

Wye Valley and Forest of Dean Bat SAC

Development Management – Horseshoe Bat activity survey and assessment guidance

Version date: July 2021



Figure 1 Photograph of a Lesser Horseshoe Bat (I. Townley)

Revisions & Amendments	
<i>Date</i>	<i>Changes</i>

SECTION 1	4
Introduction.....	4
Purpose of the guidance	4
Horseshoe Bats: Why the Wye Valley and Forest of Dean are important.....	6
How are bats protected?.....	6
SECTION 2.....	7
Pre-survey requirements.....	7
Survey Design	7
Survey Design – Objectives	7
Survey Design – Detail.....	8
Very sensitive locations – (A)	9
Highly Sensitive locations (B)	11
Sensitive locations (C)	11
Light Surveys.....	12
Survey reports	12
SECTION 3.....	13
Impact Assessment.....	13
References.....	16
Figure 1 Photograph of a Lesser Horseshoe Bat (I. Townley).....	1
Figure 2 - Map Buffering Lesser Horseshoe bats (Geometric & indicative Landscape)	17
Figure 3- Map buffering Greater Horseshoe roosts.....	18
Figure 4 - Map showing Wye Valley and Forest of Dean Bat SAC functionally connected roosts (2019)	19
Table 1 Lesser Horseshoe bat surveys	14
Table 2 Greater Horseshoe bat survey's.....	15

SECTION 1

Introduction

In 2016 a collaboration of local organisations came together to review and update the 1997 “Strategy for the Conservation of Lesser and Greater Horseshoe bats in the Forest of Dean and the Wye Valley”. The outcome was the 2016 Strategy of the same title¹. The strategy and supporting documents can be found at www.fdean.gov.uk.

Two of the strategy aims are:

- To identify, maintain and enhance forage areas (core sustenance zones) and flight lines around key roost sites
- To maintain and increase the available suite of maternity, night and occasional roosts

Planning (Development Management & Planning Policy) has a significant role to play in achieving the above aims. This guidance has been developed by the Bat Strategy Steering Group to set out some key principles for supporting the assessment and evaluation of development proposals in the Horseshoe Bat (HSB) rich landscapes found in the Wye Valley and Forest of Dean (WVFD). The guidance will be subject to periodic updates as new information and experience comes to light. Separate guidance on avoidance, mitigation and compensation techniques may well be produced by the group in the future.

Purpose of the guidance

The guidance is for those involved with the planning system; principally for consultants and applicants in order that they can easily get to grips with the requirements for bat surveys in relation to Horseshoe bats. Development proposals may require a range of ecological surveys and assessments for a range of species and habitats, this guidance only relates to guidance in relation to surveys for Horseshoe bats. It builds on more general survey guidance^{2 3} and has been influenced by other local guides on surveying horseshoe bats that have been published in Devon⁴ and Somerset⁵. This guidance focuses only on surveying habitats (often termed ‘bat activity surveys’). It does not cover how to survey roosts.

¹ A Strategy for the Conservation of Horseshoe Bats in the Wye Valley (2016)

² Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists (3rd ed)

³ Vincent Wildlife Trust (2008) Lesser Horseshoe Bat Conservation Handbook

⁴ Natural England (2019) South Hams SAC greater horseshoe bat Habitats Regulations Assessment Guidance

⁵ Natural England (2019) North Somerset and Mendip Bats Special Area of Conservation (SAC): Guidance on Development, Version 2.1 – March 2019

It is likely to be particularly useful in early stages of the planning process and pre-application advice from the local planning authority.

The aim is for a clearer approach for evidence assessment in relation to the impacts of development on the Wye Valley and Forest of Dean Bat Sites SAC. Development proposals that could affect the SAC trigger the requirements for a Habitats Regulations Assessment. The local planning authority will consider, on the basis of evidence available, whether proposals (planning applications) are likely to impact on horseshoe bats and therefore the SAC; requiring a Habitats Regulations Assessment (HRA).

The Habitats Regulations protect identified sites by designation as Special Areas of Conservation. However, the Habitats Regulations also protects habitat (Functionally Linked Land) which is important for the Favourable Conservation Status of the species.

Sufficient information is required by the local planning authority to carry out a Habitats Regulations Assessment for proposals which may involve: destruction or disturbance of roosts, loss of forage habitat, fragmentation of commuting habitat, increased luminance near roosts and forage or commuting habitat, impacts on forage or commuting habitat which supports the SAC bat populations structurally or functionally. It is at the applicants' responsibility to provide adequate evidence to inform a Habitats Regulations Assessment which is undertaken by the local planning authority.

