Highways England for A47 North Tuddenham to Easton

TR010038

Registration identification number: 20028337

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Written Representation (WR)
Dated: 27th August, 2021
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Summary of Submissions

1. The assessment of the impact of the Scheme on the environment, and how it will adversely effect the environment is not complete, nor up to date due to its failure to have regard to the presence of a super colony of the International Union for Conservation of Nature Red Listed barbastelle bat.

2. The conservation value of this species of bat fulfils the criteria for SAC and SSSI accreditation. **The Scheme fails to comply with the NPS NN, the EIA Regs, the HRA Regulations, and the Highways England licence** (Appendices 1, 2 and 3), by failing to assess the impact on this super-colony of a European protected species, both for the schemes itself and the scheme in cumulation with other developments and projects in the area.

3. We present in Appendices 4 and 5 compelling ecological evidence to support the above submission, and which shows that when evaluating impact and effect it is necessary to look at, and to take into account, the interdependency of known colonies of the barbastelle bat based not only in within the boundary of the Scheme (Paxton Barn SAC) but also those known to be based throughout Norfolk, including the super colony situated in close proximity to the River Wensum SAC

4. It is our case that without further investigation and assessment, it is impossible to form a reliable baseline, and further to make any informed decision on the adequacy or otherwise of the proposals for mitigation and compensatory measures. This is of fundamental importance; without adequate survey and assessment there can be no guarantee that the proposed construction and operation will not be detrimental to maintaining the barbastelle population at a favourable conservation status in their natural terrain.

Detailed submissions

1. We are highly concerned that the environmental impact assessment (EIA), as it presently stands, is incomplete, seriously flawed, and inadequate (EIA Regs 4, 5, 14, Schedule 4, and EIA Reg 20, as laid out in Appendix 2). We assert, in particular, that there is currently no evidence before the Examining Authority (ExA) that relates to the existence and significance of the recent scientific identification of a super colony of the endangered[1], and highly protected, barbastelle bat. We submit that without a complete and accurate baseline it will be difficult, if not impossible, for the Secretary of State to fully assess the impact of construction and operation of the project on the conservation status of the local and regional population of this species of bat. Equally assessing the effectiveness of proposed mitigation and compensatory measures would also be problematic. This makes it impossible for the Secretary of State to reach a reasoned conclusion under EIA Regulation 21 (1)(b) on the environmental information, and under NPS NN section 4.24 and 4.25 (see Appendix 1).

2. In these representations we will review the known evidence so far obtained and presented on the expected impact of the project on barbastelle bats, as well as providing the evidence missing from the Environmental Statement, but which should form part of it.

[1] https://www.mammal.org.uk/2020/08/bats-on-the-red-list/

3. We begin with a short overview (and reminder) of the relevant legal and national policy background. In Appendices 1, 2 and 3 we also provide more detailed information on the NPS NN and how it relates to biodiversity and habitats regulation assessment, and the Highways England licence which requires cumulative environmental impact assessment across the network. We also show in Appendices 1 and 2 how the Secretary of State must ensure EIA Regs compliance, both by their own status as part of regulatory framework, and by a further duty to comply with the EIA Regulations via NPS NN, by virtue of Section 4.15 to 4.21.".

4. There is a legal obligation on a public body when exercising its functions to have regard to the purpose of preserving biodiversity[2].

5. Government recognised the importance of biodiversity protection when it delivered its 25 Year Environment Plan[3] in 2018 and it is clear than when a decision on planning is made it is of the utmost important to make it is not inconsistent with the aim of this Plan.

6. Theresa May MP in the Foreword left not room for uncertainty about the true objective behind the Plan: '**From reducing our carbon emissions and building resilience against the extreme weather associated with climate change, to leading international action to protect endangered species, the UK is an international champion for the protection of our planet and we will build on our record in the years ahead'.** (our emphasis)

7. Other policy guidance on ecosystem services also include UK National Ecosystem Assessment (2011) and UKNEA Follow-on (2014)[4]; Natural Environment White Paper (2011) – The natural choice[5]; Applying an

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[2] Section 40 of the Natural Environment and Rural Communities Act 2006

[3]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

[4] UK National Ecosystem Assessment http://uknea.unep-wcmc.org/Resources/tabid/82/Default.aspx

[5] Natural Environment White Paper (2011) https://www.gov.uk/government/publications/the-natural-choice-securing-the-value-of-nature

ecosystems approach to land use: Information Note (2011)[6]; Sectoral Impacts on Biodiversity and Ecosystem Services (SIMBIOSYS) (2013)[7].

8. In March 2021 Highways England produced the Environmental Statement. Chapter 6 relates to biodiversity [APP-047] and is relevant to these representations.

9. During the EIA Scoping Opinion [APP-136] process and consultation, Natural England strongly recommended that Highways England contact Norfolk County Council with regard to barbastelle bats and highlighted that barbastelle bats should be assessed for cumulative and in-combination effects under the EIA Regulations with the Norwich Western Link Road.

10. Despite this, there are surprisingly only a few references to barbastelle bats, and Highways England have not kept abreast of more recent discoveries and data on barbastelle bats in the area. HE has undertaken no cumulative and in-combination effects assessment for barbastelle bats under the EIA Regulations with the proposed, and proximal, Norwich Western Link Road. The few references in the Environmental Statement include:

11. **'In late summer/early autumn barbastelle bats were recorded especially in the woodlands to the west of Taverham Road at a time which suggests a roost is located near this location'**.

12. **'The highest activity was recorded to the north of the existing A47 from Wood Lane eastwards through Easton Estates. The transect in this area is considered very important particularly for barbastelle bats which are woodland specialists. Barbastelle activity was low in June and July and then peaked in the early part of August during the combined dusk and dawn surveys. The majority of passes were recorded along the part of the transect that passed alongside**

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[6] Applying an ecosystems approach to land use: Information Note (2011) https://www.gov.scot/publications/applying-ecosystems-approach-land-use-information-note/

[7] Sectoral Impacts on Biodiversity and Ecosystem Services (SIMBIOSYS) (2013) http://www.epa.ie/pubs/reports/research/biodiversity/strive115simbiosys.html#.U_dvyGB0zmI

Church Plantation, there were also occasional passes by these bats elsewhere on the transect where it was heavily wooded. Other areas of high activity included small wooded areas, the River Tud and tree lines'.

13. In addition there is also produced Report to Inform Habitats Regulations Assessment [APP-139] which was prepared to assess the impact of the scheme on, inter alia, the River Wensum SAC and Paston Great Barn SAC.

14. The report touches mainly on the barbastelle bats based at Paston Great Barn SAC. It concludes: **'Barbastelle bats have been found commuting across the existing A47 to foraging grounds over agricultural areas in the vicinity of the A47. However, given the extent of available suitable habitat between the SAC and the site, it is considered likely that barbastelle bats from the SAC do not frequent the area and the above effect pathways will not have a significant effect on the population within the SAC.**[8]'

15. The report fails to consider the wider issues, to which we refer below (Appendices 4 and 5), and which points strongly to the existence of inter-dependant barbastelle bat colonies. The evidence also highlights that the maintenance of commuting and foraging corridors between the base of each colony is of fundamental importance for the longevity of the conservation status of the local and regional population of this species of bat.

16. In support of this submission we rely on the expert evidence contained within the Barbastelle Bat Research Findings report dated 26th, February 2021 [see Appendix 4], and also the Report of Dr Mark Hassall dated 19th, February 2021[see Appendix 5]

17. Figure 2 on page 9 of the Barbastelle Bat Research Findings report is highly relevant here. It shows in yellow the merged Core Sustenance Zones from six maternity colony woodlands ("the Super Colony") as

[8] Page 28 Ibid

the well as the extent of the 6 km core sustenance zones (black dashed line). It is clear from this diagram that the part of the Super Colony as well a large part of the core sustenance zones will be impacted by the Scheme.

18. It is well known that major infrastructure projects cause habitat fragmentation, habitat degradation, loss of foraging habitat, severance of bat commuting corridors, bat fatalities due to collision with motor vehicles and disturbance from noise and light. Dr Hassall also highlights that this impact can be even more serious for the barbastelle bat because of the exceptionally high fidelity of barbastelle bats to both their sheltering and feeding sites, not only within seasons, but also between years and therefore their corresponding high fidelity to connecting flight paths. Barbastelle bats are therefore extremely unlikely to deviate from these traditional 'commuting' routes whatever mitigation measures are provided.

19. Dr Mark Hassall explains that due to metapopulation dynamics implications, construction and operation of the proposed road [Norwich Western Link] may also impact on the size and longevity of other populations of barbastelle bats located in other parts of Norfolk. This takes on greater relevance when one has regard to the cumulative impact of other infrastructure development due to take place in Norfolk over the next 5 years[9]. Indeed careful consideration needs to be given to the cumulative impacts. It is well established[10] that cumulative effects can result from individually insignificant, but collectively significant actions taking place over a period of time or concentrated in a location. It is recognised that cumulative effects are particularly important in environmental impact assessment as ecological features may be already exposed to background levels of threat or pressure (in this case the endangered barbastelle bat) and may be close to critical thresholds where further impact could cause irreversible decline. Cumulative effects can also make habitats and species more vulnerable or sensitive to change.

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[9] Hornsea 3 Norfolk Vanguard Norfolk Boreas SEP (Sheringham) DEP (Dudgeon) A47 Blofield to North Burlingham A47/A11 Thickthorn JunctionNorwich Western Link

[10] See for example GUIDELINES FOR ECOLOGICAL IMPACT ASSESSMENT IN THE UK AND IRELAND Terrestrial, Freshwater, Coastal and Marine

20. These other development projects can also influence the baseline and need to be taken into account. It is clear from the evidence presented by the experts that impact of this scheme on part of the ecosystem, habitat and population of the barbastelle bat will have implications for the whole ecosystem, habitat and population of this rare species, and as such supports the need for a larger study area when looking at the spatial and temporal extent of the baseline.

21. Relevant to the Habitats Regulations, the presence of these IUCN Red Listed bats, elevates the conservation value of land to a pSAC and also satisfies the criteria for designation as a Site of Special Scientific Interest[11]. An observation that was recognised by Norfolk County Council in its Advice document submitted to the Planning and Highways Delegations Committee on 3 June 2021[12]: **'It is recommended that NCC is contacted again at the end of the 2021 survey season as surveys associated with the NWL are ongoing (2020 surveys for the NDR will be available online in due course). Please also note that Dr Charlotte Packman has been undertaking radio tracking surveys of the barbastelles in the NWL area. She should also be contacted for data. It is believed that there is a nationally significant breeding barbastelle colony of over 150 bats in this area. While this colony is not afforded SSSI or SAC status it would otherwise qualify as such. The Planning Inspectorate a public body, has a duty under Part 3, Section 40 of the Natural Environment and Rural Communities Act 2006, to have regard …to the purpose of conserving biodiversity, to consider impacts of the road scheme on this colony'**.

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[11] The protected status of the bats under Annexes II and IV of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora warrants designation of a SAC; See Chilmark Quarries SAC and Eversden and Wimpole Woods SAC as examples. The former has the barbastelle bat listed as a primary reason for selection as it is regularly used by small numbers of the bat as an hibernation site. This is also the case with the latter example and reference is made to the barbastelle bat using the site as foraging area and as flight path when the bats forge outside the area.

[12] Page 85 : https://norfolkcc.cmis.uk.com/norfolkcc/CalendarofMeetings/tabid/128/ctl/ViewMeetingPublic/mid/496/Meeting/1882/Committee/178/Default.aspx

22. Surveys undertaken in connection with the Dudgeon and Sheringham Shoal Offshore Wind Farm Extensions in 2020 [Appendix 6] have also shown the presence of roosts and a high level of barbastelle bats within the River Wensum corridor, findings that are consistent with the findings of Dr Packman and Dr Hassall. The evidence also serves to support an application to amend the River Wensum SAC conservational objects to include the roosts and or foraging sites of the barbastelle bat.

23. The super colony of this endangered species of bat exists, there can be no doubt about that, it is also clear that the proposed project impinges on roosts and or important commuting and foraging channels, with the consequence that it is inevitable that construction and operation is likely to be detrimental maintenance of the population of the species concerned at a favourable conservation status in their natural range. This is important in the light of the Supreme Court Decision in The Court has recently looked at these tests in Keir v Natural England [2021] EWHC 1059 (Admin) [see Appendix 7] . In that case the Court refused to grant leave for judicial review and an injunction on an application to protect barbastelle bats exposed to impact from the construction of HS2. This was based on the particular features of the site and size of the barbastelle bat population. There was only one tree in the licence area of relevance. It was not attractive for breeding. The habitat of the site itself was sub-optimal. There were also many potential opportunities within 3 or 6 km for roosting by the barbastelle, including maternity roosting. HH Mr Justice Holgate therefore concluded 'In my judgment, the evidence does not persuade me that the maintenance of the FCS of the barbastelle depends upon, or is affected by, the retention of the 19 trees'. The features of the site to be impacted by the scheme, and at a completely difference scale of magnitude differ, from those in Keir. The super colony comprises at least 60 roosts. The area impacted is optimal for breeding. It includes pastoral landscapes with deciduous woodland, wet meadows and woodland streams and a river. It has mature trees with cracks and loose bark that provide important roosting opportunities. The evidence also shows that other colonies in Norfolk are also dependent on this optimal landscape for roosting and foraging.

24. This authority highlights the need for, and importance of, a full and comprehensive environmental assessment in the context of the Natural England licencing process.[13]

25. We therefore call upon the Examiner to take into account this evidence and these submissions and to request further investigation into the absence within existing environmental evidence of reference to the findings mentioned. There is a need to seek bat survey data from Norfolk County Council gathered in connection with the Norwich Western Link project,[14] as well as from Equinor New Energy Ltd in relation to its offshore wind-farm plans**.** Indeed, Norfolk County Council in its submissions, encouraged such investigation. It should be noted that Norfolk County Council's bat surveys are continuing, and will not be complete until the end of the year [2021]. Currently, the absence of this data in the Environmental Statement renders it inadequate under the EIA Regulations, and this should be considered under EIA Regulation 20.

26. We submit that it would when assessing the impact be irrational to ignore the importance of the land within the Scheme boundary to the ongoing maintenance of conservation value of the population of the barbastelle bat in Norfolk and as a whole. The combined and cumulative impact of infrastructure projects throughout Norfolk needs to be addressed and considered to comply with the EIA Regulations (Appendix 2). There is no doubt that the Scheme in combination with other local based schemes will have a significant effect on the extent, abundance and distribution of the barbastelle bat. It is clear from the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland that: **'A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project'**[15].

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[13] https://www.gov.uk/government/publications/bats-apply-for-a-mitigation-licence

[14] As proposed in the Environment Statement Chapter 8 [APP-047] para 8.4.19: 'A bat survey data exchange between the Proposed Scheme and the proposed Norwich Western Link Road (NWL) was recommended in the meeting with NCC and Natural England held in February 2020'.

[15] Page 11 : https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf

27. It is our submission that without these further investigations and obtaining additional evidence, it will be impossible for the Secretary of State to fully and properly discharge his function in line with the legal requirement imposed by Section 40 of the Natural Environment and Rural Communities Act 2006.

28. For all the reasons above, the Environmental Statement is inadequate. This renders it impossible for the Secretary of State to reach a reasoned conclusion under EIA Regulation 21 (1)(b) on the environmental information provided, and under NPS NN section 4.24 and 4.25 (see Appendix 1) for the HRA assessment. Nor can the Secretary of State comply with the EIA Regulations as specified at NPS NN Section 4.15 to 4.21. The requirement for further information to be provided in the Environmental Statement, and to the Examination, should be considered under EIA Regulation 20 (see Appendix 2).

David Pett
Solicitor

APPENDIX 1: NN NPS, Relevant sections on EIA and HRA

1. The National Policy Statement for National Networks ("NPS NN") was promoted through the Planning Act 2008 ("PA2008"), approved by Parliament and published by the Secretary of State for Transport in December 2014.

2. Chapter 4 of the NPS NN (Department for Transport, 2014) sets out the principles for assessment of schemes such as the A47 North Tuddenham to Easton (A47NTE) under the PA2008 DCO regime.

3. Section 4.3 lays out that the Examining Authority and the Secretary of State, for any proposed development, should take into account:

    - *"its potential benefits, including the facilitation of economic development, including job creation, housing and environmental improvement, and any long-term or wider benefits;*

    - *its potential adverse impacts, including* ***any longer-term and cumulative adverse impacts****, as well as any measures to avoid, reduce or compensate for any adverse impacts."* *(our emphasis)*

4. The A47NTE is an Environmental Impact Assessment (EIA) project – see [APP-135, EIA Scoping Report], and legislative context and need for EIA at section 1.5 of APP-135.

5. NPS NN Section 4.15 to 4.21 describes how environmental assessment should be done.

    "The Directive specifically requires an environmental impact assessment to ***identify, describe and assess effects on human beings, fauna and flora, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them.*** *Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 sets out the information that should be included in the environmental statement including a description of the likely significant effects of the*

proposed project on the environment, ***covering the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project, and also the measures envisaged for avoiding or mitigating significant adverse effects.****" (our emphasis)*

6. Section 4.16 states:

> "*When considering significant cumulative effects, any environmental statement should provide information on* ***how the effects of the applicant's proposal would combine and interact with the effects of other development*** *(including projects for which consent has been granted, as well as those already in existence)." (our emphasis)*

7. NPS NN Section 4.22 to 4.25 describes how Habitats Regulations Assessment ("HRA") should be done.

8. Section 4.22 states:

> *"Prior to granting a Development Consent Order, the Secretary of State must, under the Habitats Regulations, consider whether it is possible that the project could have a significant effect on the objectives of aEuropean site, or on any site to which the same protection is applied as a matter of policy,* ***either alone or in combination with other plans or projects.****"*

9. Sections 4.24 and 4.25 state:

> *"If a proposed national network development makes it impossible to rule out an adverse effect on the integrity of a European site, it is possible to apply for derogation from the Habitats Directive, subject to the proposal meeting three tests. These tests are that no feasible, less-damaging alternatives should exist, that there are imperative reasons of overriding public interest for the proposal going ahead, and that adequate and timely compensation measures will be put in place to ensure the overall coherence of the network of protected sites is maintained.*
>
> *Where a development may negatively affect any priority habitat or species on a site for which they are a protected feature,* ***any Imperative Reasons of Overriding Public Interest (IROPI) case would need to be established solely on one or more of the grounds relating to human health, public safety or beneficial consequences of primary importance to the environment.****" (our emphasis)*

10. We note that the Applicant considered "Different project effects" at Section 3.4.4 of the report to inform Habitats Regulations Assessment [APP-139] and states:

> *"15. Following a meeting with Norfolk County Council and Broadland District Council in 2020,* ***additional projects that were identified as having the potential to contribute to cumulative effects were added to the scope.*** *These include:*
> - *Norwich Western Link Road*
> - *Proposed waste transfer building at Pips Skips Ltd, Sandy Lane*
> - *Hornsea Project Three Offshore Wind Farm*
> - *Norfolk Vanguard Offshore Wind Farm*
> - *Norfolk Boreas Offshore Wind Farm*
> - *Food Enterprise Park" (our emphasis)*

11. We also note that the EIA Scoping Opinion [APP-136] by the Planning Inspectorate on behalf of the SoS states on Combined and Cumulative Effects (Scoping Report section 15) at ID 4.11.4 (in the "Aspect Based Scoping Tables" section4):

> "***The cumulative assessment should include the Norwich Link Road*** *which is proposed to be built in proximity to the Proposed Development and may have an overlapping construction period with the Proposed Development." (our emphasis)*

12. Further, Natural England (in letter 18th October 2019), make these comments on the EIA Scoping opinion:

> *"It will be important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals (****in particular the proposed Norwich Western Link road****) and a thorough assessment of the 'in combination' effects of the proposed development with any existing developments and current applications. A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment."*
>
> *"… 2.4.1 Bats:* ***With regard to barbastelle bats, we strongly recommend that the applicant contacts Norfolk County Council*** *(if they have not already done so) regarding the proposed Norwich Western Link road (which will connect this current scheme with the A1065 which lies the north of the A47). The Council has*

commissioned various bat surveys in relation to the proposed link road, some of which encompass land covered by this scheme. It also holds barbastelle records for surveys undertaken in relation to the now completed Norwich Northern Distributor Road which cover areas of land to the north of this scheme. ***It may be necessary for additional bat surveys to be undertaken in order to assess potential impacts from the scheme on bats that cross the current single carriageway A47.***

… 8. Cumulative and in-combination effects

A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.

The ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. ***Note the 2 km Zone of Influence proposed under 15.2.22 may need to be extended in relation to bats, depending on the findings of the bat surveys for this scheme and the Norwich Western Link road.*** *The following types of projects should be included in such an assessment, (subject to available information):*

> *a. existing completed projects (****eg Norwich Northern Distributor Road with regards to bats****);*
> *b. approved but uncompleted projects;*
> *c. ongoing activities;*
> *d. plans or projects for which an application has been made and which are under consideration by the consenting authorities; and*
> *e. plans and projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.* ***In this context we would expect the proposed Norwich Western Link road.***

(Emphasis as in original)

APPENDIX 2: EIA Regulations

1. The A47NTE is an EIA development and the decision-making process, therefore, needed to comply with the EIA Regs.[1] As we note above in Appendix 1, the NPS NN Section 4.15 to 4.21 also requires compliance with the EIA Regs.

2. Reg 4(2) prohibits the granting of development consent for EIA development "unless an EIA has been carried out in respect of that application". The EIA is defined in Reg 5 as:

> (1) The environmental impact assessment ("the EIA") is a process consisting of—
>
> (a) the preparation of an environmental statement or updated environmental statement, as appropriate, by the applicant;
>
> (b) the carrying out of any consultation, publication and notification as required under these Regulations or, as necessary, any other enactment in respect of EIA development; and
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> (c) the steps that are required to be undertaken by the Secretary of State under regulation 21 or by the relevant authority under regulation 25, as appropriate.
>
> (2) The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors—
>
> (a) population and human health;
>
> (b) biodiversity, with particular attention to species and habitats protected under any law that implemented Directive 92/43/EEC[2] and Directive 2009/147/EC[3];
>
> (c) land, soil, water, air and climate;
>
> (d) material assets, cultural heritage and the landscape;

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[1] Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

[2] Habitats Directive

[3] Wild Birds Directive

(e) the interaction between the factors referred to in sub-paragraphs (a) to (d).

(3) The effects referred to in paragraph (2) on the factors set out in that paragraph must include the operational effects of the proposed development, where the proposed development will have operational effects.

(…) (our emphasis)

15. The environmental statement, is further defined in Reg 14:

(1) An application for an order granting development consent for EIA development must be accompanied by an environmental statement.

(2) An environmental statement is a statement which includes at least—

(a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development;
(b) a description of the likely significant effects of the proposed development on the environment;
(c) a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
(d) a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;
(e) a non-technical summary of the information referred to in sub-paragraphs (a) to (d); and
(f) any additional information **specified in Schedule 4** relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected. (our emphasis)

16. Schedule 4 of the EIA Regs then sets out in more detail the information to be included in environmental statements. This includes, *inter alia*:

"Para 1:
A description of the development, including in particular—
*… (c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (**including water, land, soil and biodiversity**) used;*

Para 4:
*A description of the factors specified in regulation 5(2) likely to be significantly affected by the development: population, human health, **biodiversity (for example fauna and flora)**, land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.*

Para 5
A description of the likely significant effects of the development on the environment resulting from, inter alia—

(a) the construction and existence of the development, including, where relevant, demolition works;
(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
(e) **the cumulation of effects with other existing and/or approved projects, taking into account any existing**

environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

(g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, ***cumulative****, transboundary,* ***short-term, medium-term and long-term****, permanent and temporary, positive and negative effects of the development.*

This description should take into account the environmental protection objectives established at Union level (as they had effect immediately before exit day) or United Kingdom level which are relevant to the project, including in particular those established under [the law of any part of the United Kingdom that implemented Council Directive 92/43/EEC and Directive 2009/147/EC." (our emphasis)

17. Finally, EIA Reg 20 allows for an Examining Authority to suspend consideration of an application if the environmental statement is found to be inadequate:

    a. "Reg 20(2)

This paragraph applies if:

(a) the applicant has submitted a statement that the applicant refers to as an environmental statement; and

(b) the Examining authority is of the view that it is necessary for the statement to contain further information.

    b. Reg 20(1)

Where an Examining authority is examining an application for an order granting development consent and paragraph (2) applies, the Examining authority must: (a) issue a written statement giving clearly and precisely the reasons for its conclusion:

(b) send a copy of that written statement to the applicant;

and

(c) suspend consideration of the application until the requirements of paragraph (3) and, where appropriate, paragraph (4) are satisfied." *(our emphasis)*

APPENDIX 3: Highways England Licence

18. The Highways England licence requires at 5.23

> *"5.23 ... the Licence holder should:*
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> *...*
>
> *c.* ***Consider the cumulative environmental impact of its activities across its network*** *and identify holistic approaches to mitigate such impacts and improve environmental performance;"*

APPENDIX 4 - Expert Report dated 26/2/2021

Mr C. Fernandez,
Norwich Western Link Project Manager,
Infrastructure Delivery,
Community and Environmental Services,
Floor 2,
County Hall,
Martineau Lane,
Norwich, NR1 2DH.

26th February 2021

Dear Mr Fernandez,

Open letter to Norfolk County Council re barbastelle bat research findings and the proposed NDR 'Western Link' dual carriageway

As you are aware, research has been carried out for a number of years on a key population of a very rare and highly protected bat species, the Western Barbastelle (*Barbastella barbastellus*). This population is located to the north-west of Norwich. The research programme has been a collaboration between Wild Wings Ecology and the University of East Anglia, contributed to and supported by the Norfolk Barbastelle Study Group and a number of other professional ecologists, bat experts and researchers.

The selected route for the proposed 'Norwich Western Link' road (NWL) would pass through this nationally important area for barbastelles, which is home to the UK's only known 'super-colony' (the 'Wensum Valley Super-Colony'), which includes what is thought to be the UK's largest extant maternity roost.

Our data on the Wensum Valley barbastelle super-colony include roost locations, colony counts, home ranges, foraging areas, commuting routes and activity levels. Our Ecological Impact Assessment (EIA) of the road on barbastelles shows that the severity and diversity of impacts cannot be effectively mitigated or compensated for. Consequently, should the road scheme proceed, even with mitigation and compensation measures in place, it would be predicted to have a substantial negative impact on the super-colony and would be very likely to cause significant and sustained long-term damage to the Favourable Conservation Status of this nationally important bat population. Therefore, it is our judgment that the road scheme as proposed cannot be delivered in compliance with wildlife laws.

We feel that it is imperative that our research findings, which are considerably more comprehensive than the council's own barbastelle surveys for this area, are fully considered in relation to the road proposals. We are glad that the council is now willing to engage with our research findings, albeit at a rather late stage in the development of the road scheme proposals. Our research is ongoing and will be subject to peer-review prior to publication.

Therefore, to ensure you are aware of our data and findings thus far and can give these proper consideration in relation to the road proposals, we are providing an interim report here. In this letter I present a résumé of some of our (relevant) key research findings, more detailed information on barbastelle bats, our data collection, preliminary results and conclusions.

Key research findings

1. The proposed NWL would cut through a **nationally important area** for a rare, Annex II species: the barbastelle bat
2. This area is home to the **UK's only known 'super-colony' of barbastelles** (a cluster of significant, linked maternity colonies)
3. The 'Wensum Valley Super-Colony' includes what is thought to be the **UK's largest extant barbastelle roost**, with ≥105 individuals
4. The super-colony as a whole is estimated to have a ***minimum* of 270 barbastelles** (to put this in context, the criteria for 'Site of Special Scientific Interest' designation for barbastelles is breeding complexes of 20 or more adults)
5. To date we have located an exceptional **63 barbastelle roost trees within the impact zone of the proposed NWL**
6. The **main block of woodland to be directly cut through by the proposed road is home to a barbastelle maternity colony** (part of the super-colony)
7. The above key findings were missed by the council's own commissioned surveys for the road and as such impacts on barbastelles cannot have been appropriately assessed, with data inadequate for a valid assessment
8. There are also concerns given the failures of bat mitigation/compensation measures for the Norwich Northern Distributor Road (NDR) and the apparent disappearance of the two barbastelle colonies that were located within 2.5 km of the NDR, prior to construction
9. Our radio-tracking data show that **barbastelles avoid the bat mitigation road crossing structures on the NDR** (including the green bridge and bat gantries), instead crossing at potentially 'unsafe' locations, risking collision with vehicles
10. The projected scale and severity of the impacts of the road on this nationally important barbastelle population and the documented ineffectiveness of mitigation/compensation options are such that the **Favourable Conservation Status[1] of this barbastelle population could not be maintained should the road scheme proceed as proposed**

[1] *"conservation status will be taken as 'favourable' when: population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis."* - Habitats Directive Article 1 (i).

1. About barbastelles

1.1 Conservation status & legislation

Barbastelles are one of the rarest of the UK's 17 resident/breeding bat species. They are one of only two of our UK bat species to be listed as '*Near Threatened*' globally on the IUCN Red List, having undergone substantial population declines and extinctions in other parts of their range. In the Mammal Society's recently updated Red List of UK Mammals, barbastelles are described as being *'at imminent risk of extinction'* and listed as '*Vulnerable*'[2].

Barbastelles are protected by a range of legislation, including The Wildlife and Countryside Act 1981 (as amended) and are listed on Annex II of The Conservation of Habitats and Species Regulations 2017 (along with only three other UK bat species). It is an offence to deliberately or recklessly disturb, capture, possess, injure or kill bats or obstruct access to, damage or destroy their roosts. Disturbance includes *'to impair their ability to breed or reproduce or rear or nurture their young or to affect significantly the local distribution or abundance of the species'.* Annex II species are those whose conservation requires the designation of 'Special Areas of Conservation'.

1.2 Barbastelles in Norfolk – and the Norwich Northern Distributor Road

Norfolk is considered a stronghold for barbastelles and, thanks to the work of the Norfolk Barbastelle Study Group (Harris 2020[3]), we now understand a lot more about the species and the importance of Norfolk in ensuring the future persistence of this species.

Post-construction monitoring of the Norwich Northern Distributor Road (NDR) raised concerns over the road's impact on two (of three) main barbastelle colonies in the area, located c. 2.5 km and c. 350 m from the road. These colonies could not be located after the road had been completed and opened to traffic (Packman 2019[4]). In light of this and the location of the remaining/third significant colony in the area (furthest from the NDR, c. 3.5 km to the west), concerns over the likely impact of the proposed extension of the NDR through this area (the NWL) were highlighted. These concerns were removed from the monitoring report, without the author's consent, prior to publication on the council's website.

NDR post-construction bat monitoring data on the implemented mitigation/compensation measures for bats (including road crossing structures) showed that these measures had very low usage by bats and as such had likely failed to protect local bat populations. However,

[2] https://www.mammal.org.uk/2020/07/one-quarter-of-native-mammals-now-at-risk-of-extinction-in-britain/
[3] Harris, J. (2020) A review of the barbastelle *Barbastella barbastellus* in Norfolk based on the work of the Norfolk Barbastelle Study Group. British Island Bats, Volume One, p33-49.
[4] Packman, C.E. (2019) Norwich Northern Distributor Road post-construction barbastelle bat radio-tracking monitoring report, Year 1: 2018 (January 2019 v1.0 – correct/author-approved version). Wild Wings Ecology, Norwich.

this was not adequately analysed and conveyed in the associated reports published by the council.

1.3 Barbastelle ecology

1.3.1 Life history & food

Barbastelles can live to at least 20 years old and they reproduce very slowly (once mature, they typically give birth to one pup each year). They are ancient woodland specialists, requiring extensive tracts of good quality, mature natural habitats to survive and thrive. They feed on insects (with moths being a key component of their diet), including a number of arable crop pests, providing an 'ecosystem service' of natural pest control.

1.3.2 The role of woodlands: raising young, shelter & foraging

In the summer months, females congregate in 'maternity colonies', where they give birth to and raise their young, known as 'pups', in communal nursery roosts. Maternity colonies are usually found in mature woodlands, where they roost in trees, often under loose bark or other features that are associated with old trees. Each colony will utilise a number of individual roost features within the woodland, regularly moving between different roosts and as such require a significant number and range of available roosts within the maternity colony woodland. Barbastelles are considered to be sedentary and are highly faithful to their maternity sites, with females returning to the same woodlands (and often using the same roosts) each year to give birth and raise their pups.

Barbastelles show considerable 'winter hardiness', being unusually active (compared to other UK species) over the winter months, continuing to emerge to forage at night when conditions are reasonably mild.

The woodlands provide not only a range of suitable roost features with diverse conditions and microclimates, but also foraging areas, where barbastelles hunt for their insect prey using echolocation, and shelter, providing protection during adverse weather and a safe environment where the young can learn to fly and hunt for food.

1.3.3 Landscape use & Core Sustenance Zones

Barbastelles have large home ranges, travelling up to 20 km away from their roosts in a night to forage (more typically in Norfolk, 5-6 km and up to 11 km). Consequently, they have large 'Core Sustenance Zones' (CSZ, see definition box below), of 6 km radius around communal bat roosts, reflecting their requirement for substantial areas of good quality habitat to support viable colonies. Foraging habitats include woodlands, riparian habitats and hedgerows/field edges.

> *"A Core Sustenance Zone (CSZ), as applied to bats, refers to the* ***area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost****. With reference to planning and development the CSZ could be used to indicate:*
>
> *1. The area surrounding the roost* ***within which development work can be assumed to impact the commuting and foraging habitat of bats using the roost****…*
>
> *2. The area within which mitigation measures should* ***ensure no net reduction in the quality and availability of foraging habitat for the colony****…*
>
> *…Note:* ***There may be justification with Annex II and other rare species to increase the CSZ to reflect use of the landscape by all bats in a population****"*
>
> (Bat Conservation Trust[5])

2. Data collection

2.1 Bat trapping surveys

Bat trapping surveys provide information on species presence, reproductive status and enable barbastelles to be fitted with radio-tags and/or rings. Bats are trapped in fine 'mist-nets', processed (biometric data recorded and, where applicable, a radio-tag and/or ring fitted) and then released.

