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Bat Survey

Kielder Castle

February 2023

Forestry England

Client	Forestry England
Project Name	Kielder Castle
Project Number	20067
Report Type	Bat Survey
Version	V1 (DRAFT)

	Name	Position	Date
Report Originator	Mark Osborne	Director	February 2023
Reviewed	Mandy Rackham	Senior Ecologist	February 2023

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Summary

OS Ecology Ltd were commissioned by Forestry England to undertake updating bat activity survey work of Kielder Castle between 2020 and 2022, both summer activity survey and hibernation checks have been completed.

Previous survey and assessment was completed by E3 Ecology in 2019.

It is proposed to renovate the castle to create holiday accommodation.

Summary Table	
Impacts on Designated Sites	No impacts on sites designated for bats are predicted from the development.
Previous survey Findings	<p>Previous surveys completed at the site in 2019 by E3 Ecology Ltd¹ identified the following:</p> <ul style="list-style-type: none"> • The structure to be of high suitability to bats, • Presence of two maternity roosts (Natterer’s bat and Common pipistrelle) • Evidence of 6 species through both activity survey and DNA analysis • Numerous day roosts across the structure
Activity Survey Findings	<p><u>June 2020</u></p> <ul style="list-style-type: none"> • Approximately 147 Natterer’s bats emerged from the void above the projector room, exiting the structure from the gatehouse. • Both common and soprano pipistrelle bats were noted to emerge from several locations associated with the windows and roofs of the building. <p><u>August 2021</u></p> <ul style="list-style-type: none"> • 18 common pipistrelle emerged from nine locations associated with the eaves, roof and windows with a maximum of 5 from any one location • 9 soprano pipistrelle emerged from 6 locations, associated with the eaves, ridge and windows. A maximum of 3 bats from any one location. • 2 <i>Myotis</i> sp. bats emerged from two locations at the eaves. • 4 ‘silent’ bats that could not be identified to species emerged from two locations, three from a window opening and 1 from the roof. <p><u>July 2022</u></p>

¹ E3 Ecology (2019) Ecological Appraisal and Bat Survey, Kielder Castle, Northumberland, October 2019

	<ul style="list-style-type: none"> • 12 common pipistrelle emerged from 7 locations associated with the eaves, ridge and windows. A maximum of 3 bats from any one location. • 2 soprano pipistrelle emerged from a single location at the eaves. • 27 Myotis sp. bats emerged, 26 from a single location, a gable on the northern elevation. • 2 'silent' bats emerged from two locations at the eaves. <p><u>August 2022</u></p> <ul style="list-style-type: none"> • 13 common pipistrelle emerged from seven locations at the eaves, ridge and windows, with a peak of 3 bats from any one location. • 15 bats of the Myotis genus emerged from four locations, 12 from the central archway on the north elevation the remainder from locations at the eaves. • 29 soprano pipistrelle emerged from 8 locations at the eaves and associated with windows. 16 emerged from a single location above a window on the eastern elevation.
<p>Hibernation Survey Findings</p>	<p>Hibernation checks during the 2021/2022 winter period have confirmed the presence of both soprano and common pipistrelle bats within the southern section of the castle. The bats are primarily recorded within window frames during the checks.</p> <p>A peak count of 14 bats were recorded during any one visit.</p> <p>In addition, remote detectors within the southern section of the castle recorded the presence of brown long-eared bat between November and December 2021 in addition to the pipistrelle species.</p>
<p>Nesting Birds</p>	<p>The site provides opportunities for nesting birds, with breeding swallow recorded during survey.</p>
<p>Assessment</p>	<ul style="list-style-type: none"> • The structure is considered to be of high value bats, providing abundant roosting opportunities for bats throughout the year and surrounded by high quality foraging opportunities. • Between 2019 and 2022 evidence of six species of bats were recorded, either through DNA analysis or activity survey. The following species and site status are listed below: <ul style="list-style-type: none"> • Common pipistrelle (maternity roost and confirmed hibernation site) • Soprano pipistrelle (day roost and confirmed hibernation site) • Myotis sp. (day roosts during activity surveys and potential hibernation location) • Whiskered bat (confirmed through DNA analysis) • Brandt's bat (confirmed through DNA analysis) • Natterer's bat (Maternity roost (peak count approximately 147 bats in June 2020). • Based on the number of species and status of several of the roosts, the site is considered likely to be of up to regional value to bats.

1. Introduction

Site Location

1.1 The site is located on the edge of Kielder Village at an approximate central grid reference of NY 63194 93454. The site location is illustrated within figure 1 in the appendices.

Site Description

1.2 The site comprises Kielder Castle, an 18th Century hunting lodge built by the Duke of Northumberland, currently in use as a visitor and information centre.

Objectives of the Study

1.3 The objectives of this report are:

- To identify and describe any potential ecological receptors that may be present on site or within an identified zone of influence.
- To identify and assess whether proposals may impact on the identified receptors.
- To identify potential mitigation, compensation or enhancement measures if required.
- To identify and detail further surveys if required.

Development Proposals

1.4 It is proposed to renovate the castle to provide holiday accommodation. The works will be phased, with the majority of works to be internal and affecting the ground floor and eastern section.

1.5 Further phases are to be completed, though timescales for these are unknown.

2. Methodology

Scope of Study

- 2.1 The site was surveyed to identify whether the following were present for legislative and planning purposes:
- Habitats of conservation value
 - Priority Habitats
 - Protected and Priority Species
- 2.2 The ecological characteristics of the site were reviewed to identify the scope of the assessment, with the zone of influence determined through professional judgement.
- 2.3 The survey area comprised the "site" defined within figure 2 (Appendix 4) and where access was available an approximate 50m buffer².
- 2.4 Access permitting, all potential bat roosting sites within the survey area were assessed.

Desk Study

- 2.5 Desk study was undertaken to assess the nature of the surrounding habitats and included:
- Assessment of aerial imagery and Ordnance Survey mapping.
 - A search of the MAGIC website³ for designated sites and European protected species within 2km of the survey area.
 - Review of previous survey reports relating to the site^{4 5}.

Field Survey

Habitats/Protected Species

- 2.6 During the preliminary survey the site was checked for evidence of protected species and habitats were assessed for their potential to support such species. For this site, the development site comprises a built structure and as such the assessment focussed on the risk of bats being present within the structure.

² The survey buffer may be increased depending on the species present and their identified core sustenance zones.

³ Multi Agency Geographic Information for the Countryside (www.magic.gov.uk)

⁴ E3 Ecology (2019) Ecological Appraisal and Bat Survey, Kielder Castle, Northumberland

⁵ E3 Ecology (2020) Addendum to Ecological Appraisal and Bat Survey, Kielder Castle, Northumberland

Bats

Daytime Risk Assessment

- 2.7 Initial bat survey was completed by E3 Ecology Ltd in 2019 and was based on that provided by the Bat Conservation Trust Good Practice Survey Guidelines⁶.
- 2.8 The details of the initial risk assessment and findings can be found within a separate report⁷.
- 2.9 Numerous updating surveys have been completed between 2020 and 2022 by Mandy Rackham MCIEEM (2020-44857-CLS-CLS) and Mark Osborne CEcol MCIEEM (2015-14412-CLS-CLS & 2015-14496- CLS-CLS).

Activity Surveys

- 2.10 The Castle and adjacent habitat are considered to be of high suitability to roosting bats with previous surveys, undertaken in 2019 by E3 Ecology Ltd⁸, confirming the presence of a number of roosts. Updating activity surveys were therefore completed in 2020, 2021 and 2022, taking account of the current guidance provided by the Bat Conservation Trust⁹ and comprised single dusk emergence surveys in 2020, 2021 and two dusk emergence surveys in 2022.

