LEATHER LANE, GREAT MISSENDEN

Analysis of Independent Bat Monitoring 2021-2022

April 2023

E2047/LL/R1

COMMISSIONED BY:
Leather Lane Community Group

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EXECUTIVE SUMMARY

i. This report presents summary data and analysis from static bat detector recordings taken at Leather Lane between May 2021 and October 2022.

ii. The data was collected by Leather Lane Community Group (LLCG) in connection with concerns about the impact of HS2 construction works (and related activities) on the Lane, and in particular whether sufficient efforts had been expended by HS2 Ltd to understand the use of the Lane by bats, the species concerned, the Lane's importance to local bat populations and the local and wider significance of the impacts arising from the HS2 construction works.

iii. The data show that the tree line along Leather Lane is unquestionably of importance for local bat populations – indeed that importance is likely to have increased in the wake of removal of alternative local landscape-scale bat commuting conduits over the last two years in connection with the HS2 project. The data also confirms the local presence of, and regular use of Leather Lane by, the rare barbastelle bat. There are no known maternity colonies of this species in the South Bucks locality and therefore the presence of this species in the maternity season is highly significant. The pattern of records for this species further alludes to the possibility of a maternity roost being local to the Leather Lane site, potentially proximal enough to fall within a 'sustenance zone' important for juvenile bats making their first forays from the natal site.

iv. This report has been compiled in order to present the analyses of the 2021-2022 dataset and thereby provide information that will assist Buckinghamshire Council in their deliberations in connection with the approval process for the detailed design of an overbridge pursuant to Schedule 17 of the High Speed Rail (London – West Midlands) Act 2017.

v. LLCG maintain that the data presented in this report confirm that the Lane has a higher value for bat species than is recognised and/or accounted for in the Environmental Statement for the HS2 project, and that this underscores the need for the most sensitive overbridge design to be pursued, in accordance with the mitigation hierarchy and the statutory obligations upon both HS2 Ltd and Buckinghamshire Council under S40-41 of the NERCA 2006 (as amended by the Environment Act 2021)

1 INTRODUCTION

1.1 Background

1.1.1 Leather Lane is a minor, single-track country lane of around 1.2km total length in the countryside north of Great Missenden, Buckinghamshire. At its lower, western, end it joins the A413 Aylesbury Road and at its upper, eastern, end it terminates at a junction with the minor road of Potter Way/Kings Road. It rises around 60m in elevation from west to east along this length. The Lane is of significant antiquity – it is in part a sunken holloway - and it is associated with line of mature trees (mostly oaks dating from the late 1800s) which form an upstanding linear E-W corridor across an otherwise fairly open expanse of farmed valley landscape. The Lane is part of a sequence of such corridors between Great Missenden and Wendover which connect substantial areas of mature woodland on higher ground to both the west and east.

1.1.2 This network of corridors, including Leather Lane, is crossed perpendicularly by the route of the High Speed Two ('HS2') rail project. In March 2021, and in connection with HS2 enabling works along the Lane around that time, Bioscan (UK) Ltd was approached by the Leather Lane Community Group ('LLCG') for advice in connection with bats, their ecology and their legal protection. The HS2 related works at that time were focused on tree removals in association with the creation of a temporary internal site access road. LLCG had concerns that this work was proceeding without adequate bat surveys having been carried out and also in potential contravention of nesting birds legislation. The Group elicited additional survey and mitigation work and restricted the number of trees from being felled at that time to three.

1.1.3 In July 2021, a separate and larger section (some 85-90m, involving ninemature trees) of the Leather Lane tree line (the 'Track Trace') was removed in preparation for the main land modelling and permanent way works along the railway alignment proper. Some efforts have since been made by EKFB in response to pressure from LLCG to ameliorate the effects of this, for example the use of cut brash to create a temporary upstanding linear structure across the 'Track Trace'.

1.1.4 While the Lane, its tree line and its function as a commuting and/or foraging resource for local bat populations and other wildlife has been subject to direct impacts from tree removal and related fragmentation effects since 2021, as well as periods of indirect impact from disturbance and artificial lighting over the same period, the majority remains intact as at Spring 2023.