We have undertaken eighteen bat trapping surveys in woodlands within the impact zone of the NWL, between 2018-2020, as part of our wider research. Bat trapping surveys were carried out in the periods May to early June and August, to gain key information on barbastelle maternity colonies whilst avoiding the mid-June to end of July period when trapping/tagging carries a significant risk of harm to heavily pregnant females and very young, dependent pups. All trapping sites are located between 0 - 3.9 km from the proposed road route, with the proposed NWL well within these colonies' 6 km CSZs (note the need to increase the size of this radius for rare Annex II species (barbastelles) to reflect landscape use by all bats in the population).

2.2 Barbastelle radio-tracking

By temporarily fitting individual barbastelles with tiny, lightweight radio-transmitters, their movements can be tracked using a receiver and antenna, revealing roost locations, home ranges, foraging areas and commuting routes. Tracking also enable an assessment of habitat use and interactions with other landscape variables, such as existing roads and bat mitigation road crossing structures e.g. 'green bridges' and 'bat gantries' on the NDR.

[5] Bat Conservation Trust (2016) Core Sustenance Zones: determining zone size. Bat Conservation Trust, London.

To date we have radio-tagged thirty-three adult female barbastelles from within the NWL impact zone (2018-2020, compared to the council's commissioned surveys for the NWL, which are based on seven radio-tagged barbastelles, 2019-2020).

2.3 Roost emergence counts & colony estimates

Once roosts are located through radio-tracking, the number of barbastelles emerging from each roost at dusk can be counted. A colony will make use of multiple roost trees within a woodland and at any one time the colony may be utilising any number of these (although typically bats within a maternity colony will be roosting together or split between a small number of these roosts at any one time). All roost trees in use by radio-tagged bats are counted simultaneously (on the same night) to give a minimum estimate of colony size. Counts are conducted by experienced bat surveyors, equipped with infrared night vision/recording equipment and bat detectors to enable species identification.

2.4 Acoustic data (bat activity levels)

Static bat detectors, which record bats' ultrasonic echolocation and social calls, have been positioned throughout key woodlands in the area. These data provide an index of barbastelle (and other bat species) activity levels, by analysing the number of bat 'passes' recorded for each species (identified from sonograms/spectrograms). Data have been collected each month over the last year (since March 2020) and data collection is ongoing.

Should the road scheme go ahead, these detectors will provide pre-construction baseline data on bat activity levels and species presence, which can be used to compare with post-construction data to enable an independent assessment of impacts on local bat populations. Detectors have been positioned at varying distances perpendicular to the proposed road route, allowing an assessment of how far away road impacts are evident on bat populations, should the road be built.

3. Preliminary results

3.1 Bat trapping surveys

To date we have trapped 462 bats from within the NWL impact zone (2018-2020), which includes 106 barbastelles (compared to the council's commissioned surveys for the NWL: 138 bats trapped, of which 10 were barbastelles (but only seven individuals)).

During trapping surveys we have recorded the following seven species from within the NWL impact zone:

- Barbastelle *Barbastella barbastellus*
- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Natterer's bat *Myotis nattereri*

- Daubenton's bat *Myotis daubentonii*
- Brown long-eared bat *Plecotus auritus*
- Noctule *Nyctalus noctula*

Table 1 compares our bat trapping survey findings with those of the council's commissioned surveys for the major block of mature woodland habitat to be directly cut through by the road. In the period 2019-2020, we have trapped 114 bats in this woodland, of which 14 were barbastelles; the council's surveys during this same period trapped just nine bats and no barbastelles.

Table 1. Comparison of barbastelle bat trapping survey effort and findings: the council's surveys for the NWL (taken from their interim report[6]) and our surveys (Packman *et al. in prep*) for the major woodland block in the direct path of the proposed NWL, 2019-2020.

Survey findings ↓	**Council's NWL surveys**	**Our surveys**		
Survey date →	**19th May 2019**	**31st August 2019**	**10th June 2020**	**6th August 2020**
Number of bats trapped	9	22	61	31
Number of barbastelles trapped	0	3	6	5
Number of barbastelles radio-tagged	0	2 (adult females)	3 (adult females)	3 (adult females)
Number of barbastelle roost trees located at site (cumulative)	0	2	10	
Barbastelle maternity colony presence identified from subsequent radio-tracking & roost counts?	No	Yes	Yes	Yes

3.2 Barbastelle radio-tracking

All-night tracking of barbastelles from key maternity colony woodlands within the 'Wensum Valley Super-Colony' (and within the impact zone of the proposed NWL) have provided detailed information on home ranges, foraging areas and commuting routes. Roost and foraging woodlands, other foraging areas and commuting routes within close proximity to the proposed NWL (northern section) are summarised in Figure 1.

Woodlands on and in close proximity to the proposed NWL route are used extensively as both roost sites (including maternity use) and foraging areas. The River Wensum is a major commuting route for the super-colony and the surrounding riparian habitat and floodplain are used extensively for foraging. At the northern end of the proposed NWL route, the road would cut through a complex network of commuting routes (between roost woodland and the river), foraging areas and maternity colony woodland.

[6] WSP (2020) Appendix F – Bat Survey Report – 2019. Bat trapping and radio-tracking. Norfolk County Council.

Detailed, 'close-approach' radio-tracking enabled crossing points over major roads in the area to be located with a high degree of precision. Crossing points were at a few discreet locations and, predictably, where suitable habitat was located close to and on both sides of the roads, such as woodland/trees or vegetated waterways (unlit). Along the western section of the NDR, radio-tracked barbastelles crossed at two specific locations only (where habitat connectivity was best) and avoided the bat mitigation road crossing structures (a green bridge and a bat gantry) in the vicinity.

Furthermore, the Marriott's Way is well used as a commuting route (and foraging area) for barbastelles in the super-colony (see Figure 1), but it was clear from the radio-tracking data that the green bridge was ineffective, with barbastelles flying up to the end of the vegetated corridors either side of the bridge, but not passing over the (exposed and mostly unvegetated) bridge itself (with a c. 300 m gap in vegetation cover over and either side of the bridge). Instead, barbastelles crossed the NDR c. 130 m to the east, utilising a quiet, dark, mature tree-lined lane, with a corresponding tree and hedgeline on the opposite side (a gap in vegetation cover of only c. 100 m).

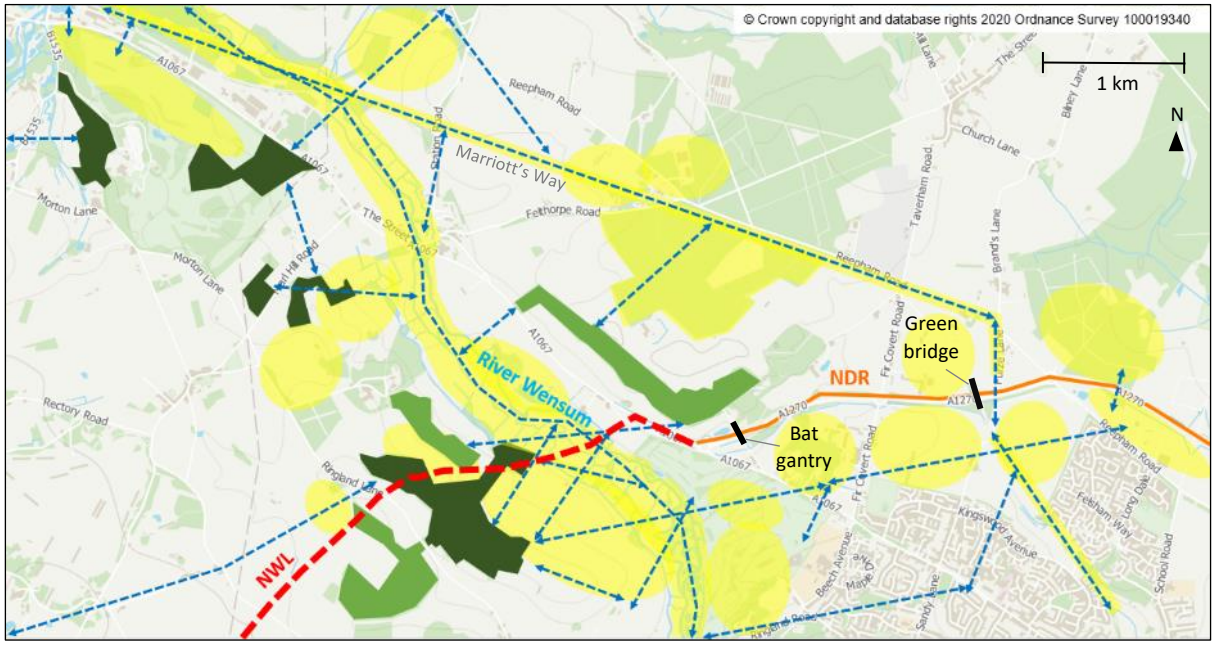

Figure 1. Summary schematic showing the key barbastelle areas which are in close proximity to the proposed NWL (northern section, red dashed line). Maternity colony (also used for foraging) woodlands shown in dark green, other barbastelle roost and key foraging woodlands in light green, foraging areas (outside of key roost/foraging woodlands) in yellow and main commuting routes with blue dashed arrows. The NDR (orange line) and bat mitigation road crossing structures within this area (green bridge and bat gantry) are also shown (labelled black rectangles). Overlaid on an Ordnance Survey map.

3.3 Roosts, emergence counts & colony size estimates

From radio-tracking adult female barbastelles in the area we have, to date, identified 63 roost trees within 3.5 km of the proposed road route.

Individual maternity colonies within the super-colony range in size from 27 - ≥105 barbastelles. Factoring in males, this gives a minimum estimate for the barbastelle population within the super-colony as a whole of 270 individuals.

Figure 2 shows the outer boundary of the merged (overlapping) 6 km Core Sustenance Zones around the known maternity colony woodlands in the area. The proposed NWL route cuts through the most critical area, the 'core of the cores', where all the CSZs overlap (i.e. the key area for all of the known maternity colonies within the super-colony).

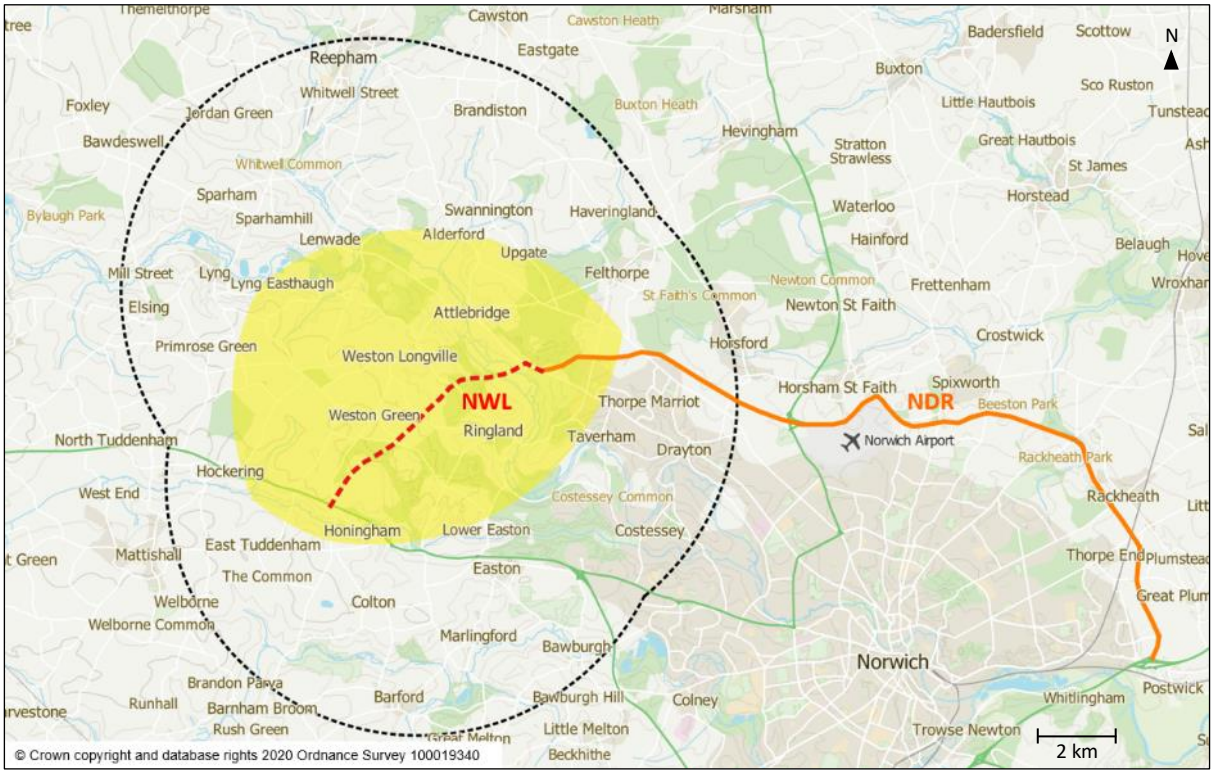

Figure 2. Outline of merged Core Sustenance Zones (black dashed line) around known barbastelle maternity colony woodlands in the vicinity of the proposed NWL, with the 'core of the cores' (the area where all six CSZs overlap) highlighted in yellow. Overlaid on an Ordnance Survey map and with the NDR (orange line) and proposed NWL (red dashed line) highlighted.

3.4 Acoustic data (bat activity levels)

The bat acoustic data are still being collected and analysed. However, based on preliminary analyses:

- 10 bat species have been recorded within woodlands in the NWL impact zone
- High levels of barbastelle activity have been recorded
- In winter/spring 2020, barbastelles were the second most commonly recorded species (after soprano pipistrelle)
- In summer 2020, barbastelles were the third most commonly recorded species, after soprano and common pipistrelles

4. Conclusions

The importance of this area for barbastelles is summarised by Emerson *et al.* 2020[7], on the basis of this research: *"there are several areas within Norfolk where high levels of activity have been recorded, including in the Wensum Valley where extensive radio-tracking work has been carried out to locate roosts of this species. The Wensum Valley appears to be a stronghold for this red-listed species in Norfolk and is likely to be important in a national context. This population is under threat by the proposed Western Link road in Norwich… loss of old mature woodland and veteran trees is the greatest threat".*

The proposed NWL is planned to pass through what is one of the most important areas in the country for barbastelles, which are '*at imminent risk of extinction*' (Mammal Society 2020). Our research has revealed the presence of the **first known barbastelle 'super-colony'** in the UK (the 'Wensum Valley Super-Colony') with an **estimated minimum population size of 270 barbastelles**. It also includes the **largest known extant roost in the country (≥ 105 barbastelles), one of 64 roosts identified to date as being used by the super-colony**. The proposed **NWL would pass through the 'core of the cores'; the critical area where the CSZs for each of the maternity colony woodlands overlap**. **In both summer and winter, barbastelle activity levels in this area are exceptionally high**. As a result there is a **very high risk that the proposed route of the NWL would have a very negative impact on this population, of significant national importance, which is vital to the future persistence of this threatened species.**

The council commissioned bat surveys to inform decision making concerning the NWL. The research reported on here shows that the council's assessment of impacts on barbastelles have been seriously underestimated. The much more comprehensive bat trapping and radio-tracking surveys summarised in this letter more accurately determine the significance of the threat to this rare species. The council's surveys will have substantially underestimated impacts on barbastelles, as the significance of the area for this rare species

[7] Emerson, J., Farrow, F., Leech, T., Parmenter, J. (eds) (2020) Norfolk's Wonderful 150. Norfolk & Norwich Naturalists' Society Occasional Publication 18. Norfolk & Norwich Naturalists' Society, Norwich.

was missed, a reflection of the paucity of bat trapping and barbastelle radio-tracking data (as documented here, in comparison to our independent, voluntary surveys carried out in the area by professional ecologists). The council's surveys failed to identify a barbastelle maternity colony in the major woodland in the direct path of the road, have only identified a handful of barbastelle roost trees in the area, have overlooked the presence of the super-colony within the road's impact zone and substantially underestimated the significance of the barbastelle population in the area. The concept of CSZs has also been overlooked, with insufficient scale and reach of impacts considered, given that barbastelles have very large home ranges, with a CSZ of 6 km radius. Consequently, **the council's presumption that impacts of the proposed NWL on the barbastelle population can be mitigated and compensated for is flawed and based on inadequate data.**

The destruction of barbastelle maternity colony woodland (used throughout both the critical summer and winter periods) is not permissible under UK wildlife laws and would be unprecedented. Our independent Ecological Impact Assessment for the NWL (and its associated substantial construction corridor) on barbastelles includes:

- Destruction of barbastelle maternity colony (and foraging) woodlands
- Habitat fragmentation
- Habitat degradation
- Loss of foraging habitat
- Severance of bat commuting routes
- Bat fatalities resulting from collisions with vehicles
- Disturbance from noise and light

The council's Environmental Impact Assessment Scoping Report[8] suggests that green bridges, underpasses and culverts would be used on the NWL scheme as mitigation against bat fatalities from vehicle collisions and severance of commuting routes. **Evidence shows that similar approaches on the NDR have failed and analysis of commuting routes in our study has revealed new evidence that barbastelles avoid using bat mitigation road crossing structures including green bridges and bat gantries.**

Compensation that has been proposed for loss of roost and foraging woodlands includes planting of tree saplings. A complex, mature woodland ecosystem capable of supporting a barbastelle maternity colony (providing a variety of roosts, shelter, abundant insect prey etc) takes hundreds of years to develop; tree whips are not replacement habitat for mature woodland ecosystems. Bat boxes have also been proposed to provide replacement roost features yet have notoriously poor uptake by bats and again, are unrealistically simplistic; they are not a replacement for mature woodland with many different roost niches and associated conditions that support colonies.

[8] WSP (May 2020) Norwich Western Link Environmental Impact Assessment Scoping Report. Norfolk County Council.

There has been no proposed mitigation/compensation for other predicted significant impacts on barbastelles and **there is a lack of evidence to demonstrate that the council's proposed mitigation and compensation measures would succeed in protecting these barbastelle colonies**. Failures in the NDR mitigation/compensation for bats and the apparent disappearance of the two barbastelle colonies that were located within 2.5 km of the road prior to construction are deeply concerning and do not bode well for the remaining key population, the Wensum Valley Super-Colony, should the NWL be built.

Under The Conservation of Habitats and Species Regulations 2017, ***'any disturbance which is likely to impair their ability to breed or reproduce or rear or nurture their young or to affect significantly the local distribution or abundance of the species'*** (for protected species which include barbastelles) **is an offence**. In order to legally proceed with the road scheme, a derogation licence must be sought from Natural England and can only be granted if three tests are met: 'imperative reasons of overriding public interest' (IROPI Test), 'no satisfactory alternative' (NSI Test) and 'maintenance of Favourable Conservation Status' (FSC Test). **It is clear that the FSC test for barbastelles cannot be met here**, satisfactory alternatives do not appear to have been meaningfully explored and IROPI seems improbable. Consequently, **the road cannot proceed, as proposed, in compliance with wildlife laws and without causing significant harm to the country's fragile barbastelle population.**

Given the **exceptional importance of the Wensum Valley barbastelle population**, we propose that key roost, foraging and commuting habitats should be robustly protected from future threats by **designation of a barbastelle Special Area of Conservation** (as required under The Conservation of Habitats and Species Regulations 2017).

Yours sincerely,

Signatories:

- *Dr Charlotte Packman* (Director, Wild Wings Ecology & Associate, University of East Anglia) – main contact*
- *Dr Iain Barr* (Senior Lecturer in Ecology, University of East Anglia)
- *Dr Stuart Newson* (lead on Norfolk Bat Survey, British Trust for Ornithology & member of Natural England's Bat Expert Panel)
- *Richard Moores* (Norfolk Mammal Recorder)
- *Jane Harris* (Research Project Officer, Norfolk Barbastelle Study Group)
- *Ash Murray* (Chair, Norfolk Barbastelle Study Group)
- *John Hiskett* (People & Wildlife Manager, Norfolk Wildlife Trust)
- *Holly Nichols* (Assistant Ecologist, Wild Wings Ecology)
- *Georgina Lester* (MSc research student, University of East Anglia)
- *Mick Finnemore* (Bat Ecologist)
- *Nick Pinder* (Bat Ecologist)

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Appendix 5. - A Case for Interpreting Results in the Interim Report by WSP (2020) in the Contexts of the Wider Ecology of Barbastelle Bats and of Ecological Theory - Mark Hassall

Appendix 1. A Case for Interpreting Results in the Interim Report by WSP (2020) in the Contexts of the Wider Ecology of Barbastelle Bats and of Ecological Theory

Introduction

1. Construction of the Norwich Northern Distributor Road (NDR) stopped when it joined the A1067. Further scientific evidence of potentially harmful impacts on the ecology of the Lower River Wensum Valley were required before proposals for a link to the A47 could be fully evaluated.

2. Provisional plans for several possible routes were evaluated in relation to political and economic criteria, but not with respect to all aspects of the scientific case, as key surveys had not yet been completed when the preferred route was chosen.

3. Since the preferred route was chosen new scientific discoveries reported in the first Interim Report by the appointed ecological consultancy WSP (WSP 2020) show that the there is a high risk that building the NWL along the preferred route would significantly damage an important and nationally valuable colony of one of the UK's rarest mammals, the barbastelle bat. The largest colony of this declining species in the UK is present in the Lower Wensum Valley (Wild Wings Ecology data), straddling the route that NCC chose as its preferred option for the proposed NWL before the new scientific discoveries by WSP could be taken into consideration.

4. As it seems that identification of the preferred route could not take into account all the relevant scientific evidence (because it was not available when the choice of preferred route was made), there is a case for suspending further development of the Outline Building Case along this preferred route until the report of the second year of survey work commissioned by NCC is available.

5. The Wensum Valley is of exceptionally high biodiversity value, containing several areas of nationally and internationally designated interest (WSP 2020), but its importance for one of the rarest mammals in the UK was not fully apparent until the WSP Interim Report was published. The extreme rarity of this species (British Mammal Society Red list 2020) places a strong onus on NCC to show that a species with such high biodiversity value will not be harmed by the proposed development (Geneletti 2003).

6. As fully acknowledged in the WSP (2020) report, the presence of barbastelle bats is a very important wildlife feature of the Lower Wensum Valley (Wild Wings Ecology 2019), as this is one of the rarest and declining species of mammal in the UK . Although there is a compelling socio-economic rationale at the local and regional levels, the very high value of one of the rarest bats in Western Europe (Rebello & Jones 2010) is of great concern at both national and international levels.

The Area Surveyed in the WSP Interim Report (WSP, 2020)

The ecological survey commissioned from WSP covered all species of bat but was restricted predominantly to an area immediately adjacent to the preferred route. Some potential day sheltering sites, summer maternity shelter sites and hibernating sites were identified. Due to access constraints, radio-telemetry surveys could not be undertaken in such close vicinity of the corridor of the "preferred route". Instead telemetry studies were focused the Golf Course/Dinosaur park site. This is only c. 2km from the preferred route so is well within the average home range of 6.5km diameter reported in Section 4.5 WSP 2020.

Summary of Key Survey Results

7. Radio telemetry studies revealed the presence of nine roosts used by the tagged bats (Table 4.8 (WSP 2020)). The closest of these roosts, that may possibly have been "maternal roosts"(Section 4.5.5.(WSP2020)) was only 440m from the planned preferred route. Up to 27 barbastelle bats were observed leaving roosts used by tagged pregnant individuals. The ground level tree surveys revealed that there were 77 trees, within 50 m of the preferred route, that had either high or moderate potential to support bat roosts. Very high numbers of barbastelle bat calls (from a wide range of locations within 500m along the preferred routes) and 23 records of barbastelle presence made from vantage points mostly within 50 - 100m of the preferred route during May to mid-June 2019 indicate a very high level of barbastelle bat activity in the immediate vicinity of the preferred route. **This provides clear new scientific evidence that were this route to be developed, there would be a very high risk that it would disturb and disrupt the activities of a significant number of this very rare species**.

The Risk of Direct Mortality Due to Increases in Road Kills.

8. The new scientific evidence in the WSP Interim Report (Tables 4.3, 4.5 & 4.6) clearly indicates that members of this Lower River Wensum Valley colony of barbastelle bats use the corridor of the preferred route both intensively and extensively. Barbastelle bats, while a highly mobile species (Kuhnert et al 2016), show very high fidelity (are highly faithful) to both sheltering sites and foraging sites and the commuting flight paths between them (Hillen et al 2011, Zeale et al 2012; Gotwald et al 2017). This behavioural inflexibility makes them particularly poorly adapted to withstand changes in their environment, such as the development of a new highway (Hillen et al 2009). **Therefore a significant number of barbastelle bats will be placed at increased risk of being killed, as the result of collisions with motor vehicles, if the NWL were to be constructed on the preferred route**. Furthermore this risk is higher for barbastelle bats, than for other species of bat, because in open habitats barbastelle bats forage closer to the ground than most other species of bat (often within 1-2 metres above ground level) and therefore they are more vulnerable to being killed in collision with motor vehicles than many other species of bats (Keith & Melber 2009). This conclusion is supported by analyses of bats killed on roads in mainland Europe, where barbastelle carcasses have been found, despite the species' rarity (Medinas et al 2013).

Potential Adverse Effects of Development on Foraging Behaviour of Barbastelle Bats.

9. Barbastelle bats typically feed in more than one foraging habitat during a single foraging trip (Zeale 2012). Exhibiting partial feeding preferences (Hassall & Lane 2005) by foraging in more than one habitat within a single foraging trip enables animals to feed on different species of prey with different and complimentary nutrient profiles. They are thus able to ingest their required dietary nutrients more efficiently than if foraging in a single habitat in accordance with the geometric framework model of mixed diet theory (Simpson and Raurbenstein 2012). Failure to obtain the right balance of nutrients would be likely to adversely affect reproductive success and hence reduce abundance. **Disturbance and disruption of any of the combination of feeding sites used would therefore risk damaging the future viability of this colony,** particularly in the context of the national decline of macro-moths (Fox 2013). In the lower Wensum Valley barbastelle bats forage along woodland edges, field boundaries, above rivers, and extensively over flood plain pastures. The availability of this combination of required feeding habitats in one locality has declined significantly in the UK due to changes in land use and agricultural practices.

10. Barbastelle bats feed predominantly, up to 99%, on moths (Sierra & Arletteaz & 1997) although they sometimes ingest 4 – 17% of Diptera with only traces members of other insect orders (Rydell et al 1996). Large species of moths are strongly preferred (Andreas et al 2012) even when their abundance is relatively low compared to high densities of smaller species. **Barbastelle bats thus have a very narrow trophic niche making them especially vulnerable to disturbance of their feeding grounds.** Individual barbastelle bats have an exceptionally high fidelity to specific foraging localities, with individuals returning to the same place to feed not just on successive nights but also during successive seasons (Hillen et al 2011, Zeale et al 2012). Any disturbance of these key feeding grounds could therefore have long term deleterious effects.

Potential Adverse Effects of Development of the NWL on Sheltering Behaviour of Barbastelle Bats.

11. Barbastelle bats not only need a mosaic of feeding sites they also require a range of shelter sites. Barbastelle bats shelter in a clearly defined sequence of sites during different times of year and under different weather conditions (Kuhnet et al 2016). Their sheltering requirements are different when sheltering in diurnal roosts compared with when they are rearing young, and different again when hibernating. Due to their highly specialised thermo-regulatory strategies and moisture requirements, barbastelle bats move between different types of shelter according to weather conditions. Hillen et al (2020) tracked **13 members of one colony to 46 different sheltering sites** and found strong inter-seasonal fidelity to roost sites. Some of the required shelter sites are found in ancient and very long-established woodlands, which are now an uncommon habitat in the UK.

12. There is a high frequency of roost switching, even by mothers rearing young. Kuhnet et al (2016), observed mothers to use 11 different sites during one reproductive period. **The number of shelters occupied at any one instant therefore significantly underestimates the number used throughout the whole annual cycle.** Thus it is not possible to assess the impacts of the proposed development on availability of required shelters without an almost continuous record of which sites are occupied by how many bats, for how long, and at which times of year.

13. The composition of groups of individual bats sheltering together does not remain constant (Patriquin 2016). Hillen et al (2020) found that there was a high level of "fission-fusion" behaviours in barbastelle bat sub-groups, resulting in a high turnover rate of sub-group composition. Even during the winter, during spells of warmer weather, individuals regularly move between hibernating sites, leaving from one group and returning to a different group in a different shelter. There is thus throughout the year a continuous turnover in the composition of individuals, as found for a wide range of other species of animal (e.g. Hassall & Tuck 2007, Timbuka 2012). Over a more extended period this process of changing group composition will result in a far higher proportion of the total population using a given shelter site than might be suggested by the proportion of the population that is recorded in that site on any given survey date. **It thus follows that the adverse impact of any disturbance or damage to a particular shelter site on the whole population will be much greater than it would be if group composition remained constant.**

14. The woodlands present in the Lower Wensum Valley provide an exceptionally favourable combination of all the different types of shelter sites required by barbastelle bats. The availability of **this combination of favourable sheltering sites is both very uncommon and declining in this country**. This helps to explain why the largest colony of this rare and declining species in the UK is found in the Lower Wensum Valley.

Why the Combination of Favourable Sheltering and Foraging Sites in the Lower Wensum Valley Makes it such a Nationally Important Site for Barbastelle Bats

15. Barbastelle bats are so rare partly because they have such a unique suite of very specific habitat requirements both for sheltering and feeding (Sierro & Arlettaz 1997, Zeale 2012, De Bruyn et al 2021), a combination which has declined nationally due to changes in land use and agricultural practice. As predicted by Southwood's (1977) habitat template model and Weins's (1985) habitat selection model, it is only when each of the separate habitat components are aligned together at appropriate spatial and temporal scales that an organism will select and be able to utilise a habitat. **The preferred route for the NWL crosses a mosaic of this very rare combination of sheltering and feeding habitats**. This explains why the barbastelle bat colony in this locality is the largest in the whole of the UK. Damage to any part of this mosaic of habitats will thus have a serious impact upon a high proportion of the total UK population of this very rare and declining species, as found for other analyses of the impact of roads on biodiversity in relation to ecosystem rarity (Geneletti 2003).

Metapopulation Dynamics Implications

16. The effects of damage to this colony may be even more widespread than at first appears if it forms a metapopulation (Hanski 1998) with other smaller satellite colonies elsewhere in the county. According to metapopulation dynamics theory (Gilpin & Hanski 2012) this central colony in the

Lower Wensum Valley may be acting as a "source" colony, helping to maintain other smaller colonies elsewhere in Norfolk, by individuals emigrating to these smaller colonies which are likely to be of more marginal viability due to them occupying less favourable mosaics of habitats. If this is the case, **damage to the central source population could also potentially threaten the continued viability of satellite sink populations** (Krebs 1976, Hanski 1998, Gilpin & Hanski (2012). This is a very serious risk because the combination of colonies of barbastelle bats in Norfolk represents a high proportion of the whole UK population of barbastelle bats.

Could Mitigation Measures Reduce the Impact of the NWL on Barbastelle Bats?

17. The overall negative effects of major roads on bats is well documented and results from a combination of road kills, traffic disturbance and ruptured connectivity. These deleterious effects having been particularly serious for low flying species including barbastelle bats (Kerth & Melber2009, Claireux 2016). In other localities adverse effects of developing new roads on other species of bats have been partially mitigated by adopting measures such as building overhead gantries, green bridges, underpasses and bat boxes. Barbastelle bats are as rare as they are because they have such extremely precise and specialised requirements for a combination of different sheltering and feeding sites and commuting routes between them. **It is therefore extremely unlikely that these highly specialised requirements could ever be met by usual mitigation measures deployed for other species**.

    For example, it takes centuries for trees to grow old enough to provide the very specific combination of barksheltering sites required by this species. Although barbastelle bats have been recorded flying through underpasses, they prefer to fly over highway developments more than some other species (Kerth & Melber 2009). Barbastelle bats are well known for their exceptionally high fidelity to both their sheltering sites (Hillen et al 2020) and foraging sites both within years and between years (Zeale 2012, De Bruyn et al 2021). **They are thus exceptionally unlikely to change their traditional commuting routes to use gantries, green bridges or underpasses**.

18. Due to the very high level of activity of barbastelle bats in close proximity to the selected route, as revealed by the surveys reported by WSP (2020), the only viable strategy to mitigate the very high risk posed by the NWL to this colony, would therefore be **to switch the proposed route to one of the earlier options located outside the home-range boundary of this super-colony of barbastelle bats**.

Equating the Value of a Species at the National and International Levels with Socio-economic Values at the Local and Regional Levels

19. The currency of local and regional interests is different from the currency of interests at a national and international level making evaluating their relative importance difficult. **However economic theory provides a conceptual framework of values which helps to overcome this problem** (Geneletti 2003, Justus et al 2009).

20. All living organisms have an **intrinsic value**. This takes account of extinction being a permanent loss to the whole planet not just for this, but also for all future, generations (Justus et al 2009).

21. For rare and declining species, another important component to their value is their **rarity value** Courchamp (2006). This is particularly relevant to planning the NWL because barbastelle bats are so

rare that they may be at risk of suffering from the "Allee Effect" which could be triggered were there any detrimental effects caused to the Lower Wensum Valley colony by developing the NWL.

The "Allee Effect" (Stephens, et al 1999, Stephens & Sunderland 1999) applies to very rare species, such as the barbastelle bat. When their populations become so low that social interactions break down, fitness of individuals decreases causing a further decline in the population. This negative feedback cycle exacerbates the decline of a population until it becomes extinct. Barbastelle bats in the Lower Wensum Valley have a complex and delicate social structure so if they are subject to disturbance in any one part of the colony it will impact on the social structure of the whole colony, generating a risk of triggering an Allee Effect leading to local extinction.

22. Species also have a **"passive use value"** (Nunes & van Bergh (2001), because members of society "*passively*" appreciate a species as being part of their living environment. Everyone has a right to be able to enjoy reading about or watching television documentaries about a particular species. Barbastelle bats are members of the only order of flying (as opposed to gliding) mammals. Bats are also the only terrestrial animals that routinely use echo-location when both navigating and feeding. For this combination of reasons members of society as a whole therefore value bats very highly. For a species of bat with a unique ecology, as is the case for barbastelle bats, the combination of these three different sorts of values is exceptionally high at both national and international levels.

Executive Summary of Conclusions.