Date	Temperature (°C)		Cloud Cover (%)	Precipitation	Wind Conditions	Sunset/Sunrise Time	Survey Period
	Start	End					
26 th June 2020	14	14	100	Rain	Still	21:40	2100-2320
13 th August 2021	15	14	100	Dry	F2-3	20:51	20:35-22:05
12 th July 2022	18	13	100	Dry	F1	21:43	21:20-23:12
25 th August 2022	15	12	80	Dry	F2	20:20	20:05-21:50

⁶ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

⁷ E3 Ecology (2019) Ecological Appraisal and Bat Survey, Kielder Castle, Northumberland

⁸ Ecological Appraisal and Bat Survey, Kielder Castle, Northumberland, October 2019

⁹ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

- 2.11 Activity surveys were undertaken in suitable weather conditions (no constant rain or high winds and sunset temperature of at least 10°C).
- 2.12 Surveyor locations are chosen to enclose the site to identify whether bats enter or leave the site.
- 2.13 Surveyors are placed where practicable to cover all potential entry/exits sites.
- 2.14 All surveyors are equipped with full spectrum detectors to enable high quality recordings to be taken and analysed following the survey, to allow for any potential surveyor error and to enable the cross referencing of calls.
- 2.15 Detectors enable the surveyors to listen to all activity during the survey.
- 2.16 Where required Infra-red cameras and lighting are used to provide more robust data.
- 2.17 The activity surveys were undertaken by Mark Osborne (2015-14412-CLS-CLS & 2015-14496-CLS-CLS), Becky White (2015-11462-CLS-CLS), Mandy Rackham (2020-44857-CLS-CLS), Zoe Dunnett, Hannah Jones, Alex Douglas, Ally Vitali, Ian Choyce, Joe Jones, Gemma Cone, Chanel Gray, James Chinaea, Louise Hepworth, Lorna Scott, Ella Farley, Sophie Ballentire.
- 2.18 The following equipment was utilised during survey:
 - Anabat Swift.
 - Anabat Scout.
 - Elekon Bat Logger.
 - Elekon Bat Scanner.
 - Canon XA20 Infrared Camera and lights

Hibernation Surveys

- 2.19 Hibernation surveys were conducted within the castle during winter 2021/22, with an updating survey completed in December 2022. Up to date Covid guidance was followed during surveys.
- 2.20 During surveys all suitable accessible areas were assessed. Survey was not undertaken in winter 2020/21 due to the ongoing pandemic.
- 2.21 In addition, remote detectors were placed within the upper floor of the southern section castle during the November and December 2021.

Date	Temperature (°C)	Cloud Cover (%)	Precipitation	Wind Conditions
15 th November 2021	6°C	80%	None	NW1
17 th December 2021	3°C	40%	None	SW1
3 rd March 2022	6°C	60%	None	W4
15 th December 2022	-5°C	0%	None	Still

2.22 The following equipment was utilised during survey:

- Anabat Swift.
- High powered torch

Limitations to Survey

2.23 Survey in 2020 was constrained by the Covid pandemic, with only a small number of surveyors utilised, with the survey focusing on the Natterer’s bat roost within the structure.

2.24 External lighting within the courtyard is considered likely to have limited bat activity in both 2021 and 2022, whilst a catering van was situated on the main Natterer’s flightline in 2021 which may have limited suitability.

Analysis of Data

2.25 Following the survey, all bat calls are manually assessed and analysed using Analook Insight and or Bat Explorer software, enabling the full spectrum of the call to be assessed.

2.26 Where possible bat calls are identified to species, referencing call parameters as detailed within Russ (2012)¹⁰, Middleton et al (2014)¹¹ and Barataud (2015)¹².

2.27 Bats are identified to species, where possible, though it is noted that there can be a significant overlap in call parameters in some species, particularly the *Myotis* genus.

2.28 *Myotis* bat calls are assessed using a range of indicators, though due their modulated calls a number of external factors can impact the reliability. As such *Myotis* bats will often be identified as *Myotis* sp. where identification to species cannot be confirmed.

¹⁰ Russ, J. (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing

¹¹ Middleton, N., Froud, A. and French, K. (2014) Social Calls of the Bats of Britain and Ireland. Pelagic Publishing

¹² Barataud, M. (2015) Acoustic Ecology of European Bats – Species Identification, Study of their Habitats and Foraging Behaviour

- 2.29 Where possible further detail on the *Myotis* species will be gathered, such as DNA. The use of full spectrum detectors gives a greater success rate in identification. This can also be backed up by computer programmes such as Bat Classify.
- 2.30 Although a greater certainty can be provided in other species, there is still an overlap in calls between other genera of bats such as *Pipistrellus* and *Nyctalus*, which can be affected by a range of environmental factors. The following table details the parameters utilised by OS Ecology Ltd and are based on “typical” open flight calls.

Table 2.3: Bat Species Identification Parameters	
Species	Peak Frequency Range (KHz)¹⁰
<i>Pipistrellus</i>	
Common pipistrelle	>42 and <49
Soprano pipistrelle	≥51
Nathusius’ pipistrelle	<39
Common or soprano pipistrelle ('50KHz pip')	≥49 and <51
Common or Nathusius’ pipistrelle ('40KHz pip')	≥40 and ≤42
<i>Nyctalus</i>	
Noctule	≥17 and <23.5
Leisler’s	≥23.5 and <29.9
<i>Eptesicus</i>	
Serotine	≥24.1 and <32.2
<i>Plectocus</i>	
Brown Long-eared Bat	≥25.5 and <42.1
<i>Barbastellus</i>	
Barbastelle	≥29.2 and <44.7
<i>Rhinolophus</i>	
Greater Horseshoe	77-84
Lesser Horseshoe	107-114

- 2.31 Where there is uncertainty in species identification species are identified to genus.

Assessment Methodology

- 2.32 Guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM) is utilised to provide habitat valuations.
- 2.33 The level of value of specific ecological receptors is assigned using a geographic frame of reference. For, example international value being most important (SACs, SPAs and pSPAs), then national (SSSIs), regional, county (LWS), district (LNR), local and lastly, within the immediate zone of influence of the site only (low).
- 2.34 In terms of species, for example breeding birds, should the population within the site constitute greater than 1% of the geographic population, it would be considered

significant at that level. In addition, presence of designated sites, scarce species and or quality¹³/diversity of habitats are used to guide that valuation

- 2.35 Assessment methods for bats have been undertaken with reference to Wray et al. (2007)¹⁴, which correlates with the geographic frame of reference. Within which they define the relative rarity of each species based on the known distribution¹⁵ at the time and the value of the roost type, assuming that roosts such as feeding perches are of lower value that maternity roosts or sites that have a high level of fidelity.

¹³ Quality can be subjective and vary in different geographic areas. Reasoned professional judgement is therefore used to inform the assessment.

¹⁴ Wray et al (2007) Valuing Bats in Ecological Impact Assessment. In Practice. Based on a presentation at the Mammal Society – Specific Issues with Bats

¹⁵ It should be noted that there are regular changes to our understanding of distribution as further studies are undertaken.

3. Results

Desk Study

Designated Sites

3.1 A search of the Multi Agency Geographic Information for the Countryside (MAGIC) Website¹⁶ indicated that there are no sites designated due to the presence of bats within 2km.

European Protected Species Licensing

3.2 A check of the MAGIC website found a single granted European Protected Species application within 2km: 2018-33755-EPS-MIT(1-3), allows the damage and destruction of a resting place, common and soprano pipistrelle, 2018-2023.

Local Bat Group

3.3 Northumberland bat group data is held by the local records centre (see below).

General Land Use

3.4 A review of aerial imagery and Ordnance Survey mapping highlighted that the general land use in the surrounding area is coniferous plantation with the site lying within Kielder Forest. The site lies within the village of Kielder with Kielder Burn lying approximately 85m to the south and Bakethin Reservoir beyond, approximately 1.1km to the south. Broadleaved woodland is present along the line of the burn and within Kielder village.

Previous Reports

3.5 The following extracts detail the results of previous surveys completed at the site in 2019 by E3 Ecology Ltd¹⁷.

3.6 Daytime assessment of the structure recorded a large accumulation of droppings indicated a maternity roost under the main entrance arch. DNA analysis confirmed these droppings to be Natterer's bat. A single soprano pipistrelle was recorded roosting within the western section of the castle and numerous droppings were recorded throughout the former accommodation rooms.

3.7 DNA analysis confirmed the presence of soprano pipistrelle, common pipistrelle and Natterer's bat within this area of the castle. Bat droppings were recorded within the two loft voids in the eastern section of the castle that could be accessed. DNA analysis confirmed the presence of whiskered bats above the void adjacent to the Wildlife Trust

¹⁶ Multi Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk (Accessed January 2023)

¹⁷ E3 Ecology (2019) Ecological Appraisal and Bat Survey, Kielder Castle, Northumberland, October 2019

office and common pipistrelle, brown long-eared bat and Brandt's bat within the larger void above the display space.