1.1.5 The focus of the LLCG campaign is now on residual and as yet unimplemented works within the ambit of the High-Speed Rail (London – West Midlands) Act 2017, specifically, the construction of an overbridge, with approach banking on either side, and an associated re-alignment of Leather Lane. These works have the potential to cause further significant impacts on the remaining intact portion of the Leather Lane tree line, and, by extension, further and significant fragmentation of the habitat corridor due to the felling of more Category A and B mature trees, mainly veteran oaks.

1.1.6 LLCG are campaigning for the most ecologically sensitive design possible to be used for this overbridge in the context of the mitigation hierarchy, related statutory obligations and in light of the fact that the detail of the overbridge design is subject to an approval process under Schedule 17 to the 2017 Act. The determining ('qualifying') authority for the Schedule 17 approval at this location is Buckinghamshire Council.

1.1.7 There have been a number of design iterations for this overbridge. The design currently favoured by HS2 Ltd and its contractors EKFB (Appendix 1) runs to the south of the Lane and would result in losses described in 1.1.5. LLCG maintain that due to the importance of Leather Lane for bats, including barbastelle, and in accordance with the mitigation hierarchy and the statutory obligations on both HS2 Ltd and Buckinghamshire Council related to the conservation and enhancement of biodiversity, a design that avoids or minimises additional tree loss should be pursued.

1.1.8 LLCG commissioned an independent engineer to come up with an alternative design and the result has been presented to EKFB and promoted to Buckinghamshire Council (Appendix 2). This runs to the north of the current Lane alignment and requires perhaps only one or two trees to be lost, as against the EKFB favoured option which will result in the removal of 87. LLCG maintain that amongst other things this design is both viable and also cheaper.

1.1.1 LLCG also question the need for a two-lane overbridge design standard to be applied to what is currently and historically a single-track rural lane. If the two-lane design standard can be relaxed, either of the designs of bridge currently being considered could, they suggest, be amended to a single-track carriageway with the space freed up potentially then available for planting across the Track in order to reinstate a continuous vegetated corridor.

1.1.2 Discussions over LLCGs alternative design were held between LLCG, Buckinghamshire Council and EKFB, including at a round-table meeting involving Bioscan on 18th May 2022. The minutes of this meeting are attached at Appendix 3[1]. There has been some questioning, mainly on the part of EKFB, as to whether the Lane is any more important for bats than is already accounted for the HS2 Environmental Statement, and whether the records of (*inter alia*) barbastelle are reliable. One of the purposes of this report is to address that question.

1.2 Purpose of this report

1.2.1 The purpose of this report is to provide empirical evidence of the importance of Leather Lane for bats, including barbastelle, to assist ongoing discussions around the most environmentally appropriate overbridge option and in due course to inform the resolution of the Schedule 17 approval process.

[1] EKFB have been provided with a copy of this document. EKFB indicated that they would be taking and circulating their own minutes of this meeting for agreement, but despite LLCG chasing for these, they have not materialised.

2 PRE-EXISTING SURVEYS AND ASSOCIATED DATA

2.1 Pre- May 2021

2.1.1 The initial approach to Bioscan in March 2021 was precipitated by concerns over HS2's contractors illuminating and attempting to fell trees with the potential to support bat roosts (and birds' nests) in the alleged absence of recent or sufficiently thorough bat surveys having been carried out or appropriate licences obtained.

2.1.2 There was related concern about the robustness of HS2 Ltd's/EKFBs baseline understanding of the value of the Lane for bats more generally. In part this arose out of events at nearby Jones Hill Wood where the rare barbastelle *Barbastella barbastellus* was reported in 2020, confirming its presence in the immediate locality – a fact that had not been picked up in HS2 Ltd's Environmental Statement or any subsequent surveys of that site by them.

2.1.3 At around this time a local resident and ecologist, Jim Ashton, carried out his own surveys[2] at Leather Lane using an Echo Meter Touch 2 bat detector. He reported the presence of at least six species of bat using Leather Lane, including barbastelle, Leisler's and Natterer's.

2.1.4 The HS2 Phase One Environmental Statement ('The ES') does identify Leather Lane as part of a network of landscape features of value for foraging and commuting bats. It cumulatively assessed these features as of "*up to county/metropolitan value*". However, the HS2 ES identifies the relevant assemblage as including common and soprano pipistrelle, *Myotis* species, noctule, serotine and brown long-eared bat. It does not recognise, nor consider, barbastelle or any other scarce or rare species.