A. *The null hypothesis that constructing the NWL along the preferred route will not have a deleterious effect on the largest colony of barbastelle bats in the UK has been tested, using data published by WSP in their Interim Report (2020).* ***No evidence was found to support this hypothesis****.*

B. *The Interim Report from WSP is based on using a combination of different methods for detecting bats: ground survey, vantage point observations, automatic sound detection and radio telemetry. All the methods revealed a high level of barbastelle bat presence and activity on, or close to, the preferred route, Sound detections at a range of sites adjacent to the preferred route revealed up to 40 passes per night for a individual locations. Roost counts of up to 27 individuals emerging from nine roosts used by radio telemetry tagged individuals. The closest of these roosts was only 440m from the preferred route and all within the 6.5 km average diameter of the home ranges monitored therefore all within the 7km diameter undisturbed buffer zone around roosts of barbastelle bats recommended by Zeale et al (2012) for this "near-threatened and declining" species.* ***The WSP Interim Report (2020) thus provides important new scientific evidence of high levels of barbastelle bat activity along the "preferred route".***

C. *The alternative hypothesis that construction of the NWL along the preferred route,* ***will result in a high risk of detrimental effects*** *on this colony of barbastelle bats, is supported by the observations of high levels of activity of this nationally and internationally highly valued species, in close proximity to the preferred route (WSP 2020) .*

D. *Barbastelle bats have extremely specialised and specific requirements for a range of sheltering sites, combined with a specialised requirement to feed in a mosaic of different foraging habitats (Zeale 2012).* ***The Lower Wensum Valley has a very rare combination of both favourable sheltering and foraging habitats****.*

E. *It is therefore appropriate to apply the **Precautionary Principle,** at least until after all available data from 2020 surveys commissioned by NCC have been published and fully evaluated. Similar data will be required for other potential routes for the NWL outside the home range boundaries of the uniquely important barbastelle bat 'super-colony' in the Lower Wensum Valley.*

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Appendix 6 - Dudgeon and Sheringham Shoal Offshore Wind Farm Extensions Bat Survey 2020

Dudgeon and Sheringham Shoal Offshore Wind Farm Extensions

Preliminary Environmental Information Report

Volume 3

Appendix 22.3 - Bat activity survey

April 2021

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Title**:**	
Dudgeon and Sheringham Shoal Offshore Wind Farm Extensions Preliminary Environmental Information Report Appendix 22.3 2020 Static Bat Detector Survey Report	
Document no.: PB8164-WFE-ZZ-ON-RP-Z-0005	
Date:	Classification
29th April 2021	**Final**
Prepared by:	
Royal HaskoningDHV	
Approved by:	Date:
Jo Rodriguez, Equinor	29th April 2021

WILD FRONTIER ECOLOGY

Sheringham Shoal and Dudgeon Extension Projects

2020 Static Bat Detector Survey Report

March 2021

Report produced by	Submitted to
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The data which we have prepared and provided is accurate, and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that any opinions expressed are our best and professional bona fide opinions.

This report conforms to the British Standard 42020:2013 Biodiversity – Code of practice for planning and development.

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Glossary of Terms

BLE	Brown Long-eared (bat)
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest
DCO	Development Consent Order
DEP	The Dudgeon Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
ETG	Expert Topic Group
NBIS	Norfolk Biodiversity Information Service
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
PEIR boundary	The area subject to survey and preliminary impact assessment to inform the PEIR, including all permanent and temporary works for DEP and SEP. The PEIR boundary will be refined down to the final DCO boundary ahead of the application for development consent.
SEP	Sheringham Shoal Extension Project
SM2	SongMeter2 static bat detector
WFE	Wild Frontier Ecology Ltd.

Non-Technical Summary

Wild Frontier Ecology Ltd. was commissioned by Equinor New Energy Ltd. (the Applicant) to undertake a suite of static bat detector surveys to understand the level of bat activity within areas considered likely to be important for foraging/commuting bats, within the PEIR boundary of proposed Dudgeon Offshore Wind Farm Extension Project (hereafter DEP) and Sheringham Shoal Offshore Wind Farm Extension Project (hereafter SEP).

The bat surveys comprised the monthly deployment of four static bat detectors within areas that had been identified as likely to be key sites for commuting and foraging bats. Areas within the PEIR boundary were outlined as important for bats based on information provided in the ETG meeting on the 28th January 2020, review of aerial photographs and maps, plus local knowledge (of the ecologists) of areas likely to be important for bats. During the ETG meeting, Norfolk County Council advised that Swannington and the River Wensum are important areas for bats. Additionally, other proposed river crossing points on the Rivers Bure, Tiffey and Yare were targeted for the bat activity survey effort, as were the areas of woodland and heathland between Bodham and Weybourne.

At the time of the surveys, the proposed PEIR boundary was not sufficiently refined to allow for targeted surveys of individual features (such as rivers and hedgerows), as the precise onshore cable route and exact crossing points of such features was not finalised. Therefore, the surveys covered the general sections of the PEIR boundary which were initially considered to offer the most suitable habitat for foraging/commuting bats. The data obtained from the survey effort provides an indication as to whether these targeted areas are important for bats. Furthermore, the 2020 survey data would provide a useful dataset in supplementing further data that will be obtained from more targeted bat surveys in 2021 (once an exact PEIR boundary and then DCO boundary is finalised), of specific features which would be directly impacted.

The static bat detectors were deployed on four occasions in 2020, between 24th June and 10th July, 30th July and 11th August (with one static re-deployed from 19th August and 25th August due to a technical fault on the initial deployment), 26th August and 10th September and finally between 24th September and 5th October. All static detector deployments have been within the appropriate survey season for foraging/commuting bats. The surveys were not commissioned until late June, so there were no surveys at the start of the survey season in April/May. Given that data was collected over a five-month period, initial conclusions can still be drawn despite no static bat detectors having been deployed early in the season.

From the first deployment of static bat detectors in June-July 2020, the detectors deployed at the Rivers Wensum and Yare recorded high numbers of bat registrations across the entire 16 nights (15,739 at River Wensum and 5,099 at River Yare respectively). The data indicates that the locations where these two detectors are deployed are important for foraging/commuting bats, specifically soprano pipistrelles *Pipistrellus pygmaeus*. Some rarer species including *Myotis* species (ultrasonic recordings of which do not allow species classification), Nathusius' pipistrelle *Pipistrellus nathusii* and barbastelle *Barbastella barbastellus* were also recorded in these two locations. The static bat detectors deployed in Weybourne Woods and a small woodland near the River Wensum recorded far fewer registrations and of fewer species (with 16 and four registrations respectively recorded in total). This may indicate that these areas may not commonly be used by foraging and commuting bats. However, technical constraints may have been a factor in such low levels of recorded activity. The number of registrations does not necessarily relate to the number of individual bats, as individual bats (or low

numbers of bats) can produce large numbers of registrations when active (e.g. foraging) in the vicinity of a bat detector.

The second deployment of static bat detectors in July-August 2020 recorded less bat activity (fewer registrations) and fewer species in general. There were no records of brown long-eared bats *Plecotus auritus*, serotines *Eptesicus serotinus* or Leisler's bats *Nyctalus leisleri*, but further registrations of soprano pipistrelles, common pipistrelles *Pipistrellus pipistrellus*, noctules, barbastelles and *Myotis* species. The detector which was deployed by the River Wensum recorded for only two days (before failing due to a likely technical fault), yet still had 666 (mostly soprano pipistrelles) registrations. As this detector had stopped recording after only two nights, it was re-deployed at the same location later in August. The other areas with high levels of bat activity recorded across 11- or 12-night periods are near Colton and Swannington (1,313 and 981, respectively). For the Colton deployment, most recordings were of soprano pipistrelles, including some which are close to the sunset times which suggests there may be nearby roosting. The Swannington results differed, with common pipistrelles having the highest number of registrations. The detector which was positioned in Weybourne Woods recorded 70 registrations relating to three bat species: common and soprano pipistrelles and *Myotis* species.

The re-deployed static detector recorded 1,486 registrations relating to at least five species of bats. The highest frequency of registrations again related to soprano pipistrelles. Of particular note, there were frequent *Myotis* sp. bats and barbastelles recorded, whereas barbastelles were not recorded in any other deployment locations across the July/ August surveys. As both *Myotis* sp. and barbastelles were recorded during the first June/ July deployment this indicates that the Wensum River corridor is important for these rarer bat species.

The third deployment of static bat detectors in August-September 2020 included moderate levels of bat activity and some records of rarer species. The detector deployed near Weybourne Woods had 1,381 records of bats, which was the highest number of records for the Weybourne Wood deployments. These records were mostly attributable to soprano pipistrelles, but there were also registrations of *Myotis* sp. and barbastelles. The detector located by Swannington and the River Wensum had high frequencies of registrations recorded across the third deployment (2,039 and 1,875, respectively). Both deployments recorded at least six species and included rarer species such as Nathusius' pipistrelle, barbastelle and *Myotis* sp. The detector located by the River Bure had the fewest registrations, with 164 in total. These registrations, however, relate to at least six species including *Myotis* sp. and barbastelle. Registrations times for pipistrelle species from these the detectors at Weybourne Woods, Swannington and the River Wensum were all close to sunset/ sunrise times, suggesting that there may be roosts located nearby.

The fourth deployment of static bat detectors in September- October 2020 recorded less bat activity overall, perhaps reflecting relatively suboptimal foraging conditions (e.g. lower overnight temperatures) into autumn. However, a range of species were still recorded throughout this deployment. The highest number of registrations was from the detector deployed by the River Wensum. There were 971 registrations recorded, of which 771 were from *Myotis* sp. bats. This is by far the highest number of *Myotis* sp. registrations recorded during any one of the static bat detector deployments. Additionally, some of these registrations are within 10 minutes of sunset/ sunrise time, suggesting that there may be a roost/ roosts located nearby. At the least, it suggests that the River Wensum provides an important foraging habitat for *Myotis* sp. bats. Barbastelles were also recorded on this detector. The detectors located by the River Bure and Tiffey had some bat activity (485 and 259, respectively) which included *Myotis* sp. and

barbastelles. The detector located in Weybourne woods had relatively low levels of bat activity (337 registrations in total) and from only common and soprano pipistrelles.

Most static bat detector surveys recorded common or soprano pipistrelles as having the highest frequency of registrations, with over 87% of all recorded bat activity relating to these species. Surveys recorded more registrations of soprano pipistrelle in total (across all surveys) and at individual survey locations on Rivers Wensum, Yare and Tiffey. Common pipistrelle was the most abundantly recorded species at River Bure, Swannington and Weybourne Woods. In most survey locations, noctule was the most frequently recorded non-pipistrelle bat species. *Myotis* species were recorded at most survey locations, with the highest levels recorded at rivers, particularly Wensum. It is likely that part/all of these registrations relate to Daubenton's bat, given the species' preference for foraging in/around aquatic habitats. Surveys recorded relatively low numbers of registrations of barbastelle and brown long-eared bat, but across most locations. From the data obtained the areas around the River Wensum and Swannington appear the most important for barbastelles. Other rarer species including Nathusius' pipistrelle and serotine were very rarely recorded, and only at the River Wensum. Results therefore show that the River Wensum supports more species and has highest number of total bat registrations of all sampled locations.

The initial results highlight the importance of undertaking further surveys to fully understand how foraging/commuting bats, particularly the rarer species, are using the habitats within the PEIR boundary. Surveys from April to September 2021 will include walked transect surveys and additional deployment of static bat detectors focusing on specific features that are identified as being likely to be impacted by the onshore cable and associated construction works.

1. Background

Equinor New Energy Ltd. (the Applicant) is proposing to extend the existing operational Dudgeon and Sheringham Offshore Wind Farms, named the Dudgeon Extension Project (hereafter DEP) and Sheringham Extension Project (hereafter SEP). DEP and SEP will consist of a number of offshore and onshore elements including the offshore wind turbines and subsea array cables, up to two offshore substations, offshore and onshore export cables, and a new area for up to two onshore substations to accommodate the connection of DEP and SEP to the transmission grid. A full description of DEP and SEP is provided within Chapter 6 Project Description.

In August 2019, Wild Frontier Ecology Ltd. (WFE) was commissioned by the Applicant to undertake surveys for foraging and commuting bats to inform an initial ecological impact assessment of the proposed onshore grid connection (a subterranean cable).

This report outlines the aims, methods and results of the static bat detector surveys completed between late June and early October 2020.

2. Relevant Policy and Legislation

All bat species are listed under Annex IV (and certain species also under Annex II) of the European Union's Council Directive 92/43/EEC (The Habitats Directive), and are given UK protected status by Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended).

Bats and their roosts also receive protection from disturbance from the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). This protection extends to both the species and roost sites.

It is an offence to kill, injure, capture, possess or otherwise disturb bats. Bat roosts are protected at all times of the year (making it an offence to damage, destroy or obstruct access to bat roosts), regardless of whether bats are present at the time.

Whilst foraging and commuting bats are not legally protected in the same way that bat roosts are, there is still a legal basis for protecting features on which bats rely. This is especially the case for species which are listed under the protection of Annex IV. If a development intercepts an important commuting route of bats this could potentially prevent bats from accessing a key foraging area and result in the abandonment or long-term decline of the colony/roost, thereby committing an offence.

3. Survey Methods

3.1 Survey Objectives

The static bat detector surveys were required to identify and ascertain the usage by bats of areas anticipated to be of importance for foraging and commuting bats within the PEIR boundary. As a refined PEIR boundary had not been confirmed at the time of the surveys, it was not possible to focus the static bat detector survey effort on particular features which would be likely impacted (such as hedgerows to be breached or rivers to be crossed). Instead, the static bat detector surveys focused on general areas within the PEIR boundary where habitats were considered likely to support higher numbers and a wider variety of species of bats. Although the data from these surveys is limited in terms of its coverage, the findings will provide a useful baseline to inform further route refinement and supplement data from targeted bat surveys of likely 'high-risk' areas, which are due to be completed in 2021.

3.2 Static Bat Detector Surveys

3.2.1 Areas of the PEIR boundary surveyed

Areas of the PEIR boundary were outlined as important based on information provided in the ETG meeting on the 28th January 2020. During the meeting, Norfolk County Council advised that Swannington and the Wensum are important areas for bats (in particular, barbastelle), and surveys should focus on these areas.

The decision as to which areas warranted surveys was also based on a review of aerial photographs and maps to identify areas/features such as woodland, watercourses, scrub, non-improved grasslands, heathland and other habitats which are likely to support relatively high levels of invertebrates and therefore are likely to be important areas for foraging bats. The local knowledge of the team of field ecologists was also used to inform the selection of survey locations. However, at the beginning of the surveys in June, landowner access for ecological surveys was continuing to be arranged, which resulted in restricted access to certain sections of the PEIR boundary for bat surveys being available. Over the subsequent surveying months, landowner access became increasingly available, therefore enabling more extensive survey coverage.

In addition to the area around Swannington and the River Wensum, the static bat detector surveys targeted the PEIR boundary crossings of the Rivers Bure, Tiffey and Yare, as well as the area of woodland and heathland between Bodham and Weybourne. Areas along the PEIR boundary which were highlighted as warranting bat detector surveys are shown in Figure 21, below.

The static deployments are separated into four groups of dates, with the areas and deployment time periods summarised in Table 1, below.

The areas covered by the first deployment between June 24th and July 10th 2020 are as follows:

- The eastern part of Weybourne Woods between Bodham and Weybourne (Figure 2),
- The River Wensum near Attlebridge (Figure 3),
- Grazing floodplain near the River Wensum at Attlebridge (Figure 3), and
- The River Tiffey at Barford (Figure 4).

The areas covered by the second deployment from 30th July to 10th August and the 19th to 25th August included:

- The western part of Weybourne Woods between Bodham and Kelling (Figure 6),
- A small pocket of woodland in grazed fields near Swannington, north of the River Wensum (Figure 7),
- The River Wensum (Figure 8), and
- A pocket of woodland just north of the River Yare near Colton (Figure 9).

The areas covered by the third deployment from the 25th August and 10th September included:

- The eastern part of Weybourne Woods (Figure 11)
- The River Bure (Figure 12)
- An area of scrub adjacent to a woodland near Swannington (Figure 13), and
- The River Wensum (Figure 14)

The areas covered by the fourth deployment from the 24th September and 5th October included:

- A large conservation pond within the western part of Weybourne Woods (Figure 16)
- The River Bure (Figure 17)
- The River Wensum (Figure 18), and
- The River Tiffey (Figure 19)

***Table 1**. Summary of deployment locations and operational dates for static bat surveys in 2020*

Deployment Location	Deployment 1	Deployment 2	Deployment 3	Deployment 4
Weybourne Woods	SM2 F 24th June - 8th July	SM2 H 30th July - 11th August	SM2 K 26th August - 10th September	SM2 H 24th September - 2nd October
River Bure	No deployment	No deployment	SM2 N 26th August - 9th September	SM2 J 24th September - 5th October
Swannington	No deployment	SM2 N 30th July - 9th August	SM2 J 26th August - 10th September	No deployment
River Wensum	SM2 E 24th June - 9th July And SM2 I 24th June - 8th July	SM2 I 30th July - 1st August and redeployed 19th August - 25th August	SM2 H 26th August - 31st August	SM2 N 24th September - 5th October
River Yare	No deployment	SM2 K River Yare 30th July - 10th August	No deployment	No deployment
River Tiffey	SM2 K 24th June - 10th July	No deployment	No deployment	SM2 K 24th September - 5th October

3.2.2 Deployment dates and durations of the 2020 static bat detector surveys

The first deployment of static bat detectors (SM2 F, SM2 I, SM2 E, SM2 K) was for the following period between June-July:

- SM2 F: 24th June- 8th July 2020 (14 nights)
- SM2 I: 24th June- 8th July 2020 (14 nights)
- SM2 E: 24th June- 9th July 2020 (15 nights)
- SM2 K: 24th June- 10th July 2020 (16 nights)

The first deployment of static bat detectors was for 16 nights in total, although only one detector (SM2 K) remained operational throughout this period. Detectors SM2 F, SM2 I and SM2 E did not record for the full deployments, with detectors SM2 F and SM2 I ceasing to record after 14 full nights and SM2 E ceasing to record after 15 nights. This is thought to be due to a technical fault, possibly caused by insufficient battery charge, insufficient memory on data cards (especially as detectors unavoidably record other wildlife such as crickets), or the detector being damaged, such as by livestock or the weather.

Weather conditions throughout this period were mostly mild, with only two days where there was significant rainfall. Winds were mostly below Beaufort scale 2 and cloud cover was varied. Temperatures ranged between 29°C and 11°C.

The second deployment of static bat detectors was for the following period between July-August:

- SM2 I: 30th July-1st August (2 nights)
- SM2 N: 30th July-9th August (10 nights)
- SM2 K: 30th July-10th August (11 nights)
- SM2 H: 30th July-11th August (12 nights)

The static bat detectors were deployed for 12 nights in total, although only one detector (SM2 H) remained operational throughout this period. Detectors SM2 I, SM2 N and SM2 K did not record for the full deployments, with detector SM2 I ceasing to record after just two full nights. This is thought to be due the aforementioned reasons, including technical fault, insufficient memory on data cards or the detector being damaged.

Weather conditions throughout this period were mostly mild and warm, with temperatures ranging from 34°C to 9°C. Only the first few days of August experienced occasional showers and some stronger winds.

As static bat detector SM2 I, which was deployed by the River Wensum, only recorded for two nights, this detector was deployed later in August. The re-deployed detector was operational for seven nights between the following dates:

- SM2 I: 19th August-25th August (7 nights)

Weather for the re-deployment of SM2 I was consistently mild, with highs of 22°C and lows of 11°C.

The third deployment of static bat detectors was for the following periods between August-September:

- SM2 H: 26th August- 31st August (5 nights)
- SM2 N: 26th August- 9th September (14 nights)
- SM2 K: 26th August- 10th September (15 nights)
- SM2 J: 26th August- 10th September (15 nights)

The majority of the static bat detectors were deployed for 15 nights in total, with detectors SM2 J and SM2 K operational throughout the entirety of this period. Static bat detector SM2 N was almost operational throughout the whole deployment but stopped recording one day before the detector was collected. SM2 H was only operational for five nights out of the 15-night deployment. This is thought to be due the aforementioned reasons, including technical fault, insufficient memory on data cards or the detector being damaged.

Weather conditions throughout the deployment were varied with highs of 24°C and lows of 6°C. At the beginning of the deployment, Storm Ellen was causing winds which were up to 45 mph and heavy rain. From the 26th August - 2nd September, a second storm (Storm Francis) caused further heavy rain and strong winds up to 55mph. Throughout the beginning of September the weather was mild.

The fourth deployment of static bat detectors was for the following periods between September-October:

- SM2 H: 24th September- 2nd October (8 nights)
- SM2 J: 24th September- 5th October (11 nights)
- SM2 N: 24th September- 5th October (11 nights)
- SM2 K: 24th September- 5th October (11 nights)

The majority of the static bat detectors were deployed for 11 nights in total, with three of the detectors recording throughout the duration of the deployment. One static bat detector, SM2 H, was only operational for eight nights. This is likely due to similar reasons to those listed above.

Weather conditions throughout the deployment were cooler than previous months, but less varied. Temperatures reached highs of 18°C and lows of 5°C.

The surveys used Wildlife Acoustics SongMeter SM2BAT automated bat detectors. The locations of the deployed bat detectors are shown in Figures 1-19 and summarised in Table 1. The static bat detectors were deployed, retrieved and the data analysed by WFE ecologists. Further details including the software and techniques used to analyse the data is provided in Section 3.3, below.

The bat detectors were programmed to commence recording for bats approximately 30 minutes before sunset and record throughout the night until roughly 30 minutes after sunrise.

3.3 Bat Survey Audio Recording Analysis

All sound recordings were reviewed to confirm the full range of bat species recorded. All SM2BAT recordings were analysed using AnalookW software. Registrations were analysed by Susannah Dickenson BSc MCIEEM (NE bat survey class licence registration no. 2016-22497-CLS-CLS).

Audio analysis of frequency division and time expansion data was achieved by comparing sound characteristics and sonogram shapes and measurements (peak call frequency, call frequency range, and mode pulse interval) to reference measurements and/or recordings provided by Russ et al. (2012)[1], Parsons and Jones (2000)[2], the Bat Conservation Trust (2008)[3], Sowler (2010)[4], and Wild Frontier Ecology's in-house call reference library.

As some of the static bat detectors recorded extremely high numbers of registrations/ recordings, AnalookW filters which automatically identify registrations, were used to analyse batches of registrations (namely pipistrelle *Pipistrellus* sps. registrations) in order to reduce analysis time. Use of filters does not compromise the information presented in this report or the conclusions that have been drawn.

3.4 Data Search

A data search for biological records was completed with the Norfolk Biodiversity Information Service (NBIS) in January 2021. This returned 3,532 records of 12 confirmed species of bat within a 2km buffer of the PEIR boundary. To further refine the data, it was manipulated to show only records within the PEIR boundary and those of significance which lie outside of the PEIR boundary. Records of significance were determined by the conservation status of the species[5][6]. Species considered rare include noctules, Nathusius's Pipistrelle, whiskered bat *Myotis mystacinus*, western barbastelle, Leisler's bat and serotine. They were only included in the results where the location of the record was within approximately 50m of the PEIR boundary or well connected to the boundary via good quality habitat such as woodland and rivers.

There are 99 records of bats which lie within the PEIR boundary and an additional 385 records of significance outside of the PEIR boundary. The data search records for each species are summarised in 2 and 3, below.

***Table 2**. Summary of data search records returned within the PEIR boundary.*

Species	Number of records
Soprano pipistrelle	24

[1] Russ, J. (2012). British Bat Registrations A Guide to Species Identification, Pelagic Publishing, Exeter.

[2] Parsons, S. and Jones, G. 2000. Acoustic Identification of Twelve Species of Echolocating Bat by Discriminate Function Analysis and Artificial Neural Networks. The Journal of Experimental Biology 203: 2641-2656.

[3] Bat Conservation Trust. 2008. Bat Sound Library. Online at: http://www.bats.org.uk/pages/bat_sound_library_introduction.html?handle:bat_sound_library_introduction.html

[4] Sowler S. (2010) Difficult Sonograms and Social Registrations – Advanced Anabat Analysis. Alana Ecology Workshop. Bury St. Edmunds, Suffolk

[5] Battersby J. (2005) UK Mammals: Species Status and Population Trends. Online at: http://programmeofficers.co.uk/Preston/CoreDocuments/LCC206.pdf

[6] Mathews F, and Harrower C. (2020). IUCN – compliant Red List for Britain's Terrestrial Mammals. Assessment by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough ISBN 978-1-78354-485-1

Species	Number of records
Noctule	14
Pipistrelle Sp.	24
Daubenton's bat	9
Western Barbastelle	9
Unidentified	5
Natterer's	4
Brown long-eared bat	3
Serotine	2
Whiskered bat	2
Nathusius's Pipistrelle	2
Common pipistrelle	1

***Table 3**. Summary of significant records returned outside of the PEIR boundary.*

Species	Number of records
Noctule	166
Nathusius's Pipistrelle	10
Western Barbastelle	159
Whiskered bat	6
Serotine	43
Leisler's bat	1

Figure 1: Overview map showing deployment locations for all four deployments (June-July, July-August, August-September, and September-October 2020)

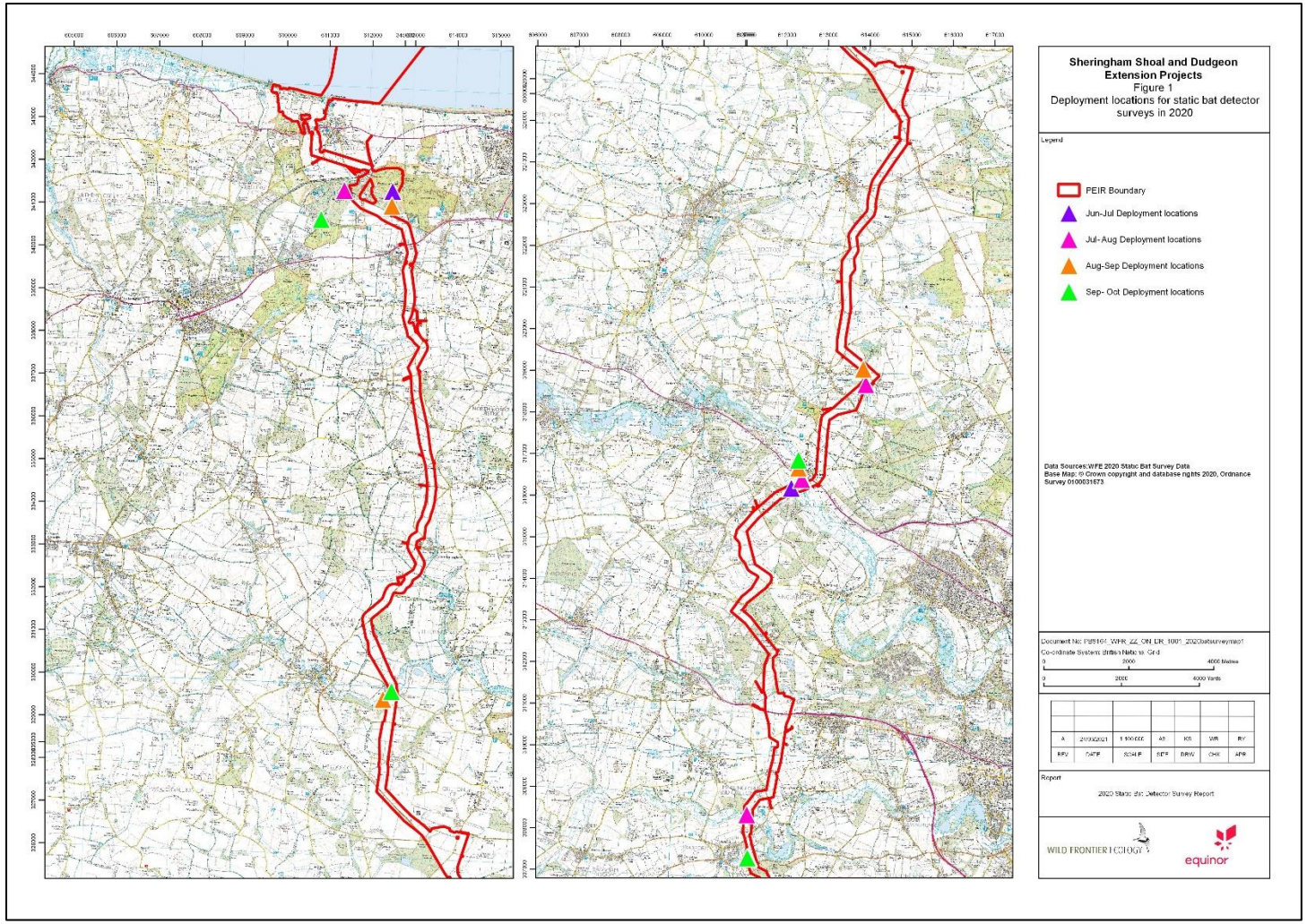


Figure 2: Overview map of first deployment of static bat detectors (24th June - 8th/ 9th/10th July 2020)

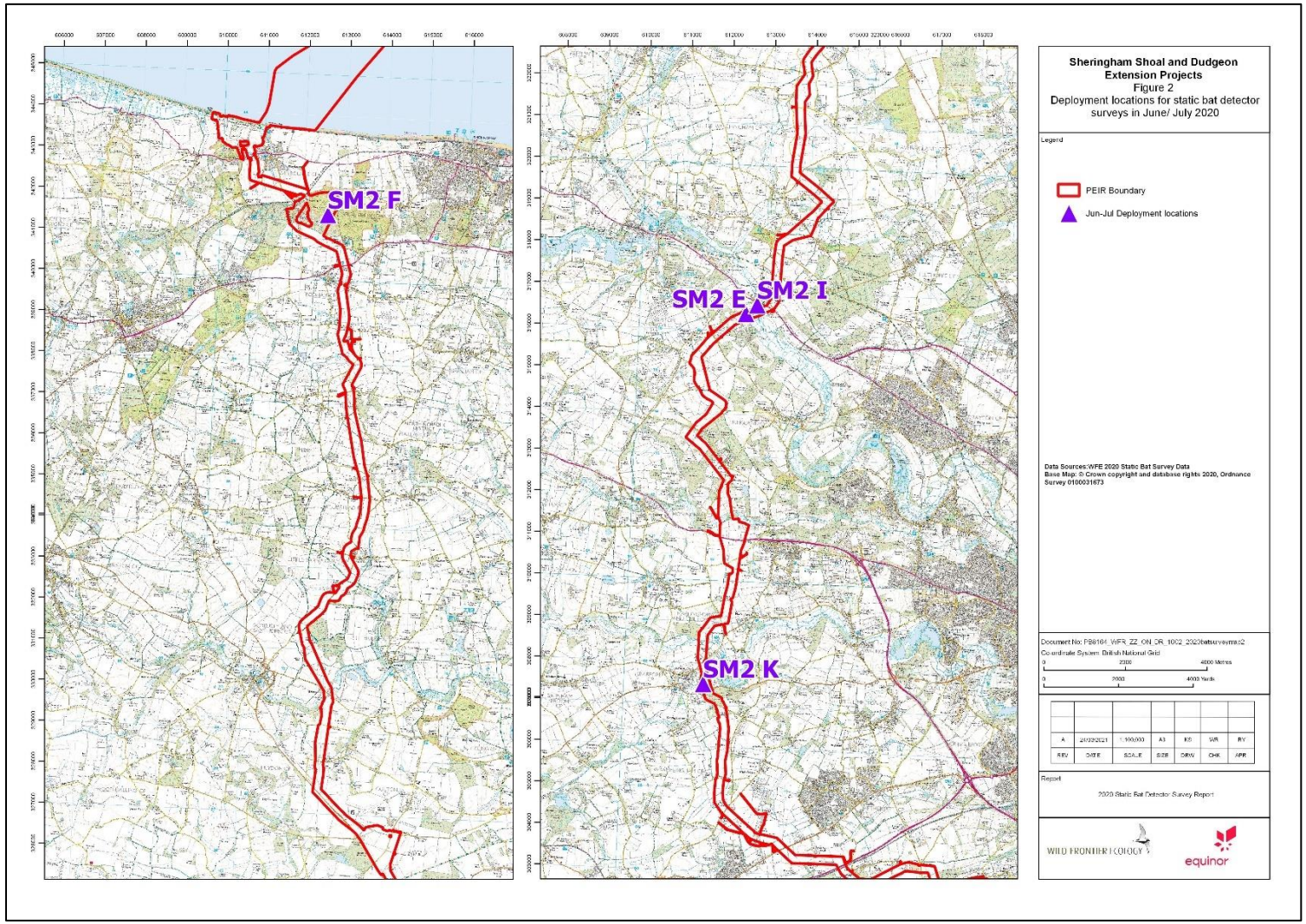


Figure 3: Location of deployment for static bat detector SM2 F (24th June - 8th July 2020)

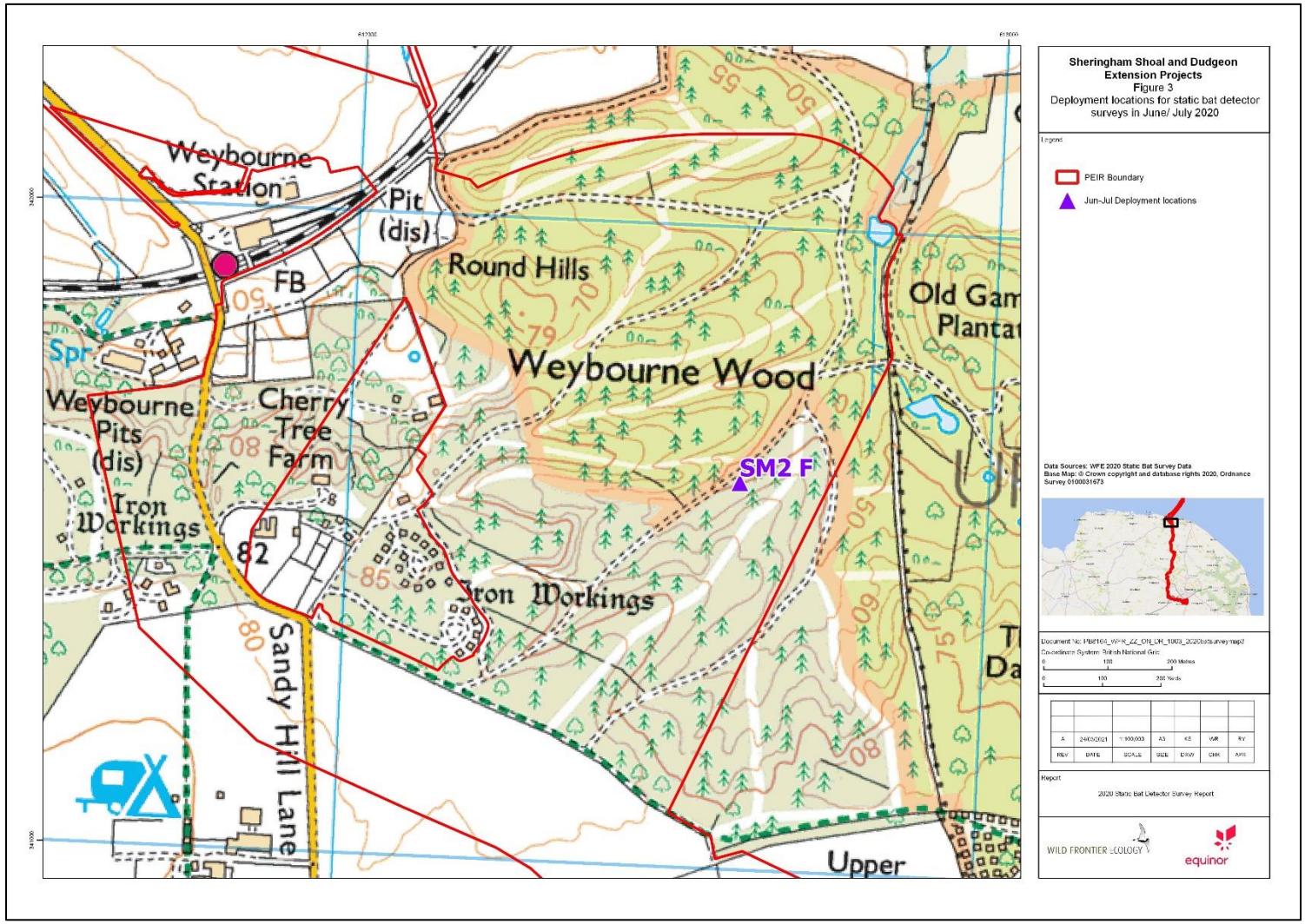


Figure 4: Location of deployment for static bat detectors SM2 I (24th June - 8th July 2020) and SM2 E (24th June -9th July 2020)