- 3.8 Five pipistrelle bats were recorded roosting on the second floor of the southern section of the castle, large accumulations of droppings were recorded within this area, which were confirmed through DNA analysis as being common pipistrelle.
- 3.9 Dusk emergence surveys recorded the presence of a Natterer's maternity colony (with a peak count of at least 57) in the void above the video room, with the access point at the wall top, under the main entrance arch. A small maternity colony of common pipistrelle bats was also recorded within the southern section of the castle.
- 3.10 Various access points were recorded however the majority of bats emerged from the windows on the second floor. Numerous roost locations were recorded around the castle confirming multiple day roost locations of common pipistrelle, soprano pipistrelle and *Myotis* sp.

Data Search

Local Records Centre

- 3.11 The table below summarises the records of bat species provided by the local records centre (LRC) in January 2023. The full data search results can be provided on request.

Table 3.1: Records from Kielder Castle		
Taxon	Species	Records of Particular Note
Bats	Myotis bat sp.	4 roosts
	Whiskered Bat	2015 (downed bat)
	Pipistrelle Bat	2018 (droppings)
	Common Pipistrelle	21 bats
	Soprano Pipistrelle	3 records (2007, 2008 & 2021) Peak of 108 in 2008

Table 3.2: Records from LRC Data Search within 2km			
Taxon	Species	No. of Records within Search Area	Records of Particular Note
Bats	Bats	3	-
	Brown Long-eared Bat	4	-
	Common Pipistrelle	29	-
	Daubenton's Bat	19	-
	Myotis Bat species	14	-

	Natterer's Bat	9	-
	Pipistrelle Bat species	7	-
	Soprano Pipistrelle	18	-
	Whiskered Bat	2	-
	Whiskered/Brandt's Bat	2	-

Field Survey

Activity Surveys

3.12 Full details of the bat activity survey results are provided in the appendices. The following table provides a summary of results.

Table 3.3: Activity Survey Results	
Survey Date	Results
26 th June 2020	Approximately 147 Natterer's bats emerged from the void above the projector room, exiting the structure from the gatehouse. Both common and soprano pipistrelle bats were noted to emerge from several locations associated with the windows and roofs of the building.
13 th August 2021	18 common pipistrelle emerged from nine locations associated with the eaves, roof and windows with a maximum of 5 from any one location 9 soprano pipistrelle emerged from 6 locations, associated with the eaves, ridge and windows. A maximum of 3 bats from any one location. 2 <i>Myotis</i> sp. bats emerged from two locations at the eaves. 4 'silent' bats that could not be identified to species emerged from two locations, three from a window opening and 1 from the roof.
12 th July 2022	12 common pipistrelle emerged from 7 locations associated with the eaves, ridge and windows. A maximum of 3 bats from any one location. 2 soprano pipistrelle emerged from a single location at the eaves. 27 <i>Myotis</i> sp. bats emerged, 26 from a single location, a gable on the northern elevation. 2 'silent' bats emerged from two locations at the eaves.
25 th August 2022	13 common pipistrelle emerged from seven locations at the eaves, ridge and windows, with a peak of 3 bats from any one location. 15 bats of the <i>Myotis</i> genus emerged from four locations, 12 from the central archway on the north elevation the remainder from locations at the eaves. 29 soprano pipistrelle emerged from 8 locations at the eaves and associated with windows. 16 emerged from a single location above a window on the eastern elevation.

Table 3.4: Hibernation Survey Results	
Survey Date	Results
15 th November 2021	12 common pipistrelles and a single soprano pipistrelle present within the upper floors of the castle. The bats were found within the exposed lintels and window frames.
17 th December 2021	9 common pipistrelle recorded within the upper floors of the castle. The bats were found within the exposed lintels and window frames.
3 rd March 2022	14 common pipistrelle recorded within the upper floors of the castle. The bats were found within the exposed lintels and window frames.
15 th December 2022	11 common pipistrelles and a single soprano pipistrelle present within the upper floors of the castle. The bats were found within the exposed lintels and window frames, predominantly on the southern aspect of the structure.
In addition, remote detectors within the southern section of the castle recorded the presence of soprano pipistrelle common pipistrelle and brown long-eared bat between November and December 2021.	

5. Site Assessment

Assessment of Survey Findings

5.1 The assessment is based on survey effort undertaken to date.

Bats

5.2 The structure is considered to be of high value bats, providing abundant roosting opportunities for bats throughout the year and surrounded by high quality foraging opportunities.

5.3 Between 2019 and 2022 evidence of six species of bats were recorded, either through DNA analysis or activity survey. The following species and site status are listed below:

- Common pipistrelle (maternity roost and confirmed hibernation site)
- Soprano pipistrelle (day roost and confirmed hibernation site)
- Myotis sp. (day roosts during activity surveys and potential hibernation location)
- Whiskered bat (confirmed through DNA analysis)
- Brandt's bat (confirmed through DNA analysis)
- Natterer's bat (Maternity roost (peak count approximately 147 bats in June 2020).

5.4 Based on the number of species and status of several of the roosts, the site is considered likely to be of up to regional value to bats.

Nesting Birds

5.5 The site provides opportunities for nesting birds, with breeding swallow recorded during survey.

Other Protected Species

5.6 Other protected species are considered likely absent.

Designated Sites

5.7 There are no sites designated due to the presence of bats within 2km.

6. Impacts

6.1 The following impacts are based on the survey work to date and the understanding that the Client wishes to undertake the following:

- It is proposed to renovate the castle to provide holiday accommodation. The works will be phased, with the majority of works to be internal and affecting the ground floor and eastern section during the first phase.
- Further phases are to be completed, though timescales for these are unknown.

6.2 As a result of the assessment completed and the nature of the proposed works, the likely impacts, without appropriate avoidance measures, mitigation and/or compensation scheme, are:

- Potential disturbance and harm to roosting bats, should they be present at the time of the works.
- Potential destruction and modification of bat roosts through the phased works, including both maternity and hibernation roosts.
- Potential harm and/or disturbance to nesting birds, should works be undertaken in the breeding bird season (March to August inclusive).

7. Recommendations

7.1 Recommendations are in line with the previous survey report¹⁸ and will likely include the following. Final mitigation plans will be confirmed following receipt of the final plans and timetable.

Further Survey

7.2 Should works not take place within 12 months of the date of the most recent survey in this report, additional updating survey work for bats is likely to be required.

7.3 Based on the nature of the site and the proposed works, no further survey work for other protected species or habitats (other than pre-commencement checks detailed below) are considered necessary for this site.

Avoidance Measures

7.4 The following measures should be incorporated into the design of the scheme to avoid impacts on wildlife:

- External lighting that may affect the site's suitability for bats will be avoided. If required this will be limited to low level, avoiding use of high intensity security lighting. The final lighting strategy will be determined by the results of the bat activity survey work detailed above.
- Alternatives to timber treatments that are injurious to mammals will be sought and used on site (see http://www.jncc.gov.uk/pdf/batwork_manualpt4.pdf).
- Works will not be undertaken during the nesting bird season (March to August inclusive) unless the site is checked by an appropriately experienced ecologist and nests are confirmed to be absent.

Mitigation Strategy

7.5 The following will be required:

- Works will be undertaken under an appropriate Natural England licence.
- Works on the building to be undertaken to a detailed method statement and species management plan, including:
 - a) Removal of key features around potential bat roosting features by hand;
 - b) Supervision of the removal of key features by a suitably qualified ecologist.
 - c) Retention of roosts where practicable
 - d) Updating survey in line with the terms of the licence prior to each phase.

¹⁸ E3 Ecology (2019) Ecological Appraisal and Bat Survey, Kielder Castle, Northumberland, October 2019

Compensation Scheme

7.6 A detailed compensation scheme cannot be completed until the further survey work, highlighted above is completed however elements of this strategy could include:

- Bat roosting opportunities will be included within the building. These will be required as part of the mitigation and compensation scheme under the Natural England licence.
- The incorporation of opportunities for roosting bats and nesting birds in line with the previous report.

Appendix 1 – Bat Suitability and Survey Effort

Classifications of suitability are based on those provided within the Bat Conservation Trust Good Practice Survey Guidelines¹⁹, with the table below taken from page 35 of the guidelines (table 4.1).

