



Elite Ecology

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**Oakfields,
Isycoed**



Bat Activity Survey Report

October 2020

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0. Executive Summary

- 0.1 This report has been prepared at the request of Mr. Colin Bowen (Bower Edleston Architects) on behalf of the proprietor. It relates to the potential presence of bats and birds at the proposed re-development site located at Oakfields, Isycoed, Clwyd, LL13 9RY (Central OS Grid Reference: SJ 40089 50110). To fulfil this brief, Elite Ecology undertook both a desktop study and a field survey.
- 0.2 The surveyed structures are proposed to be demolished and replaced with a new residential dwelling.
- 0.3 Due to the presence of bat droppings and the number of suitable roosting features, the structures were deemed to have 'high' potential for bats to roost and 'high' to support nesting birds. Therefore, three further activity surveys were required during the bat survey season (May to September, inclusive). One was carried out on the 30th of August 2019. The second survey was carried out on the 24th of September 2020.

0.4 Summary

Bat presence/absence

It has been confirmed that both common pipistrelle (*Pipistrellus pipistrellus*) and whiskered (*Myotis mystacinus*) bats are using the site. Further surveys are required in order to assess the type of roosts present and the numbers during the optimal survey season.

Bird presence/absence

From the survey visit undertaken on the site, it can be concluded that B2 contains evidence of nesting birds. Additionally, the surrounding landscape provides all of the necessary habitat elements that birds require, and their presence can be assumed.

Ecological value of building units

The ecological value of the building has been deemed as 'high' to bats due to the identification of common pipistrelle (*Pipistrellus pipistrellus*) and whiskered (*Myotis mystacinus*) bat use. The ecological value of the buildings to birds has been deemed as 'moderate' due to the presence of a small number of nests from the previous bird nesting season.

0.5 Recommendations

The recommendations for 'Oakfields, Isycoed' can be summarised as follows (please refer to section '5 – Recommendations' for a more in-depth description):

- One further activity survey is required during the bat survey season of May and September. Three surveys are required to cover all elevations.
- Compensation to include features mentioned in 5.1.1.
- No works can be undertaken during the bird breeding season of March to August (inclusive), unless the structure has been inspected by a suitably qualified ecologist no more than 24 hours prior to the commencement of works.
- Install two [Large Bird Nest Boxes](#).
- Incorporate [eaves/ridge](#) overhangs or easily accessible loft spaces for the swallow (*Hirundo rustica*) populations. These should be enhanced with the inclusion of two [No.10 Schwegler Swallow Nest Boxes](#) per feature.
- Optional: Install a variety of [bird boxes](#) around the site post development to replace for the local bird populations.

Contents

0. Executive Summary	2
1 Introduction	4
1.1 Report rationale	4
1.2 Site description	4
1.3 Proposed works	4
1.4 Aims of surveys	5
2 Survey Methodology	6
2.1 Desktop Survey Methodology	6
2.2 Field Survey Methodology	6
2.3 Surveyors Information.....	9
2.4 Field surveys	9
3 Results	11
3.1 Desktop Survey Results	11
3.2 Field surveys	11
3.2.1 Habitat description	11
3.2.2 Building survey	12
3.2.3 Summary of the building inspection.....	13
3.2.4 DNA Results	13
3.2.5 Activity surveys.....	14
4 Impact Assessment	15
4.1 Constraints	15
4.2 Potential Impacts of the re-development	15
4.2.1 Designated sites	15
4.2.2 Bat Roosts.....	15
4.2.3 Bird Nests	15
4.2.4 Foraging and commuting habitat	16
5 Recommendations	17
6 Summary	22
7 References	23
8 Appendices	24
Appendix A: Site Plans	25
Appendix B: The Ecological Data Search Maps	26
Appendix C: Artificial Lighting and Bats	27
Appendix D: Photographic Records.....	28
Appendix E: The Annual Bat Year (BCT).....	30
Appendix F: Legislation and Policy	31
Appendix G: Bat DNA Results	32
9 Notice to Readers: Conditions of this Report	33