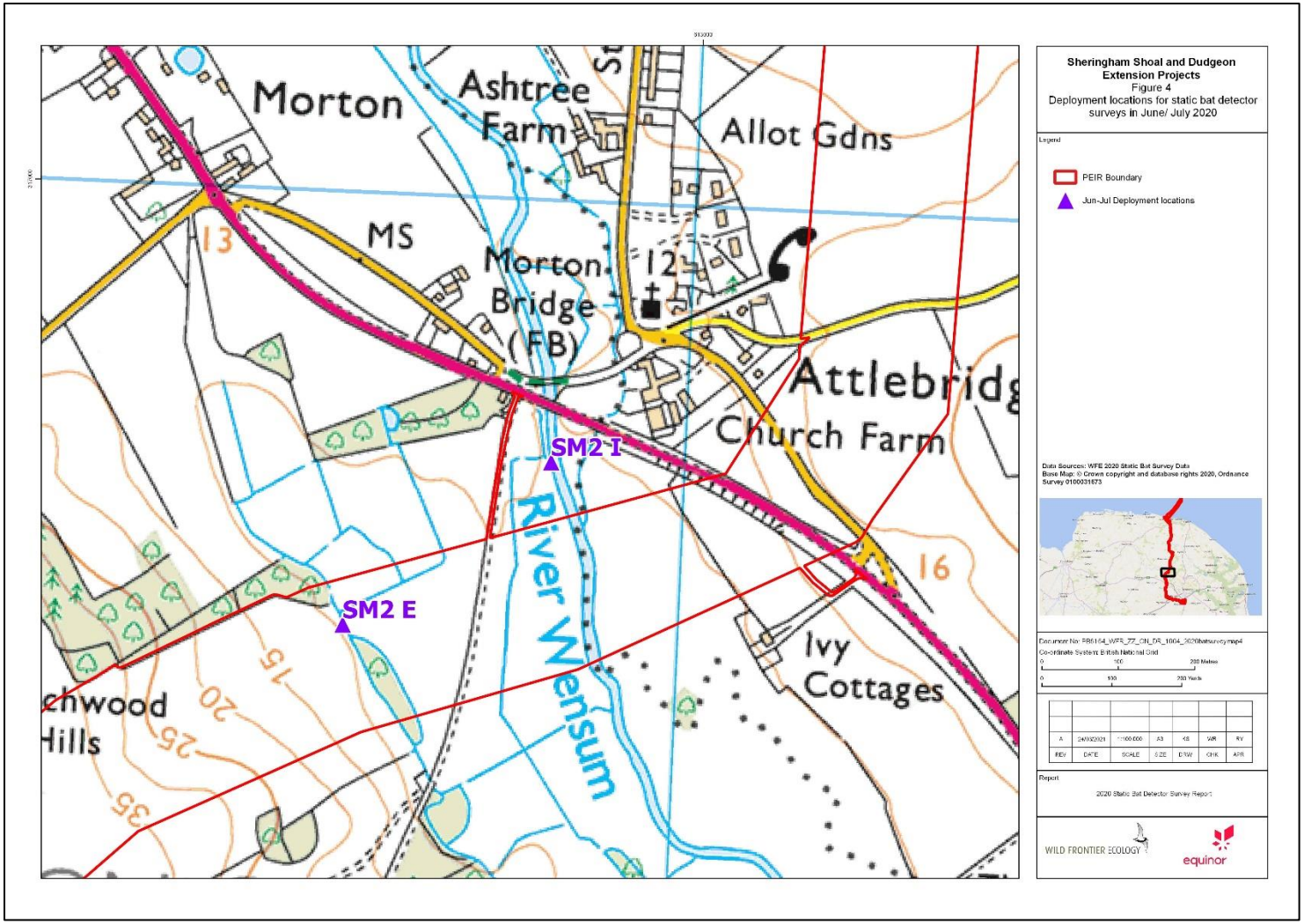


Figure 5: Location of deployment for static bat detector SM2 K (24th June - 10th July 2020)

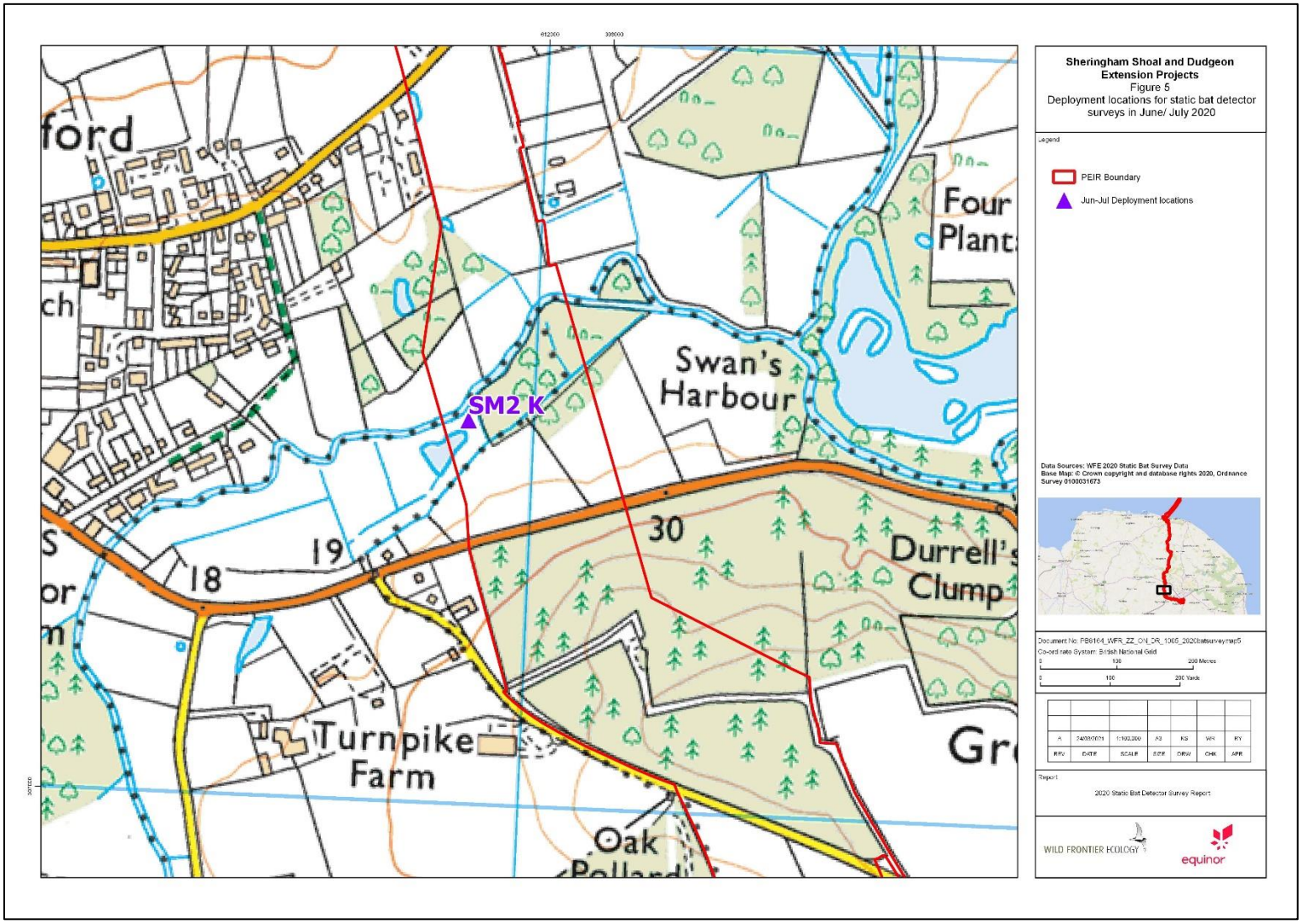


Figure 6: Overview map of second deployment of static bat detectors (30th July – 2nd/9th/10th/11th August 2020)

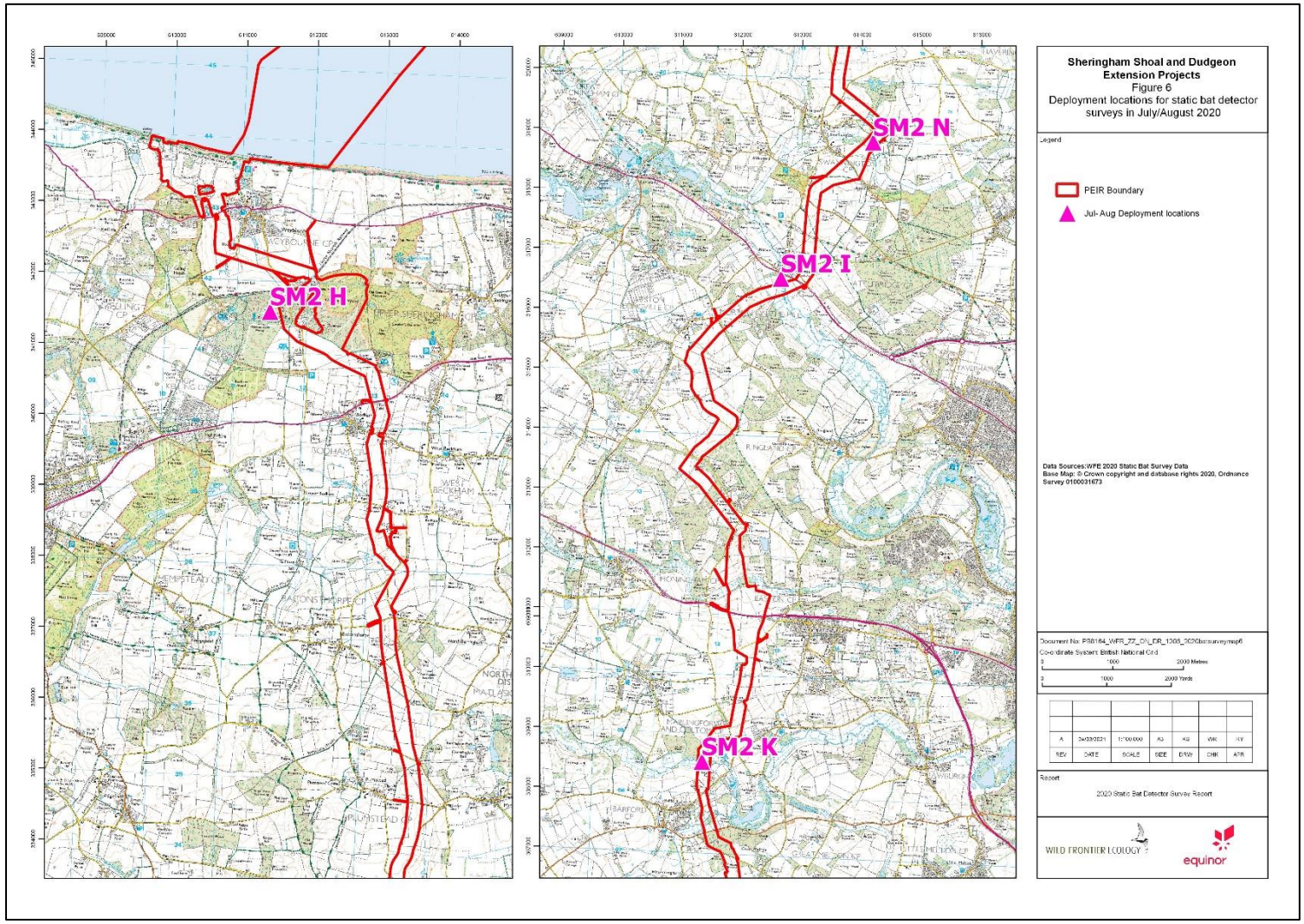


Figure 7: Location of deployment for static bat detector SM2 H (30th July - 11th August 2020)

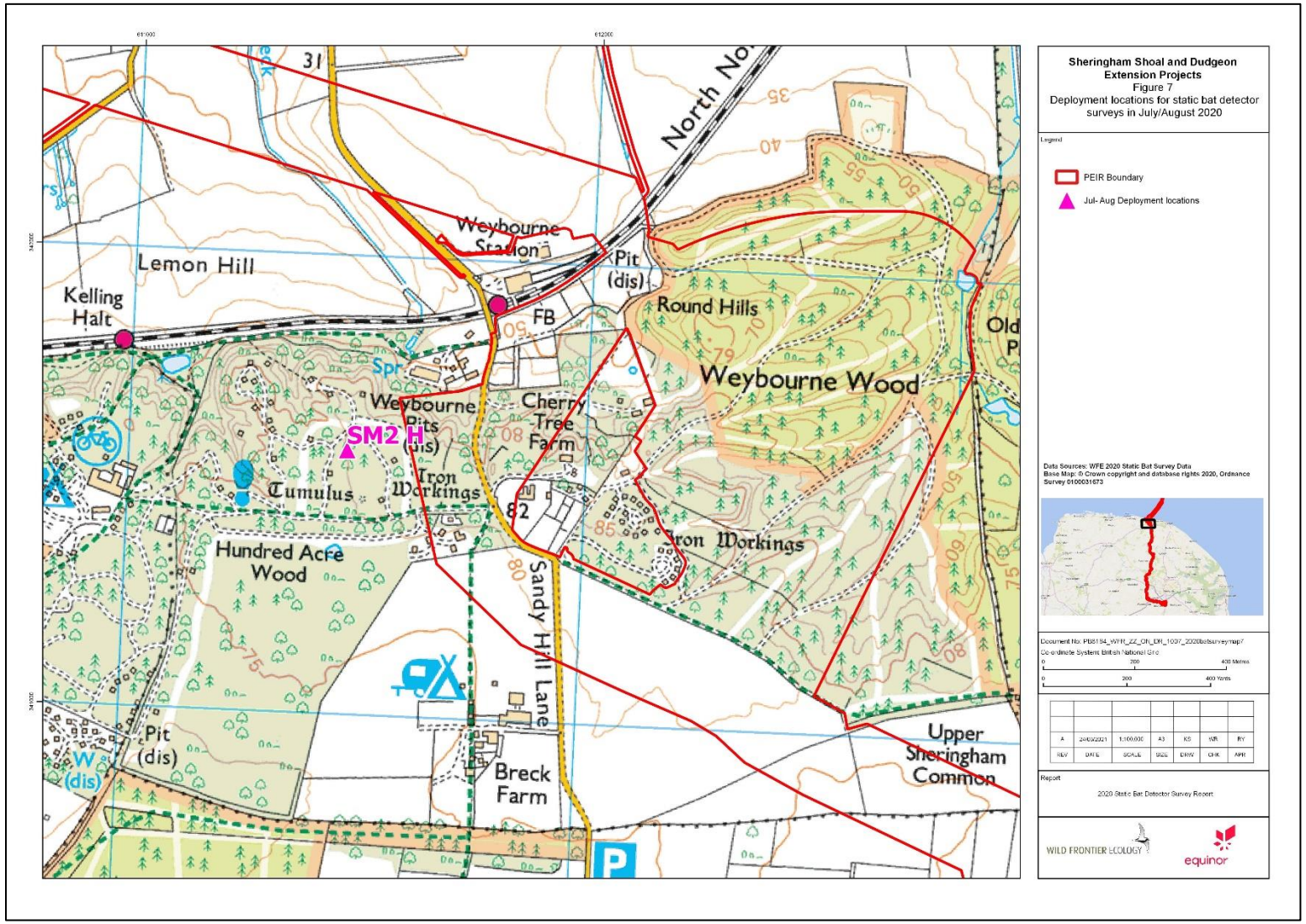


Figure 8: Location of deployment for static bat detector SM2 N (30th July - 9th August 2020)

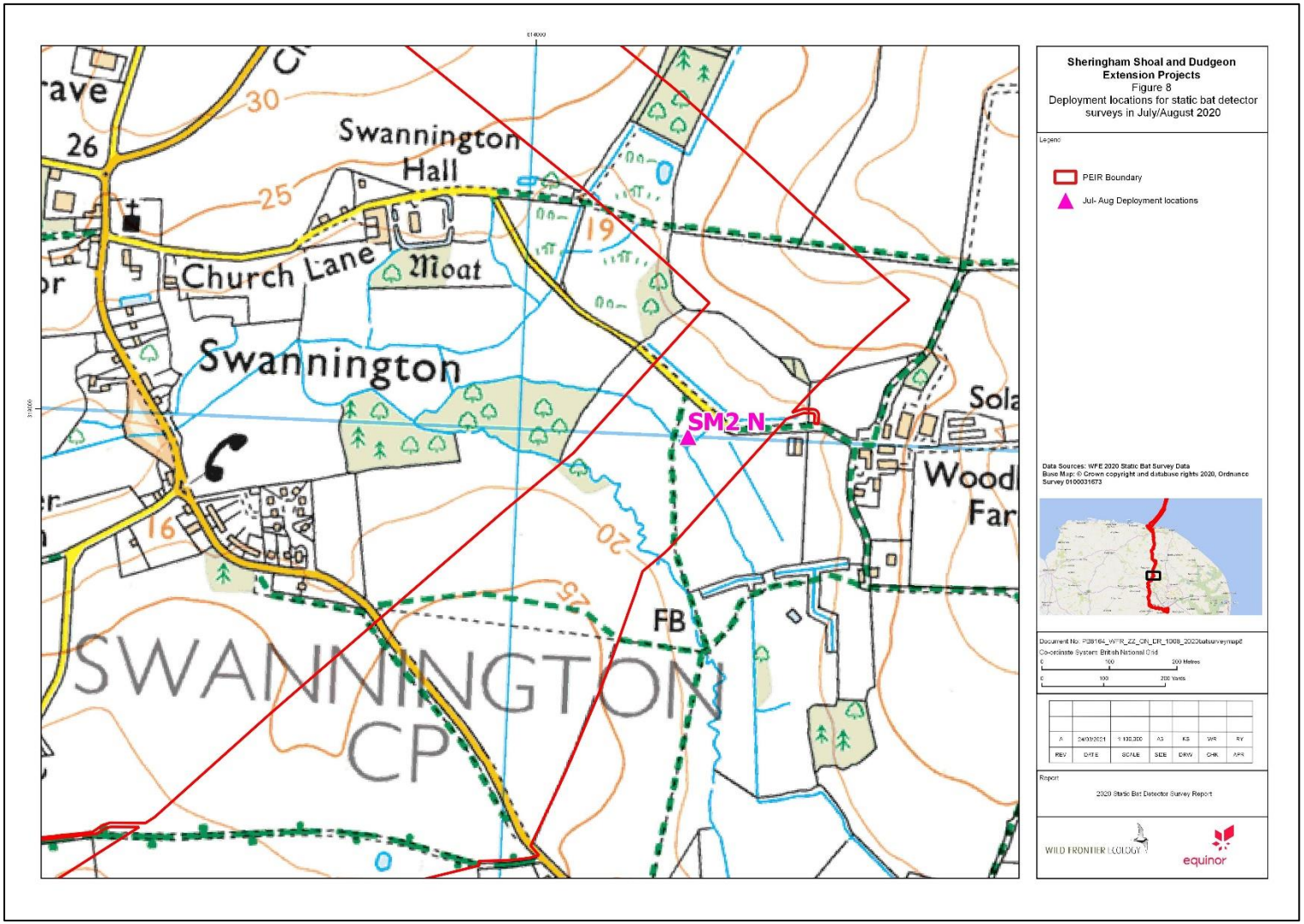


Figure 9: Location of deployment for static bat detector SM2 I (30th July - 1st August and 19th August - 25th August 2020)

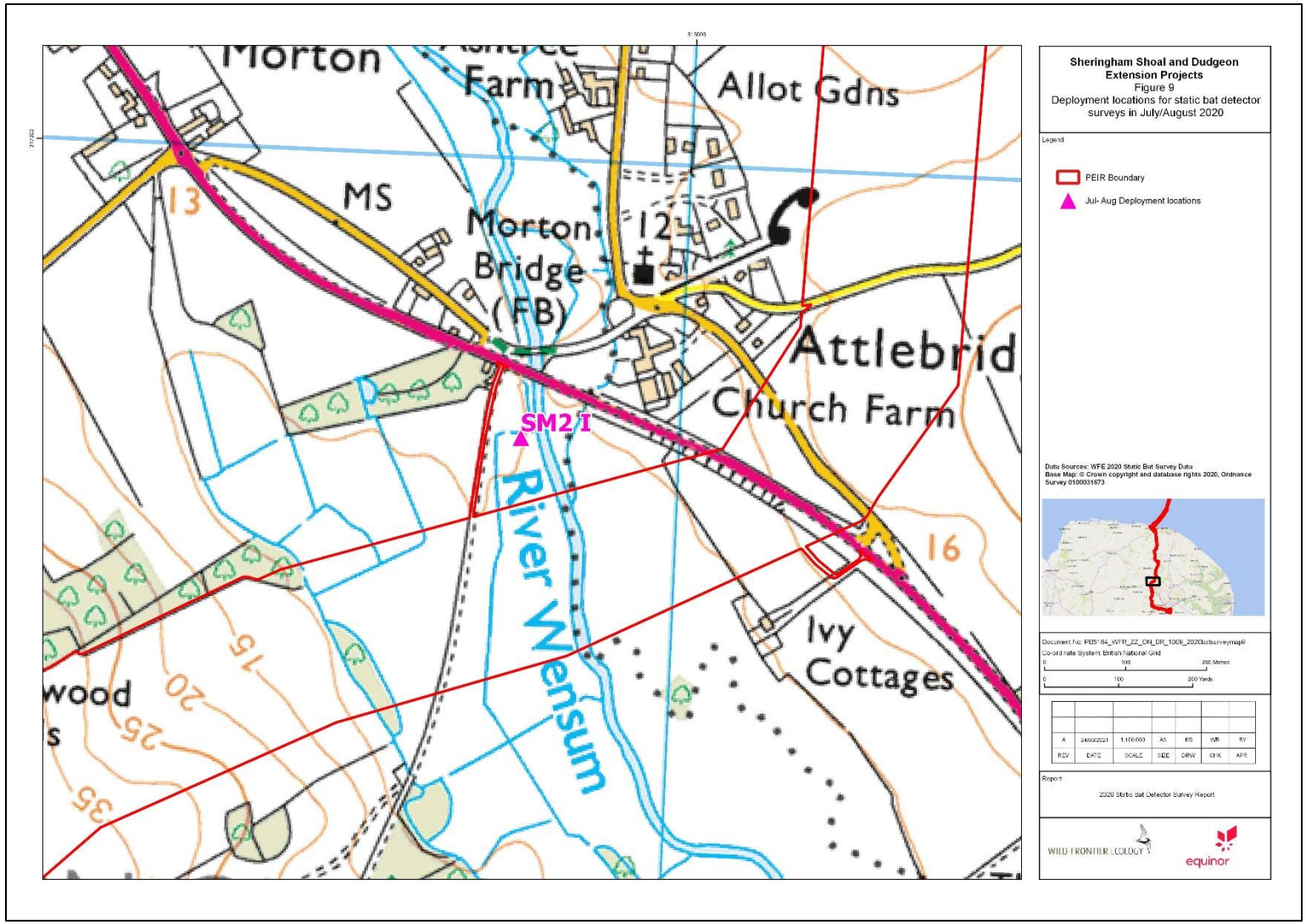


Figure 10: Location of deployment for static bat detector SM2 K (30th July - 10th August 2020)

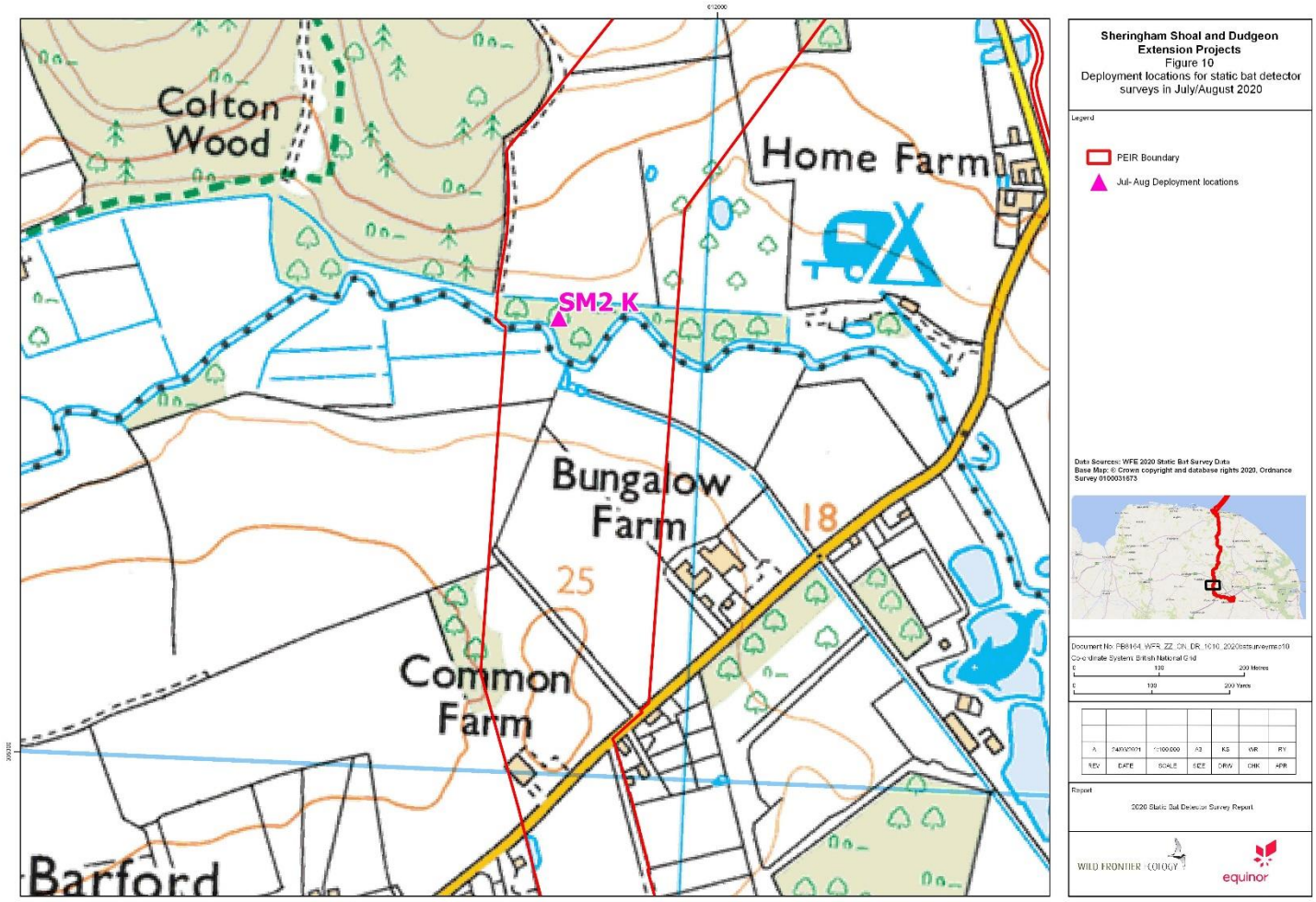


Figure 11: Overview map of third deployment of static bat detectors (26th August – 31st August/9th/10th September 2020)

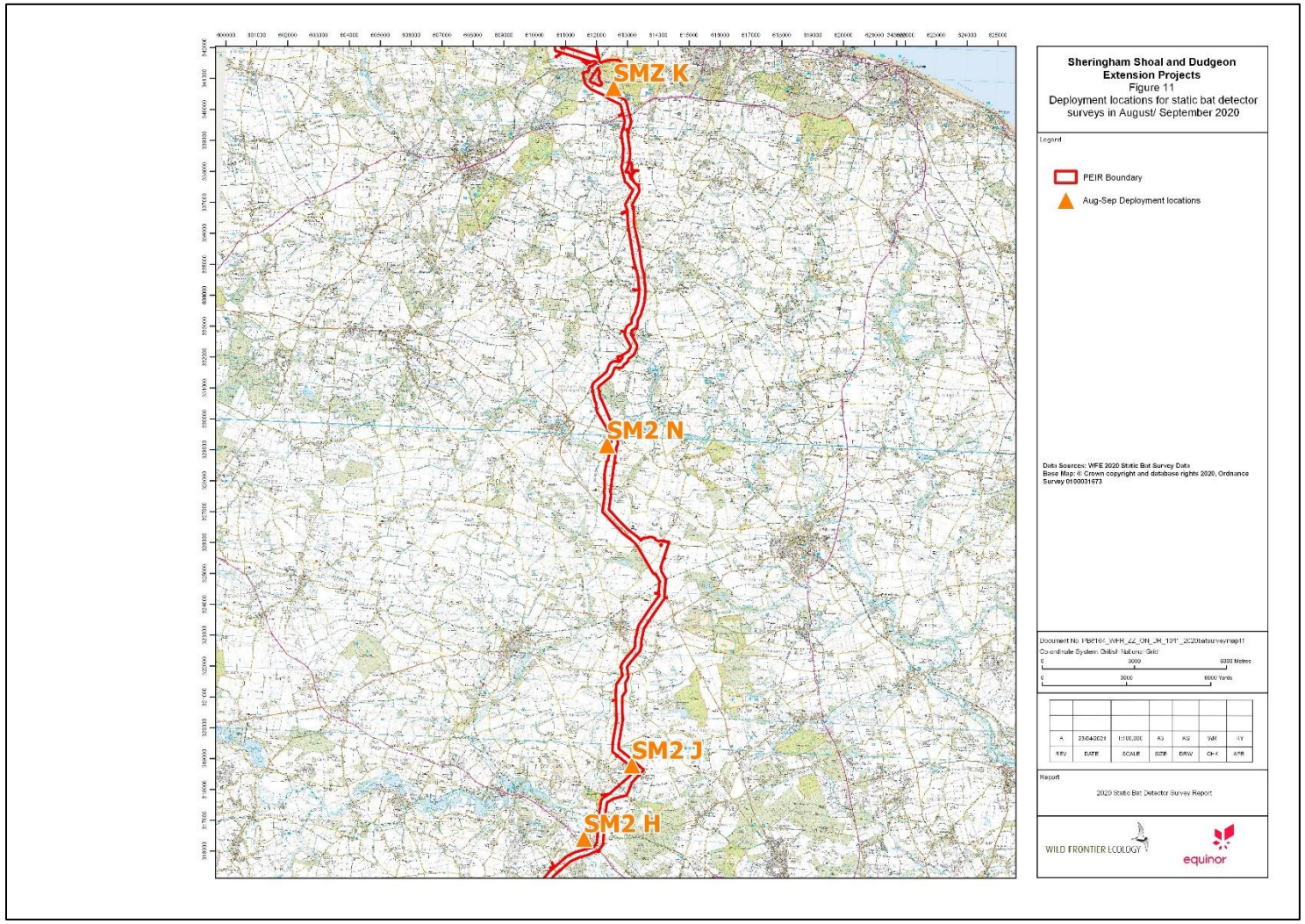


Figure 12: Location of deployment for static bat detector SM2 K (26th August - 10th September 2020)