Guidelines for assessing the potential suitability of proposed development sites for bats (based on the presence of habitat features within the landscape, to be applied using professional judgement)		
Suitability	Description	
	Roosting Habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site, likely to be used by roosting bats	Negligible habitat features on site, likely to be used by commuting and foraging bats
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically.</p> <p>However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions^a and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e unlikely to be suitable for maternity or hibernation^b).</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential^c.</p>	<p>Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or unvegetated stream, but isolated, i.e not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^a and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions ^a and surrounding habitat	<p>Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourse and grazed parkland.</p>

¹⁹ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

		Site is close to and connected to known roosts.
<p>a. For example in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.</p> <p>b. Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten et al., 2015). This phenomenon requires some research in the UK but ecologists should be aware of potential for larger numbers of this species to be present during the autumn and winter in larger buildings in highly urbanised environments.</p> <p>c. The system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015)</p>		

The classification of the suitability relates to the level of further survey recommended.

Survey effort and timing depending on suitability of the structure or tree (Tables 7.1-7.3 in the BCT Guidelines)			
	Low roost suitability	Moderate roost suitability	High roost suitability
Survey Effort	One survey visit One dusk emergence or dawn re-entry survey	Two separate visits One dusk emergence and a separate dawn re-entry survey	Three separate visits At least one dusk emergence and a separate dawn re-entry survey. The third can be either dusk or dawn.
Timings	May-August (structures) No further survey (trees)	May to September. At least one must be in the optimum period (May to August)	May to September. two must be in the optimum period (May to August)
If bats are recorded	If bats emerge during surveys, the survey schedule will be adjusted to increase the survey effort so that enough information can be collected to characterise the roost and provide data should a Natural England Licence be required.		

Appendix 2 – Policy and Legislation

Planning Policy

National Planning Policy Framework (NPPF)²⁰

The revised National Planning Policy Framework sets out the government's planning policies for England and how these are expected to be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. Planning law requires that applications for planning permission be determined in accordance with the development plan. The key paragraphs from the relating to the natural environment are detailed below.

Ecologically Relevant Paragraphs of the NPPF	
Paragraph	Statement
8	<p>Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):</p> <ul style="list-style-type: none"> a) an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure; b) a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and c) an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy
174	<p>Planning policies and decisions should contribute to and enhance the natural and local environment by:</p> <ul style="list-style-type: none"> a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate; d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate

²⁰ National Planning Policy Framework July 2021
(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf)

Ecologically Relevant Paragraphs of the NPPF	
Paragraph	Statement
175	Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries
179	To protect and enhance biodiversity and geodiversity, plans should: <ul style="list-style-type: none"> a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.
180	When determining planning applications, local planning authorities should apply the following principles: <ul style="list-style-type: none"> a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest; c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons⁶³ and a suitable compensation strategy exists; and d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.
181	The following should be given the same protection as habitats sites: <ul style="list-style-type: none"> a) potential Special Protection Areas and possible Special Areas of Conservation; b) listed or proposed Ramsar sites⁶⁴; and c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites
182	The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

Government Circular ODPM 06/2005 Biodiversity and Geological Conservation²¹ (England only)

²¹ODPM Circular 06/2005 Office of the Deputy Prime Minister Eland House, Bressenden Place, London SW1E 5DU
Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System

This Circular provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England.

Part IV - Conservation of Species protected by Law details that the presence of a protected species is a material consideration when considering a development proposal that may result in harm to the species or its habitat and that planning authorities must have regard to species protected under the Habitat Regulations.

It goes on to say that: *it is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted.*

Natural Environment and Rural Communities (NERC) Act 2006^{22 23}

Section 40 – To conserve biodiversity

Section 40 puts a duty on public authorities to conserve biodiversity when undertaking its duties and functions,

Section 41 – Biodiversity list and Action

Section 41 – Requires the Secretary of State *to publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity. They must also take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section or promote the taking by others of such steps.*

The 2007 lists were superseded by the UK Post-2010 Biodiversity Framework.

UK Priority Habitats (excl. marine habitats)²⁴	
UK BAP broad habitat	UK BAP priority habitat
Rivers and Streams	Rivers
Standing Open Waters and Canals	Oligotrophic and Dystrophic Lakes
	Ponds
	Mesotrophic Lakes
	Eutrophic Standing Waters
	Aquifer Fed Naturally Fluctuating Water Bodies
Arable and Horticultural	Arable Field Margins
Boundary and Linear Features	Hedgerows
Broadleaved, Mixed and Yew Woodland	Traditional Orchards

²² <https://www.legislation.gov.uk/ukpga/2006/16/section/40>

²³ <https://www.legislation.gov.uk/ukpga/2006/16/section/41>

²⁴ <http://jncc.defra.gov.uk/page-5706>

UK Priority Habitats (excl. marine habitats)²⁴	
UK BAP broad habitat	UK BAP priority habitat
	Wood-Pasture and Parkland
	Upland Oakwood
	Lowland Beech and Yew Woodland
	Upland Mixed Ashwoods
	Wet Woodland
	Lowland Mixed Deciduous Woodland
	Upland Birchwoods
Coniferous Woodland	Native Pine Woodlands
Acid Grassland	Lowland Dry Acid Grassland
Calcareous Grassland	Lowland Calcareous Grassland
	Upland Calcareous Grassland
Neutral Grassland	Lowland Meadows
	Upland Hay Meadows
Improved Grassland	Coastal and Floodplain Grazing Marsh
Dwarf Shrub Heath	Lowland Heathland
	Upland Heathland
Fen, Marsh and Swamp	Upland Flushes, Fens and Swamps
	Purple Moor Grass and Rush Pastures
	Lowland Fens
	Reedbeds
Bogs	Lowland Raised Bog
	Blanket Bog
Montane Habitats	Mountain Heaths and Willow Scrub
Inland Rock	Inland Rock Outcrop and Scree Habitats
	Calaminarian Grasslands
	Open Mosaic Habitats on Previously Developed Land
	Limestone Pavements
Supralittoral Rock	Maritime Cliff and Slopes
Supralittoral Sediment	Coastal Vegetated Shingle
	Machair
	Coastal Sand Dunes

Protected Species Legislation

European Protected Species

European Protected Species (EPS) are species of plants and animals (other than birds) protected by law throughout the European Union. They are listed in Annexes II and IV of the European Habitats Directive and receive full protection under The Conservation of Species and Habitats Regulations 2017 (as amended). This make it an offence to:

- deliberately capture, injure or kill any European Protected Species (EPS)
- to deliberately disturb any European Protected Species (EPS);

- to damage or destroy a breeding site or place of rest or shelter used by any European Protected Species (EPS).

The Wildlife and Countryside Act 1981 (as amended) adds further protection by making it an offence to intentionally or recklessly²⁵ disturb an EPS while it is occupying a structure or place which it uses for shelter or protection, or to obstruct access to any structure or place the species uses for shelter or protection.

European Protected Species relevant to the UK			
Animals		Plants	
All bat species	Great Crested Newt	Shore dock	Creeping marshwort
Large blue butterfly	Otter	Killarney fern	Slender naiad
Wild cat	Smooth snake	Early gentian	Fen Orchid
Dolphins, porpoises and whales (all species)	Sturgeon fish	Lady's slipper	Floating-leaved water plantain
Dormouse	Natterjack toad	Yellow marsh saxifrage	
Sand lizard	Pool Frog		
Fisher's Estuarine Moth	Snail, Lesser Whirlpool Ram's-horn		
Marine turtles			

²⁵ Under the Countryside and Rights of Way Act 2000 (CROW Act) extended the protection to cover reckless damage or disturbance