1 Introduction

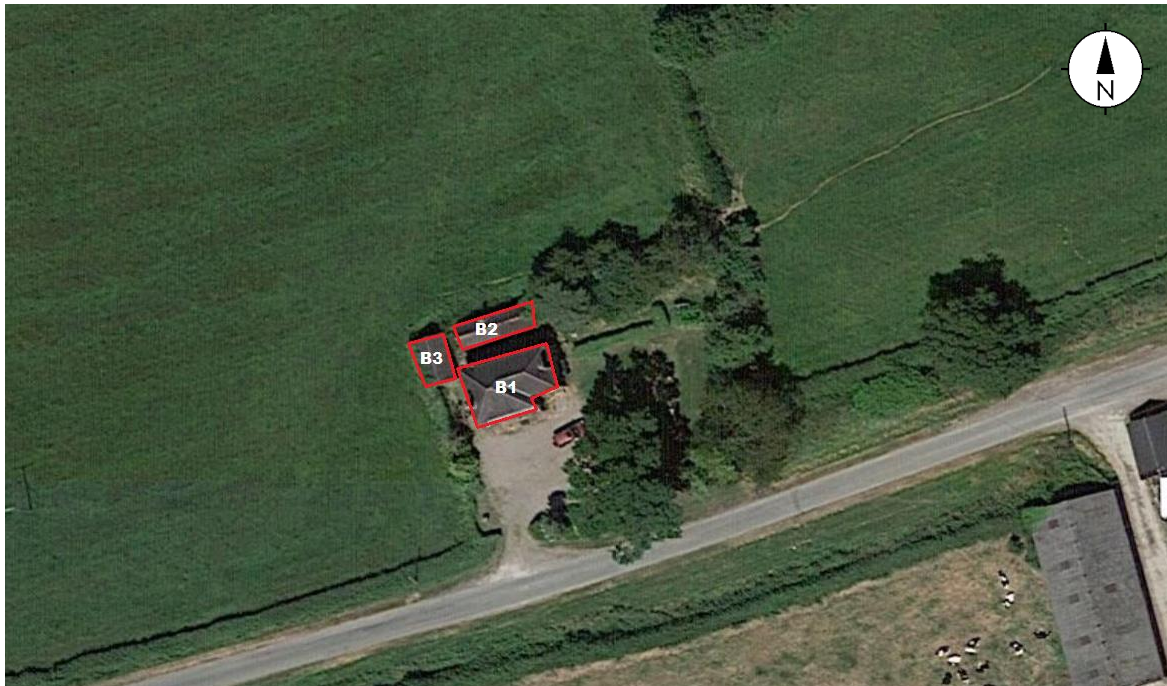
1.1 Report rationale

This report has been prepared at the request of Mr. Colin Bowen (Bower Edleston Architects) on behalf of the proprietor. It relates to the potential presence of bats and birds at the proposed re-development site located at Oakfields, Isycoed, Clwyd, LL13 9RY (Central OS Grid Reference: SJ 40089 50110). To fulfil this brief, Elite Ecology undertook both a desktop study and a field survey.

1.2 Site description

The site itself is situated within a semi-rural setting within the local government community of Isycoed, Clwyd. Hard standing ground, amenity grassland and hedgerows are situated in the immediate vicinity of the building, as well as a small amount of other buildings (residential dwellings and their associated gardens) and arable and pastureland. This report relates to three buildings on a site which measures approximately 190m². The habitats on site considered to contain potential to support the local bat and bird populations by offering roosting/nesting, commuting and foraging opportunities.

Figure 1: An aerial photograph of the surveyed structures at Oakfields, Isycoed (as shown by the red outline). The arbitrary building numbers referred to throughout this report are also illustrated.



1.3 Proposed works

The surveyed structures are proposed to be demolished and replaced with a new residential dwelling.

1.4 **Aims of surveys**

The aims of the surveys were to undertake an assessment of the building(s), vegetation and surrounding area to establish whether any bats and birds may be present and, if so, in what way they are using the site. The actions of the surveyors on the site and during the production of this report were conducted in accordance with Bat Conservation Trust (BCT) guidelines (3rd edition).

1.4.1 This survey effort considered the potential for all **bat and bird species (including barn owls)** onsite:

- To establish the possibility of bat roosts and bird nests being present at the proposed development site.
- To assess any roost/nest status (i.e. what type and numbers of individuals).
- To assess suitable food, resources and habitat requirements on site and in the local landscape.

1.4.2 The information will subsequently be used in conjunction with the knowledge of the proposed works at the site to determine the potential need for further survey effort, the impacts of the proposed scheme of works, to establish whether a Natural England Development Licence is required along with species-specific mitigation and compensation. This is done in order to keep any protected species at a favourable conservation status on site.