The precautionary principle underpins the Habitats Directive and the decision whether or not an appropriate assessment is necessary must be made on a precautionary basis. A high level of certainty is required when assessing whether a plan or project will adversely affect the integrity of a European site.

The competent authority (the local planning authority in this case) must be sure that the scheme will not adversely affect the integrity of the site. There can be no reasonable scientific doubt remaining as to the absence of adverse effects on the integrity of the site.

To be able to conclude with enough certainty that a proposed project or development will not have a significant adverse impact on the SAC, the proposal or project must therefore be supported by adequate evidence and bespoke, reasoned mitigation. Where appropriate a long-term monitoring plan will be expected to assess whether the bat populations have responded favourably to the mitigation.

This guidance provides detailed guidelines on the survey effort and impact assessment necessary to inform the HRA process. Consultants should also give due regard to the Chartered Institute of Ecology and Environmental Management guidelines on report writing⁶, Preliminary Ecological

⁶ Guidelines for Ecological Report Writing. Second Edition December 2017

Appraisal (PEA)⁷ and Ecological Impact Assessment (EclA)⁸. The CIEEM guidelines on report writing provide a suitable template (in Appendix B of the CIEEM guidelines) for the final report including desk study, methodology, survey, assessment and mitigation measures.

Horseshoe Bats: Why the Wye Valley and Forest of Dean are important

In Great Britain there are estimated to be approximately 50,400 lesser horseshoe bats and approximately 12,900 greater horseshoe bats⁹. The Wye Valley and Forest of Dean support significant proportions of both populations (approximately 26% and 6% respectively).

Horseshoe bats thrive in this area because it contains a network of caves, disused mines, tunnels and old buildings that provide substantial roosting opportunities. These roosts are set in a landscape that is predominantly rural and wooded, providing high quality and well-connected foraging habitat.

Eleven large maternity and hibernation roosts are notified as Sites of Special Scientific Interest (SSSIs). Collectively these make up the Wye Valley and Forest of Dean Bat Sites Special Area of Conservation (SAC) (hereafter termed "SAC roosts"). Many other smaller roosts (including hibernation, maternity, satellite, transitional and night roosts) also exist in the landscape (Map 4, hereafter termed "functionally linked roosts"). Tracking studies have shown that bats using the large SAC roosts also make use of the smaller functionally linked roosts at some point during their lifecycle.

How are bats protected?

More generally, in addition to the SAC, all bat species in the UK are protected by law: this includes protection from killing, injury, disturbance to a roost. This could include significant disturbance which effect a bat population away from a roost, for example, removal of vital vegetation or foraging area.

Bat roosts are also protected from damage, destruction and obstruction of access, even if bats are not present at the time. For example, it would be a criminal offence to demolish a building which supports a summer roost when bats are not present during the winter hibernation period. The law is also applied independently of the planning process, by the police, and any breach can lead to prosecution.

Through the planning system councils also have to ensure bat populations are safeguarded, enhanced and become more resilient (National Planning Policy Framework, 25 year Environment Plan, The Conservation of Habitats and Species Regulations 2017, the Wildlife and Countryside Act 1981 (as amended) and the Natural Environment and Rural Communities Act 2006 (as amended)).

⁷ Guidelines for Preliminary Ecological Appraisal. Second Edition December 2017

⁸ Guidelines for Ecological Impact Assessment In The UK And Ireland. Terrestrial, Freshwater, Coastal and Marine. September 2018 Version 1.1 - Updated September 2019

⁹ Mammal Society (2018) A review of the population and conservation status of British mammals

SECTION 2

Section 2 sets out the expected survey requirements dependant on the location, type and extent of the development proposed. The section only provides guidance in relation to HSB's and other guidance should be used for other species and habitats.

Pre-survey requirements

The first step must be to complete a Preliminary Ecological Appraisal in accordance with CIEEM guidelines and Chapter 4 of BCTs professional survey guidelines. In relation to HSB's this must include:

NOTE - The required PEA/EcIA should cover any other additionally surveys in respect of other species and habitats for any given development and provide interpretation of any lighting surveys/assessment in the impact assessment and mitigation sections of the EcIA.