Appendix 3 – Bat Activity Survey Data Tables

Date	13th August 2021			Sunset	20:51		
Start Time	20:35			End Time	22:05		
Time	Surveyor 1 Becky White	Surveyor 2 Hannah Jones	Surveyor 3 Alex Douglas	Surveyor 4 Ally Vitali	Surveyor 5 Mandy Rackham	Surveyor 6 Zoe Dunnett	Surveyor 7 Lorna Scott
20:35							
20:40							
20:45	20:49:02 55 HNS	20:48:52 55 commuting	20:48:04 55 HNS				
20:50		20:54:15 55 commuting			20:54:09 55 commuting 20:54:55 Silent bat emerged from 2nd floor window		20:54:11 55 commuting
20:55	20:56:15 45 emerged from eaves, western elevation	20:59:08 55 commuting	20:57:48 55 emerged from 1st floor window	20:55:45 55 commuting 20:57:32 55 emerged from between scaffolding 20:58:10 45 emerged from roof at gutter height 20:58:32 - 21:02:04 5x45 emerged from opening in gable 21:03:15 45 emerged from corner of gable 21:03:27 - 21:04:42 45x2 emerged from roof at gutter height 21:04:51 45 emerged from corner of gable	20:55:54 Silent bat emerged as above 20:57:20 - 21:01:07 55x3 emerged from window as above 21:02:13 45 commuting 21:03:30 45 emerged from window as above	20:57:38 Bat SNH foraging over courtyard	
21:00	21:00:16 45 and 55 commuting along woodland edge 21:01:20 55 HNS 21:02:16 45 foraging 21:04:40 45 HNS	21:00:29 45 emerged from roof 21:01:52 45 commuting 21:03:39 Bat SNH	21:02:35 Bat SNH emerged from crenellation 21:03:14 45 HNS 21:04:01 45 HNS			21:02:23 45 foraging	21:00:05 45 emerged from under slates 21:01:09 45 commuting 21:02:10 45 emerged from under slates 21:03:20 45 commuting 21:04:59 45 HNS

21:05	21:06:55 45 foraging	21:05:07 45 HNS 21:06:33 Bat SNH	21:06:26 55 emerged from window 21:08:15 55 emerged from window	21:08:21 45 commuting	21:06:30 Silent bat emerged as above 21:08:47 45 emerged from 1st floor window		
21:10	21:10:30 Bat SNH commuting 21:11:12 45 HNS 21:14:44 55 commuting	21:10:28 Bat SNH 21:14:17 55 foraging 21:14:47 45 commuting	21:12:15 55 HNS	21:12:21 45 emerged from between scaffolding 21:14:17 55 HNS 21:14:45 45 emerged from roof at gutter height	21:10:22 45 emerged from 2nd floor window as above 21:11:18 45 emerged from window as above		21:07:50 - 21:25:22 Intermittent 45 and 55 activity 21:18:40 Myo HNS 21:23:39 Myo possible emergence from roof
21:15	21:16:23 45 HNS 21:17:25 45 HNS 21:19:00 Myo HNS				21:18:56 55 foraging in courtyard		
21:20	21:21:30 Myo foraging			21:23:55 Myo Emerged from between scaffolding	21:23:47 Myo foraging at height		
21:25				21:25:24 45 commuting 21:27:03 Myo emerged from between scaffolding			
21:30			21:32:21 45 foraging				
21:35	21:26:18 45 foraging intermittently until ~ 22:15	21:26:43 45 constant HNS until 22:21	21:38:21 55 commuting		21:38:22 55 out of 2nd floor window		21:38:15 55 HNS
21:40	21:35:57 55 foraging		21:43:57 Myo foraging				
21:45	21:48:30 Myo HNS	21:50:42 BLE HNS	21:48:23 Myo foraging				
21:50	21:58:25 Myo HNS 22:05:50 Myo HNS	22:06:16 Myo HNS			21:50:37 BLE HNS 21:52:04 55 HNS		21:50:22 BLE HNS 21:50:39 BLE commuting
21:55	22:12:30 Myo HNS	Occasional 55 commuting activity					21:55:57 45 commuting
22:00			22:03:19 45 HNS 22:03:08 45 foraging	Intermittent 45 and 55 activity 21:50:17 BLE HNS	22:03:26 45 HNS		22:03:27 45 HNS
22:05			22:08:36 45 HNS		22:06:19 Myo HNS		22:06:18 Myo HNS
22:10			22:11:52 55 foraging		22:13:00 55 HNS		22:13:58 55 HNS
22:15					22:15:46 55 HNS		22:17:16 45 HNS
22:20							
22:25							

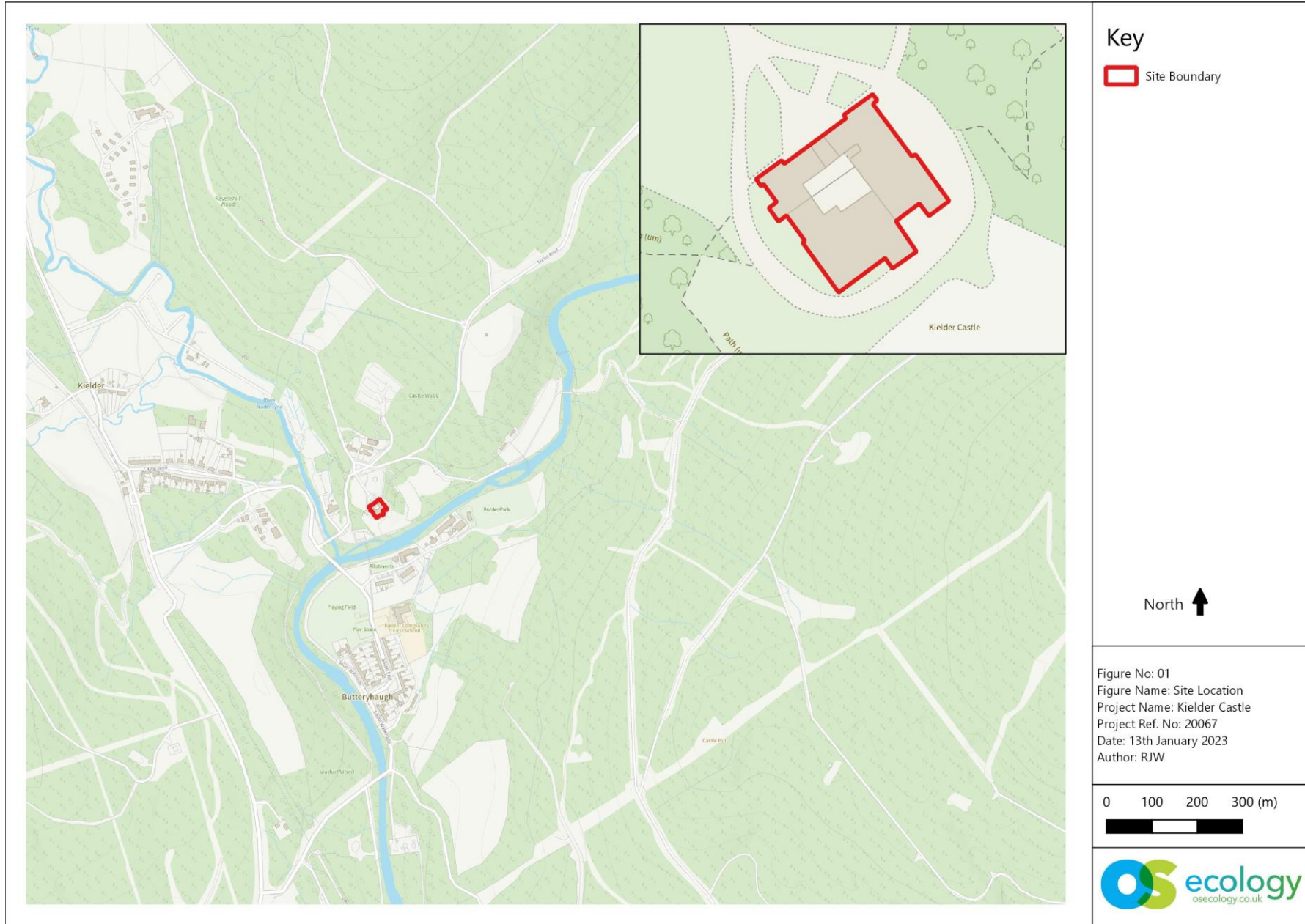
Date	12th July 2022			Sunset	21:43		
Start Time	21:20			End Time	23:12		
Time	Surveyor 1 Mark Osborne	Surveyor 2 Gemma Cone	Surveyor 3 Sophie Ballentyre	Surveyor 4 Ian Choyce	Surveyor 5 Joe Jones	Surveyor 6 Louise Hepworth	Surveyor 7 Lorna Scott
21:20:00							
21:25:00							
21:30:00		21:33:37 45 HNS			21:33:39 45 commuting		
21:35:00	21:35 Silent bat commuting over from courtyard			21:36 45 emerged from ridge	21:34-21:47 45x3 emerged from eaves on northern elevation	21:32 - 21:40 Intermittent 45 and 55 HNS	21:39:38 45 commuting
21:40:00		21:42:08 55 HNS	21:41:01 45 emerged from wall top 21:41:51 45 commuting 21:44:15 55 commuting		21:42-21:57 45x3 emerged from western gable 21:50 55x2 emerged from under gutter at eaves	21:40:40 45 emerged from above window	21:40:53 45 commuting 21:41:49 45 commuting 21:43:02 45 commuting 21:44:27 Silent bat commuting
21:45:00	21:49 Silent bat emerged from roof into courtyard	21:48:20 45 commuted from courtyard 21:49:48 45 commuted over from courtyard	21:45 - 21:56 Intermittent 45 and 55 activity			Intermittent 45 activity, mainly HNS	21:48-21:52 Intermittent 45 activity
21:50:00				21:50 45 commuting		21:54:20 45 emerged as above	