2.1.5 The ES further notes that "*The hedgerows* [including that along Leather Lane] *are the only connectivity between the large areas of woodland to the east and west of the land required*[3]*"* and goes on to assess the impacts from fragmentation of this network as *"a permanent adverse effect on the conservation status of hedgerows that is significant at the district/borough level*[4]*".* The compunction to seek to avoid, minimise and compensate such impacts wherever possible, in accordance with the mitigation hierarchy, is therefore clear and would apply even in the absence of barbastelle.

2.2 Post Data collection by LLCG from May 2021

2.2.1 From May 2021, LLCG sought to assemble an independent dataset of bat use of Leather Lane, including whether there was evidence of roosts being present, and to inform their promotion of alternative design proposals for an overbridge and associated re-alignment of the Lane that would enable greater retention of the existing mature tree resource.

2.2.2 Bioscan assisted in this process through the loan of one and sometimes two static bat detectors (with instructions on deployment) through 2021 and 2022 and by conducting analysis of the data thereby obtained to determine what it conveys about the relative importance of Leather Lane as a landscape feature for bats, the species assemblage and

[2] https://drive.google.com/file/d/1MVNKPEoJxpHD_SDZgSM6c8682QwYjzVE/view?usp=share_link

[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/397883/Volume2_CFA10_Dunsmore_Wendover_and_Halton.pdf Page 106.

[4] Para 7.4.8 of the same document.

abundances involved, including whether the patterns of activity are suggestive of roost sites on or in close proximity to the Lane.

2.2.3 Data was subsequently collected by deployment of the static detector/s at various locations along Leather Lane for a total of 78 nights spread over the period May to December 2021 and 88 nights over the period May to October 2022 (total = 166 nights).

2.2.4 This report summarises the results of the analyses of these datasets and offers interpretation of the results. It is presented here to assist decision makers in determining the value of Leather Lane for local and wider bat populations, and whether such value merits pursuit of an alternative design for delivery of the HS2 project at this location, in accordance with the mitigation hierarchy.

2.2.5 The report consolidates and updates previous correspondence between Bioscan and the LLCG, some of which has already been submitted onwards to Bucks Council and/or EKFB Ltd (contractors for HS2 Ltd). This includes letters and e-mails dated 11th June 2021, 17th June 2021, 27th June 2021, 28th November 2021, 3rd December 2021 and 13th November 2022.

3 METHODOLOGY

3.1 Pre-2021 information

3.1.1 The main source of pre-existing bat data for the Leather Lane area prior to 2021 is the HS2 ES, specifically the Volume 2 'Community Forum Area' ('CFA') report related to CFA 10: this being the section of the route encompassing Dunsmore, Wendover and Halton and including the Leather Lane site.

3.1.2 As well as the results of surveys of this general area carried out by HS2 Ltd, the ES also includes a review of pre-existing data such as roost records available to HS2's consultants at that time.

3.1.3 It is relevant to note that concerns about the adequacy of the baseline data in the ES were raised by the joint Buckinghamshire Councils in their response to the draft HS2 ES[5], including the following comments at paragraph 7.3.4:

- "*Has sufficient survey effort been conducted to rule out presence of Barbastelle? What surveys have been conducted and where have they been conducted? No survey data has been provided to back up assertions.*

- *Have potentially important bat commuting routes between woodland blocks or areas of high quality habitat to the north and south of the Proposed Scheme been assessed and surveyed?*"

3.1.4 Notwithstanding the concerns raised by the joint Councils above, the final published ES relies on the same data from activity surveys for bats as the baseline information for assessment. The CFA10 report states at Table 8 (page 106) that: "*Driven and walked activity transects in the southern and central part of this area* [including Leather Lane] *recorded five species; common pipistrelle and soprano pipistrelle (in low to moderate numbers) with occasional passes of Myotis species, noctules and serotine bats. The activity indicates that this habitat is likely to be used for foraging and commuting between roosts and other foraging sites. In addition to the species listed above, the desk study indicates the presence of four brown long-eared roosts and a common pipistrelle roost within 1km of the land required for the proposed scheme. The hedgerows are the only connectivity between the large areas of woodland to the east and west of the land required. Noctule bats and soprano pipistrelle bats are species of principal importance*."