2 Survey Methodology

2.1 Desktop Survey Methodology

- 2.1.1 A variety of resources were independently consulted to assess the known local records within the nearby area and the importance of the site within the local landscape from an ecological perspective. The resources used were the Local Records Centre, www.naturalengland.org.uk, www.ordnancesurvey.co.uk, Google Maps, Google Earth and Bing Maps. A search of other relevant nature conservation information was made through the use of the Multi-Agency Geographic Information for the Countryside (MAGIC) database.
- 2.1.2 The local records centre was contacted to provide data on all protected bat and species within 2km of the proposed development site at this point. North Wales Environmental information service (Cofnod) were the relevant local record centre for this project.

2.2 Field Survey Methodology

2.2.1 Initial Site Survey

This is done by assessing the site by visually inspecting all building/s/structures and any trees/vegetation to be impacted by the proposed works. This is done to assess the resource availability for protected species on site and in the immediate area. Particular reference is made to:

- The presence or absence of bats and birds' onsite.
- Any evidence of potential bat roosts and birds' nests onsite.
- Whether any additional survey effort will be required.

During the initial survey, an internal and external inspection of the building(s) is undertaken to look for signs of bat activity. This is done in accordance with BCT guidelines for the assessment of building(s) and built structures.

2.2.2 External Inspection

This survey method is used to locate potential ingress and egress points around the structures that both bats and birds could use to gain access into the building. It also aims to identify any areas where cracks and crevices are present to be used as roosting/nesting features. This visual inspection is carried out in full daylight using binoculars, endoscope, torches and ladders. This will allow for the determination of the following information:

- The type of building(s) surveyed.
- The approximate age of building(s) surveyed.
- The construction type and materials used.
- The presence of potential roost features (e.g. missing roof tiles, raised ridge tiles, air vents, cracks and crevices within the mortar).
- The presence of suitable ingress and egress points (e.g. missing windows and doors, missing mortar, lifted tiles).
- The location of any anecdotal evidence for the presence of protected species (e.g. nests, droppings or food remains).

2.2.3 Internal Inspection

This survey method aims to locate and examine areas which potentially provide suitable environmental conditions for bats. This visual inspection was undertaken by using binoculars, endoscope, torches, ladders and bat detectors to inspect internal features of the building(s).

This will allow for the determination of the following information:

- The presence of warm areas, dark areas, joints, crevices, beams and cavities that could be used for roosting and nesting purposes by bats and birds.
- To locate possible bat roost and bird nest sites.
- To listen for social calling bats.
- To locate any evidence of bat and bird presence through the identification of live or dead specimens, grease marks, droppings, food remnants, urine stains and/or the characteristic smell of bats.

2.2.4 Building/Vegetation Classification

A building/vegetation classification will be assigned to each surveyed feature that is proposed to be impacted by the scheme of works. This classification is based on the features potential to support roosting bats. The rating is also influenced by the location of the structure(s) in the local landscape, along with the number of suitable alternative roosting features, the type of features present in the landscape and the surveyor's experience. For example:

A structure that has a high level of anthropogenic disturbance with limited opportunities for access by bats, that is also situated within an urbanised area with few or no mature trees, parkland, woodland or wetland would generally equate to having negligible/low potential.

Conversely, an older structure (e.g. pre 20th century or early 20th century) with multiple features suitable for use by bats that is close to optimal foraging habitat would equate to having high potential.

The amount of additional survey effort required for each feature will depend on its rating:

- Negligible – No further survey effort is required
- Low – One further activity survey is required (structures only).
- Moderate – Two further activity surveys are required.
- High – Three further activity surveys are required.

2.2.5 Roost Categories

Any structures with evidence of bats will be further evaluated to assess which of the following roost categories may be present onsite:

➤ **Day Roost:**

A place where individual bats or small groups of males, rest or shelter during the daytime. These bats are rarely found at night at these sites.

➤ **Feeding Roost:**

A place where individual bats rest or feed during the night, but are rarely present in the day.

➤ **Hibernation Roost:**

A place where bats may be found either individually or together during the winter months. These roosts often have a constant cool temperature and high humidity.

➤ **Maternity Roost:**

A place where female bats give birth and raise their young to independence.

➤ **Mating Roost:**

A place where mating/copulation takes place between male and female bats. These can continue through the winter months.

➤ **Night Roost:**

A place where bats rest and/or shelter during the night, but will rarely be found here during the day. These can be used colonially or individually by the bats.