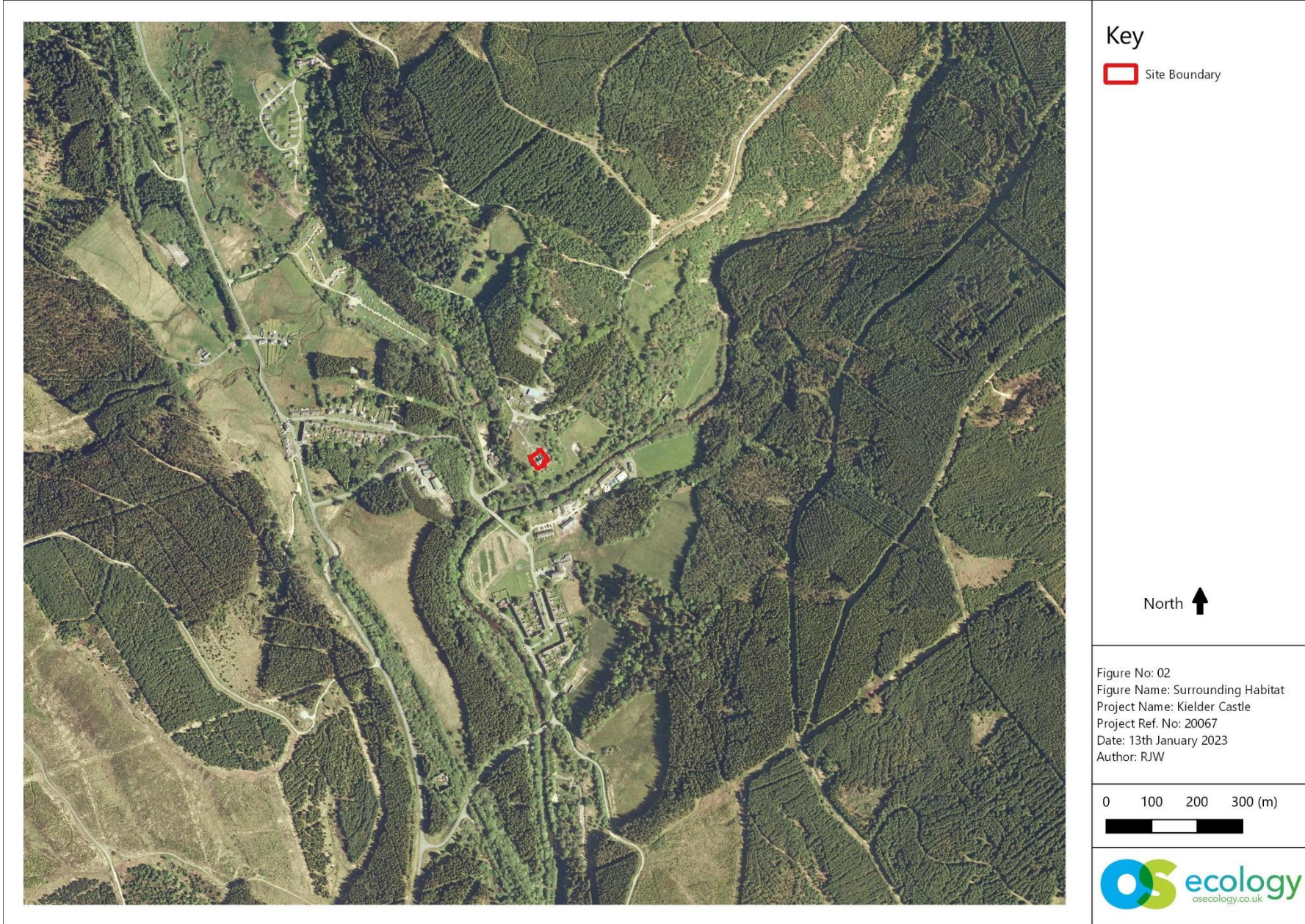
21:55:00			21:56:36 45 emerged from walltop	21:58 45 emerged from ridge			
22:00:00	22:02 Silent bat emerged from gable	22:03:28 Myo flew from entrance					
22:05:00							
22:10:00		22:10:14 Myo HNS					21:56 - 22:41 Myox26 emerged from gable
22:15:00	22:18 45 commuting across	22:15:20 Myo flew in and out of porch 22:17:45 Myo foraging	22:01 - 22:53 45 and 55 intermittent activity	22:17 45 commuting		21:56 - 23:13 Intermittent 45 and 55 activity, mainly HNS	
22:20:00		22:20:57 Myo HNS		22:23 45 commuting		22:13 Myo HNS	
22:25:00						22:37 Myo HNS	
22:30:00						22:52 Myo HNS	
22:35:00	22:38 45 HNS			22:36 45 HNS 22:38 55 commuting	22:07 - 23:12 Intermittent 45, 55 and Myo activity	23:03 Myo HNS	
22:40:00							
22:45:00	22:45 55 HNS			22:45 45 commuting 22:46 55 HNS			22:45 - 23:08 Intermittent 45, 55 and Myo activity
22:50:00	22:54 45 HNS			22:53 55 HNS			
22:55:00		22:55:56 Myo foraging in front of castle 22:57:09 45 HNS		22:55 Myo HNS			
23:00:00			23:03 Myo HNS	23:01 Myo HNS			
23:05:00	23:05:28 Myo HNS 23:06:33 45 HNS			23:06 45 HNS			
23:10:00				23:10 45 commuting			

Date		25th August 2022			Sunset		20:20	
Start Time		20:05			End Time		21:50	
Time	Surveyor 1 Gemma Cone	Surveyor 2 Chanel Gray	Surveyor 3 James Chinae	Surveyor 4 Louise Hepworth	Surveyor 5 Lorna Scott	Surveyor 6 Ella Farley	Surveyor 7 Sophie Ballentire	
20:05:00								
20:10:00					20:12:14 55 emerged from under tile at gable			
20:15:00					20:18:13 Silent bat emerged from eaves, north elevation			
20:20:00					20:24:25 55x2 emerged as above		20:24 - 20:40 Intermittent 45 and 55 activity	
20:25:00			20:29:43 45 emerged from roof west of courtyard	20:28 - 20:47 55x16 emerged from apex of window on eastern elevation		20:29:43 45 emerged from roof west of courtyard		
20:30:00	20:34 55 commuting	20:30 45 HNS 20:34 55 HNS			20:33:56 45 emerged from eaves, north elevation			
20:35:00	20:35:15 Myo emerged from gable 20:39:30 55 HNS	20:35:35 55 HNS 20:39:40 55 commuting	20:35:25 55 emerged from roof north west corner 20:39:22 55 emerged from roof to north		20:37 - 20:44 Intermittent 55 activity	20:35:25 55 emerged from roof north west corner 20:38:55 55 emerged from 3rd window from right		
20:40:00	20:41:48 45 emerged from ridge	20:41 45 HNS 20:42 45 HNS	20:41-20:47 Intermittent 45 activity			20:40:33 55 emerged from roof 20:43:16 45x3 emerged from 4th window from right		20:40-20:44 55x2 emerged from above window