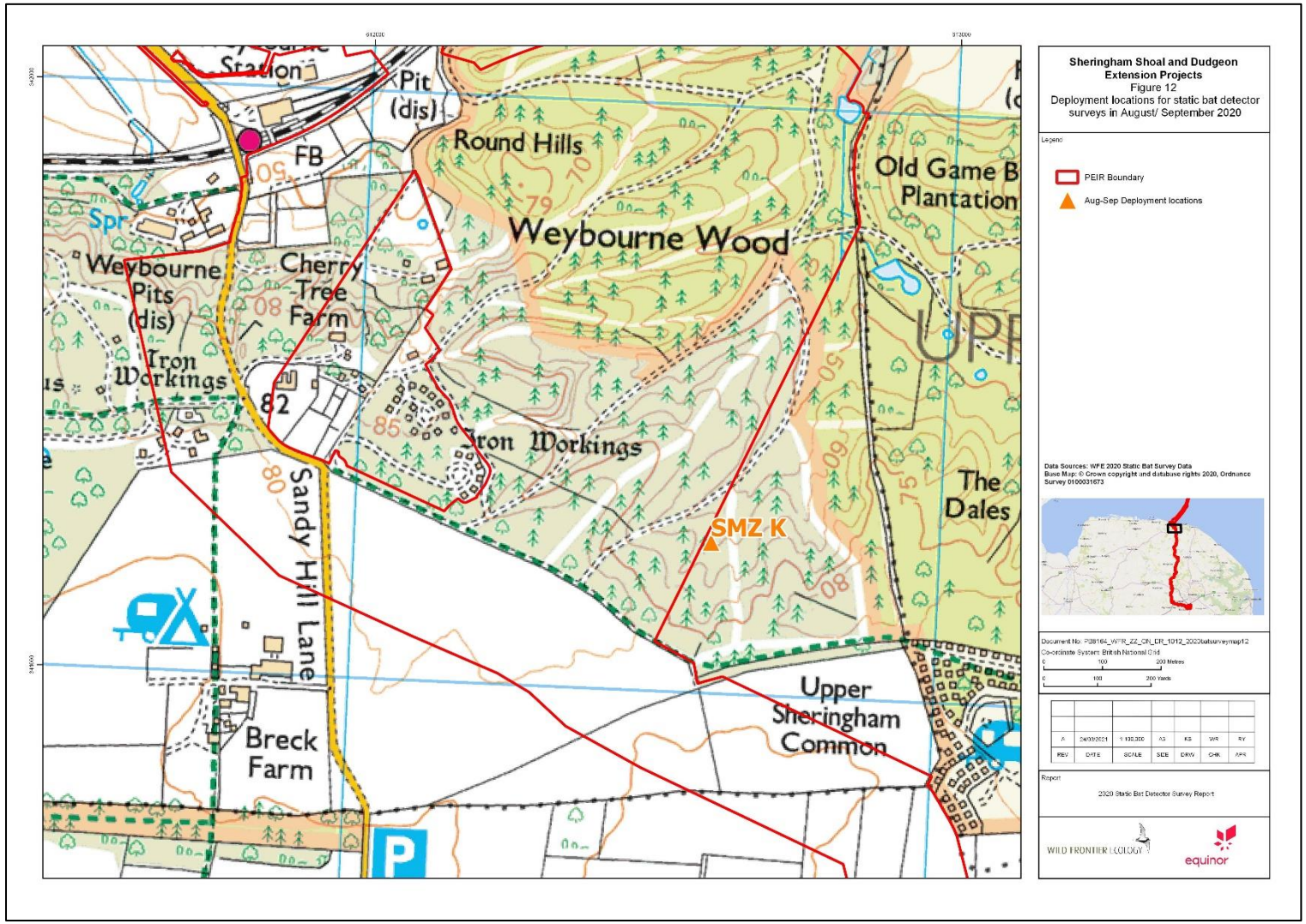


Figure 13: Location of deployment for static bat detector SM2 N (26th August - 9th September 2020)

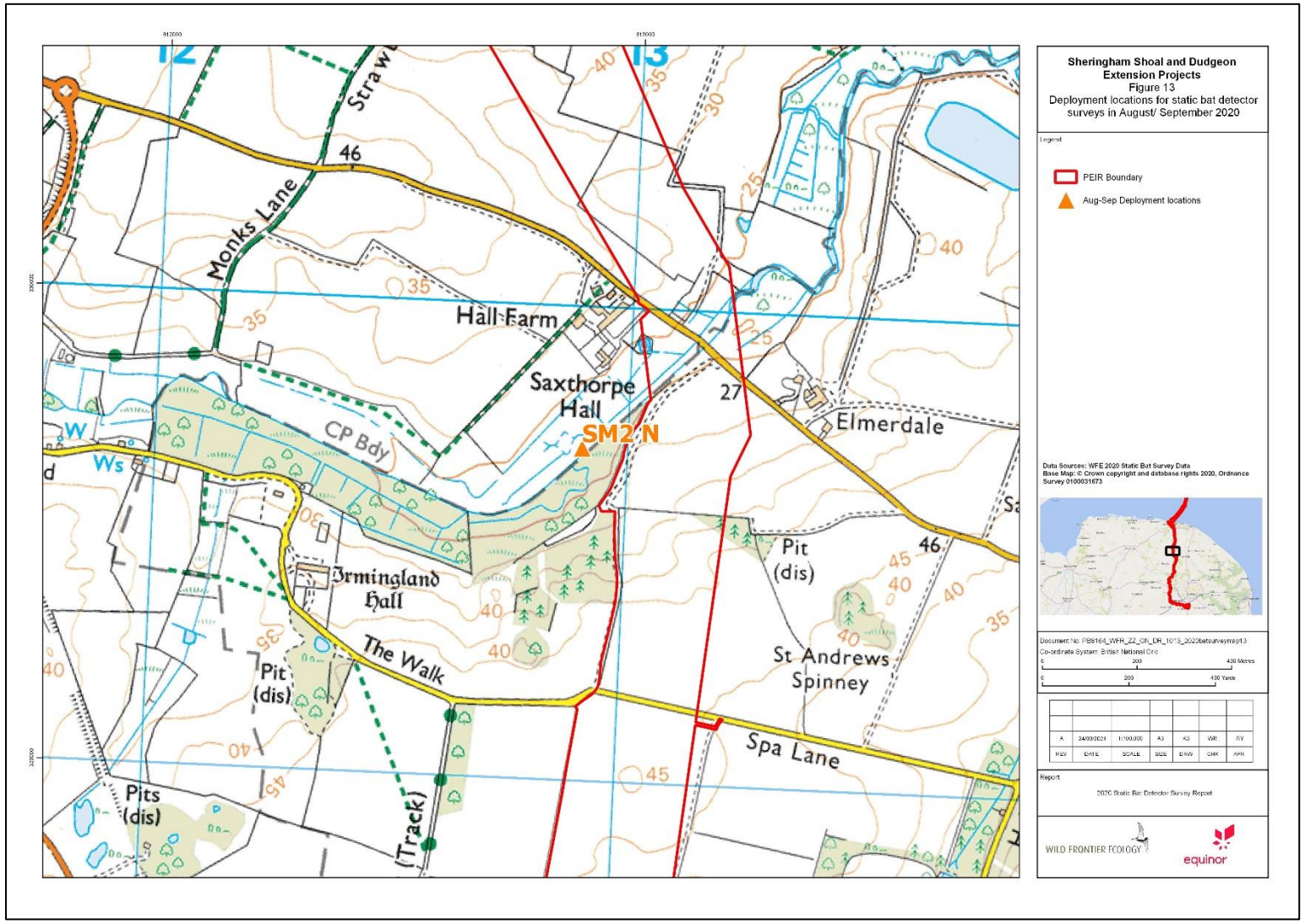


Figure 14: Location of deployment for static bat detector SM2 J (26th August - 10th September 2020)

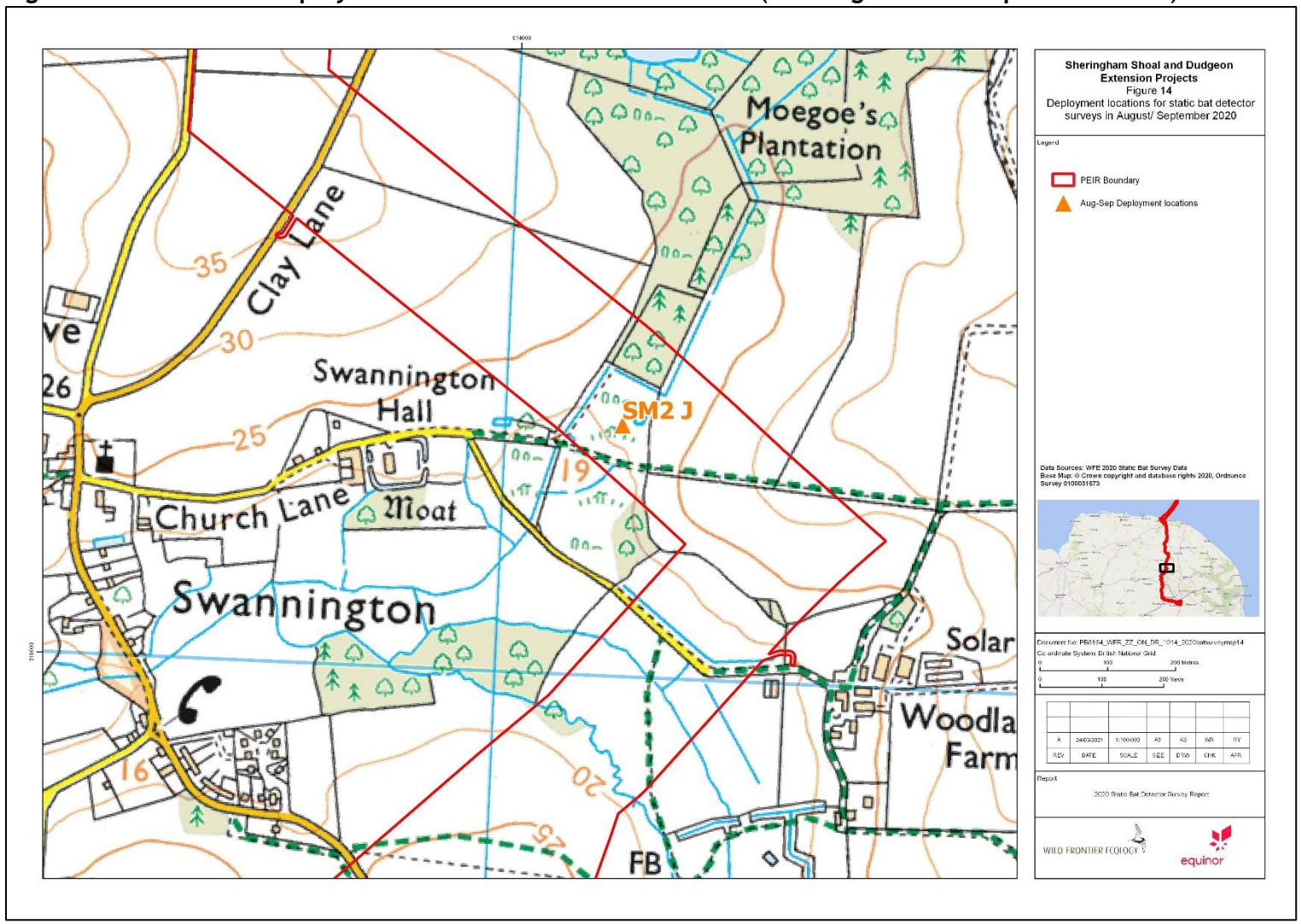


Figure 15: Location of deployment for static bat detector SM2 H (26th August - 31st August 2020)

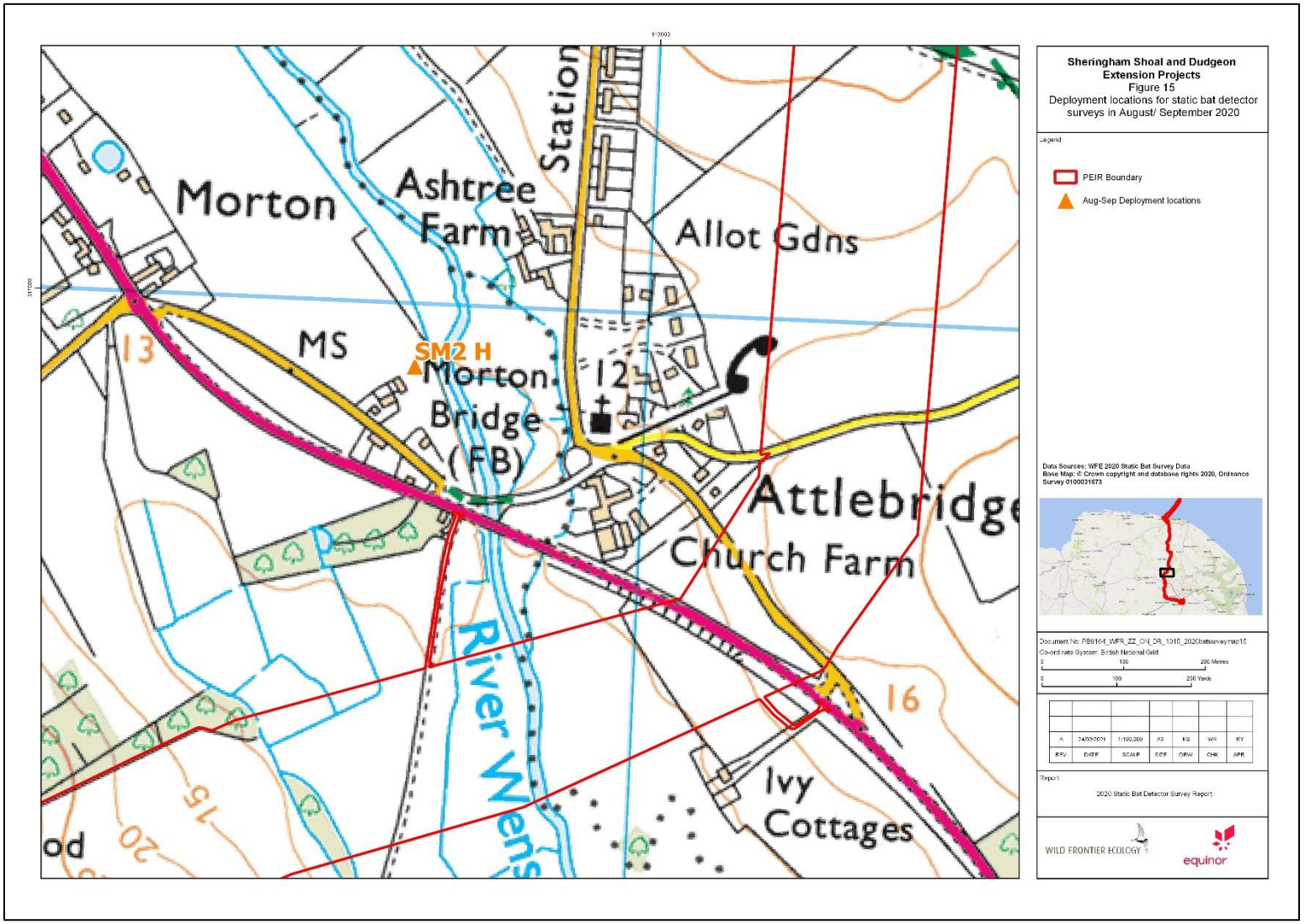


Figure 16: Overview map of fourth deployment of static bat detectors (24th September – 2nd/5th October 2020)

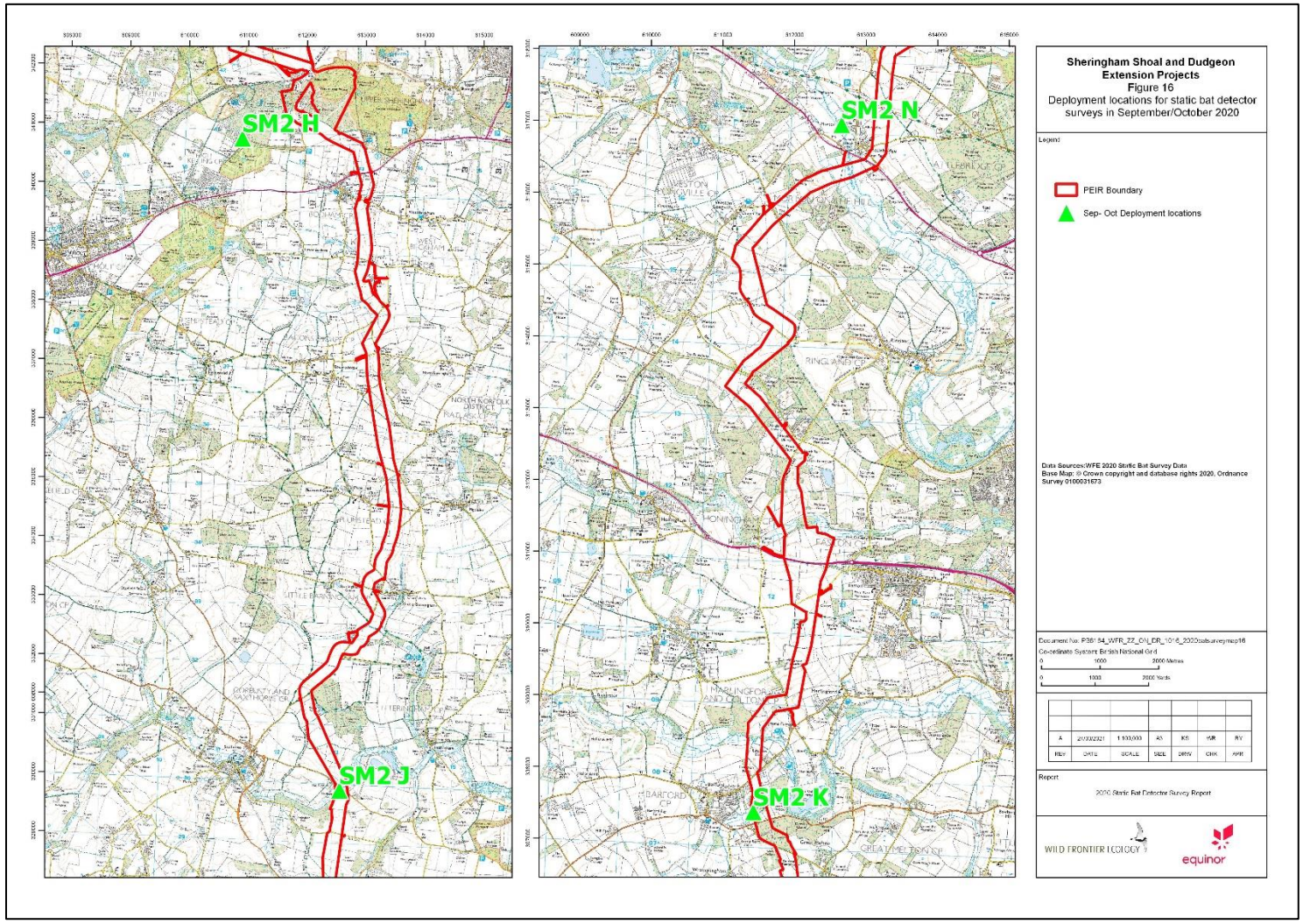


Figure 17: Location of deployment for static bat detector SM2 H (24th September - 2nd October 2020)

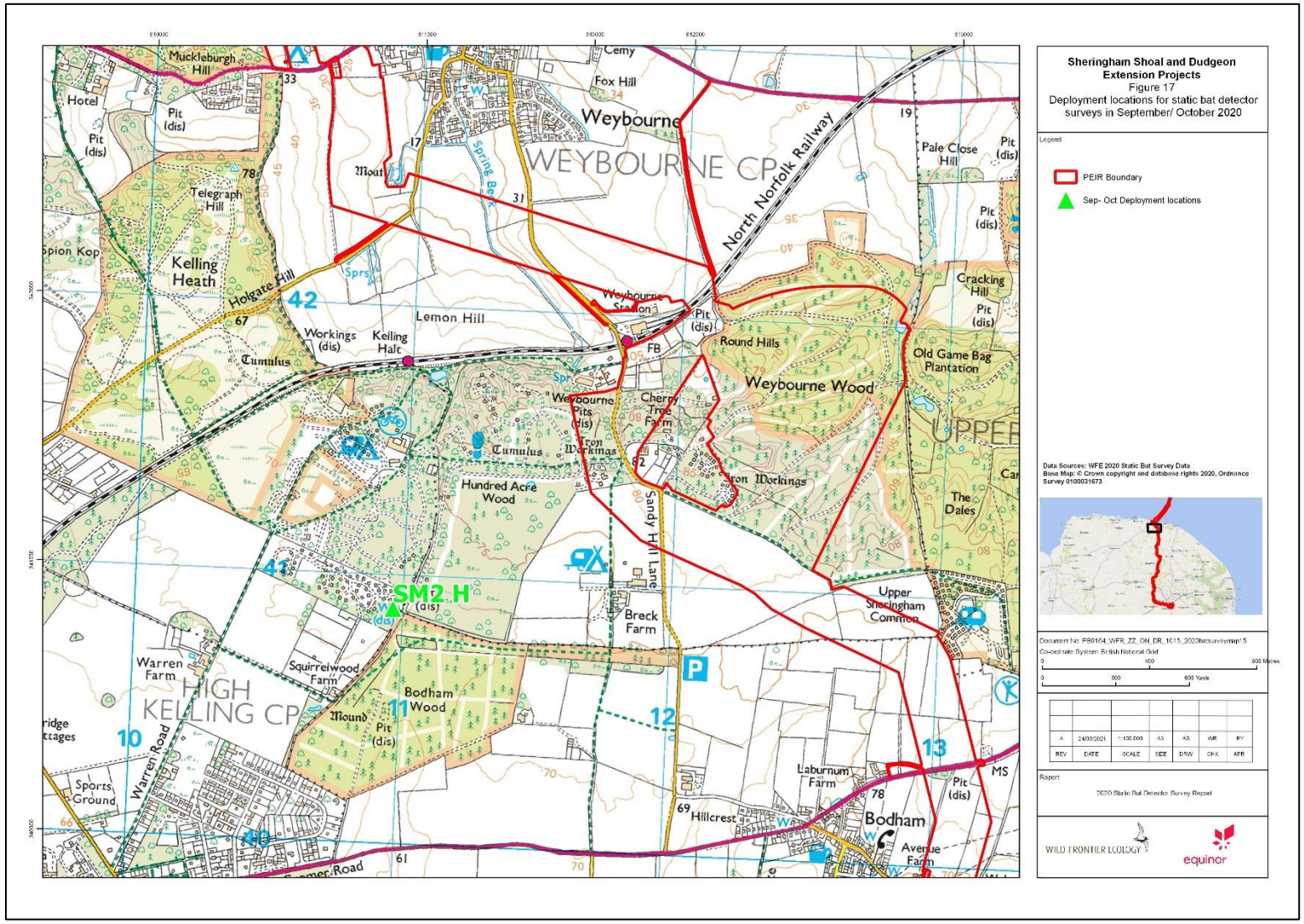


Figure 18: Location of deployment for static bat detector SM2 J (24th September - 5th October 2020)

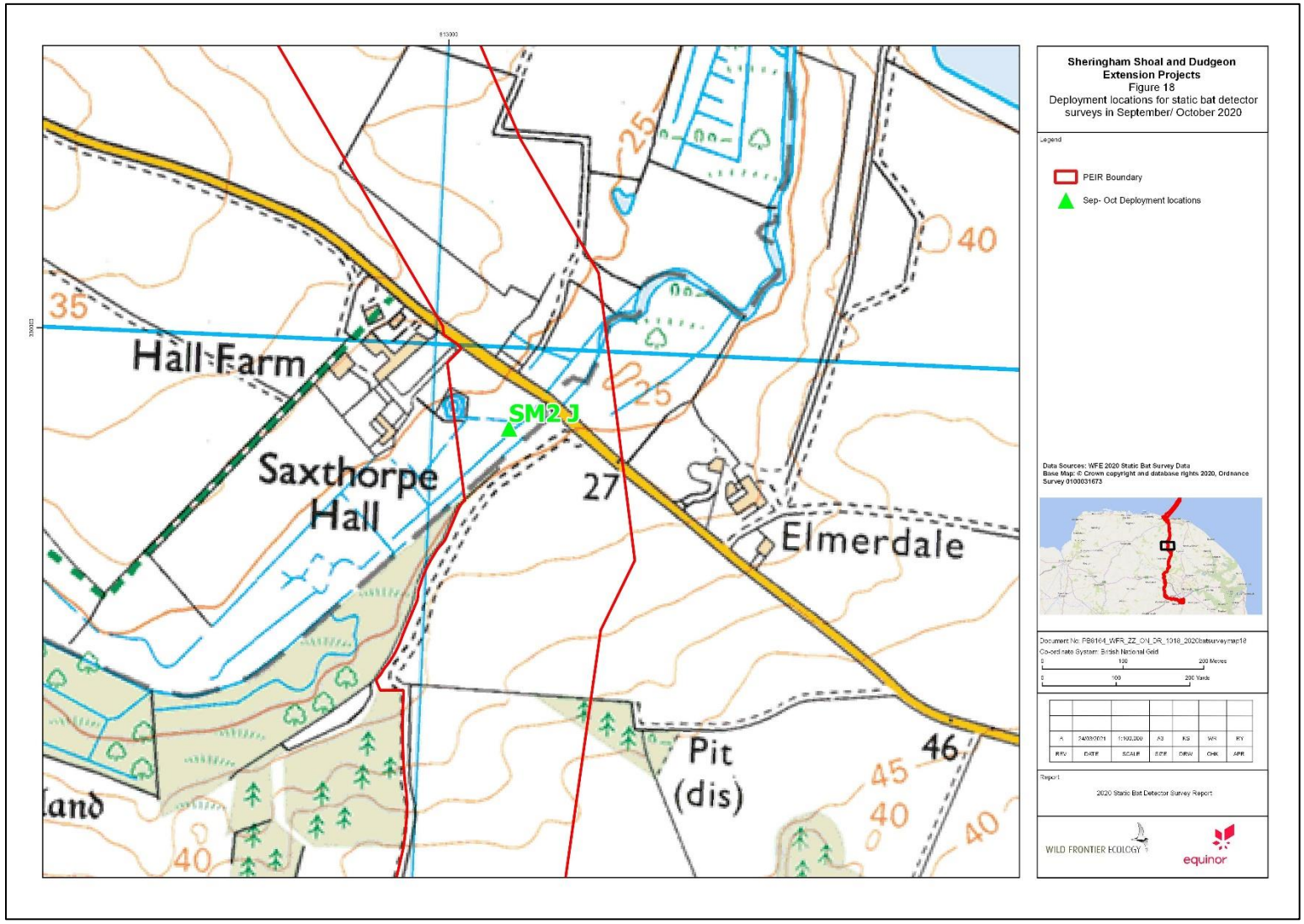


Figure 19: Location of deployment for static bat detector SM2 N (24th September - 5th October 2020)

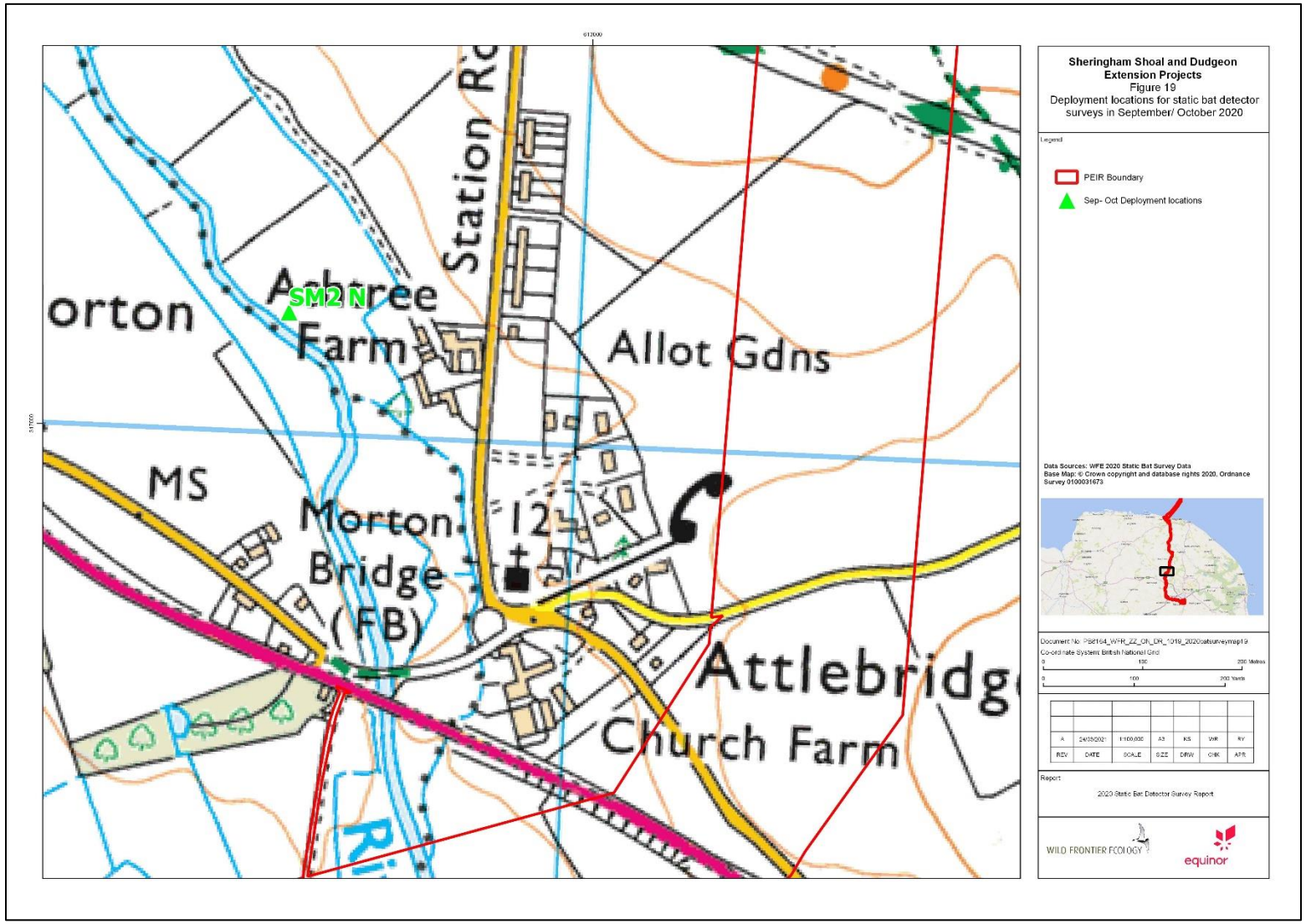


Figure 20: Location of deployment for static bat detector SM2 K (24th September - 5th October 2020)

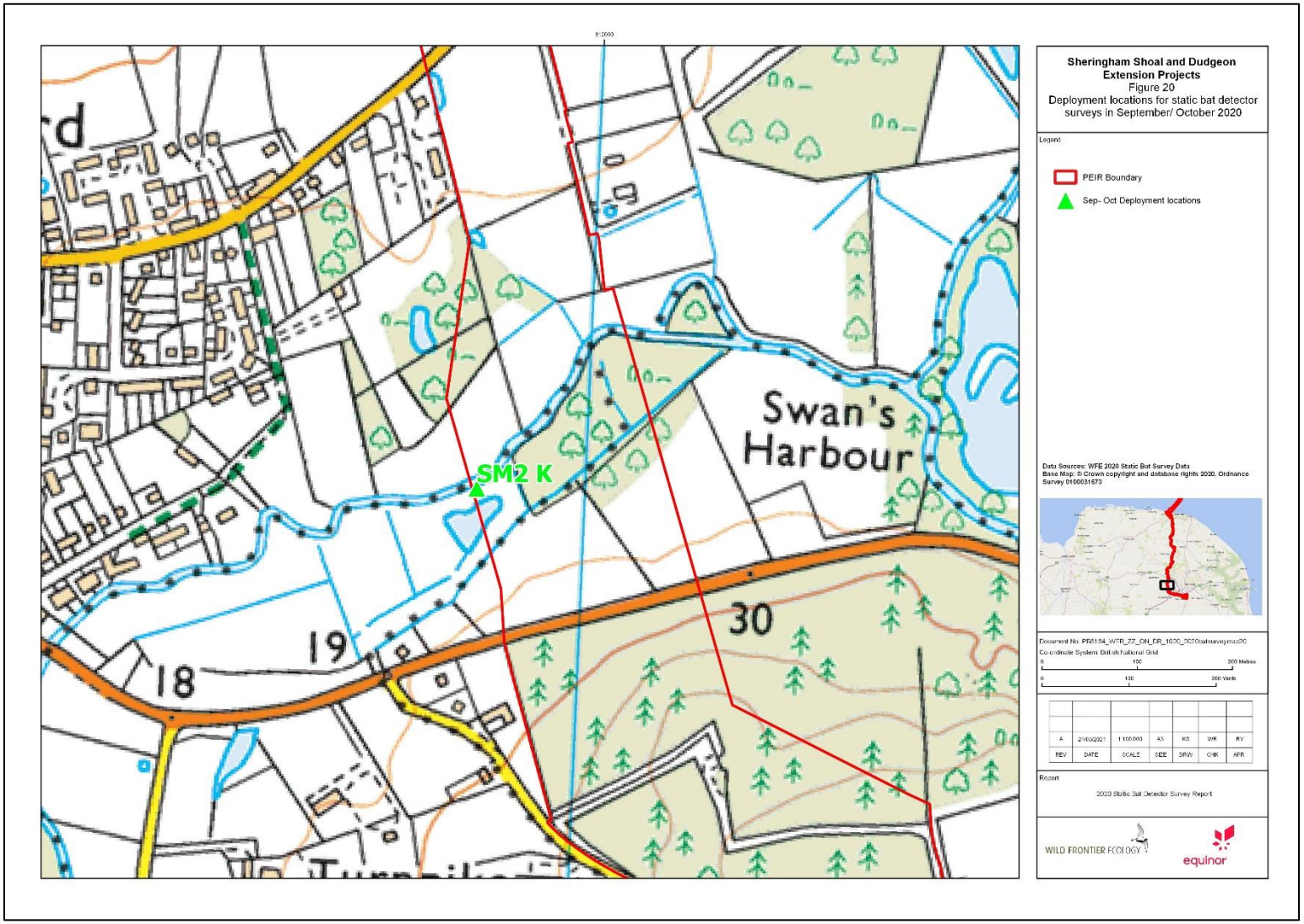
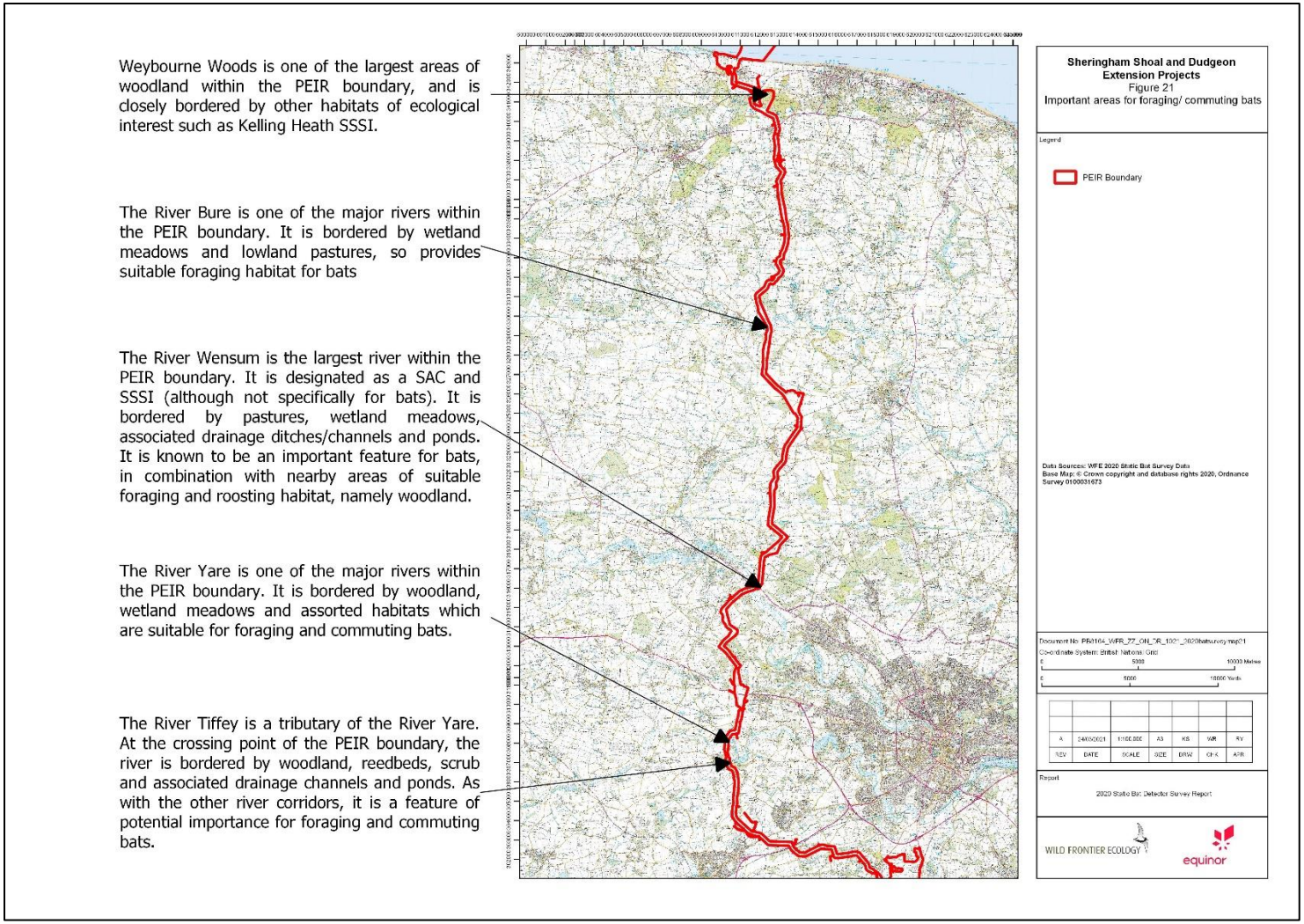


Figure 21: Map of areas selected for 2020 bat surveys based on anticipated value/sensitivity of habitats and features for bats



4. Results

4.1 Static Bat Detector Results: first deployment (24th June - 8th/9th/10th July 2020)

4.1.1 SM2 F Results

SM2 F was operational for 14 nights between the 24th June and 8th July 2020. It was deployed in the northernmost location, near 100 Acre Wood in Kelling (Figure 3). The detector recorded a total of four bat registrations consisting of one noctule and three of common pipistrelle. One of the common pipistrelle registrations was in July and all other registrations were recorded in June.