3.1.5 By the standards of the time (and even more so today), and as raised as a concern by the then joint councils, these surveys are a significant measure short of comprehensive or in alignment with best practice standards.

3.1.6 On the basis of these results, the HS2 ES determined that the "*Bat assemblage using mature hedges, trees and tree-lined lanes for foraging and commuting at Rocky lane, Bowood lane, Kings lane and Leather Lane.*" was of "*up to county/metropolitan*" importance, even in the absence of any detection of barbastelle.

[5] https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjG0KnCtY3-AhWqQkEAHa8nCoUQFnoECA4QAQ&url=https%3A%2F%2Fwww.aylesburyvaledc.gov.uk%2Fsites%2Fdefault%2Ffiles%2Fpage_downloads%2FCFA-10-Buckinghamshire-Councils-FINAL-response-HS2-draft-ES.pdf&usg=AOvVaw2hdxg_Y2pUm06Qsymdjn8P

3.1.7 A discussion of fragmentation effects on the hedgerow network between South Heath and Wendover Dean is presented at 7.4.7-7.4.8 of the CFA10 ES report. The loss and fragmentation of the hedgerow network is discussed as "*particularly important to the south* [sic] *of South Heath (at Leather Lane, Bowood Lane and Rocky Lane) and north of Wellwick Farm where hedgerows provide the main connectivity across the arable landscape. Loss and fragmentation of this extent will result in a permanent adverse effect on the conservation status of hedgerows that is significant at the district/borough level*."

3.1.8 On bats specifically, the CFA10 ES report considers that "*No significant effects are expected on the bat assemblage associated with mature hedges, trees and tree-lined lanes at the southern end of the area. The construction of the South Heath cutting, the Rocky Lane south cutting and the Small Dean viaduct southern approach embankment will remove mature hedges, trees and tree-lined lanes, particularly from Rocky Lane, Bowood Lane, King's Lane and Leather Lane. These features are used by common and soprano pipistrelles, a Myotis species, noctules and serotines. The width of the land required for the construction of the Proposed Scheme (that ranges between 60m and 550m) is therefore likely to reduce the frequency with which this assemblage crosses the land required for the construction of the Proposed Scheme. However, no known roosts will be removed and extensive foraging sites (predominantly woodland) will be retained on either side of the route, as such loss of habitat is unlikely to result in an adverse effect on the assemblages' conservation status*." (para 7.4.19).

3.1.9 The CFA10 ES report proposes mitigation and compensation measures to attempt to ameliorate the potential impacts on use of Leather Lane and other linear features in the locality from fragmentation by the HS2 project. Essentially these are based around planting the approach embankments associated with the proposed overbridge to "*encourage bats to fly at a safe height over the Proposed Scheme (particularly at Leather Lane…)*".

3.2 New data collection along Leather Lane – 2021 and 2022

3.2.1 Static detectors positioned at various points along Leather Lane (see Figure 1 for locations) collected data on active bats during the following time periods:

Table 1: 2021-2022 dataset – summary of spatial and temporal coverage

Year	Month	Dates (nights) of deployment of detector/s (for locations see Figure 1)			Notes
		'Lane'	'Track Trace'	'Potter Row'	
2021	May 2021	22-23 & 28-31			
	June 2021	01-06, 08-17, 19-24			
	July 2021	No data (main period of tree felling)			
	August 2021	02-05, 11-14, 16-18, 31			
	September 2021	01			
	October 2021	01, 03-04, 07-08, 10-14, 16-17			
	December 2021	21-27	21-27		Two detectors deployed
2022	May	29-31			
	June	01-04, 06-07, 09-11, 16-17, 19-24			
	July	06-31			
	August	01-03, 07-16, 25-31			
	September	01-06	18, 20-26, 28-29		
	October	14-17		6th & 8th	

3.2.2 The cumulative dataset consequently comprises 148 nights of data from the 'Lane' location, 16 nights from the 'Track Trace' location and two nights from a third location sampled to collect data close to a suspected roost site near the junction between Leather Lane and Potter Row (Figure 1). The dataset also comprises 12 nights of data from before the main period of tree felling in July 2021. Due to the extreme sparsity of data in the HS2 ES there is no other substantive 'control' data – and no data from before any potentially disrupting activities (including lighting) commenced in March 2021.