- Records of horseshoe bats must be requested from the Gloucestershire Centre for Environmental Records (or where appropriate Herefordshire Biological Records Centre or South East Wales Biodiversity Records Centre)
- The management of each field or habitat parcel must be recorded
- The height and width of all hedgerows must be measured and recorded

Survey Design

Survey Design – Objectives

Four types of survey are likely to be required to inform the impact of proposed developments, these are:

- Specific bat activity surveys
- Habitats/land use surveys
- Light surveys.
- Potential Roost sites (where there are appropriate structures)

From the outset it is important to identify the purpose of the surveys through survey objectives to inform survey design and methodology. For example:

- i. To clearly understand the use of an area by bats, including Horseshoe bats, for foraging over summer periods, including proximity to maternity roosts for juvenile bats, in a local and national context
- ii. To clearly understand bat (including Horseshoe bats) commuting routes, characteristics and features within, to and from the/a area site
- iii. To clearly understand the use of a site/area as forage habitat by bats (including Horseshoe bats) in the winter and its connections to hibernation sites
- iv. To identify key locations, features and designs for biodiversity enhancement measures for bats (including Horseshoe bats) within an area or site

Survey Design – Detail

Detailed survey design will need to be tailored to the specifics of locations and objectives for the surveys. The bat survey requirements set out below will form the basis of requirements for survey unless an evidenced based case for an alternative approach is demonstrated. Where alternative survey approaches are proposed these should be agreed with the LPA and/or Natural England in advance to ensure adequate survey is undertaken.

Three survey approaches (A, B and C) have been developed based on the proximity to roost sites, scale of development and relationship to important horseshoe bat landscape assets.

- Very sensitive locations – (A)
- Highly Sensitive locations - (B)
- Sensitive locations – (C)

(See Table 1 for lesser horseshoe bats and Table 2 for Greater horseshoe bats).

A series of roost proximity maps or buffers (Figures 2 & 3) indicate the proximity of roosts sites

NOTE - Outside these bat survey zones development proposals may still have impacts on bats, and developers should have regard to best practice guidelines, such as Bat Conservation Trust survey guidelines and Natural England's Standing Advice for Bats.

and therefore provide guidance on the appropriate survey approaches (A,B,C). More detailed information on roost locations can be obtained by ecological consultants from the relevant local records centres; which should be incorporated into PEA's. It is expected that as information becomes available this guidance and the maps will be refined and updated. It's also important to note that the areas identified on proximity maps are based on geometry from a roost point. This approach does not reflect how bats may use the landscape. Some broad interpretation based on aerial photography is indicated in the 'landscape' buffer layers show on the maps.

Where the results of surveys do not provide a full picture of use by Horseshoe bats (less than certain) further surveys may be required. If there remains insufficient information or the risk of

impacts remains uncertain planning permission may be refused due to the lack of adequate information.

In some circumstances a developer may be able to clearly demonstrate (from their qualified ecologist's site visit and report) that the impacts of a proposed development are proven to be minor and can be avoided or mitigated (or do not require mitigation) without an impact on SAC bat habitat, so a full season's survey is not needed. This should be substantiated in a suitably robust statement submitted as part of the development proposals.

Very sensitive locations – (A)

Surveys should include:

- 1) Preliminary Ecological Appraisal (in accordance with CIEEM guidelines) to inform the survey methodology, scope and Ecological Impact Assessment (EclA). Surveys must be extended to include the management and use of each field, e.g. whether the field is grazed or used as grass ley, and the height, width and management of hedgerows in the period of bat activity. Information can be sought from the landowner. If grazed, the type of stock and management regimes should be detailed if possible. Habitat mapping should include approximate area/hectarage of habitats.
- 2) The main survey effort should be that using automated detectors. Automatic bat detector systems need to be deployed at an appropriate location (i.e. on a likely flyway or forage area). Enough detectors should be deployed so that each location is monitored through the survey period in order that temporal comparisons can be made. Surveys should also pay particular attention to linear landscape features such as watercourses, transport corridors (e.g. roads, sunken lanes railways), walls, and to features that form a linear feature such as hedgerows, coppice, woodland fringe, tree lines, ditches and rhynes and areas of scrub and pasture that may provide flight lines. 1). Horseshoe bat calls are directional at high frequency and are subject to a marked degree of attenuation. Because of this detectors should be deployed using the 'judgemental' or 'stratified' approaches (as opposed to 'random' or 'systematic') outlined in BCTs professional survey guidelines (see section 8.2.4.2).
- 3) During the 'active' season (April – October inclusive), a minimum of 35 days surveying is required. Surveying should be spread throughout the spring/summer/autumn to gain an understanding of how bats use a site throughout the season. A minimum of 10 days of surveying should take place during the spring (April-May), 15 days during the summer (June – August) and 10 days during the autumn (Sept-October).
- 4) Recent research in the Forest of Dean has shown that bats are frequently active during the winter (November – March inclusive). Winter surveys are therefore generally required in