The results are summarised in Table 4, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 5, below (information for dates during which no bat registrations were recorded is not listed).

***Table 4**: SM2 F June-July 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Date of registration	Times of registrations
Noctule	1	0.06	26/06/2020	21:49
Common pipistrelle	3	0.19	29/06/2020 30/06/2020 04/07/2020	03:14 04:00 04:09

***Table 5**: Summary of weather and sunset/rise times for SM2 F location*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
26/06/2020	04:33	21:23	29°C	17°C
29/06/2020	04:35	21:23	17°C	12°C
30/06/2020	04:33	21:24	21°C	13°C
04/07/2020	04:33	21:23	21°C	15°C

4.1.2 SM2 I results

SM2 I (Figure 4) was located south of Attlebridge and positioned on the south bank of the River Wensum. The static detector was operational for 14 nights between the 24th June and 8th July 2020. This detector had the highest number of registrations of all the detectors deployed across the June/July period, with a total of 15,739 registrations. June accounted for more registrations, with 9,391 total bat registrations recorded over the seven-night period, in comparison to 6,348 registrations recorded across the nine nights in July.

Soprano pipistrelles had the highest number of registrations in total with 11,331. Common pipistrelles had the second highest total frequency, with 2,132 registrations. 184 records were assigned as 50kHz *pipistrellus*, as these registrations could not be classified to one of either common or soprano pipistrelles. There were some registrations of pipistrelle calls with peak frequency at 40-42kHz, which may have been low range registrations from common pipistrelles, or possibly Nathusius' pipistrelle. There were another 47

Pipistrellus sp. records which are attributable to either common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle.

613 registrations were attributed to *Myotis* bat species, for which the echolocation registrations do not allow accurate speculation on the particular species. Considering the location of the detector close to a river, it is reasonable to expect that a significant proportion (or possibly all) of these records relate to Daubenton's bat.

There were 696 bat registrations which cannot be classified to a particular species, typically because they are too fragmented or faint to allow a confident classification. These unidentified bat registrations are possibly attributable (at least in part) to brown long-eared bat, *Myotis* sp. or barbastelle.

The detector recorded 651 registrations of noctule. There were also a further 32 registrations which may have been noctule, serotine *Eptesicus serotinus* or Leisler's bat *Nyctalus leisleri*, but the registrations do not allow confident species classification.

There were two registrations clearly identifiable as serotine, 26 attributable to brown long-eared bat and 21 attributable to barbastelle.

The results are summarised in Table 6, below. The weather and sunset times for SM2 I and SM2 E static location are summarised in Table 7.

***Table 6**: SM2 I June - July 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	11,331	708.19	21:31	04:18
Common pipistrelle	2,132	133.25	21:43	04:16
Unidentified	696	43.5	22:20	04:13
50 kHz *Pipistrellus*	184	11.5	22:11	03:55
Myotis sp.	613	38.31	22:16	03:55
Noctule	651	40.69	21:28	04:40
Pipistrellus sp.	47	2.93	22:30	03:44
40-42 kHz Pipistrelle	4	0.25	23:49	02:24
Nyctalus sp.	32	2	22:19	03:39
Serotine	2	0.125	02:54	02:54
Brown long-eared bat	26	1.63	22:13	03:57
Barbastelle	21	1.31	22:35	03:07

***Table 7**: Summary of weather and sunset/rise times for SM2 I and E location*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
24/06/2020	(Not deployed)	21:24	25°C	15°C
25/06/2020	04:32	21:24	23°C	17°C
26/06/2020	04:33	21:24	29°C	17°C
27/06/2020	04:33	21:23	23°C	15°C
28/06/2020	04:34	21:23	20°C	11°C
29/06/2020	04:35	21:23	17°C	12°C
30/06/2020	04:35	21:23	21°C	13°C
01/07/2020	04:36	21:22	20°C	15°C
02/07/2020	04:37	21:22	18°C	13°C
03/07/2020	04:38	21:22	19°C	12°C
04/07/2020	04:38	21:21	21°C	15°C
05/07/2020	04:39	21:20	21°C	14°C
06/07/2020	04:40	21:20	18°C	12°C
07/07/2020	04:41	21:19	17°C	11°C
08/07/2020	04:42	21:18	16°C	12°C
09/07/2020	04:43	21:18	18°C	14°C
10/07/2020	04:44	(not deployed)	17°C	13°C

4.1.3 SM2 E results

SM2 E (Figure 4) was deployed alongside a ditch between two small woodlands in grazing floodplains to the south of the River Wensum. The static detector was operational for 15 nights between the 24th June and 9th July 2020. It recorded far fewer registrations than SM2 I and SM2 F, with only 16 registrations recorded in total. Ten of these registrations were in June and six were in July. All 16 registrations were of noctule.

The results are summarised in Table 8, below. The sunset, sunrise time and weather are shown in Table 7, above (as detectors SM2 E and SM2 I were deployed very close together the same sunrise/set times and weather conditions apply).

It should be noted that when this detector was collected it was found to have been knocked over (most likely by cattle grazing in the field) and was lying in dense vegetation. It is likely that the sensitivity of this detector was constrained by the dense vegetation, possibly explaining why it only recorded noctule registrations, as these species are fairly loud and easily detectable calls in relation to other bat species.

***Table 8**: SM2 E June-July 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Noctule	16	1	21:41	03:43

4.1.4 SM2 K results

SM2 K (Figure 5), deployed just south of the River Tiffey, recorded a total of 5,099 registrations. It was deployed and operational for 16 nights, between the 24th June and the 10th July. Slightly more of these registrations (2,865 in total) were in June than July (2,234). The majority of the registrations were of soprano pipistrelles, which had a total registration count of 3,147. Common pipistrelle had the second highest frequency with 1,449 registrations recorded in total across the June/July survey.

Where *Pipistrellus* species could not be determined between common and soprano (i.e. where registrations had a peak frequency of 50kHz, rather than 45 which indicates common pipistrelle or 55 which indicates soprano pipistrelle), these were noted in a category labelled as 50 kHz *pipistrellus;* these registrations would relate to either of the aforementioned pipistrelle species, echolocating atypically. A total of 92 50kHz *Pipistrellus* registrations were recorded in total across the June/July survey period.

The detector recorded a total of 361 registrations of noctule. There was one *Nyctalus* sp. registration that could either have been from a noctule or a Leisler's bat; the call was not of sufficient clarity to allow confident assignment to either species.

There were also 33 registrations of *Myotis* species.

There were 16 registrations which were in the category of unidentified. These could not be specifically attributed to a species due to the quality of the recording (e.g. faint, distant, partial recordings), but are likely to relate to brown long-eared bat, *Myotis* sp. bats or possibly barbastelle.

The results from the SM2 K are summarised in Table 9, below. The weather and sunset times for the location of this bat detector are summarised in Table 10, below.

***Table 9**: SM2 K June-July 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	3,147	196.69	21:27	04:26
Common pipistrelle	1,449	90.56	21:21	04:24
Noctule	361	22.56	21:16	04:36
50 kHz *Pipistrellus*	92	5.75	22:17	03:53
sp.*Myotis* sp.	33	2.06	22:22	03:12
Unidentified	16	1	22:40	04:04

***Table 10**: Summary of weather and sunset/rise times for SM2 K location*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
24/06/2020	(Not deployed)	21:25	25°C	15°C
25/06/2020	04:31	21:25	23°C	17°C
26/06/2020	04:32	21:25	29°C	17°C
27/06/2020	04:32	21:25	23°C	15°C
28/06/2020	04:33	21:25	20°C	11°C

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
29/06/2020	04:33	21:24	17°C	12°C
30/06/2020	04:34	21:24	21°C	13°C
01/07/2020	04:35	21:24	20°C	15°C
02/07/2020	04:35	21:23	18°C	13°C
03/07/2020	04:36	21:23	19°C	12°C
04/07/2020	04:37	21:22	21°C	15°C
05/07/2020	04:38	21:22	21°C	14°C
06/07/2020	04:39	21:21	18°C	12°C
07/07/2020	04:40	21:20	17°C	11°C
08/07/2020	04:41	21:20	16°C	12°C
09/07/2020	04:42	21:19	18°C	14°C
10/07/2020	04:43	(not deployed)	17°C	13°C

4.2 Static Bat Detector Results from the Second Deployment (30th July - 2nd/9th/10th/11th August 2020 and 19th August - 25th August 2020)

4.2.1 SM2 H results

SM2 H (Figure 7) was deployed in Weybourne Woods (in an alternate location to SMZ F from the June/July deployment). It recorded for 12 consecutive nights from the evening of 30th July to the morning of 11th August 2020.

Across the 12-night period a total of 70 bat registrations were recorded. *Pipistrelle* species account for 69 of these registrations, 55 of which relate to common pipistrelle and 14 of which relate to soprano pipistrelle.

There was one *Myotis* sp. registration recorded over the July-August deployment.

The results are summarised in Table 11, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 12, below.

***Table 11**: SM2 H July-August 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Common pipistrelle	55	4.58	21:25	05:17
Soprano pipistrelle	14	1.16	20:31	05:51
Myotis sp.	1	0.08	04:10	04:10

***Table 12**: Summary of weather and sunset/ sunrise times for SM2 H*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
30/07/2020	(Not deployed)	20:52	28°C	13°C
31/07/2020	05:12	20:50	31°C	15°C
01/08/2020	05:14	20:48	26°C	17°C
02/08/2020	05:16	20:47	22°C	12°C
03/08/2020	05:17	20:45	19°C	10°C
04/08/2020	05:19	20:43	22°C	9°C
05/08/2020	05:21	20:39	28°C	16°C
06/08/2020	05:22	20:20	27°C	18°C
07/08/2020	05:24	20:37	34°C	15°C
08/08/2020	05:26	20:35	24°C	17°C
09/08/2020	05:27	20:34	24°C	17°C
10/08/2020	05:29	20:32	30°C	17°C
11/08/2020	05:31	(not deployed)	30°C	18°C

4.2.2 SM2 N results

SM2 N was located in a small pocket of woodland, which is situated in a grazed pasture area to the north-west of Swannington (Figure 8). The detector was active for ten nights from the evening of 30th July to the morning of 9th August 2020 (the detector was not retrieved until 11th August, but it had ceased recording two nights earlier).

SM2 N recorded 981 bat registrations in total, with the majority (724) relating to common pipistrelles. There were 201 soprano pipistrelle registrations and one registration categorised as 50kHz *Pipistrellus* that could have been from an atypical registration of common pipistrelle or a soprano pipistrelle but cannot be confidently assigned to either species.

There were three *Myotis* sp. registrations and 51 noctule registrations.

There was one registration which could be allocated as any bat species and was classified as 'unidentified'.

The results are summarised in Table 13, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 14, below.

***Table 13**: SM2 N July-August 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Common pipistrelle	724	72.4	20:53	05:01
Soprano pipistrelle	201	20.1	20:57	04:38
Noctule	51	5.1	20:53	04:47
Myotis	3	0.3	22:23	02:21

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Unidentified	1	0.1	23:04	23:04

***Table 14**: Summary of weather and sunset/ sunrise times for SM2 N*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
30/07/2020	(Not deployed)	20:51	28°C	13°C
31/07/2020	05:13	20:49	31°C	15°C
01/08/2020	05:15	20:47	26°C	17°C
02/08/2020	05:16	20:46	22°C	12°C
03/08/2020	05:18	20:44	19°C	10°C
04/08/2020	05:20	20:42	22°C	9°C
05/08/2020	05:21	20:40	28°C	16°C
06/08/2020	05:23	20:38	27°C	18°C
07/08/2020	05:24	20:36	34°C	15°C
08/08/2020	05:26	20:35	24°C	17°C
09/08/2020	05:28	(ceased recording)	24°C	17°C

4.2.3 SM2 I results (30th July - 1st August)

SM2 I (Figure 9) was active for two nights from the evening of 30th July to the morning of 1st August 2020. This was a much shorter time period than the other bat detectors were active for, as the detector experienced a fault and ceased recording after just two nights. The bat detector was redeployed at the same location later in August, to ensure that this area was fully surveyed as required. The results of the re-deployment are provided in Section 4.2.4, below.

The static bat detector recorded 666 registrations relating to at least four species across the two nights. There were 374 soprano pipistrelle registrations and 156 common pipistrelle registrations. There were 42 *Pipistrellus* sp. records which are attributable to either common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle.

There were 19 *Myotis* sp. registrations, which, although they cannot be confidently classified to species level, given the location of the detector close to a river, there is a high likelihood that these records relate to Daubenton's bat.

The detector also recorded 72 noctule registrations.

There were three bat registrations which could not be classified to a particular species; these are listed as 'Unidentified'.

The results are summarised in Table 15, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 16, below.

***Table 15**: SM2 I 30th July - 1st August 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	374	187	21:32	04:42
Common pipistrelle	156	78	21:29	04:46
Noctule	72	36	22:15	04:52
Pipistrellus sp.	42	21	21:32	04:41
Myotis sp.	19	9.5	21:47	04:05
Unidentified	3	1.5	23:06	03:38

***Table 16**: Summary of weather and sunset/ sunrise times for SM2 I*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
30/07/2020	(Not deployed)	20:51	28°C	13 °C
31/07/2020	05:13	20:49	31°C	15°C
01/08/2020	05:15	(ceased recording)	26°C	17°C

4.2.4 SM2 I (19th August - 25th August)

SM2 I was re-deployed at the same location by the River Wensum, as the first time it was deployed in July/ August, it was only operational for two days. The location of this deployment is shown in Figure 9. The static detector was deployed and active for six nights from the evening of the 19th August until the morning of 25th August 2020.

The static detector recorded 1,486 registrations relating to at least four species across the six nights. The highest frequency of registrations is from soprano pipistrelles, with 1,244 registrations. There were 51 common pipistrelle registrations and there were 92 *Pipistrellus* sp. records which are attributable to either common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle.

There were 20 *Myotis* sp. registrations, which, although they cannot be confidently classified to species level, given the location of the detector close to a river, there is a high likelihood that these records relate to Daubenton's bat.

The detector recorded 52 noctule registrations. There were 18 barbastelle registrations and three brown long-eared bat registrations.

There were three bat registrations which could not be classified to a particular species; these are listed as 'Unidentified'.

The results are summarised in Table 17, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 18, below.

***Table 17**: SM2 I August 19th - August 25th 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	1,244	207	21:00	05:01
Pipistrellus sp.	95	15.83	21:32	05:02
Common pipistrelle	52	8.5	20:58	05:21
Noctule	52	8.6	21:00	05:11
sp.*Myotis* sp.	29	3.3	20:40	05:02
Barbastelle	18	3	20:42	04:53
Brown long-eared bat	3	0.5	21:50	23:44
Unidentified	3	0.5	21:41	04:46

***Table 18**: Summary of weather and sunset/ sunrise times for SM2 I*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
19/08/2020	(Not deployed)	20:21	21°C	15 °C
20/08/2020	05:46	20:10	26°C	17°C
21/08/2020	05:48	20:08	23	17
22/08/2020	05:50	20:05	23	15
23/08/2020	05:51	20:03	22	14
24/08/2020	05:53	20:01	21	11
25/08/2020	05:15	(Not deployed)	23°C	14°C

4.2.5 SM2 K results

SM2 K (Figure 10) was deployed in a woodland just north of the River Yare, in an area which is surrounded by large plantation woodlands and open grasslands, south of the village of Colton. The static bat detector was deployed and active for 11 nights from the evening of 30th July until the morning of 10th August 2020.

The detector recorded 1,313 registrations relating to at least four species of bats. The highest frequency of registrations relates to soprano pipistrelles, with 817 recordings. Common pipistrelles were the second most frequently recorded species, with 359 registrations.

There were 16 *Myotis* sp. registrations, which, although they cannot be confidently classified to species level, given the location of the detector close to a river, there is a high likelihood that these records relate to Daubenton's bat.

The detector recorded 19 registrations of noctule

There were also two unidentified registrations, which could not be confidently assigned to a bat species.

The results are summarised in Table 19, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 20, below.

***Table 19**: SM2 K July-August 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	817	74.27	20:40	05:06
Common pipistrelle	459	41.72	20:49	05:00
Noctule	19	1.72	20:59	02:30
Myotis	16	1.45	21:04	04:37
Unidentified	3	0.18	21:31	00:49

***Table 20**: Summary of weather and sunset/ sunrise times for SM2 K*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
30/07/2020	(Not deployed)	20:51	28°C	13°C
31/07/2020	05:14	20:49	31°C	15°C
01/08/2020	05:15	20:47	26°C	17°C
02/08/2020	05:17	20:46	22°C	12°C
03/08/2020	05:19	20:44	19°C	10°C
04/08/2020	05:20	20:42	22°C	9°C
05/08/2020	05:22	20:40	28°C	16°C
06/08/2020	05:24	20:38	27°C	18°C
07/08/2020	05:25	20:37	34°C	15°C
08/08/2020	05:27	20:35	24°C	17°C
09/08/2020	05:28	20:33	24°C	17°C
10/08/2020	05:30	(Not deployed)	30°C	17°C

4.3 Static Bat Detector Results from the Third Deployment (26th August - 9th/10th September 2020)

4.3.1 SM2 K results

SM2 K was deployed in the east of Weybourne Woods (Figure 12). It was deployed for 15 nights from 26th August - 10th September 2020.

The detector recorded 1,381 registrations relating to at least five species of bats. The highest frequency of registrations relates to common pipistrelles, with 857 recordings. Soprano pipistrelle was the second most frequently recorded species, with 457

registrations. There are three *Pipistrellus* sp. records which are attributable to either common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle.

There were 26 *Myotis* sp. registrations, 30 of noctule, seven registrations of barbastelle and one which was unidentifiable.

The results are summarised in Table 21, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 22, below.

***Table 21**: SM2 K August-September 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	457	30.5	19:26	06:06
Common pipistrelle	857	57.1	19:28	05:43
Pipistrelle sp.	3	0.2	21:13	05:16
Noctule	30	2	19:20	06:02
Myotis	26	1.7	20:34	05:12
Barbastelle	7	0.47	21:11	04:59
Unidentified	1	0.06	05:59	05:59

***Table 22**: Summary of weather and sunset/ sunrise times for SM2 K*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
26/08/2020	(Not deployed)	19:57	19°C	12°C
27/08/2020	05:57	19:55	19°C	12°C
28/08/2020	05:59	19:52	17°C	12°C
29/08/2020	06:01	19:50	15°C	14°C
30/08/2020	06:03	19:48	16°C	11°C
31/08/2020	06:04	19:45	16°C	8°C
01/09/2020	06:06	19:43	17	6
02/09/2020	06:08	19:41	21	6
03/09/2020	06:09	19:38	22	13
04/09/2020	06:11	19:36	18	12
05/09/2020	06:13	19:34	18	9
06/09/2020	06:14	19:31	18	9

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
07/09/2020	06:16	19:29	19	10
08/09/2020	06:18	19:26	24	15
09/09/2020	06:20	19:24	23	11
10/09/2020	06:21	(Not deployed)	17	10

4.3.2 SM2 N results

SM2 N was deployed in a small pocket of woodland near the River Bure (Figure 13). The detector was operational for 14 nights from 26th August to 9th September 2020.

The detector recorded 164 registrations relating to at least six species of bats. The highest frequency of registrations relates to common pipistrelles, with 79 registrations. Soprano pipistrelles were the second most frequently recorded species, with 19 registrations.

There were 12 *Myotis* sp. registrations.

The detector recorded 40 registrations of noctule. There were also a further three registrations which may have been noctule, serotine *Eptesicus serotinus* or Leisler's bat *Nyctalus leisleri*, but the registrations do not allow confident species classification.

There were three registrations of barbastelles, one of brown long-eared bat and seven records which were unidentifiable.

The results are summarised in Table 23, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 24, below.

***Table 23**: SM2 N August - September 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Common pipistrelle	79	5.2	21:00	05:04
Noctule	40	2.67	21:10	04:15
Soprano pipistrelle	19	1.27	20:57	03:02
Myotis	12	0.8	20:58	03:15
Nyctalus	3	0.2	20:49	04:15
Barbastelle	3	0.2	20:49	01:47
Brown long-eared bat	1	0.06	21:45	21:45

***Table 24**: Summary of weather and sunset/ sunrise times for SM2 N*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
26/08/2020	(Not deployed)	19:57	19°C	12°C
27/08/2020	05:58	19:55	19°C	12°C
28/08/2020	06:00	19:52	17°C	12°C
29/08/2020	06:01	19:50	15°C	14°C
30/08/2020	06:03	19:48	16°C	11°C
31/08/2020	06:05	19:45	16°C	8°C
01/09/2020	06:06	19:43	17	6
02/09/2020	06:08	19:41	21	6
03/09/2020	06:10	19:38	22	13
04/09/2020	06:11	19:36	18	12
05/09/2020	06:13	19:34	18	9
06/09/2020	06:15	19:31	18	9
07/09/2020	06:16	19:29	19	10
08/09/2020	06:18	19:27	24	15
09/09/2020	06:20	(Not operational)	23	11

4.3.3 SM2 J results

SM2 J was deployed in an area of scrub/ rank grassland, grazed by cattle and part of a large network of grazed fields and woodlands east of Swannington (Figure 14). The detector was deployed and operational for 15 nights from 26th August - 10th September 2020.

The detector recorded 2,039 registrations relating to at least six species of bats. The highest frequency of registrations relates to common pipistrelles, with 1,533 recordings. Soprano pipistrelles were the second most frequently recorded species, with 379 registrations. There are 13 *Pipistrellus* sp. records which are attributable to either common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle.

There were four *Myotis* sp. registrations.

The detector recorded 83 registration of noctule. There were also a further three registrations which may have been noctule, serotine or Leisler's bat, but the registrations do not allow confident species classification. One registration is from noctule or Leisler's.

There were 16 registrations of barbastelles, one of brown long-eared bat and six records which were unidentifiable.

The results are summarised in Table 25, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 26, below.

***Table 25**: SM2 J August- September 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Common pipistrelle	1,533	102.2	19:45	05:49
Soprano pipistrelle	379	25.3	19:31	05:50
Noctule	83	5.5	19:23	06:00
Barbastelle	16	1.06	20:24	02:18
Pipistrelle sp.	13	0.87	21:28	21:28
Myotis	4	0.27	21:15	00:37
Nyctalus	3	0.2	21:46	04:26
Serotine/ Liesler's	1	0.06	21:23	21:23
Brown long-eared bat	1	0.06	05:20	05:20

***Table 26**: Summary of weather and sunset/ sunrise times for SM2 J*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
26/08/2020	(Not deployed)	19:57	19°C	12°C
27/08/2020	05:58	19:54	19°C	12°C
28/08/2020	06:00	19:52	17°C	12°C
29/08/2020	06:01	19:50	15°C	14°C
30/08/2020	06:03	19:47	16°C	11°C
31/08/2020	06:05	19:45	16°C	8°C
01/09/2020	06:06	19:43	17	6
02/09/2020	06:08	19:40	21	6
03/09/2020	06:10	19:38	22	13
04/09/2020	06:11	19:36	18	12
05/09/2020	06:13	19:33	18	9
06/09/2020	06:15	19:31	18	9
07/09/2020	06:17	19:29	19	10
08/09/2020	06:18	19:26	24	15
09/09/2020	06:20	19:24	23	11
10/09/2020	06:22	(Not deployed)	17	10

4.3.4 SM2 H results

SM2 H was deployed by the River Wensum, north of the A1067 (Figure 15). The detector was deployed from 26th August - 10th September, but it was only operational for five nights between 26th August and 31st August 2020.

The detectors recorded 1,875 registrations relating to at least four species of bats. The highest frequency of registrations relates to soprano pipistrelles, with 1,468 recordings. Common pipistrelles were the second most frequently recorded species, with 398 registrations. There are four *Pipistrellus* sp. records which are attributable to either common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle.

There were four *Myotis* sp. registrations, which, although they cannot be confidently classified to species level, given the location of the detector close to a river, there is a high likelihood that these records relate to Daubenton's bat.

The detector recorded one registration of noctule.

The results are summarised in Table 27, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 28, below.

***Table 27**: SM2 H August 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	1,468	293.6	19:59	05:41
Common pipistrelle	398	79.6	20:26	05:46
Pipistrelle sp.	4	0.8	21:03	21:03
Myotis	4	0.8	20:56	20:56
Noctule	1	0.2	20:27	20:27

***Table 28**: Summary of weather and sunset/ sunrise times for SM2 H*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
26/08/2020	(Not deployed)	19:57	19°C	12°C
27/08/2020	05:58	19:54	19°C	12°C
28/08/2020	06:00	19:52	17°C	12°C
29/08/2020	06:02	19:50	15°C	14°C
30/08/2020	06:03	19:47	16°C	11°C
31/08/2020	06:05	(Not deployed)	16°C	8°C

4.4 Static Bat Detector Results from the Third Deployment (24th September – 2nd/5th October 2020)

4.4.1 SM2 H results

SM2 H was located near a large pond within the western side of Weybourne Woods (Figure 17). The static bat detector was operational for eight nights from 24th September – 2nd October 2020.

The detector recorded 337 registrations relating to two species of bats. The highest frequency of registrations relates to soprano pipistrelles, with 315 recordings. Common pipistrelles were the second most frequently recorded species, with 22 registrations.

The results are summarised in Table 29, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 30, below.

***Table 29**: SM2 H September-October 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	315	35	18:19	06:56
Common pipistrelle	22	2.44	18:35	06:29

***Table 30**: Summary of weather and sunset/ sunrise times for SM2 H*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
24/09/2020	(Not deployed)	18:48	17°C	8°C
25/09/2020	06:47	18:46	11°C	8°C
26/09/2020	06:49	18:43	13°C	8°C
27/09/2020	06:50	18:41	13°C	11°C
28/09/2020	06:52	18:39	16°C	9°C
29/09/2020	06:54	18:36	15°C	9°C
30/09/2020	06:56	18:34	18°C	9°C
01/10/2020	06:57	18:31	14°C	17°C
02/10/2020	06:59	(Not operational)	15°C	8°C

4.4.2 SM2 J results

SM2 J was deployed in a small section of woodland adjacent to the River Bure (Figure 18). The static bat detector was operational and deployed for 11 nights from 24th September - 5th October 2020.

The detector recorded 485 registrations relating to at least six species of bats. The highest frequency of registrations relates to common pipistrelles, with 245 recordings. Soprano pipistrelles were the second most frequently recorded species, with 86 registrations. There are two *Pipistrellus* sp. records which are attributable to either common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle.

There were 21 *Myotis* sp. registrations, 86 noctule registrations, seven registrations of barbastelles and one record which was unidentifiable.

The results are summarised in Table 21, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 32, below.

***Table 31**: SM2 J September-October 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Common pipistrelle	857	57.13	19:28	05:43
Soprano pipistrelle	457	30.47	19:26	06:06
Noctule	30	2	19:20	06:02
Myotis	26	1.73	20:34	05:12
Barbastelle	7	0.47	21:11	04:59
Pipistrelle sp.	3	0.2	21:13	05:06
Unidentified	1	0.06	05:09	05:09

***Table 32**: Summary of weather and sunset/ sunrise times for SM2 J*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
24/09/2020	(Not deployed)	18:48	17°C	8°C
25/09/2020	06:47	18:46	11°C	8°C
26/09/2020	06:49	18:43	13°C	8°C
27/09/2020	06:50	18:41	13°C	11°C
28/09/2020	06:52	18:39	16°C	9°C
29/09/2020	06:54	18:36	15°C	9°C
30/09/2020	06:56	18:34	18°C	9°C
01/10/2020	06:57	18:31	14°C	17°C
02/10/2020	06:59	18:29	15°C	8°C
03/10/2020	07:01	18:27	15°C	11°C
04/10/2020	07:03	18:24	11°C	9°C
05/10/2020	07:04	(Not deployed)	12°C	5°C

4.4.3 SM2 N results

SM2 N was deployed adjacent to the River Wensum (Figure 19). The static bat detector was operational and deployed for 11 nights from 24th September - 5th October 2020.

The detectors recorded 971 registrations relating to at least five species of bats. The highest frequency of registrations relates to *Myotis* sp., with 771 registrations.

Common pipistrelles were recorded, with 48 recordings. Soprano pipistrelles were also frequently recorded, with 37 registrations. There are two *Pipistrellus* sp. records which are attributable to either common pipistrelle, soprano pipistrelle or Nathusius' pipistrelle.

The detector recorded 103 registrations of noctule, two registrations of barbastelles and eight which were unidentifiable.

The results are summarised in Table 33, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 34, below.

***Table 33**: SM2 N September-October 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Myotis	771	70.1	18:54	06:18
Noctule	103	9.4	18:27	07:00
Common pipistrelle	48	4.4	18:56	05:39
Soprano pipistrelle	37	3.4	18:50	06:22
Unidentified	8	0.7	19:46	00:12
Pipistrelle sp.	2	0.2	19:08	19:08
Barbastelle	2	0.2	19:37	02:02

***Table 34**: Summary of weather and sunset/ sunrise times for SM2 N*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
24/09/2020	(Not deployed)	18:48	17°C	8°C
25/09/2020	06:47	18:46	11°C	8°C
26/09/2020	06:49	18:43	13°C	8°C
27/09/2020	06:50	18:41	13°C	11°C
28/09/2020	06:52	18:39	16°C	9°C
29/09/2020	06:54	18:36	15°C	9°C
30/09/2020	06:56	18:34	18°C	9°C
01/10/2020	06:57	18:32	14°C	17°C
02/10/2020	06:59	18:29	15°C	8°C
03/10/2020	07:01	18:27	15°C	11°C
04/10/2020	07:02	18:25	11°C	9°C
05/10/2020	07:04	(Not deployed)	12°C	5°C

4.4.4 SM2 K results

SM2 K was deployed adjacent to the River Tiffey (Figure 20). The static bat detector was operational and deployed for 11 nights from 24th September - 5th October 2020.

The detectors recorded 259 registrations relating to five bat species. The highest frequency of registrations relates to soprano pipistrelles, with 189 registrations. Common pipistrelles were the second most frequently recorded species, with 41 registrations.

There were nine *Myotis* sp. registrations.

The detector recorded five registrations of noctule. There were also three further registrations which may have been noctule, serotine or Leisler's bat , but the registrations do not allow confident species classification.

There was one registration of barbastelles and 11 records which were unidentifiable.

The results are summarised in Table 35, below. The sunset/sunrise times and weather for the dates of the records are displayed in Table 36, below.