➤ **Satellite Roost:**

These are alternative roosting sites that are found within close proximity to the main nursery colony within the maternity roost. These are used throughout the breeding season by individual or small groups of female bats.

➤ **Swarming Site:**

A place where large numbers of bats come together during the latter summer months through until Autumn. These sites are classed as being important mating areas.

➤ **Transitional/Occasional Roost:**

A place that is used by individuals or small groups of bats for a small period of time. These are used by the bats prior to hibernation and/or shortly after hibernation.

2.2.6 Bat Detector Survey (presence/absence survey)

If required, the object for this survey method is to detect any bats leaving or returning to their roost sites within the surveyed features. This is achieved by undertaking dusk and dawn activity surveys under the following protocol:

- Commencing the survey 15 minutes before sunset (dusk survey) and 2 hours before sunrise (dawn survey).
- Listening for any social calls at potential roost sites using bat detectors.
- Standing at different survey points around the building(s) and/or vegetation using bat detectors to hear the bat echolocation.
- The survey will attempt to witness the first bats emerging (dusk) and the bats returning (dawn) to their roosts.
- Standing at different transect points at foraging/commuting areas around the site.
- Carrying out this survey methodology for up to two hours after sunset (dusk) and up to 15 minutes after sunrise (dawn). This will cover the emergence and re-entry of the bats at the potential roost site, for some bat species.

- 2.2.7 In order to comply with the required legislation, the results from the surveys will be collated to establish whether a European Protected Species (EPS) development licence will be required. If required, project appropriate species-specific compensation and mitigation measures will be devised to ensure the species remains at a favourable conservation status at the impacted site.

2.3 Surveyors Information

- 2.3.1 The survey was undertaken by licensed bat ecologist/s and members of the Chartered Institute of Ecology & Environmental Management (CIEEM) and Elite Ecology staff members:

Mr. Matthew Hodgson, Ecologist, Natural England Bat Survey Licence Number: 2019-41695-CLS-CLS Bat Survey Level 2.

Mr. Matthew Cotterill: BSc [Hons], Ecologist, Natural England Bat Survey Licence Number: 2019-43981-CLS-CLS Level 1.

Mr. Alex Fitzroy, BSc (Hons), Ecologist.

Mr. Matthew Priddey, Assistant Ecologist.

Miss. Ella Moore, BSc, Assistant Ecologist.

Miss. Livia Spadetto, MSc, Assistant Ecologist.

2.4 Field surveys

- 2.4.1 Site Surveys

Elite Ecology were not made aware of any previous site surveys.

Bat Activity Survey

2.4.2 Roost Surveys

The buildings at Oakfields, Isycoed were externally and internally inspected for the presence of bats and birds with the use of various types of equipment (including binoculars, torches, endoscope and ladders) in full daylight. Subsequent activity surveys use a variety of bat detectors that include Bat Box Duet, SSF Bat2 and the EcoObs Batcorder. The following table outlines the environmental variables from the survey visits:

Environmental variables	PRA Survey of the Building and Activity Survey 1 – 30 th August 2019. Dusk	Activity Survey 2 – 24 th September 2020. Dusk
Temp Start:	17.5°C	11°C
Temp Finish:	16.9°C	10°C
Humidity Start:	86%	68%
Humidity Finish:	90%	75%
Cloud Cover Start:	100%	50%
Cloud Cover Finish:	100%	50%
Wind Speed Average:	Low	Still
Precipitation:	None	None

3 Results

3.1 Desktop Survey Results

3.1.1 Bats:

The ecological data search provided by Cofnod revealed no bat species within the 2km search radius of the structure at Oakfields, Isycoed.

3.1.2 Birds:

No ecological data search for birds was commissioned. All UK birds can be split into three categories of conservation importance (red, amber and green – please see [RSPB](#) for more information). This report represents an accurate representation of the structure's potential to support nesting birds.