Band A unless otherwise robustly justified with evidence. Automated detectors should be deployed in similar locations as above between November and March for 5 consecutive days in at least 3 of the 5 winter months (3 months x 5 days = 15 days total). Alternatively, detectors could be deployed for 10 days within two of the winter months (2 months x 10 days = 20 days total).

5) The number of automated detectors will vary in response to the number of linear landscape elements and foraging habitat types, the habitat structure, habitat quality, used by horseshoe bats and taking into account their flight-altitude. Every site is different, but the objective would be to sample each habitat component equally. Generally:

- With hedges it depends on the height and width, and also whether they have trees, as to how many detectors might be needed to ensure the coverage is comprehensive no matter what the wind decides to do. Static detectors should be placed in each hedgerow at 1.5-2m height with the microphone angled slightly towards the ground.
- With grassland, the number depends on whether the site is grazed or not; if it is a comparison of the fields with livestock and the fields without is needed. It will be necessary to understand how areas/fields have been used/managed in past years and how they are expected to be in the survey period.
- When surveying woodland it can be difficult to detect horseshoe bats because their echolocation attenuates even more than in open habitats. Detectors are best deployed with rides and glades.
- The open areas of a quarry are sampled with two detectors reflecting the un-vegetated and vegetated cliffs so the two can be compared.
- Where, for example, linear features link to other linear features or suitable bat habitat outside the site, automated detectors should deploy 2 microphones in order to determine flight directions.

(Please note: Photo location / grid ref and mapping of all static detector locations should be shown in the final report.)

6) The results from recordings should be regularly reviewed during surveys to ensure the number and placement of automated detectors is responsive to emerging findings and survey objectives.

7) Manual transect surveys (April to October) should be used to gather additional information that may not be ascertained from automated detectors (for example in the centre of fields or where it is easier to determine bat activity and flight direction) and will depend on the proximity to roosts, size of the site and the types of habitat present. Manual transect surveys should be carried out on ten separate evenings; at least one survey should be undertaken in each month from April to October, as the bats' movements vary through the year. Transects should cover all

habitats likely to be affected by the proposed development, including a proportion away from commuting features in field. Manual transect surveys only give a snap shot of activity (10 nights out of 214; ~5%) and are considered to be less effective at detecting horseshoe bats therefore a sufficient number of automated bat detector systems should also be deployed as a priority (see points 2-5 above).

8) Surveys should be carried out on warm (>10 °C but >15°C in late summer), still evenings that provide optimal conditions for foraging (insect activity is significantly reduced at low temperatures; see commentary below). Details of temperature and weather conditions during surveys should be included in the final report. Winter surveys should record the temperature and weather conditions.

9) Surveys should cover the period of peak activity for bats from sunset for at least the next 3 hrs.

10) Transect surveys should preferably be with sensitive, tested and calibrated, equipment suitable for detecting horseshoe bats . Digital echolocation records of the survey should be made available with the final report; along with details of the type and serial number of the detector.

Highly Sensitive locations (B)

As for band A sites. However it is more likely (than in 'A' sites) that a detailed and evidenced ecological impact avoidance strategy that is fully embedded within the development proposal may reduce the need for specific horseshoe bat surveys.

Sensitive locations (C)

Preliminary Ecological Appraisal (in accordance with CIEEM guidelines) to inform the survey methodology, scope and Ecological Impact Assessment (EclA). Surveys must be extended to include the management and use of each field, e.g. whether the field is grazed or used as grass ley, and the height, width and management of hedgerows in the period of bat activity. Information can be sought from the landowner. If grazed, the type of stock and management regimes should be detailed if possible. Habitat mapping should include approximate area/hectarage of habitats.

Survey effort in Band C is dependent on whether commuting structures are present and the suitability of the adjacent habitat to support prey species hunted by horseshoe bats. Nonetheless this should be in accordance with Bat Conservation Trust guidelines (Collins, 2016 as amended). Subject to specific proposals it would generally be considered that a detailed and evidenced ecological impact avoidance strategy may be sufficient to avoid the need for specific horseshoe bat surveys.

