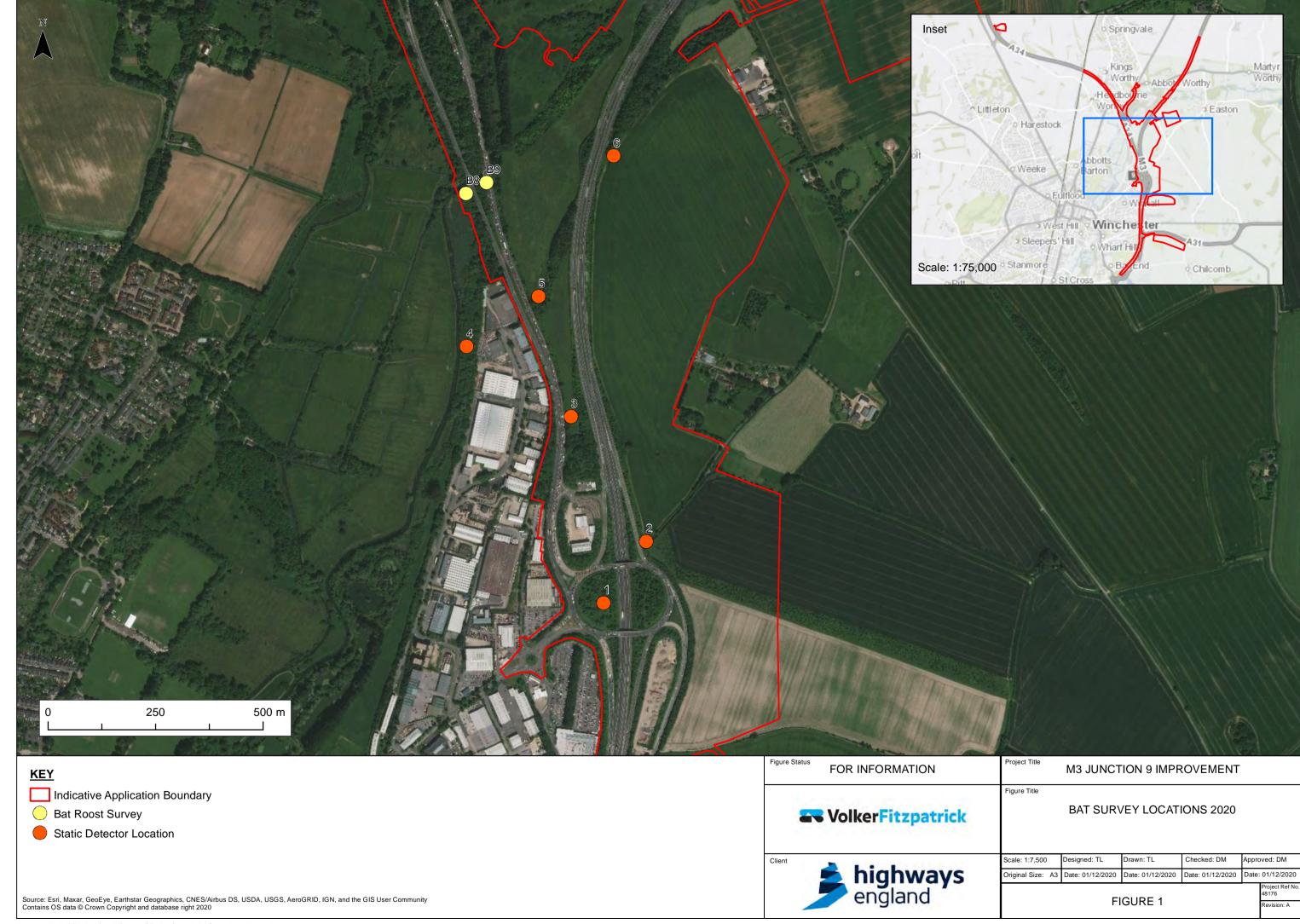
Highways England (2018) M3 Junction 9 Improvement Scheme PCF – Preliminary Bat Roost Assessment Report.

Highways England (2019) M3 Junction 9 Improvements Environmental Impact Assessment Scoping Report.



6 Figures

Figure 1 – bat survey locations





Appendix A Legislation

- A.1.1 Bats and their roosts are protected under the Conservation of Habitats and Species Regulations 2017 (as amended). As such it is an offence to:
 - deliberately capture, injure or kill a wild bat;
 - deliberately disturb wild bats: disturbance of animals includes any particular disturbance which is likely:
 - a. (a) to impair their ability
 - (i) to survive, breed or reproduce, or to nurture their young; or
 - (ii) in the case of animals 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
 - c. damage or destroy a breeding site or resting place used by this species.
- A.1.2 Bats are also protected under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of animals when using places of shelter, and obstruction of access to places of shelter.
- A.1.3 Certain species of bat including the noctule bat, brown long-eared bat and soprano pipistrelle bat are also listed as Species of Principal Importance (SPI) for the Conservation of Biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Under Section 40 of the NERC Act (2006), public bodies (including local planning authorities) have a duty to have regard for the conservation of SPI when carrying out their functions, including determining planning applications.