***Table 35**: SM2 K September-October 2020 static bat detector results*

Species	Total registrations	Average registrations per night	Earliest registration	Latest registration
Soprano pipistrelle	189	17.2	18:29	06:54
Common pipistrelle	41	3.7	18:55	06:47
Unidentified	11	1	20:14	03:06
Myotis	9	0.8	20:46	04:23
Noctule	5	0.5	19:13	05:48
Nyctalus sp.	3	0.2	22:13	22:13
Barbastelle	1	0.09	19:22	19:22

***Table 36**: Summary of weather and sunset/ sunrise times for SM2 K*

Date	Sunrise time	Sunset time	Maximum temperature	Minimum temperature
24/09/2020	(Not deployed)	18:48	17°C	8°C
25/09/2020	06:47	18:46	11°C	8°C
26/09/2020	06:49	18:44	13°C	8°C
27/09/2020	06:50	18:41	13°C	11°C
28/09/2020	06:52	18:39	16°C	9°C
29/09/2020	06:54	18:36	15°C	9°C
30/09/2020	06:56	18:34	18°C	9°C
01/10/2020	06:57	18:32	14°C	17°C
02/10/2020	06:59	18:29	15°C	8°C
03/10/2020	07:01	18:27	15°C	11°C
04/10/2020	07:02	18:25	11°C	9°C
05/10/2020	07:04	(Not deployed)	12°C	5°C

5.5 Summary of results across all four deployments

Survey Location	Average number of bat registrations per night for bat detector deployments in:			
	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct
Weybourne Wood/ Hundred Acre Wood/Bodham Wood	0.19 common pipistrelle 0.06 noctule	4.6 common pipistrelle 1.2 soprano pipistrelle **0.08 *Myotis*** sp.	57 common pipistrelle 30 soprano pipistrelle 2 noctule **1.7 *Myotis*** sp. **0.46 barbastelle**	35 soprano pipistrelle 2.4 common pipistrelle
River Bure	(no deployment at this location)	(no deployment at this location)	5.3 common pipistrelle 1.3 soprano pipistrelle 2.67 noctule **0.8 *Myotis*** sp. **0.2 barbastelle** 0.07 brown long-eared bat	22 common pipistrelle 7.8 soprano pipistrelle 7.8 noctule **2.5 barbastelle** **1.9 *Myotis*** sp. 0.45 brown long-eared bat
Swannington (tributaries of the River Wensum)	(no deployment at this location)	72 common pipistrelle 20 soprano pipistrelle 5.1 noctule **0.3 *Myotis* sp**	102 common pipistrelle 25 soprano pipistrelle 5.5 noctule **1.07 barbastelle** **0.27 *Myotis*** sp. 0.07 brown long-eared bat	(no deployment at this location)
River Wensum (including surrounding floodplain*)	708 soprano pipistrelle 133 common pipistrelle 42 noctule **38 *Myotis*** sp. 1.6 brown long-eared bat **1.3 barbastelle** **0.13 serotine**	180 soprano pipistrelle 23 common pipistrelle 14 noctule **4.3 *Myotis*** sp. **2 barbastelle** 0.33 brown long-eared bat	294 soprano pipistrelle 80 common pipistrelle **0.8 *Myotis*** sp. **0.8 Nathusius' pipistrelle** 0.2 noctule	**70 *Myotis*** sp. 9.4 noctule 4.4 common pipistrelle 3.4 soprano pipistrelle **0.18 barbastelle**
River Yare	(no deployment at this location)	74 soprano pipistrelle 42 common pipistrelle 1.7 noctule **1.5 *Myotis*** sp.	(no deployment at this location)	(no deployment at this location)
River Tiffey	197 soprano pipistrelle 91 common pipistrelle 23 noctule **2.1 *Myotis*** sp.	(no deployment at this location)	(no deployment at this location)	17 soprano pipistrelle 3.7 common pipistrelle **0.81 *Myotis*** sp. 0.45 noctule **0.09 barbastelle**

4.6 Constraints and Limitations of Survey

The season of peak foraging/commuting bat activity is typically between April and October, inclusive. As static bat detector surveys began in June, not all of the 2020 survey season has been covered. Considering the surveys spanned five of the seven months, the data is considered sufficient to allow initial conclusions to be drawn. As the static bat detector deployments will continue in 2021, any shortfalls in the data will be addressed in due course.

The results collected to date indicate areas which are used by foraging and commuting bats. Where analysis has revealed bat activity close to sunset/sunrise times, this can be indicative of nearby roost locations. However, a different survey approach (i.e. emergence/re-entry surveys) would be required to confirm the location of any roosts.

The results obtained from the 2020 survey effort provide a useful basis to indicate which areas are important for foraging and commuting bats. They also show areas where rarer species, such as barbastelle, may be impacted by the proposed works associated with the PEIR boundary. However further surveys must be completed before specific impacts to foraging and/or commuting bats can be made.

4.7 Further Survey Requirements and Expiry Dates

The survey results obtained from the 2020 survey effort should be regarded as valid for at least one year. Additional surveys will need to be completed throughout 2021 once a finalised PEIR boundary (followed by DCO boundary) has been determined. Whilst the surveys so far have been somewhat limited in terms of their coverage, the 2021 surveys will be able to focus far more accurately and comprehensively on features which will be impacted by the refined proposals than the surveys in 2020 have been able to. In addition, bat transect surveys and possible bat emergence surveys (e.g. of trees targeted for removal) will also be required once the precise PEIR/DCO boundary has been identified.

5. Conclusions

5.1 First deployment- June to July

The static bat detector survey effort for June and July 2020 has confirmed that the locations where static bat detectors SM2 I and SM2 K were deployed are important foraging areas for multiple species of bats. Static bat detector SM2 I was deployed adjacent to the Wensum, whilst SM2 K was deployed adjacent to the River Tiffey. Both areas are important foraging sites for soprano pipistrelle and considering the first registrations began two minutes after sunset, it is possible there are pipistrelle roosts nearby.

Static bat detector SM2 I, adjacent to the River Wensum, had the highest number and greatest range of species recorded during this deployment. Notable species recorded included barbastelle, *Nyctalus* species, serotine, *Myotis* species and possible Nathusius' pipistrelle. The area around the River Wensum is considered to be important for barbastelles, so careful consideration must be given to the potential impacts on barbastelles using this area for foraging or possibly roosting.

Static bat detector SM2 E and SM2 F recorded relatively low levels of foraging/commuting bat activity. This may indicate that these areas may not commonly be used by foraging and commuting bats. However, technical faults may have been a factor in such low levels of recorded activity. The number of registrations does not necessarily relate to the number of individual bats, as individual bats (or low numbers of bats) can produce large numbers of registrations when active (e.g. foraging) in the vicinity of a bat detector. Further surveys of Weybourne Woods and the River Tiffey were undertaken to allow more accurate conclusions to be drawn.

5.2 Second deployment- July to August

The second deployment of static bat detectors indicated that areas around the River Yare are important for foraging and commuting bats, especially soprano pipistrelles. The first registration times are often very close to the sunset time, indicating that there may be a roost or roosts nearby. Other species including common pipistrelles, *Myotis* and noctules were also recorded there.

Static bat detector SM2 N, which was located in a small pocket of woodland near Swannington, also had many registrations, mostly comprising common and soprano pipistrelles. The common pipistrelle registrations were often within a few minutes of sunset times, suggesting that there could be a roost or roosts located nearby.

The detector which was deployed near the River Wensum (SM2 I) had 666 registrations, relating to at least four species of bat, which is fairly high considering it was actively recording for just two nights. Soprano pipistrelles were frequently recorded, along with common pipistrelles, noctules and occasional *Myotis* sp. SM2 I was re-deployed at the same location by the River Wensum, to ensure that it had been fully covered by the July/ August survey effort. The static detector recorded 1,486 registrations relating to at least four species across the six nights. The highest frequency of registrations is from soprano pipistrelles, with 1,244 registrations across the seven-night period. There were also frequent registrations of common pipistrelle, *Pipistrellus* sp. and noctules. Of particular note are the 20 *Myotis* sp. bats and the 18 barbastelles recorded. These two species are less frequent than the pipistrelles but have the closest registration time to sunset. This suggests that there may be a roost/ roosts in the vicinity. Barbastelles were not recorded in any other deployment locations across the July/ August surveys. As both *Myotis* sp.

and barbastelles were recorded during the first June/ July deployment this indicates that the Wensum river corridor is likely important for these rarer bat species.

Static bat detector SM2 H located in Weybourne Woods had a lower frequency of registrations compared to the other detectors. Weybourne Woods is a large and varied habitat so low registration numbers do not yet rule out the importance of the area for foraging and commuting bats.

5.3 Third deployment- August to September

SM2 K which was located in the east of Weybourne Woods had 1,381 records of bats, which was the highest number of records for the Weybourne Wood deployments. These records were mostly attributable to soprano pipistrelles, but there were also registrations from the rarer *Myotis* sp. and barbastelles. Pipistrelle species were close to sunset/ sunrise time suggesting that there may be roost/ roosts located nearby.

The detector located by Swannington (SM2 J) and the River Wensum (SM2 H) had high frequencies of registrations recorded across the third deployment (2,039 and 1,875, respectively). Both deployments recorded at least six species and included rarer species such as Nathusius' pipistrelle, barbastelle and *Myotis* sp. Both detectors also had pipistrelle registrations which were close to sunset/ sunrise time suggesting that there may be roost/ roosts located nearby.

The detector located by the River Bure (SM2 N) had the fewest number of registrations, with 164 recorded. These registrations were however from at least six species, including *Myotis* sp. and barbastelle. Registrations times for pipistrelle species from detectors SM2 K, SM2 J and SM2 H were all close to sunset/ sunrise times, suggesting that there may be roosts located nearby.

5.4 Forth deployment- September to October

The fourth deployment of static bat detectors was undertaken between September and October 2020 and the findings of which show a reduced level of bat activity being recorded. Lower levels of bat activity are to be expected when temperatures start to drop, but there was still a range of species recorded throughout this deployment.

The highest number of registrations was from static bat detector deployed by the River Wensum (SM2 N). There were 971 registrations recorded, of which 771 were from *Myotis* sp. bats. This is by far, the highest number of *Myotis* sp. registrations recorded across all the static bat detector deployments. Additionally, some of these registrations are within 10 minutes of sunset/ sunrise time, suggesting that there may be a roost/ roosts located nearby or at least that the River Wensum provides an important foraging habitat for *Myotis* sp. bats. Barbastelles were also recorded at relatively high levels during this deployment.

The detectors located by the River Bure and Tiffey had some bat activity (485 and 259, respectively) which included *Myotis* sp. and barbastelles. The detector located in Weybourne Woods had relatively low levels (337 registrations) of bat activity from only common and soprano pipistrelles.

5.5 Areas of importance/ overall summary

Most static bat detector surveys recorded *Pipistrellus* species as having the highest frequency of registrations, with over 87% of all recorded bat activity relating to pipistrelle species. Surveys recorded more registrations of soprano pipistrelle in total (across all surveys) and at individual survey locations on Rivers Wensum, Yare and Tiffey. Common pipistrelle was the most abundant species at River Bure, Swannington and Weybourne Woods. In most survey locations, noctule was the most frequently recorded non-pipistrelle bat species. *Myotis* species (ultrasonic recordings of which do not allow species classification) were recorded at most survey locations, with the highest levels recorded at rivers, particularly the Wensum. It is likely that part/all of these registrations relate to Daubenton's bat, given the species' preference for foraging in/around aquatic habitats. Surveys recorded relatively low numbers of registrations of barbastelle and brown long-eared bat, but across most locations. From the data obtained, the areas around the River Wensum and Swannington appear to be the most important for barbastelles. Other rarer species including Nathusius' pipistrelle and serotine were very rarely recorded, and only at the River Wensum. Results therefore show that the River Wensum supports more species and has highest number of total bat registrations of all sampled locations.

5.6 Further Survey and Assessment

The further 2021 static bat detector deployments will continue to focus on areas such as Weybourne Woods, the River Bure, the River Tiffey, Swannington, the River Wensum, the River Tud and the River Yare. The data collected on and around these sites will continue to build on the current data, allowing for more accurate conclusions to be drawn. During the active bat season of 2021, walked transect surveys will also take place.

Impacts to foraging/commuting bats will be assessed once the PEIR boundary has been refined and finalised. Further surveys for commuting/ foraging and roosting bats will take place to allow greater understanding on species and number of bats present along specific areas within the PEIR boundary. Once accurate conclusions from full and specific survey data can be drawn, the impact assessment for bats is possible. Following this, appropriate advice for mitigation and enhancement opportunities with respect to foraging/commuting bats can be proposed, including an requirement for European Protected Species mitigation licensing

Appendix 7 - Supreme Court Judgment in Kier

Neutral Citation Number: [2021] EWHC 1059 (Admin)
Case No: CO/1327/2021

IN THE HIGH COURT OF JUSTICE
QUEEN'S BENCH DIVISION
PLANNING COURT

Royal Courts of Justice
Strand, London, WC2A 2LL
27/04/2021

B e f o r e :

THE HON. MR JUSTICE HOLGATE

Between:

The Queen on the application of MARK KEIR	**Claimant**
- and –	
NATURAL ENGLAND	**Defendant**
- and –	
(1) MORGAN SINDALL CONSTRUCTION & INFRASTRUCTURE LIMITED, BAM NUTTALL LIMITED, and FERROVIAL AGROMAN (UK) LIMITED **(2) HIGH SPEED TWO (HS2) LTD**	**Interested Parties**

Charles Streeten (instructed by Richard Buxton Solicitors) for the Claimant
Leon Glenister (instructed by Browne Jacobson LLP) for the Defendant
James Strachan QC and Victoria Hutton (instructed by Government Legal) for the 2nd Interested Party
The 1st Interested Party was not represented and did not appear

Hearing date: 23rd April 2021

HTML VERSION OF JUDGMENT APPROVED

Mr Justice Holgate :

Introduction

1. The High Speed Rail (London - West-Midlands) Act 2017 ("the 2017 Act") authorises the construction of the HS2 high speed railway. High Speed Two (HS2) Limited, the second interested party ("IP2") is the "nominated undertaker" under the 2017 Act. The first interested party, previously described as Fusion and Murphy Joint Venture, is the contractor for the enabling works for the central section of the phase 1 route.[1]

2. This case concerns a small section of the route which crosses an area of ancient woodland forming part of Jones Hill Wood, near Wendover, Buckinghamshire. The project requires 0.7ha of land used for this purpose.

3. The Wood contains a number of different species of bat which are "European protected species" under regulation 42 of and Schedule 2 to the Conservation of Habitats and Species Regulations 2017 (SI 2017 No. 1012) ("the 2017 Regulations"). Under regulation 43 it is an offence *inter alia* to deliberately capture, injure or kill any wild animal of such a species, or to deliberately disturb, or damage or destroy a breeding site or resting place of such an animal.

4. By regulation 55 a licence may be granted for any of the purposes set out in subparagraph (2), including "imperative reasons of overriding public-interest, including those of a social or economic nature." Anything done in accordance with such a licence is not an offence under *inter alia* regulation 43 (see regulation 55(3)). Such a licence is often referred to as a derogation licence.

5. The construction of the railway through the Wood requires a number of trees to be felled. Some 19 of those trees have "potential roosting features" with varying degrees of suitability for bats.

6. The 2017 Act does not disapply the licensing regime under the 2017 Regulations or grant any licence for the purposes of regulation 55 in relation to the works authorised to be constructed. Accordingly, IP1 had to make an application for a regulation 55 licence in relation to certain works in the Wood, including the felling of the 19 trees. It did so on 18 December 2020.

7. The relevant licensing body for the purposes of regulation 55 is the defendant, Natural England ("NE") (pursuant to s. 78 of the Natural Environment and Rural Communities Act 2006).

8. On 3 February 2021 NE notified IP1 that it would not grant a licence at that stage because it was not satisfied that the information provided met the third of three statutory tests, namely that the actions to be authorised would not be detrimental to maintaining certain bat species at a "favourable conservation status" ("FCS"). They indicated the nature of the further information that should be considered.

9. On 5 March 2021 IP1 submitted to NE a revised application with additional information. On 25 March 2021 NE issued a further decision to the effect that it was satisfied that the FCS test had been met.

10. On 30 March 2021 NE granted the licence to IP1 which is the subject of this proposed claim for judicial review. It is a detailed document which incorporates a number of other documents approved by NE. The licence authorises the works and activities described in the Annex WML-OR58(B). They include inspection of the 19 trees before any works are carried out and the loss of any bat roosts actually present in those trees. The licensee must comply with *inter alia* the Jones Hill Wood Method Statement and the work schedule (see condition 7). Condition B2 in Annex B also requires adherence to the approved work schedule. The schedule requires felling to be carried out in April. Pre-felling surveys must be carried out under condition 12.

11. Condition B5 requires that before any destructive works may be undertaken inspections must be carried out to search for any bats that may be present. All searches and felling must be carried out, or directly supervised by, a named ecologist or accredited agent. Any bat discovered must be relocated to a suitable roost or to a suitable foraging/commuting habitat.

12. Condition B13 prohibits licensed activities which affect *inter alia* maternity and habitation roosts while any such roosts are in use for those purposes. A "maternity roost" is defined in condition B27 as one where female bats give birth and rear their pups to independence. Condition B2 prohibits felling until "after temperatures have not dropped below 8ºC for 4 days." The object of that condition is to prohibit felling until the point is reached when bats emerge from hibernation.

13. Condition B19 requires the provision of a number of defined compensation features under the direct supervision of the named ecologist or accredited agent. They include 24 replacement roost features (specific designs of "bat boxes") and the planting of 3.2ha of woodland habitat and fruit trees on an adjacent site. Condition B24 requires maintenance and monitoring of the mitigation and compensation measures until 2031 together with annual reports to NE (see condition B25).

The proceedings in the High Court

14. The claimant, Mark Keir, is a member of a group of ecologists and citizens opposed to the HS2 project, known as "Earth Protectors". Some of the group were camping in that part of the wood which is planned to be felled until IP2 regained possession in October 2020.

15. On 16 February 2021 the claimant's solicitors wrote to NE to ask that copies of the licence application and documentation be provided to them before the grant of any licence so that the group's ecologists could review the material and raise any concerns they might have before any final decision was made. NE replied on 19 February 2021 stating that they do not follow that practice in other cases and would not do so here. I note that Parliament has not imposed any requirement for public consultation in relation to applications for licences under regulation 55 and that the claimant raises no complaint about the procedure followed.

16. Once the licence was granted on 30 March 2021, the claimant's solicitors requested the relevant papers from NE. NE provided them by late morning on the following day. The claimant's legal team and experts studied the papers over the Easter weekend.

17. On Tuesday 6 April the claimant's solicitors wrote to NE to set out their concerns at that stage. They noted that the assessment accepted by NE had proceeded on the basis of a worse case assumption that the area to be felled included one maternity roost for the barbastelle bat. The claimant's group had serious concerns about the efficacy of the mitigation to be provided and its adequacy to achieve compliance with the FCS test. The letter referred to the loss of that assumed roost and indicated that a challenge might be made to the lawfulness of the licensing decision on that basis. However, the authors accepted that "NE may have been provided with confidence in its decision by proven success of these techniques elsewhere." They asked to see evidence that bat boxes can be used to provide compensation for the loss of a barbastelle breeding site. The letter did not indicate any of the other grounds of challenge now pursued. No pre-action protocol letter was sent.

18. NE responded on Friday 9 April expressing confidence in the adequacy of the mitigation and compensation measures which would be provided to maintain the conservation status of any species of bat affected by the works at the Wood. The response also pointed out that barbastelle bats may use several maternity roosts, each for a few

days at a time, and that the loss of one roost feature within a network of woodlands had been considered in that context. However, the response did not refer to any evidence of the kind requested on behalf of Mr Keir.

19. Over the following weekend, the claimant obtained advice and grounds of challenge were drafted. The claim was served on NE on 12 April. The grounds range much more widely than the points raised in the letter of 6 April. The claim was accompanied by expert reports from two ecologists, Mr. Dominic Woodfield and Mr. Rob Mileto.

20. The claim was also accompanied by an urgent application in form N463. The interim relief sought included an order for a rolled up hearing, an injunction prohibiting the carrying out of any works or activities under the licence, and an order suspending the licence. The claimant's solicitors accepted that it would be appropriate for a hearing to be held to deal with these matters. NE and IP2 opposed the application. IP2 also requested a hearing. NE submitted that the issue of whether permission be granted should be dealt with initially on paper.

21. It is to be noted that paragraph 3(b) of the Statement of Facts and Grounds accepted, rightly in my judgment, that a key issue in determining whether the interim injunction should be granted is whether the licensed works would result in environmental damage undermining the "favourable conservation status of a rare species protected by the Habitats Regulations", namely the barbastelle bat. That is relevant to any attempt to justify the injunction on the grounds of the preservation of the *status quo*.

22. The applications came before Lang J. on 16 April 2021. After considering the matters on the papers, she ordered that permission be dealt with at a rolled up hearing to be listed in the week commencing 24 May 2021 or as soon as possible after 8 June 2021, with a time estimate of 2 days. The judge also granted an injunction restraining the carrying out of "works or other activities" within the licensed area until the determination of the claim or future order. It became common ground between the parties at the hearing that (a) this went beyond the scope of the order that had been sought and (b) that there was no legal justification for any interim order in the present claim to go beyond restraining works or activities pursuant to the licence which the claimant seeks to impugn.

23. It appears that the judge made her order initially without having received written submissions by counsel for IP2. She subsequently had the opportunity to consider that document and issued a further order in the same terms, but with additional reasoning which addressed the submissions for IP2. The order is said to have been issued at 5:18pm on 16 April, just before the weekend.

24. The judge also gave liberty to apply on 2 days' notice for the variation or discharge of the order. On Monday 19 April IP2 made an urgent application for the order of Lang J to be varied on the grounds that (a) the felling of trees pursuant to the licence needed to take place before the end of April 2021 and would take 3-4 days and (b) if the works were not carried out until October, after the maternity season is over, there would be serious and costly delay to this part of the HS2 project.

25. The application came before me on the papers on 19 April, at which stage I indicated provisionally the directions I was minded to make so that the parties could respond. In the light of their representations I made an order on 20 April which provided for a 1 day hearing to take place on 23 April to deal with the issues of whether the injunction should be continued or discharged and whether permission should be granted to apply for judicial review.

26. The claimant's Solicitors suggested in correspondence that IP2's application had failed to give 2 days' notice and/or that I was prevented by the terms of the order made by Lang J from making the order I did go on to make on 20 April. A request for the solicitors to explain and justify their stance did not cast any real light on the matter. In my view the standard language of paragraph 7 of the order of Lang J simply required 2 days' notice to be given before the court could consider and determine an application to vary or discharge that order. It did not mean that either IP2 had to give notice by letter or email 2 days before filing its application, or that a judge could not make any order on the application, such as the giving of directions for a hearing, until 2 days had elapsed from the filing of the application. The building in of either of these delays into the procedural timetable would have served no real purpose. They would also frustrate the court's ability to respond urgently to an application to vary an order, which itself had been made in response to an urgent application and without the hearing which the claimant had acknowledged to be appropriate. The stance adopted on behalf of the claimant appeared to be purely tactical, just

as the initial reluctance that the injunction, if continued, should be restricted in scope to that originally sought by the claimant. It is difficult to see how such conduct could comply with CPR 1.3.

27. I acknowledge that the claimant's solicitors did also raise a concern as to whether the hearing I proposed to order for 23 April would allow sufficient time for preparation. However, the claimant was able to file a detailed skeleton argument and three further witness statements all within the timetable set. Fortunately, Mr. Charles Streeten, who appeared on behalf of the claimant, confirmed at the hearing on 23 April that there was no objection to the matter going ahead that day and that his clients had not been prejudiced by the timescale.

28. I also recognise that the timetable indicated by me on 19 April, and ordered on 20 April, was challenging for the parties. But it turns out that the parties did co-operate successfully with each other so as to comply with the order. I appreciate that substantial efforts had to be made by each of the legal teams and those providing evidence or instructions during the week commencing 19 April. I am grateful for this and for all the help received by the court by way of both written material and oral submissions.

29. The help I received contrasts with what was put before Lang J. The claimant's main bundle contained 472 pages and a supplementary bundle contained a further 514 pages. Much of the documentation was of a highly technical nature and in sequence which was difficult to follow. A good deal of time and assistance was needed to navigate this material during the hearing. I had the benefit of very focused and carefully cross-referenced skeletons. The same cannot be said of the Statement of Facts and Grounds put before Lang J, which did not identify the key passages in the application and decision-making documents upon which the legal submissions depended. For example, the list of essential reading referred to 120 pages of such material *en bloc*, without identifying any specific passages and so was of no assistance. This was a serious problem in the present case. A key document for the submissions of all parties at the hearing, the "Method Statement Assessment: Additional Notes", which contained a good deal of the explanation for NE's final decision, and is over 40 pages long, was not mentioned at all in either the Statement of Facts and Grounds or the list of essential reading. It was simply buried within the Supplementary Bundle. NE and IP2 have expressed their concern that these factors might have affected Lang J's consideration of the applications before her.

Statutory framework and legal principles

30. Regulation 43 of the 2017 Regulations provides (so far as is material) :-

> "(1) A person who—
>
> (a) deliberately captures, injures or kills any wild animal of a European protected species,
>
> (b) deliberately disturbs wild animals of any such species,
>
> (c) deliberately takes or destroys the eggs of such an animal, or
>
> (d) damages or destroys a breeding site or resting place of such an animal,
>
> is guilty of an offence.
>
> (2) For the purposes of paragraph (1)(b), disturbance of animals includes in particular any disturbance which is likely—
>
> (a) to impair their ability—
>
> (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."

31. Regulation 55 provides (so far as is material): -

> "(1) Subject to the provisions of this regulation, the relevant licensing body may grant a licence for the purposes specified in paragraph (2).
>
> (2) The purposes are—
>
> (a) ….; (b) ….; (c) ….; (d) ….
>
> (e) preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;
>
> (f) ….; (g) ….
>
> (3) Regulations 43 (protection of certain wild animals: offences), 45 (prohibition of certain methods of capturing or killing wild animals) and 47 (protection of certain wild plants: offences) do not apply to anything done under and in accordance with the terms of a licence granted under paragraph (1).
>
> ……..
>
> (9) The relevant licensing body must not grant a licence under this regulation unless it is satisfied—
>
> (a) that there is no satisfactory alternative; and
>
> (b) that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range."

32. Accordingly, three tests had to be met to NE's satisfaction before it could grant the licence dated 30 March 2021:-

> (1) the demonstration of one of the purposes in regulation 55(2), in this case "imperative reasons of overriding public importance, including those of a social or economic nature and beneficial consequences of primary importance for the environment";
>
> (2) the absence of a "satisfactory alternative" to the proposal (regulation 55(9)(a));
>
> (3) the actions authorised will not be detrimental to the maintenance of the population of the relevant species at a "favourable conservation status in their natural range" (regulation 55(9)(b)).

33. NE was satisfied in relation to tests (1) and (2) by the time of their decision on 3 February 2021. The claimant raises no legal challenge in relation to either of those two aspects. NE was not satisfied with the information provided initially to address test (3).

34. It is solely the decision of NE on 30 March 2021 that it was satisfied on test (3), after taking into account further information, which has given rise to this legal challenge. Even then, the claimant's complaint is concerned with what Mr Streeten described in paragraph 2 of his skeleton as a narrow issue: the licence involves the destruction of maternity roosts of a rare European protected species, the barbastelle bat, "*without certainty* that this will not be detrimental to the maintenance of the population of the species at a favourable conservation status." Mr Streeten confirmed that the claimant raises no challenge in relation to the way in which the decision-making by NE or the licence deals with other bats as European protected species.

35. It is agreed that the barbastelle bat is a rare species included on the IUCN Red List for British terrestrial mammals. In his first report at paragraph 31 Mr. Woodfield says that the barbastelle is one of the rarest mammals in the UK. The population has been estimated to be as low as 5,000. Few maternity roosts are known in the UK, none in Buckinghamshire and only one in Berkshire.

36. The precautionary principle enshrined in Article 191(2) of the Treaty on the Functioning of the European Union is relevant to the application of regulation 55(9)(b). Thus, where, in the light of the best scientific knowledge in the field, there is a reasonable doubt that a human activity will not have adverse effects on the conservation of habitats and protected species, that activity cannot be authorised (see para. 63 of the Opinion of Advocate General Oe in *Luonnonsuojeluyhdistys Tapiola Pohjois-Savo - Kainbury* [2020] CMLR 1 otherwise referred to as the *Tapiola* case). This principle is implicit in the requirement that it be demonstrated that a derogation will not be "detrimental" to the FCS of a species (*ibid*). It explains what was meant by the CJEU in the passage at [66] cited by Mr Streeten:-

> "In that context, it must also be noted that, in accordance with the precautionary principle enshrined in Article 191(2) TFEU, if, after examining the best scientific data available, there remains uncertainty as to whether or not a derogation will be detrimental to the maintenance or restoration of populations of an endangered species at a favourable conservation status, the Member State must refrain from granting or implementing that derogation."

37. Mr Streeten agreed that "certainty" in that passage cannot mean "absolute certainty" for obvious reasons. Instead, as the Advocate General explained, it refers to the absence of reasonable doubt. Indeed, Mr Streeten agreed that the court should proceed on the basis that where the precautionary principle is engaged, the test requires that there be no "reasonable scientific doubt" about the relevant detrimental effect (see Jay J in *Wealden District Council v Secretary of State for Communities and Local Government* [2017] EWHC 351 (Admin) at [44]).

38. Reg 3(1) of the 2017 Regulations relies on the definitions of "conservation status" and "favourable conservation status" contained in Article 1(i) of Council Directive 92/43/EEC:-

> "(i) *conservation status* of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2;
>
> The *conservation status* will be taken as 'favourable' when:
>
> - population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
> - the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
> - there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis."

39. It is important to note that regulation 55(9)(b) focuses on the conservation of the *species*, not individual members of that species. That has to be so because in an appropriate case a licence may authorise even the killing of a wild animal belonging to a protected species (see regulation 43(1) (a)).

40. It is also plain that the identification of the "conservation status" of a species is itself a multi-factoral judgment about the sum of the influences acting on the species in question, affecting its distribution and populations in what is judged to be a long-term period. Whether that status is favourable is another multi-factoral judgment to do with whether the species is maintaining itself as a viable component of its habitat in the long term, whether the natural range of the species is being or likely to be reduced in the foreseeable future, and whether there is and will continue to be a sufficiently large habitat to maintain populations in the long term. Similarly, regulation 55(9)(b) refers to the maintenance of the population of the species at a favourable conservation status *in their natural range.* These tests or considerations are concerned with a much broader perspective than the effects of the development or an activity on the individual specimen or specimens of a protected species on a particular site.

41. Given that it is agreed that none of these considerations have to be established in any given case with absolute certainty, Mr. Streeten accepted, rightly in my judgment, that it is relevant for a decision-maker to consider

degrees of likelihood or confidence when evaluating these matters. However, I agree with Mr. Streeten that that approach must accord with the precautionary principle. In other words, levels of confidence, or likelihood, or risk, may be judged to be acceptable if the decision-maker does not consider that there is a reasonable scientific doubt about whether an action authorised by a licence would be detrimental to the maintenance of the population of a species at a "favourable conservation status in their natural range." On the other hand, as Mr. Streeten put it crisply, an expression of likelihood, such as the balance of probabilities, should not be *substituted* as a decision-making test for the "absence of reasonable scientific doubt" required by the precautionary principle.

42. As the Advocate General in the *Tapiola* case indicated, the word "detrimental" in Article 16(1) of the Directive (or regulation 55(9)(b) of the 2017 Regulations) is all of a piece with the precautionary principle, and thus with the analysis set out above. The term has to be read together with all the remaining language of the provision. Regulation 55(9)(b) requires an overall judgment to be made comprised of a number of elements, or, as Mr. Glenister put it on behalf of NE, building blocks. I also accept Mr. Glenister's submission, which Mr. Streeten did not dispute, that the judgment required by regulation 55(9)(b) involves consideration not just of the impact of the activities to be authorised, but also the mitigation and compensation measures to be secured by the licence.

43. It is well-established that the court affords an enhanced margin of appreciation to judgments of a scientific expert deciding issues of the kind raised by regulation 55(9)(b). Furthermore, a challenge to the rationality of a judgment on the application of planning or environmental controls faces a high hurdle (see e.g. *Newsmith Stainless Limited v Secretary of State for the Environment, Transport and Regions* [2017] PTSR 1126*; R (Mott) v Environment Agency* [2016] I WLR 4338; *R (Spurrier) v Secretary of State for Transport* [2020] PTSR 240 at [170] to [179]; *R (Plan B Earth) v Secretary of State for Transport* [2020] PTSR 1446 at [177]; *R (BACI Bedfordshire Limited) v Environment Agency* [2020] Env L.R. 16 at [98]-[99]). In the present case, the reasoning of NE challenged by the claimant involved evaluative judgment and matters of degree, dependent upon expert technical opinion.

44. The principles determining when fresh evidence and expert evidence may be received in proceedings for judicial review are also well-established (see e.g. *R (Law Society) v Lord Chancellor* [2019] 1 WLR 1649). Although the Statement of Facts and Grounds proffered expert evidence in this case in order to help the court understand technical matters (see para. 49), in fact those documents were largely directed at challenging the merits of the judgments reached by NE and advancing alternative expert opinions. Mr. Streeten said that they would be admissible to support the attack on the rationality of certain of NE's judgments. But where there is room for reasonable differences of opinion, including those of the decision-maker, a rationality challenge cannot succeed (*Law Society* case at [41]). As Lindblom LJ stated in *Plan B Earth* at [180] "the court's reviewing role does not stretch to determining disputed issues of technical, expert evidence."

45. There is also common ground on the approach which should be taken by the court to the grant of any injunction (*R (Medical Justice) v Secretary of State for the Home Department* [2010] EWHC 1425 (Admin) at [6] to [7] and [12]; *Packham v Secretary of State for Transport* [2020] EWHC 829 (Admin) at [116] to [117]). First, it is necessary for the claimant to show a real prospect of success on one or more of his legal grounds of challenge. It is accepted by the claimant that if that test is not satisfied that the injunction must be discharged. Second, if that test is met then the court should go on to consider the balance of convenience which includes the public interest issues raised by the effect of the licence on the conservation status of the barbastelle bat and the effect of continuing the injunction on the HS2 project.

46. It is firmly established that decision letters of Planning Inspectors are to be read fairly and with an appropriate degree of benevolence when seeking to understand how a decision was reached. They must be read as a whole and in the context of the material and issues with which the parties to an appeal are taken to be familiar. They must not be read in an overly forensic or legalistic way (see e.g. *Bloor Homes East Midlands Limited v Secretary of State for Communities and Local Government* [2017] PTSR 1283 at [19]; *St Modwen Developments Limited v Secretary of State for Communities and Local Government* [2018] PTSR 746 at [6] referring to *R (Mansell) v Tonbridge and Malling Borough Council* [2019] PTSR 1452 at [41] and [62]-[64]). In that context the Inspector is under a statutory obligation to give reasons for his decision.

47. Here it is common ground that NE was under no general duty to give reasons. The legislation for the grant of

derogation licences does not include any requirements for public involvement. There is no opportunity for representations to be made. NE is not deciding issues as between several parties. Instead, it is reaching its own independent determination as to whether to grant a licence. There is no reason why any more rigorous approach should be taken than that summarised in [46] above.

48. There was no dispute about the relevance of the principles in [46]. Indeed, Mr. Streeten went a little further. He submitted that the line of cases which includes *Jones v Mordue* [2016] 1 WLR 2682 should be applied by analogy. The decision-maker in NE should be treated as being familiar with the statutory framework, the precautionary principle and the legal and policy principles applicable to FCS (including NE's policy guidance) and to have taken them into account and applied the relevant tests, unless there is a sufficient, positive contra-indication. I agree.