Light Surveys

This is not covered in detail in this guidance but surveys of existing light levels on proposed development sites should be undertaken and submitted with the planning application in accordance with guidelines given in the 'Guidance Note 08/18 Bats and artificial lighting in the UK' (Institute of Lighting Engineers/ Bat Conservation Trust, 2018). This should cover the full moon and dark of the moon periods so that an assessment of comparative SAC bat activity on a proposed site can be ascertained.

Baseline measurements should be taken systematically across the site or features in question. At each sample location, a reading should be taken at ground level on the horizontal plane (to give illuminance hitting the ground) and vertical readings should also be taken at each sample location at 1.5m above ground level. The orientation for vertical readings should be perpendicular to the surface/edge of the habitat feature in question (such as a hedgerow) to produce a 'worst case' reading. Further measurements at other orientations may prove beneficial in capturing influence of all luminaires in proximity to the feature or principal directions of flight used by bats. This survey data can then be used to inform the masterplan of a project.

Surveys should also consider lighting and the absence of such where a road would be subsequently street lit post development, outside the red line boundary of the proposed development site.

Survey reports

Reports should follow CIEEMs Guidelines For Ecological Report Writing. Reports should also include:

- The make and model number of the automated detectors used
- A map showing where automated detectors were deployed, Photo location and grid ref
- The sound analysis software package used
- Sample sonographs included as an appendix
- Confirmation that the outputs have been manually checked for errors (e.g. false positives and negatives)

Results should be presented in tabular form and summarised on a map or aerial photograph. The data should be carefully interrogated to identify any feeding hotspots or important commuting lines. Analysis such as 'heat mapping' may be also be useful.

Consultants must pass on records to Gloucestershire Centre for Environmental Records (or where appropriate Herefordshire Biological Records Centre and South East Wales Biodiversity Records Centre).

SECTION 3

Impact Assessment

Adverse impacts are actions resulting in negative changes to an ecological feature: the effect of the impact is the outcome of that impact. Impacts can be direct physical impacts these are generally easier to assess and predict, or indirect impacts. Indirect impacts can affect a wider area, be more complex and have lower predictability.

The SAC bat populations can be impacted by: Direct physical impacts from construction and operation of a development including: to a roost, removal of vegetation, changes in vegetation management and lighting. Indirect Impacts include increased disturbance from activity in and near the development site and/or the wider area affecting connectivity for horseshoe bats. For example increases in traffic, noise, vibration and or lighting, development of adjacent infrastructure and services.

Where adverse impacts are predicted a proportionate EclA will be required. The level of detail required in an EclA will inevitably be proportionate to the scale of the development and complexity of its potential impacts. This guidance does not provide detailed information on EclA, applicants and consultants are directed to the CIEEM guidelines on EclA⁴. Briefly the impact assessment should cover all phases of any project including:

- determine the importance of ecological features affected, through survey and/or research and with reference to available contextual information
- assess impacts potentially affecting important features
- characterise the impacts, e.g. extent, magnitude, duration, reversibility, timing and frequency
- identify cumulative impacts
- identify significant effects of impacts in the absence of any mitigation.

The surveys and research that are undertaken may indicate that the scope of the assessment should be adjusted and further studies carried out.