3.3 Analysis of 2021-2022 data

3.3.1 The 2021 and 2022 data collected by LLCG has been analysed by experienced and bat licensed staff at Bioscan UK Limited. Primarily this has been done via application of the proprietary software package 'Analook'. The full data files are retained and available on request.

3.3.2 The Anabat system records in 15 second segments when sound (bats or otherwise) triggers the detector. For example, if one bat is detected for two seconds one sound file is created; if four bats are recorded continuously for 15 seconds again one sound file is created. Consequently, the numbers of 'registrations' is not directly representative of the numbers of bats: in cases where registration numbers are low and intermittent, it is likely that only singles or ones and twos of that species were being detected. However, where registrations are condensed (i.e. frequent over a short time period), it is not always possible to reliably disaggregate where this may be due to intensive activity from low numbers of bats near the detector (for example a single bat making multiple passes whilst feeding close by) as against larger numbers of bats engaged in the same activity or even commuting past the detector in quick succession. However, where rare species (such as barbastelle) are encountered in the dataset, it may be possible to slightly improve certainty on numbers by conducting further analysis (for example for registrations representative of social or feeding activity).

3.3.3 In terms of speciation, the identification and labelling of bat 'calls' within recording segments was undertaken with the aid of published species call parameters[6], as well as Bioscan's in-house library of sonograms and recordings and the fund of embedded experience from Bioscan staff's many years of professional bat surveys. The label(s) for each sound file were then tallied to produce the file count for each survey period (i.e. night).

3.3.4 Some bat genera (in particular bats from the *Myotis* genus) are difficult or impossible to speciate from sound recordings, and some bat calls may also fall at the margins of or outside the normal call parameters for the given species due to environmental factors. For registrations where that is the case, registrations were labelled as indeterminate or intermediate (e.g. Nat/common pipistrelle, or Nyct/Epte) or in the case of Myotis bats, just by reference to genus. This is standard good practice to avoid false precision.

[6] J Russ, (2012) . British Bat Calls: A Guide to Species Identification. Pelagic Publishing

4 RESULTS

Regrettably, we are not able to release our detailed results at this time.

Last May (2022) LLCG held a meeting with EKFB, HS2 and local councillors. One outcome of this meeting was that EKFB would commission their own bat survey, after which the ecologists would reconvene and discuss the adequacy (or otherwise) of the proposed mitigation measures. We have made our full report available to Buckinghamshire ecologists and councillors, but (to the best of our knowledge), EKFB have not released any material related to any surveys which they may have commissioned.

This does not increase our confidence that EKFB will implement the other measures agreed at the meeting, so we are withholding the data which backs up our report, until EKFB

a) *Release their report, and associated data, and*
b) *Attend a meeting as previously agreed*

We are concerned that if we do release our data, then EKFB will seek to undermine it, and our position, rather than enter into the dialog regarding how the threats to the bats can best be mitigated.

Leather Lane Conservation Group

5 DISCUSSION OF RESULTS

5.1 Evidence for fragmentation impacts

5.1.1 Although the collective dataset presents challenges to robust analysis and the drawing of firm conclusions for decision making, being collected within the constraints of third-party access, with limited resources and without a comparative 'control' dataset from before HS2 related activities began to impact on the Leather Lane site, we consider a number of fairly robust conclusions can be drawn from its analysis. These are set out below:

1) There is **unequivocal evidence** that the Lane is used by barbastelle, and **some evidence** that such use has already been impacted by the HS2 works, particularly since July 2022. The extent to which such use may have resulted in significant impacts on the conservation status of the species in the wider local area is unknown. The apparent trend over the two years towards a peak of activity in late summer/early autumn could be interpreted as evidence for there being roosts in the relatively near vicinity. If that is the case, the Lane and its surrounds could be of elevated value if they fall within the juvenile sustenance zone for juvenile bats making their first independent forays from local roost sites. In any event, the HS2 project undoubtedly presents a risk to this species locally that was hitherto not recognised (for example in the ES) and which merits full re-consideration of mitigation and compensation in line with the mitigation hierarchy and the precautionary principle.