3.1.3 Designated sites

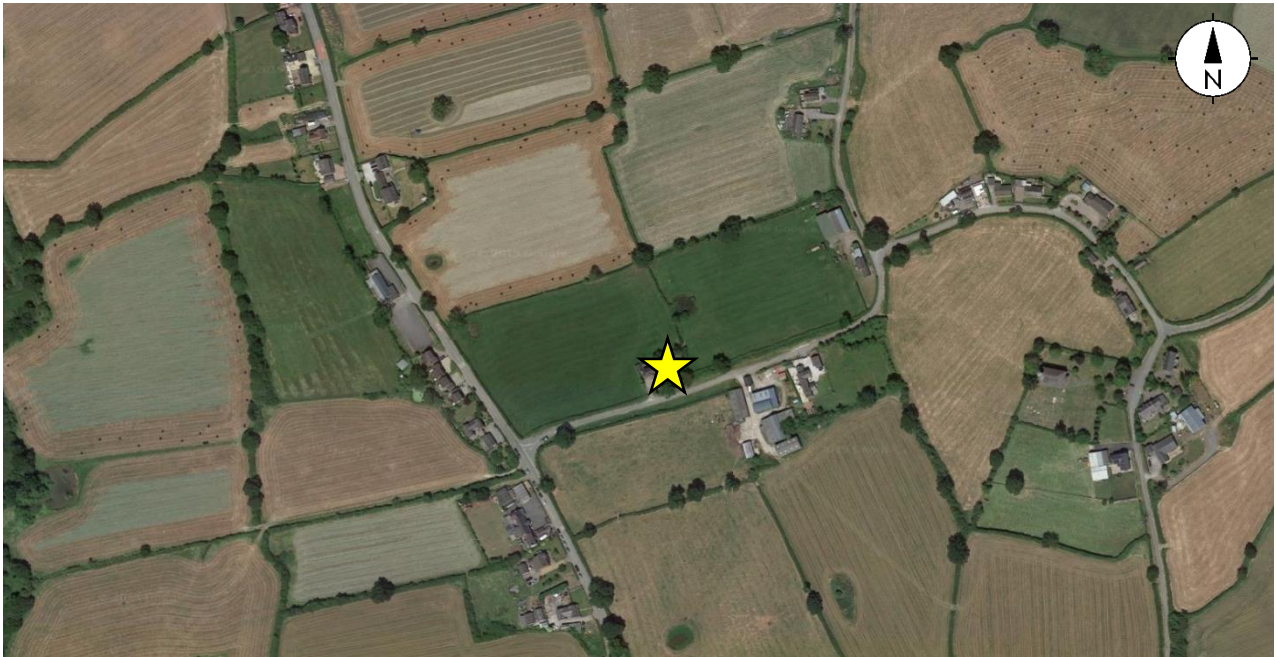
As the current proposals remain within the site boundary, it was not necessary to obtain any further information regarding both Statutory and Non-Statutory Nature Conservation Designations. This is due to the proposed works not altering any of the landscape surrounding the site.

3.2 Field surveys

3.2.1 Habitat description

The site itself is situated within a semi-rural setting within the local government community of Isycoed, Clwyd. Hard standing ground, amenity grassland and hedgerows are situated in the immediate vicinity of the building, as well as a small amount of other buildings (residential dwellings and their associated gardens) and arable and pastureland. The wider landscape is comprised of arable land, scattered trees and hedgerows. There is a large waterbody located 600m to the west of the site and the site offers good connectivity to the wider landscape. Therefore, the habitats that are present in and around the site contains all of the elements that are considered to be critical in both bat and bird life cycles.

Figure 2: An aerial photograph of the surveyed site (yellow star) and some of the nearby habitats to the structures at Oakfields, Isycoed.



3.2.2 Building survey

External Inspection:

There are three buildings on site, the main house (B1), an outbuilding (B2) and the garage (B3).

The main house has solid brick walls, with a hipped slate tile roof. The tiles are in good condition, although there are gaps present underneath the ridge tiles. There are gaps present around the eaves that could facilitate bat access into the building. The windows and doors around the property are intact and do not allow access to the interior for wildlife. No evidence of nesting birds was found externally.

The outbuildings (B2 and B3) have solid brick walls, with a pitched slate tile roof. There are missing windows which could be used by bats or birds to access the building. There are also gaps present in the walls and some lifted tiles are present, with gaps around the eaves. No bird nests were found on the exterior of this structure.

Internal Inspection:

Internally, B1 is used for residential purposes but is currently unoccupied. There are timber beams present supporting the roof, with torching present beneath the tiles. A scattering of bat droppings were found within the loft, as well as some cobwebs. A small sample of bat droppings were collected and sent for DNA testing. No bird nests are present within this structure.