20:45:00		20:47 Silent bat flew from archway 20:47 45 commuting			20:47:25 45 emerged from roof tiles, northern elevation	20:47:18 55x2 emerged from 3rd window from right	
20:50:00	Intermittent 55 and 45 foraging around trees		20:51 45 emerged from roof - west 20:52-20:53 45x2 emerged from ridge - western roof		20:52 - 20:57 55 and 45x3 emerged from southern gable	20:51:10 45 emerged as above	
20:55:00		20:51 - 21:11 Intermittent 45 and 55 activity					
21:00:00			20:55 - 21:12 Intermittent 45 activity 20:55:20 Myo emerged from roof to south west 20:57:49 Myo emerged from central west window	20:51 - 21:45 Intermittent 45, 55 and Myo activity			20:45-21:45 intermittent 45, 55 and Myo activity
21:05:00		21:07 Myo HNS					
21:10:00		21:12 Myo flew from archway				20:55 - 21:31 Intermittent 45 and Myo activity	
21:15:00		21:15-21:22 Myox10 flew from archway			21:01 - 21:49 Intermittent 45, 55 and Myo activity		
21:20:00	Intermittent 55 and Myo activity		Intermittent 45, 55 and Myo activity				
21:25:00							
21:30:00		21:31-21:35 45 intermittently HNS					
21:35:00							
21:40:00							
21:45:00							
21:50:00							
21:55:00							
	Flight Activity	Species					
	Potential Emergence	39 = Nathusius' pipistrelle		Myo = Myotis sp.			
	Confirmed Emergence	45 = Common pipistrelle		55 = Soprano pipistrelle			
HNS	Heard Not Seen	Noc = Noctule		BLE = Brown long-eared bat			
SNH	Seen Not Heard						

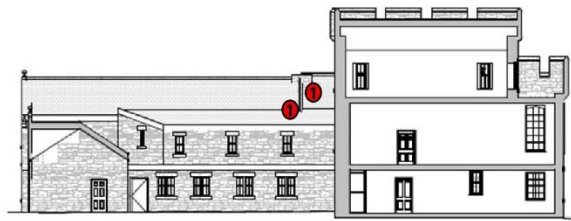
Appendix 4 – Figures



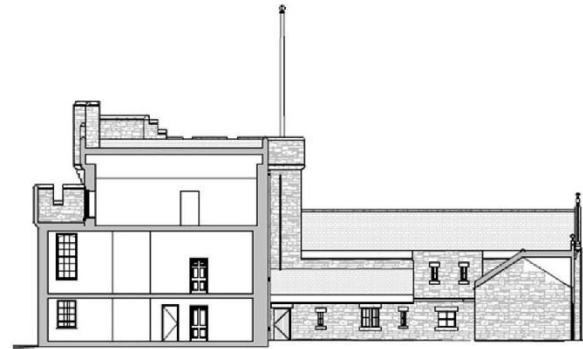




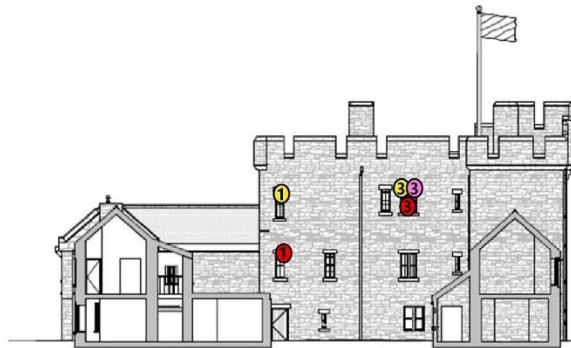




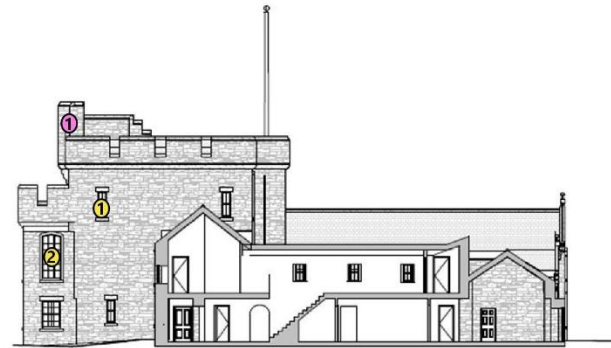
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EXISTING WEST WING ELEVATION
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EXISTING COURTYARD CROSS SECTION
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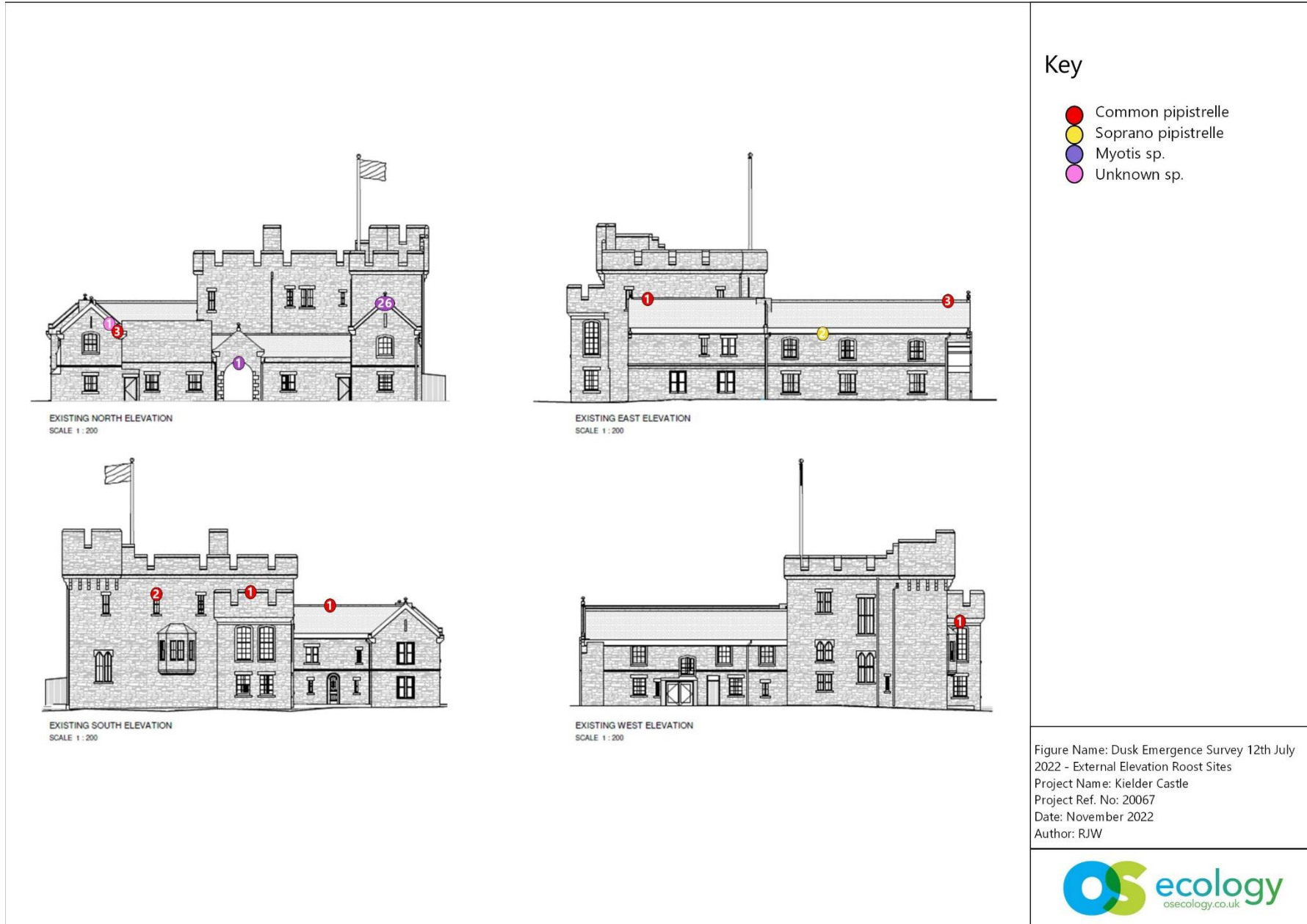
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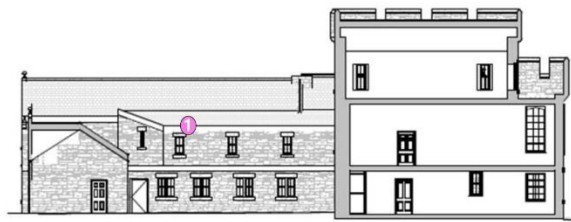
Key