Table 1 Lesser Horseshoe bat surveys

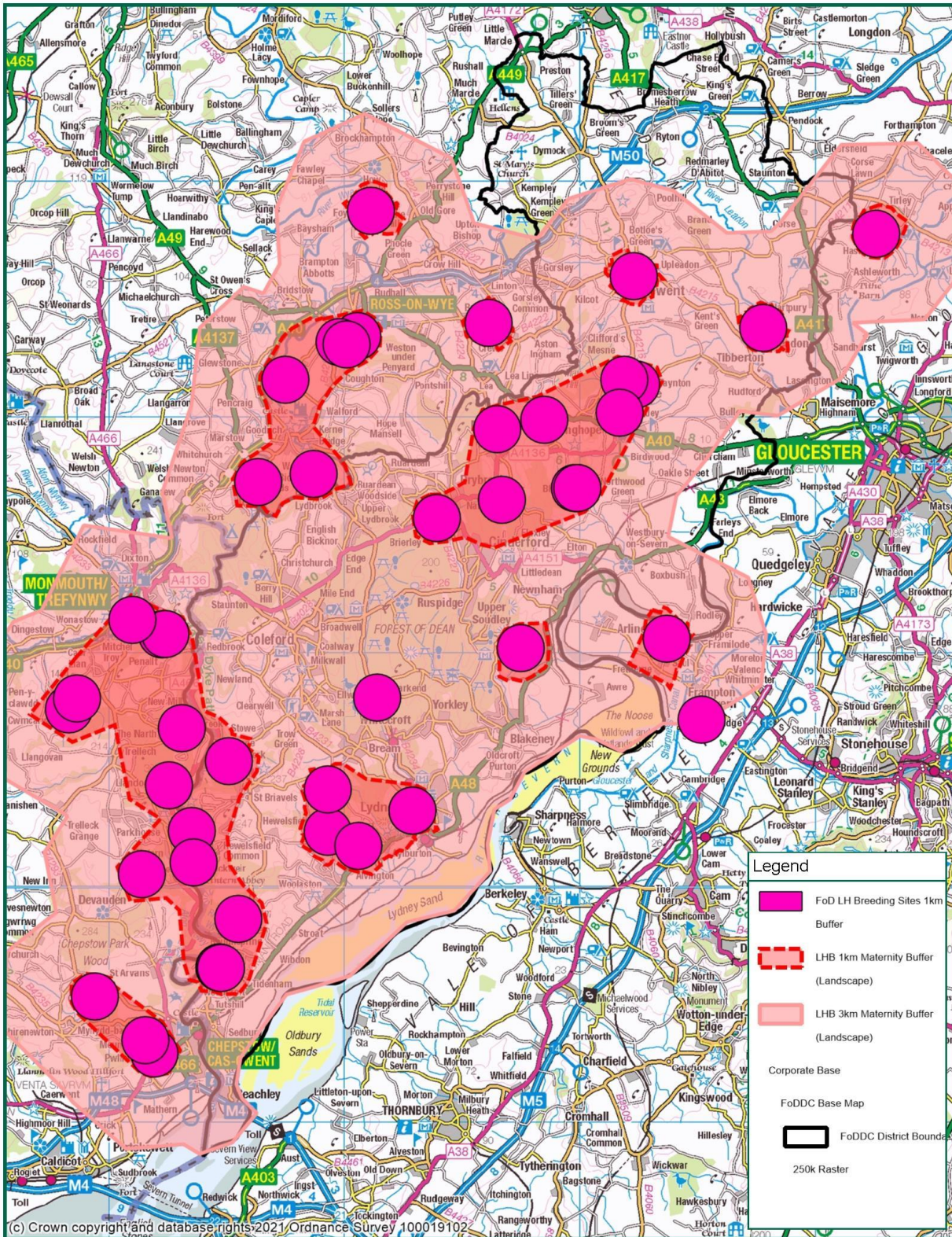
Lesser Horseshoe					
See Map 1	Developments impacting on potential roost features such as barns, disused buildings, caves/mines/quarries, bridges, roof voids with flying access, cellars etc.	Developments within or impacting on SSSI's, LWS, Ancient Woodland & other priority habitat eg orchards	Impact on grassland or arable land > 250 sq m	In or within 250m of woodland / Copse / Parkland	impact on or within 15 m of centre of hedgerow /linear habitat feature such as stream
Up to 1km of known maternity /hibernation roost site	A	A	A	A	A
Within 1-3km of known maternity / hibernation roost site	A	A	B	A	A
Within 3-4km of known maternity /hibernation roost site	A	A	C	B	B

Table 2 Greater Horseshoe bat survey's

Greater Horseshoe					
See Map 2	Developments impacting on potential roost features such as barns, disused buildings, caves/mines/quarries, bridges, roof voids with flying access, cellars etc.	Impacts on SSSIs, LWS, Ancient Woodland & other priority habitat	Impact on grassland or arable land (non priority habitat) > 250 sq m	In or within 250m of woodland / Copse / Parkland	Impact on or within 15m of hedgerow (from centre) or other /linear feature eg stream
Within 2km of known maternity roost site	A	A	A	A	A
Within 2-4km of known maternity roost site	A	A	A	A	B
Within 3km of a hibernation roost	A	A	A	B	B