The outbuildings (B2 and B3) are primarily used for storage. There are timber beams supporting the roof, with remnants of torching present under the tiles. Within B2, evidence of one blackbird (*Turdus merula*) and two swallow (*Hirundo rustica*) nests were noted. A small number of bat droppings and insect remains were found within B3.

3.2.3 Summary of the building inspection

Due to the presence of bat droppings and the number of suitable roosting features, the structures were deemed to be of 'high' bat roost potential and 'high' potential for birds to nest.

Therefore, three further activity surveys are required during the bat survey season (May to September, inclusive).

Table 1: Low/Moderate/High potential building(s) survey recommendations. The full guidance can be found in the Bat Conservation Trust Good Practice Survey Guidelines. These guidelines are what all local authorities abide by.

Bat Conservation Trust

Table 7.3 Recommended minimum number of survey visits for presence/absence surveys to give confidence in a negative result for structures (also recommended for trees but unlikely to give confidence in a negative result).

Low roost suitability	Moderate roost suitability	High roost suitability
One survey visit. One dusk emergence or dawn re-entry survey ^a (structures). No further surveys required (trees).	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey. ^b	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn. ^b

^a Structures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case-by-case basis (see Section 5.2.9). If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. In some cases, more than one survey may be needed, particularly where there are several buildings in this category.

^b Multiple survey visits should be spread out to sample as much of the recommended survey period (see Table 7.1) as possible; it is recommended that surveys are spaced at least two weeks apart, preferably more. A dawn survey immediately after a dusk one is considered only one visit.

3.2.4 DNA Results

A small sample of droppings were collected and sent for DNA testing with EcoWarwicker at the University of Warwick. The results from this testing revealed whiskered (*Myotis mystacinus*) bats with a 100% bootstrap level.

Please note: The results from this testing may not be representative of all species present on site. This is due to the random collection of the droppings meaning some species may be missed.

3.2.5 Activity surveys

One activity survey was undertaken on the structures at Oakfields, Isycoed.

Activity Survey 1 (30th August 2019):

This survey was undertaken at dusk, with sunset being recorded at 20:07. There was a lot of common pipistrelle (*Pipistrellus pipistrellus*) activity, with most of it being focused in the southern garden. During this survey, two common pipistrelle (*Pipistrellus pipistrellus*) bats were seen emerging from the south-eastern corner of the main house.

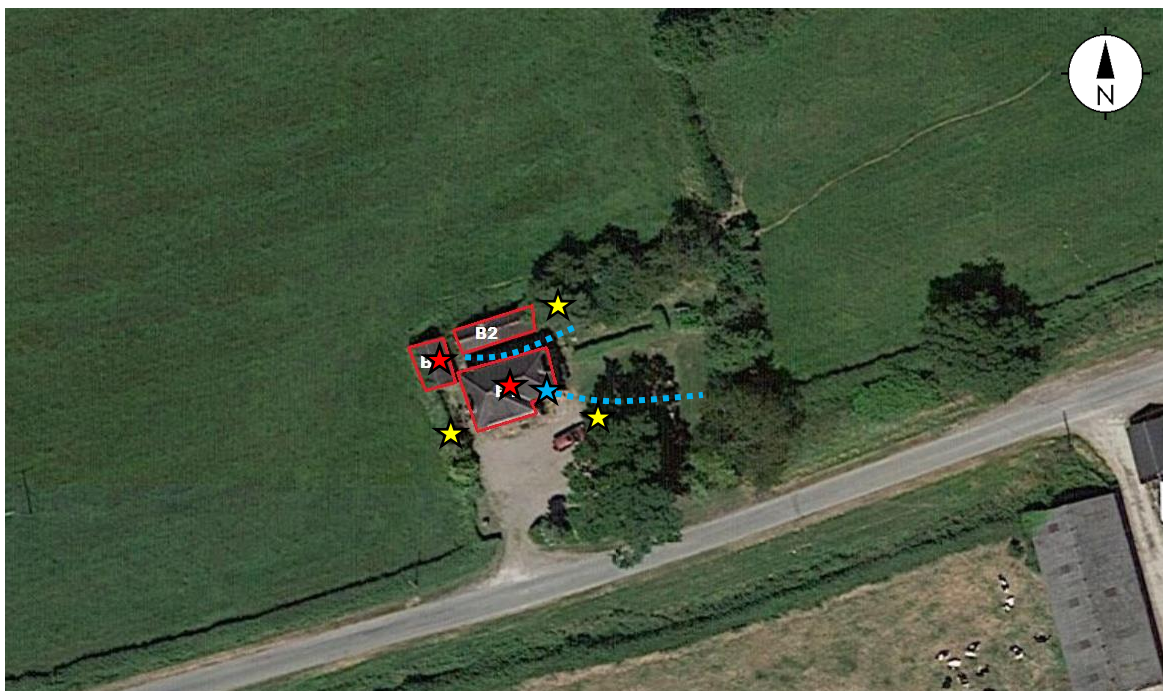
Activity Survey 2 (24th September 2020):