- Common pipistrelle
- Soprano pipistrelle
- Unknown Species

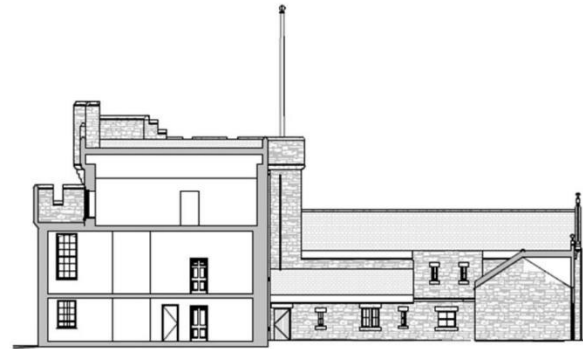
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August 2021 - Internal Elevation Roost Sites
Project Name: Kielder Castle
Project Ref. No: 20067
Date: 17th September 2021
Author: RJW







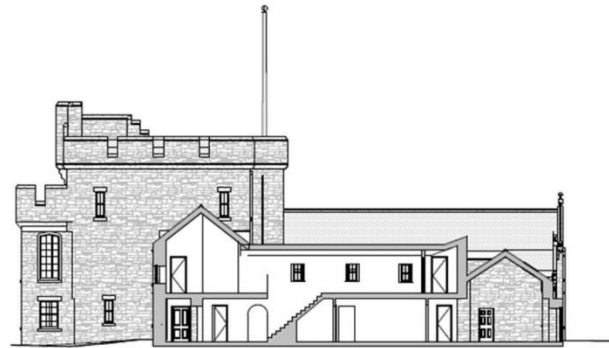
EXISTING EAST WING ELEVATION
SCALE 1 : 200



EXISTING WEST WING ELEVATION
SCALE 1 : 200



EXISTING COURTYARD CROSS SECTION
SCALE 1 : 200



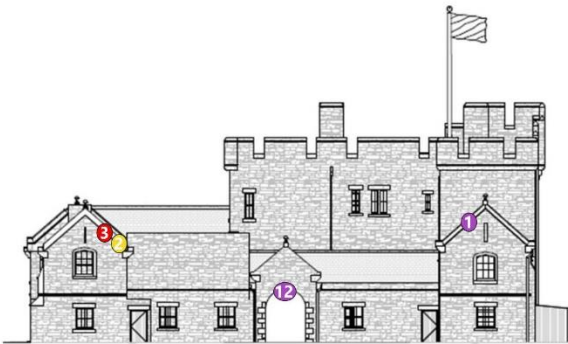
EXISTING EAST WING SECTION
SCALE 1 : 200

Key

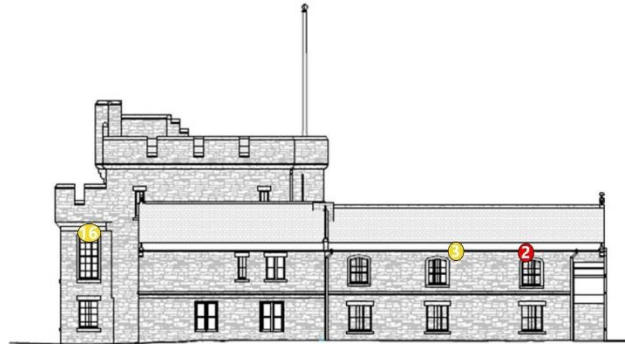
- Unknown Species

Figure Name: Dusk Emergence Survey 12th July
2022 - Internal Elevation Roost Sites
Project Name: Kielder Castle
Project Ref. No: 20067
Date: November 2022
Author: RJW

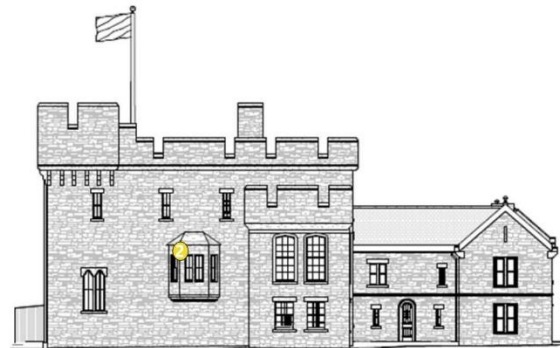




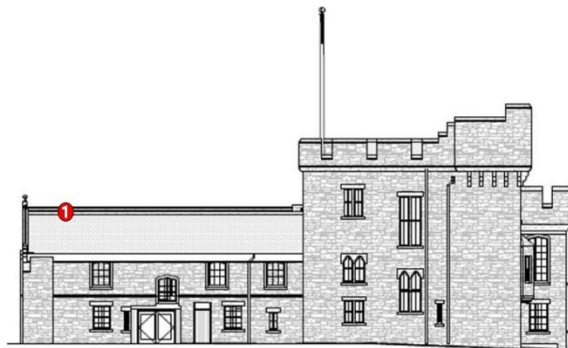
EXISTING NORTH ELEVATION
SCALE 1 : 200



EXISTING EAST ELEVATION
SCALE 1 : 200



EXISTING SOUTH ELEVATION
SCALE 1 : 200

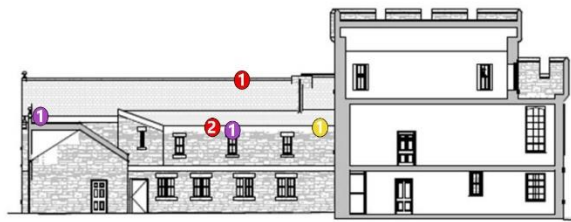


EXISTING WEST ELEVATION
SCALE 1 : 200

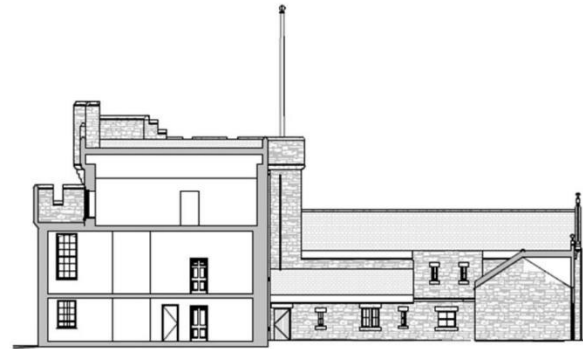
Key

- Common pipistrelle
- Soprano pipistrelle
- Myotis sp.

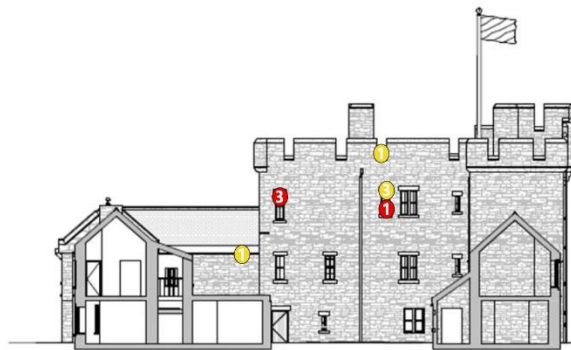
Figure Name: Dusk Emergence Survey 25th
August 2022 - External Elevation Roost Sites
Project Name: Kielder Castle
Project Ref. No: 20067
Date: November 2022
Author: RJW



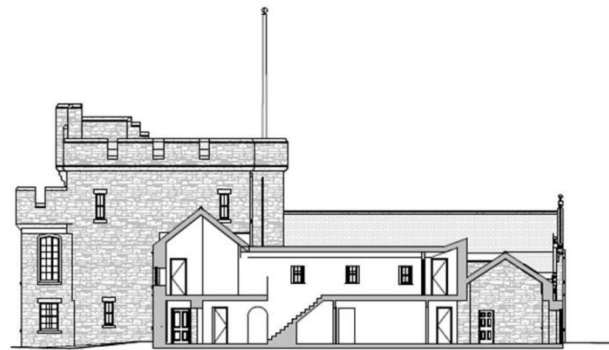
EXISTING EAST WING ELEVATION
SCALE 1 : 200



EXISTING WEST WING ELEVATION
SCALE 1 : 200



EXISTING COURTYARD CROSS SECTION
SCALE 1 : 200



EXISTING EAST WING SECTION
SCALE 1 : 200

Key

- Common pipistrelle
- Soprano pipistrelle
- Unknown Species

Figure Name: Dusk Emergence Survey 25th
August 2022 - Internal Elevation Roost Sites
Project Name: Kielder Castle
Project Ref. No: 20067
Date: November 2022
Author: RJW