49. It became clear during the hearing that there is no real disagreement about the principles to be applied to the issues now before the court as summarised above. The dispute between the parties concerns the application of these principles. But the principles are so important to the determination of those issues that it has been necessary for them to be set out.

The context for the decision being challenged

50. The barbastelle is said to have a wide distribution and is thinly spread across southern and central England. Mr. Woodfield states that the species requires a complex mosaic of habitats, in particular large areas of mature woodland or well-connected smaller woodland patches and riparian habitat. Mature trees with cracks and loose bark provide important roosting opportunities. These particular bats prefer pastoral landscapes with deciduous woodland, wet meadows and water bodies, such as woodland streams and rivers. They prefer dead trees with holly understorey. In summer, breeding females move regularly between a large number of tree roosts (see paras. 35 to 37).

51. The court was informed that the site in question does not presently contain water bodies, but the compensation required by the licence includes the creation of such features.

52. Following NE's decision on 3 February 2021 IP1 submitted a revised Application Method Statement and Mitigation Strategy ("AMSMS"). Appendix 10, "Response to NE's Further Information Request", records that barbastelle breeding sites are often associated with transient features such as lightning strikes and tear outs. Such features are "infrequently present" in the wood in question, given the dominance of beech trees in good condition. Appendix 2 referred to the suboptimal quality of the wood for barbastelle, noting a lack of thick understorey and few dead trees.

53. The home range for a barbastelle colony, or the colony sustenance zone, is given as 6km. IP1 obtained records of any sightings within 6km. There was one 2km away from the Wood in 2016. The Environmental Statement for the project prepared in 2013 noted there were no records within 5km of the HS2 line and none in the Wendover area during surveys in 2013. No barbastelles were found within 3km of the Wood according to the 2020 surveys carried out by SES. Another ecologist (Ecotech) found a Barbastelle "day roost" in September 2020 in an old oak outside the statutory limits for the HS2 scheme on the eastern edge of the woodland. This was the outcome of surveys carried out in "late summer 2020" and on 29 September 2020. One barbastelle was seen.

54. Within the relevant part of the HS2 limits there are a few hundred trees. An initial ground assessment of all those specimens was made to identify those trees, 37 in number, which merited further survey. The remainder had only negligible potential for bat roosts. According to Appendix 1 to the AMSMS, of the 37 trees within HS2 limits, 19 are to be felled and 18 are to be retained in an ecological management zone. Overall, 2 out of the 37 trees were assessed as having features with high suitability for roosts for bats generally, 12 moderate, 16 low and 7 negligible. Of the 19 trees to be felled with suitability for bat roosts, only 1 tree was assessed as having high suitability, and 11 were assessed as moderate and 7 as low. According to guidelines issued by the Bat Conservation Trust, even trees with moderate suitability are unlikely to support a roost of high conservation interest.

55. Only one of the trees to be felled was considered to have the potential to support a barbastelle breeding site. However, appendix 10 to the AMSMS notes that the feature in question "is not a typically favoured roost site." But because it had not been possible to inspect the feature fully, and given the limitations on the data collected for the licence application, it was *assumed* that a barbastelle breeding site is present as a worse case scenario. Plainly, it is impossible to divorce the making of this assumption from all the scientific evidence and opinion gathered in the application documents on the degree of likelihood that the tree would be used as a breeding site if it were not to be felled. The worse case assumption also assumed that there is one barbastelle resting place potentially present in the Wood. It is then a matter of judgment for the decision-maker as to what are the implications of a worse case assumption. At times the claimant's evidence and submissions appeared to be turning this assumption into an artificial construct far removed from the reality of the circumstances of the Wood and the local area. That is not what the precautionary principle requires.

56. The material submitted by IP1 in Appendix 10 also gave detailed consideration to the habitat available for barbastelle which would remain and not be affected by the HS2 project. This is plainly of relevance to the application of the FCS test. There are 2,670.4 ha of deciduous woodland within 6km, of which Jones Hill Wood represents 0.07% as a resource for barbastelle. Within HS2 limits and within 6km of the Jones Hill Wood, 140 trees out of 487 trees suitable for bat roosting would remain. By extrapolation it was estimated that over 88,000 trees would be suitable for bat roosting within 6km but outside HS2 limits. It was explained why that extrapolation was likely to provide an under-estimate. "Given the expanse of the habitat available, it can be assumed that the surrounding landscape is not at carrying capacity for [Natterer's bat or barbastelle] and that if bats from JHW were displaced, their colonies would continue to persist within the local area." On this basis, the loss of 0.7ha of woodland at Jones Hill Wood would amount to no more than 0.02% of the overall estimated tree roosting resource for barbastelle within 6km. Accordingly, the removal of that woodland would have an impact no higher than the "local level", based on the worse case scenario that a maternity colony is assumed to be present. The analysis also considered "core foraging areas" less than 6km. The retained woodland within a minimum range of 3km did not alter that conclusion. "Given the roost-switching nature of the barbastelle…. it is likely that bats would switch to another suitable tree within the local landscape and continue to forage across the 273.3ha of retained woodland within their minimum 3km core foraging range"

57. I acknowledge that some of the material to which I have referred above is disputed by the experts instructed by the claimant. But as I have already explained, the judicial review procedure does not enable such disputes to be resolved by the court. For example, Mr. Woodfield expresses the view that there may be a greater number of barbastelle roosts in the Wood. However, Mr. Streeten rightly accepted that there is no legal basis for the claimant to challenge the worst case assumptions which have been accepted by NE.

58. The matters to which I have referred inevitably represent only a selection of the highly detailed analysis carried out in a suite of documents for IP1. NE concluded *inter alia* that:-

> "At JHW, due to the large areas over which bats forage, the wider available foraging resource (adjacent woodlands in the vicinity) and the extensive habitat creation measures to be delivered, it can be concluded that the activities authorised under the licence will not be detrimental to the maintenance of the population of the bat species concerned at a favourable conservation status in their natural range."

A summary of the grounds of challenge

59. Mr. Streeten summarised the grounds of challenge in paragraph 5 of his skeleton. NE erred in law in that:-

> **Ground 1**
>
> It failed to apply the correct approach under regulation 55(9)(b) of the 2017 Regulations. Specifically, it did not ask itself whether the proposed works would not be detrimental to the maintenance of the FCS of population of the barbastelle on the basis of the best available scientific information, giving the benefit of the doubt to conservation. It did not require "certainty", as it should have.

Ground 2

It failed to give reasons justifying a departure from its own policy/guidance documents and/or failed to have regard to obviously material considerations;

Ground 3

It erred in fact regarding the whether HS2 had consent to erect the mitigation proposed;

Ground 4

It failed to give reasons justifying the inconsistency of its decision with its previous decision refusing the IP's application for a derogation licence;

Ground 5

It acted irrationally in that it failed to acquaint itself with sufficient information reasonably to be able to take a decision, relied on documents which are internally inconsistent and contradictory resulting in a decision which simply does not add up, and reached a conclusion which no rational decision maker, properly directed, could have reached.

60. Ground 3 was simply concerned with whether IP2 had control of an area of land in which it was proposed to locate certain of the compensatory bat boxes. On 14 April 2021 NE told IP1 that no work authorised by the licence should proceed until it was established that it could be carried out in accordance with the conditions of the licence. On 18 April 2021 IP1 prepared a modified location plan under the conditions of the licence relocating certain of the bat boxes. On 20 April NE gave their "formal agreement" to the amendment. At the hearing it was suggested that IP1 might lack the necessary legal control for the revised locations. Mr. James Strachan QC for HP2 disputed that assertion. I asked counsel to discuss the issue over the luncheon adjournment to see whether this could be resolved. When the hearing was resumed, Mr. Streeten told the court that the claimant was not pursuing ground 3. I will refer to the remaining grounds by their original numbering.

61. In this judgment I will address the grounds pleaded in the light of the written and oral submissions. Attempts were made to raise further issues in the expert evidence and also in oral submissions. I indicated that I would not deal with these points in the light of *R (Dolan) v Secretary of State for Health and Social Care* [2021] 1 All ER 780. Subject to that, I have considered all of the submissions made, and the documents to which I was referred.

Ground 1

62. Mr. Streeten submits that the NE's approach to the FCS test failed to apply the precautionary principle required for regulation 55(9)(b) which requires reasonable scientific doubt to be removed. With respect, that submission lacked necessary precision. Instead, the law required NE to be satisfied that it had no reasonable scientific doubt that the licensed actions would not be detrimental to maintaining the barbastelle population at a favourable conservation status in their natural range. That is a judgment which is applied to the overall effect of the licence, not simply for example, the tree-felling authorised, but also all the mitigation and compensation measures required by the licence. That judgment is made in the context of those matters considered by NE to affect the conservation status of the barbastelle at the local level and more widely.

63. It is common ground that both NE's licensing decision on the FCS test and the licence itself expressly referred to the test which regulation 55(9)(b) required to be satisfied. NE concluded that in the absence of mitigation, there would be an adverse effect on the conservation status of the assemblage of bats within the licence area. For the more common bats it was judged that the impacts could be significant at the site level and for the rarer species up to the local level. NE then addressed the mitigation and compensation measures and monitoring that would be secured by conditions of the licence. Taking into account also the wider area over which bats may forage and roost, NE reached the conclusion that the activities to be licensed would not be detrimental to the maintenance of

each species at a favourable conservation status within their natural range.

64. Accordingly, Mr. Streeten accepted that ground 1 depends upon the claimant being able to identify sufficient, positive contra-indications which show that NE's decision did not comply with the precautionary principle.

65. He relied upon two statements in the Method Statement Assessment: Additional Notes document which summarised further information supplied by IP1 after the decision dated 3 February 2021 and NE's reaction thereto. First, taking into account the extensive amount of woodland available for barbastelles within either 3km or 6km of Jones Hill Wood, it was said by IP1 that the loss of 0.7ha was "unlikely to have a significant impact at any higher than the local level on the breeding colony (if present)." Second, NE concluded that "there is reasonable likelihood that the loss of roosting, foraging and commuting resource will impact the species at the site level only …". Mr. Streeten submits that these references to likelihood are inconsistent with the need to exclude reasonable scientific doubt.

66. This contention is unarguable. As I have previously explained, and is not in dispute, expressions of likelihood may be taken into account as factors in a FCS assessment. But NE did not commit the error of substituting "likelihood" as a test for absence of *reasonable* scientific doubt. The precautionary principle does not require the exclusion of *any* scientific doubt. NE explained in several places where they considered the information provided to be satisfactory.

67. I also note NE's reasoning in the following passage:-

> "It has been identified that a barbastelle maternity roost could be present in the assessment of the possible worst-case scenario. This is considered to be unlikely. Even if a barbastelle maternity roost is present it is likely to be occasionally used, with small numbers of bats present and part of a much wider roosting resource for the colony. The works will be compensated and mitigated for in accordance with the predicted worst-case scenario assessment.
>
> A single tree (1EW03-SOE-BF005627) has been identified with the potential to support a barbastelle maternity roost and this tree cannot be fully inspected; however, the potential roost feature comprising a trunk cavity (1m above ground level) does not appear to be particularly suitable and not characteristic of barbastelle. Roost cavity preference is mainly beneath loose bark and at a greater height above ground, usually above the understorey and facing south more frequently than in random cavities.
>
> The further clarification regarding roosting and foraging resource and the importance of JHW to the bat assemblage predicted is provided with clear justification and referencing of data sources and peer reviewed papers throughout. The further information provides context regarding the importance of the site relative to the wider landscape. The loss of 19 trees comprising 0.7ha of the woodland will be a minor impact at the site level only to the bat assemblage considered in the worst-case scenario assessment. The justification provided regarding barbastelle roosting preferences, the potential roosting resource at JHW and the constrained survey of tree reference number BF005627 is fully justified and the supporting information provided in Row F of the table in Appendix 10 is satisfactory."

68. Taking into account the limitation of the survey data, a worse case scenario has been assumed that a barbastelle breeding roost is present in one tree. That has resulted in a mitigation and compensation package being approved by NE. That approach does not preclude regard also being had to factors making it unlikely that the barbastelle is present in the Wood. These are all legitimate matters of evaluative judgment for the decision-maker.

69. I reach the same conclusion in relation to Mr. Streeten's third example taken from the "Licensing Decision" document. The first three pages of the document record that NE was satisfied with the material put forward by IP1 under 5 headings in a checklist leading to the conclusion that the test in regulation 55 (9)(b) had been satisfied. The document does not repeat NE's underlying reasoning. That had been set out elsewhere. Mr. Streeten relies on one sentence on the fourth page of this document: "Medium risk due to the extreme use of LP4 and the potential

presence of the barbastelle." The impact was also described as "medium" but that simply reflects the loss of an *assumed* maternity roost (p. 37 of the Bat Mitigation Guidelines) and not all the other considerations taken into account in NE's more detailed reasoning. The heading to the fourth page explains that it is dealing with the adviser's "licence recommendations" to the technical services licensing team "*following* a satisfied decision being reached on the FCS test." This text should not be wrenched out of context and treated as explaining NE's FCS decision. For that it is necessary to look at the detailed documentation dealing with that aspect, to which I have already referred. Much of the focus of the remaining parts of this document is on provisions for inspection and compliance under the licence.

70. Next Mr. Streeten referred to one line in table 3 of schedule 2 to the AMSMS, where the entry against "conclusions on worse case local population conservation status" is "unknown." He suggested that this involved a failure to assess the impact of the proposed licence on the conservation status of the barbastelle population at the local level, contrary to [61] of *Tapiola.* There is an air of unreality about this submission. The straightforward point has been made in table 3, and in much more detail elsewhere, that what is being referred to is a lack of observations of the barbastelle recorded in the local area. Similarly in relation to the Wood, table 3 assessed that if the barbastelle is present in that location at all, it would be in "very low numbers". None of this reveals any arguable legal error or failure to apply the precautionary principle. Instead, table 3 went onto explain the worse case assumption that was being adopted for the purposes of assessment.

71. The criticisms made of NE fail to read the documentation as a whole. The claimant's case involved highly selective filleting of the material and an excessively legalistic or forensic approach.

72. Finally, Mr Streeten relied upon the criticisms of NE made under ground 4, namely that NE had failed to address points of dissatisfaction they had raised in their decision dated 3 February 2021. For reasons set out below, I do not consider ground 4 to be arguable. It does not assist the claimant under ground 1.

73. For all these reasons, I consider ground 1 to be unarguable.

Ground 2

74. Mr. Streeten submitted that the defendant had departed from policies in two of its documents without dealing with the matter in its reasoning (see *R (UTAG) v TFL and Mayor of London* [2021] EWHC 72 (Admin) at [106]-[107]).

Bat Mitigation Guidelines

75. This document was published in January 2004. Mr. Streeten relied upon Figure 4 at p.39 which ranks requirements for mitigation and compensation according to the "status" of the roost. At the "high significance" end of the scale the guidance given for maternity sites of the rarest species is that, "depending on the impact", there should be no "destruction of former roost until replacement completed and significant usage demonstrated." Mr. Streeten criticises the licence because it does not require any significant usage of the bat boxes by barbastelle bats to be demonstrated before any tree containing a roost may be felled.

76. Mr. Glenister replied that the Method Statement Assessment: Additional Notes does expressly refer to the Guidelines although not to the particular passage relied upon by the claimant.

77. Figure 4 needs to be seen in context. The Guidelines explain that the level of mitigation required depends on the size and type of impact and the "importance of the population affected." This is a complex site-specific and species-specific issue. Figure 4 only purports to give "general guidance" as to what would be an "appropriate starting point" for preparing a mitigation scheme.

78. When this issue is considered properly and in context, the claimant's criticism, once again, has a complete air of unreality about it. NE's judgment is that barbastelle are unlikely to be present in the Wood. But the Guidance proceeds on the basis that a maternity site is *in fact* present (i.e. no destruction of "former roosts"). Then the claimant's argument fails to address the conditions of the licence. As we have seen, they prevent felling during

both the hibernation season and the maternity season. Condition 13 prohibits the licensed activities from taking place while any *actual* maternity roost found to be on site is being used for that purpose. In reality, the bat boxes provide compensation for the loss of what is no more than a single "potential roosting feature" in one tree, which would not be "typically favoured" by the species. NE's decision also had regard to the substantial availability of habitat within 3 or 6 km, in addition to the compensation and mitigation measures.

79. The licence and the reasoning in the documentation make it perfectly obvious why there was no need to require the bat boxes to be significantly used by a breeding barbastelle before a maternity roost is destroyed. Read sensibly and fairly, and avoiding a legalistic approach, there was simply no need for NE to refer expressly to the "starting point" in Figure 4. NE's consideration of this issue had gone far beyond that starting point. The claimant's criticism is unarguable.

Policy LP4

80. Surveys were carried out for IP1 in October 2020 after the maternity season for that year had ended. NE referred to this point in its decision dated 3 February 2021. It said that "further hibernation surveys" were required to be carried out before the application for a licence could be resubmitted. However, I note that NE did not consider that any resubmission would have to await the carrying out of a survey for any maternity roosts between May and August 2021. The extent to which further surveying was required so that NE could make a decision under regulation 55(9)(b) was a matter for their judgment.

81. Because IP1 was aware that a less than full suite of surveys had been carried out, its licence application was made relying upon NE's policy LP4 which states:-

> "Natural England will be expected to ensure that licensing decisions are properly supported by survey information, taking into account industry standards and guidelines. It may however accept a lower than standard survey effort where: the costs or delays associated with carrying out standard survey requirements would be disproportionate to the additional certainty that it would bring; the ecological impacts of development can be predicted with sufficient certainty; and mitigation or compensation will ensure that the licensed activity does not detrimentally affect the conservation status of the local population of any EPS."

82. Paragraph 2.1 of the policy document explains that LP4 is expected to apply predominantly to bats and great crested newts. The policy provides the opportunity to reduce survey requirements where the impacts of development on a species can be predicted confidently (para. 3.1). The policy arose from concerns that there had been insufficient flexibility in requirements for surveys and the suggestion that greater reliance be placed on expert judgment (para. 3.2). There were also concerns about high survey costs and delay, whereas the costs of precautionary mitigation are relatively moderate in many cases (para. 3.5).

83. Against that background paragraphs 4.1 to 4.3 states:-

> "4.1. Good survey information must remain the cornerstone of our decision making. We do not wish to see survey standards diluted, and we must not accept poor quality surveys that pose unacceptable risks to EPS.
>
> 4.2. As such this policy must only be used if the following circumstances apply:
>
> - the costs or delays associated with carrying out standard survey requirements would be disproportionate to the additional certainty that it would bring
> - the ecological impacts of development can be predicted with sufficient certainty
> - mitigation or compensation will ensure that the licensed activity does not detrimentally affect the conservation status of the local population of any EPS

> 4.3. We feel that this proposed policy offers further scope to increase flexibility and pragmatism to survey standards, in circumstances where a reduced surveying effort can be clearly justified, and where safeguards can be provided in the form of mitigation or compensation measures. We recognise the risks of relying on expert judgement but if we use this policy in a way which will reward expertise and good judgement this could help to drive up standards."

84. Paragraph 5.1 states:-

> "This assessment requires us to find the right balance between obtaining information through surveying, and relying on expert judgement. A number of factors will be relevant including:
>
> - The amount of money a full survey programme would cost, relative to the scale of the project and the scale of potential impact
> - The delays that would be incurred if it was necessary to stop work and wait for a full survey programme to be undertaken
> - The level of surveying that it is possible to undertake. For example:
>   - if bats are discovered towards the end of the survey season there may still be time to undertake a proportion of the standard survey requirements;
>   - If health and safety concerns prevent access to a building, it should still be possible to perform"

85. Paragraph 6.2 indicates that whether ecological impacts can be predicted with "sufficient certainty" will depend on "whether the situation is routine or whether it is novel or complex."

86. Paragraph 7.1 states:-

> "There needs to be the same level of confidence that the 3 licensing tests are met as there would be if standard surveys were carried out. This policy is about using alternative information to survey data, not about lowering the level of confidence required to make decisions."

87. In its decision letter dated 3 February 2021 NE stated:-

> "Due to the proposed use of LP4 and your predicted worst-case scenario assuming the presence of barbastelle maternity roost, additional clarity will be required before the Favourable Conservation Status test for barbastelle can be met. For a rare species of bat such as barbastelle, the use of further advanced level bat survey techniques would normally be required in addition to the standard baseline surveys. This would inform how the colony utilises the development site and wider landscape, in order to assess the importance of the site for the continued viability of the colony and to fully assess the impacts of the works on future breeding success."

88. Mr. Streeten emphasises that NE asked for further information on how the woods are being used to establish how important the application site might be within a bat population's home range. But I note that they also asked for more information on other related aspects, such as the likelihood of breeding roosts being present, the likelihood of the single tree identified being used by barbastelle, whether it is "typically favoured by the species", the wider impact of the roost and habitat loss, and how the foraging resource on the site functions in the wider landscape. Just as when we come to deal with the answers given, it is important not to look at particular questions in isolation when it is obvious that the subject-matter is inter-related.

89. As I have mentioned, IP1 provided a substantial amount of material in reply, some of which the court has been

taken to. It included additional hibernation surveys and a walk-over survey, the use of bat detectors and the availability and extent of potential roosts and habitat in the wider area.

90. Mr. Streeten submits that in its decision reached on 30 March 2021, NE failed to apply the requirement in paragraph 7.1 that "the same level of confidence" as would have been achieved if "standard surveys" or indeed those indicated in February 2021 had been carried out. He submits that no information was given about "the importance of the site for the continued viability of the [barbastelle] colony." Instead, it was simply said that the local conservation status was "unknown". No justification was given for not requiring the "normal" level of certainty required.

91. I have already rejected several of these criticisms. In my judgment, it is fanciful to suggest that adequate information was not given about the importance of the site for barbastelle. Mr. Streeten speaks of the "continued viability of the colony" as if it actually exists. But the worse case scenario is simply an assumption which enabled the effects of, for example, the loss of one potential maternity roost to be assessed in the broader context explained by IP1 and also precautionary mitigation to be identified, both as inputs to the application of the statutory test laid down by regulation 55(9)(b).

92. It is particularly important that the Method Statement Assessment: Additional Notes is read as a whole. Towards the beginning of this assessment the author expressly set out key paragraphs from the LP4 policy document, including those upon which the claimant relies.

93. Mr. Streeten says that NE's document does not set out a response by IP1 or by NE to the point made in the February 2021 decision that advanced level techniques would normally be required. But this part of the March 2021 document must be read in the context of NE's assessment of the additional information supplied by IP1 in other parts of that document, both before and after the short section referred to by Mr Streeten. I have already referred to some of this material (see e.g. [67] above). In addition, NE expressed its satisfaction with the adequacy of the information it had received. NE also had regard to the low number of the trees to be felled, habitat quality, size and connectivity of the woodland. It regarded the further tree inspections carried out as "very thorough." "The professional opinion of the ecologist regarding roosting potential for hibernating and breeding bats is satisfactory".

94. It is therefore impossible to argue that NE failed to have regard to any aspect of policy LP4. In effect the claimant is really seeking to argue that NE has failed to *apply* the policy in paragraph 7.1 that the same level of confidence be achieved as if "surveys had been carried out" (claimant's skeleton at para. 53(b)). But having clearly referred to the relevant policy requirements, the question is whether there is any positive indication in NE's document that it has departed from its policy. In my judgment there is none. This has simply been an attempt to argue that NE has departed from its policy from the way in which it has handled the technical information supplied by IP1. But this complaint is simply unarguable. NE has expressed its satisfaction with the overall information supplied to it in the context of applying the guidance on policy LP4. It has not sought to lower the level of confidence which it judges to be appropriate in the circumstances of this case when applying regulation 55(9)(b).

95. Equally, the suggestion that LP4 is inapplicable to situations which are "novel or complex" is unarguable. This is not what the policy document states and no question of law arises. Instead, this is a matter of expert judgment for NE.

96. There is also nothing in the complaint that there is no adequate scientific evidence to support the use of bat boxes as mitigation for the loss of maternity roosts for barbastelle bats, particularly where there is disruption caused by the felling works (paragraph 53(c) of the claimant's skeleton). NE has relied upon scientific papers published in 2004 and 2018 to support the use of bat boxes for this species in woodland. It is NE's judgment that this mitigation is also appropriate in this case where felling is to take place. Mr Woodfield's report states that other experts disagree. That is a legitimate dispute between experts, but it is not a legitimate ground for judicial review. Furthermore, as Mr. Strachan QC, points out, additional mitigation will be provided, including avoidance of the felling works during the breeding season. There is also the availability of extensive areas of other woodland.

97. For all these reasons, ground 2 is unarguable.

Ground 4

98. Mr. Streeten relies upon the principle established in planning law that where a decision is taken which is materially inconsistent with a previous decision, it must ordinarily give reasons for disagreeing with that decision (*North Wiltshire District Council v Secretary of State for the Environment* (1993) 65 P & CR 137). NE submitted that this principle does not apply to decision-making under regulation 55. I will assume that it does.

99. The alleged inconsistencies relied upon are set out in paragraph 57 of the claimant's skeleton, comparing the Method Statement Assessment: Additional Notes with the decision letter dated 3 February 2021. In summary the points are:-

> (i) NE no longer maintained that for a rare species of bat, such as the barbastelle, advanced level survey techniques would be required, in addition to standard surveys, to inform how the colony used the license site and the wider landscape and to assess the importance of the site for the continued viability of the colony and the impact of the works on future breeding success;
>
> (ii) In relation to the predicted scale of impact of the felling, NE changed its position from treating the conservation status of a barbastelle maternity roost from regional to local;
>
> (iii) NE ceased to be concerned about the adequacy of the proposed arrangements for monitoring the success of the compensation measures given the lack of sufficient baseline data.

100. It should be remembered that the decision dated 3 February 2021 was not a final decision, as, for example, where planning permission has previously been granted or refused for a particular type of development on a site. Here, NE's earlier decision did not rule out in principle the grant of the licence sought. Instead, it indicated a number of areas where further information, explanation, clarification or proposals were judged to be necessary.

101. Dealing with the claimant's point (i), it is to be noted that the decision letter of 3 February 2021 stated that advanced level surveys would *normally* be required. The letter did not in fact lay down any such requirement in this case. The immediately preceding sentence sought clarification. In fact the interaction between NE and IP1 is easier to follow in row E of IP1's document dated 5 March 2021 responding to NE's requests for further information, where there is less disaggregation of the material. IP1 also relied upon the information in row F dealing with impacts. Following the decision in February 2021, IP1 carried out further surveys and provided further information to support the case that there was only one tree of potential interest for the barbastelle and that that species was unlikely to be present. NE made it plain that they were satisfied with the information provided. NE was not obliged to go further and spell out that analysis to show how "the colony utilises the development site and the wider landscape" was unnecessary, given that it was unlikely that the barbastelle was present and, even if it was, its presence would be only occasional and in small numbers, taking into account the much wider roosting resource available.

102. There is nothing in the complaint under (ii). NE had merely said that a paper published by Wray in 2010 had considered a maternity roost to have regional importance. The defendant did not go as far as to say that it adopted that assessment for this particular location. Instead, it asked IP1 to justify its assessment. It is apparent from the papers that IP1 provided that justification and NE accepted it. NE's position in deciding to grant a licence did not involve any disagreement with its earlier position so as to require any further reasoning, according to the law.

103. There is also nothing in point (iii). NE asked for further information. IP1 referred to the further material they had submitted on monitoring. It is plain from the decision document that NE was satisfied with the information ultimately provided. Mr. Glenister also drew attention to regulation 47 of the 2017 Regulations which will enable NE to amend the licence in response to the monitoring reports it receives during the 10 year duration of the licence. Once again there is no change of position on the part of the decision-maker requiring the provision of any additional reasoning.

104. Mr. Streeten advanced a new point in his oral submissions that NE had failed to address its earlier criticism that

the 2020 surveys should be re-assessed so as to disregard any discouragement of bats resulting from the presence of a protestor's camp in the vicinity. IP1 explained that its surveys on potential roost features aligned with results obtained in 2016, in relation to which there is no suggestion that protestors were present. Reference was also made to the surveys in the 2013 Environmental Statement. NE stated that it was satisfied with the material provided. No error of law arises.

105. Ground 4 is unarguable.

Ground 5

106. Under this ground the claimant alleges irrationality. The claimant does not arguably surmount the high hurdle which applies to challenges of this nature, particularly in the field of specialist scientific expertise.

107. Mr. Streeten began by relying upon submissions which he had made under other grounds and which I have already rejected as unarguable.

108. He also submitted that NE had failed to take reasonable steps to obtain information to enable it to make its decision lawfully. However, the "Tameside principle" has been qualified by the decision in *R (Khatun) v Newham London Borough Council* [2005] QB 37 at [34] – [36]. The decision-maker's judgment on how much information to obtain can only be challenged on the grounds of irrationality. No arguable basis has been shown for a challenge of that kind in this highly specialist field.

109. Finally, Mr. Streeten relied upon *R (Balchin) v Parliamentary Commissioner for Administration* [1996] EWHC 152 (Admin) at [27] for the proposition that a decision "which does not add up" because "there is an error of reasoning which robs the decision of logic" is flawed for irrationality. The four steps in his argument were set out in paragraph 61 of the claimant's skeleton. Some of the points involve a misreading of material accepted by NE, or are simply an inappropriate challenge to their judgment, for reasons I have already given. But, in any event the claimant has inappropriately filleted four points from the overall material accepted by NE. The argument suffers from the elementary flaw of failing to read both that material and the decision as a whole. It wrongly assumes that there was no other material going to the rationality of this decision when there plainly was.

110. Ground 5 is unarguable.

Interim injunction

111. Because the proposed grounds of challenge are wholly unarguable, and certainly do not satisfy the "real prospect of success" test, the injunction granted by Lang J on 16 April 2021 must be discharged.

112. However, I have gone on to consider the balance of convenience on the assumption, contrary to my judgment, that one or more of the proposed grounds of challenge has a real prospect of success. I will set out my conclusions on this aspect briefly.

113. The first issue is whether to continue the injunction would effectively dispose of the claim, because in practical terms IP2 would cease to be able to rely upon the licence by the time a rolled-up hearing might take place towards the end of May. Although condition 7 of the licence prohibits felling during the maternity season assumed to begin on 1 May, condition B12 also prohibits felling until the hibernation season ends, as expressed by the temperature criterion. It was suggested that there might be some leeway for the licence to be modified, so as to reflect a recent spell of cold weather, and that a super-expedited rolled-up hearing could take place before an assumed delay to the start of the breeding season. Unfortunately, this is subject to the vagaries of the weather. Mr Glenister said that he had been told that NE might be prepared to treat the start of the breeding system as delayed, but only by a week or so. In any event, up to 2 weeks would be necessary for evidence to be filed in response to the claim, final submissions would have to be prepared, time allocated for a 2 day hearing with pre-reading, time would be needed for the preparation of a judgment and then 3-4 days for the felling to take place. Realistically I can have no real confidence that felling could take place before the time limit in a revised condition 7 would apply to protect any delayed start to the breeding season. Accordingly, a continuation of the injunction would

effectively preclude reliance by IP2 on the licence granted on 30 March 2021.

114. I accept the evidence in Mr. Dineen's witness statement as to the impact which delay in felling the trees would have on this part of the HS2 project. If the felling could not take place until October 2021, earthworks could not begin until March or April 2022. Currently those works are scheduled to begin in June 2021. In paragraph 5 of IP2's submission to the court dated 14 April 2021, a conservative estimate of the costs of the delay was given in the broad order of £25 to £50m. Mr. Dineen now says that those figures have been re-assessed as being in the range of £60.7-£88.8m. His statement dated 19 April 2021 was accompanied by a schedule. Plainly there has not been time for the claimant to consider this in any detail or to raise any questions. The claimant simply says that these costs will not be incurred because the claim could be dealt with at a super-expedited hearing, a point which I have already rejected. I proceed on the basis that the continuation of the injunction would cause additional costs in the region of at least £25m to £50m, and probably substantially more. I attach very considerable weight to this factor.

115. I also attach considerable weight to the public interest in the continuation of work on the HS2 project without substantial interruption. Parliament has decided that it is in the public interest for the project to be undertaken and the Government has subsequently confirmed that it continues to agree with that decision (see e.g. *Packham*). There is no challenge to NE's decision in this case applying regulation 55(2)(e) to the works which are the subject of this dispute.

116. Mr. Streeten submits that the injunction should be continued in order to preserve the current *status quo*. It is necessary to be clear as to what is meant by this. It cannot mean merely the retention of the 19 trees within the licence site. The relevant *status quo* must have a more limited ambit. The object of the injunction sought is to prevent reliance upon the licence where, it is said, legal errors have been made in the application of the FCS test. So, the question is whether the injunction is necessary in order to avoid a significant risk to the maintenance of the favourable conservation status of the barbastelle. Mr Streeten accepted that that is the correct approach.

117. Even if it were to be arguable that NE has made an error of law in one or more of the respects alleged, I am not persuaded that the injunction is necessary to avoid that risk, or, alternatively, that any significant weight should be attached to that factor. I reach that conclusion after having considered all the ecological material before the court as a whole. I do not propose to analyse the varying conflicting points of view. I mention, by way of example, certain factors which have been accepted by NE the independent statutory authority responsible for applying regulation 55. There is only one tree in the licence area of relevance. It is not particularly attractive for breeding by the barbastelle. The habitat of the site itself is sub-optimal. On the other hand, there are many potential opportunities within 3 or 6 km for roosting by the barbastelle, including maternity roosting, in so far as the species may be present in the area. In my judgment, the evidence does not persuade me that the maintenance of the FCS of the barbastelle depends upon, or is affected by, the retention of the 19 trees.

118. Mr Strachan QC rightly did not pursue the issue of delay in relation to the continuation of the injunction.

119. A few other peripheral matters were raised (e.g. conduct), but I attach no significant weight to any of them.

120. I have no hesitation in concluding that the balance of convenience comes down firmly in favour of the injunction being discharged.

Conclusion

121. The application for permission to apply for judicial review is refused and the injunction on 16 April 2021, as varied on 23 April 2021, is discharged. I reiterate my gratitude for all the help I have received from the parties and legal teams in this case.

Note 1 On 21 April the Court was informed that this joint venture does not exist as a legal entity. The first interested party is collectively (1) Morgan Sindall Construction & Infrastructure Limited, (2) BAM Nuttall Limited and (3) Ferrovial Agroman (UK) Limited. An appropriate order substituting the correct parties has been made. [Back]