2) There is **strong evidence** from the dataset that a fragmentation impact has occurred on local bat populations more generally from the works to Leather Lane to date. This is manifested in the general trends of decline across the species-spectrum, not just amongst species of conservation concern. The possible and unsurprising exception is common pipistrelle which is an adaptable species less likely to be subject to lasting negative effects from fragmentation of flightlines, and from impacts such as artificial illumination.

3) There is **strong evidence** that the removal of vegetation to form the Track Trace has resulted in markedly reduced bat activity in that area. There does not appear to be any particularly strong evidence to suggest that such losses have been counterbalanced by increases in activity elsewhere along the less disturbed parts of the Lane, which again may indicate significant and ongoing impacts that merit an optimal compensation design solution.

5.1.2 We conclude that the data presented and analysed in this report provide a compelling basis for seeking the optimum solution to mitigate potentially significant impacts on a range of bat species from the HS2 Project at the Leather Lane site that are now detectable, and likely to increase. Any viable opportunity to protect the corridor from further fragmentation – e.g. by constructing the new lane to the north side – should be taken.

6 CONCLUSIONS

6.1.1 The conclusions of the Phase One Environmental Statement for the High Speed Two project were that impacts on bats arising from the project works at Leather Lane were acceptable having regard to a) the bat species known to use Leather Lane at that time, and b) the mitigation proposed.

6.1.2 However, data collected by Leather Lane Community Group since May 2021, and analysed in this report, provide irrefutable evidence that the baseline understanding of bat use of Leather Lane was incompletely understood at the time of the HS2 Environmental Statement and in fact under estimated. This necessarily brings into renewed question whether the originally proposed mitigation and compensation was and/or remains adequate.

6.1.3 It is incumbent upon those making responsible land-use decisions (in particular those involving the public purse), to seek to avoid, minimise and (as a last resort) compensate for negative environmental effects. This requires an iterative approach to detailed design as relevant facts come to light. The Schedule 17 consenting process enshrined within the High Speed Rail (London-West Midlands) Act 2017 provides an additional regulatory driver to ensure that the mitigation hierarchy is followed wherever possible in the delivery of the project. The data and analyses presented in this report are therefore highly material to the Schedule 17 process.

6.1.4 Having reviewed the data collected by LLCG, we believe it supports their assertions that the tree line along Leather Lane is important for local bat populations – indeed that importance is likely to have increased in the wake of removal of alternative local landscape-scale bat commuting conduits over the last two years in connection with the HS2 project. The data also confirms the local presence of, and regular use of Leather Lane by, the rare barbastelle bat. No known maternity colonies of this species exist in the South Bucks locality and therefore the presence of this species is highly significant.

6.1.5 **There is thus a clear risk of the substantive removal of the commuting and foraging corridor offered by Leather Lane having a regionally significant impact on bat populations that has not hitherto been recognised in environmental assessment processes and is not adequately mitigated or compensated by the present favoured designs for residual works.**

6.1.6 This risk either needs to be fully particularised by means of detailed additional work to locate barbastelle roosts and consider local networks important to them (and other species), or it translates to a compunction for works to be re-appraised in the light of the mitigation hierarchy, and for efforts to be pursued to avoid, minimise or compensate the likely impacts that will arise. In the absence of more detailed information about how the commuting conduit relates to local roosts, including of the rare barbastelle, a precautionary approach is required. This compunction is statutory and applies regardless of the fact that the project otherwise has the appropriate legal and regulatory consents. We emphasise that is not unprecedented that environmental matters arise during construction that require to be dealt with by reactive design changes. Indeed, that is no more than responsible practice.

6.1.7 In this situation, we are aware of less damaging design alternatives having been identified by local campaigners and, furthermore, that engineering expertise has been brought to bear to demonstrate that these alternatives are practical and viable. This was accepted by both HS2 and the EKFB design team, at a meeting held in May 2022, at which EKFB also agreed to carry out their own bat surveys, to inform a decision on how the lane should be re-routed.

6.1.8 There are thus compelling reasons why the lower impact design alternative needs to be looked at seriously and indeed the data analysed in this report would support the case for challenge if it is not.

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