References

1. A Strategy for the Conservation of Horseshoe Bats in the Wye Valley (2016)
2. Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists (3rd ed)
3. Vincent Wildlife Trust (2008) Lesser Horseshoe Bat Conservation Handbook
4. Natural England (2010) South Hams SAC greater horseshoe bat consultation zone planning guidance
5. Natural England (2017) North Somerset and Mendip Bats Special Area of Conservation (SAC): Guidance on Development, Version 2.1 – March 2019
6. Guidelines For Ecological Report Writing. Second Edition December 2017
7. Guidelines For Preliminary Ecological Appraisal. Second Edition December 2017
8. Guidelines For Ecological Impact Assessment In The Uk And Ireland. Terrestrial, Freshwater, Coastal and Marine. September 2018 Version 1.1 - Updated September 2019
9. Mammal Society (2018) A review of the population and conservation status of British mammals



**Map A Lesser Horseshoe Bats
(Version 1.2)**

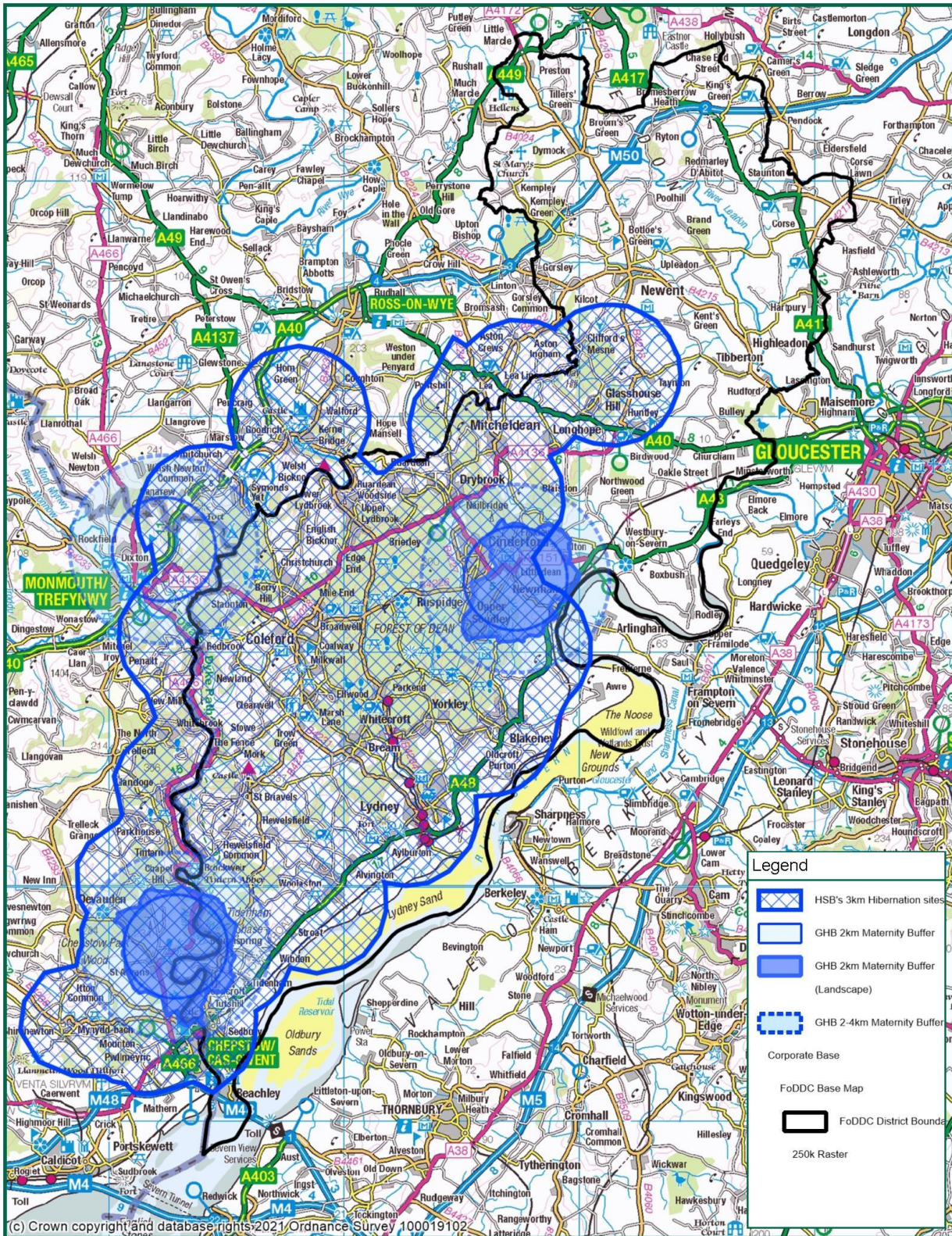
Scale: 1:200000

19 July 2021



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Figure 2 - Map Buffering Lesser Horseshoe bats (Geometric & indicative Landscape)



Map B Greater Horseshoe Bats (Version 1.2)

Scale: 1:200000

19 July 2021



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Figure 3- Map buffering Greater Horseshoe roosts

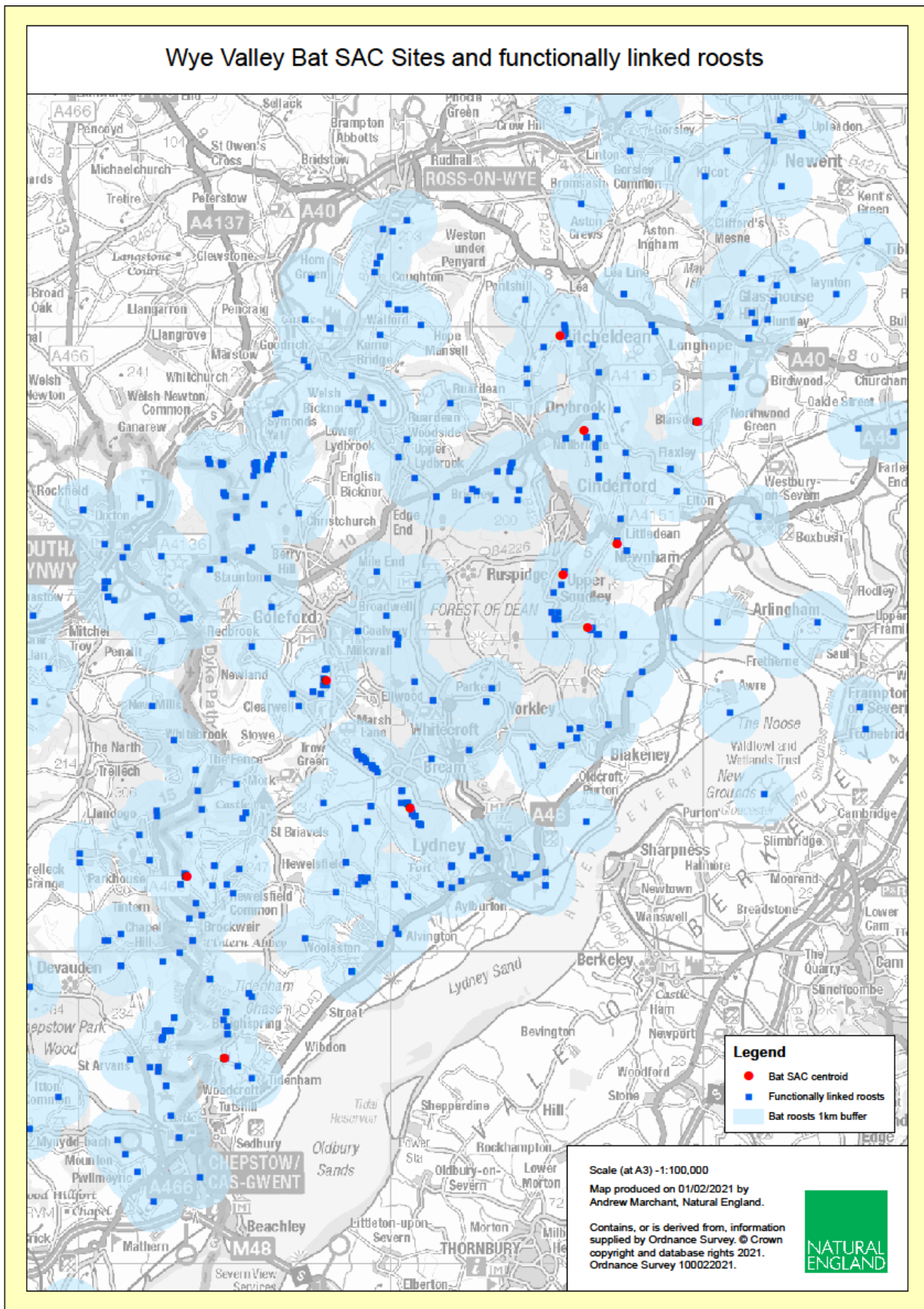


Figure 4 - Map showing Wye Valley and Forest of Dean Bat SAC functionally connected roosts (2019)