The activity survey was undertaken at dusk on the 24th of September 2020, with sunset time recorded at 19:04. During the site visit, two whiskered (*Myotis mystacinus*) bats were witnessed emerging from the south-eastern end of the site. In addition to this, some brown-long eared (*Plecotus auritus*) and plenty of whiskered (*Myotis mystacinus*) bats were identified on site. In addition to this, a noctule (*Nyctalus noctula*) bat was seen to forage in the vicinity of the buildings.

Summary

One further activity survey is required in order to assess the species assemblage of the site and in what numbers they are present.

Figure 3: An aerial photograph of the surveyed site (red outline), the surveyor locations (yellow stars) and the identified bat flight paths (blue lines). The blue star illustrates the identified egress points identified. The red stars illustrates where the bat droppings were identified.



4 Impact Assessment

4.1 Constraints

Constraints on:	Survey Information	Equipment Used
Constraint (Yes or No):	No	No
Explanation of Constraints:	N/A	N/A
Action Taken:	N/A	N/A

4.2 Potential Impacts of the re-development

The current planning proposal is for the structures at Oakfields, Isycoed to be demolished and replaced by a new residential dwelling. The potential impacts of these works have been identified as follows:

4.2.1 Designated sites

As the proposed works are due to remain within the site boundary, the presence of any designated sites nearby is not applicable to this project. This, therefore, means that any building works would be of no detriment to the surrounding habitats and landscape.

4.2.2 Bat Roosts

Impact	Short-term Impacts: Disturbance	Long-term Impacts: Roost Modification	Long-term Impacts: Roost Loss
Classification:	High	Unknown	Unknown
Justification:	Roosts of common pipistrelle (<i>Pipistrellus pipistrellus</i>) and whiskered (<i>Myotis mystacinus</i>) bats are present in the loft of the existing property.	Roosts of common pipistrelle (<i>Pipistrellus pipistrellus</i>) and whiskered (<i>Myotis mystacinus</i>) bats are present in the loft of the existing property.	Roosts of common pipistrelle (<i>Pipistrellus pipistrellus</i>) and whiskered (<i>Myotis mystacinus</i>) bats are present in the loft of the existing property.
Any further action:	One further survey is required.	One further survey is required.	One further survey is required.

4.2.3 Bird Nests

Due to the presence of bird nests on or within the buildings, the proposed scheme of works will be of a 'high' effect to the local bird populations. Please see section 5 for more information on the compensation and mitigation for this species.

4.2.4 Foraging and commuting habitat

It is considered that the re-development of the site would have a '**negligible**' effect on potential foraging and commuting habitat. The site itself offers little foraging habitat, with the adjacent land containing better opportunities for bats and birds to use. Post development, all foraging and commuting habitats will be maintained, thus not negatively affecting the local landscape.

5 Recommendations

5.1 Bats:

Due to the identification of whiskered (*Myotis mystacinus*) bat droppings and the emergence of one common pipistrelle (*Pipistrellus pipistrellus*) bat during the first activity survey, two further activity surveys were required for the structures at Oakfields, Isycoed. These will need to take place during the optimal months of mid-May to August, with temperatures above 10°C. These surveys will need to focus on all three buildings at the site, with three surveyors required to adequately cover all elevations.

5.1.1 Outline Mitigation and Compensation Strategy

Mitigation Licence

A Natural Resources Wales Mitigation Licence will need to be applied for to ensure that the works proceed legally.

Timings of the Works

Works on the structure should only take place in conditions that are deemed suitable for bat activity (temperature above 7°C and avoiding heavy rain). This will reduce any impacts on bats should they be found during the work.

Works

At the start of the proposed works, a licenced bat ecologist is required to be on site to conduct a toolbox talk prior to works commencing. On the morning prior to the commencement of the works, two [2F Schwegler Bat Box](#) per species identified is required to be installed on a nearby tree facing north.

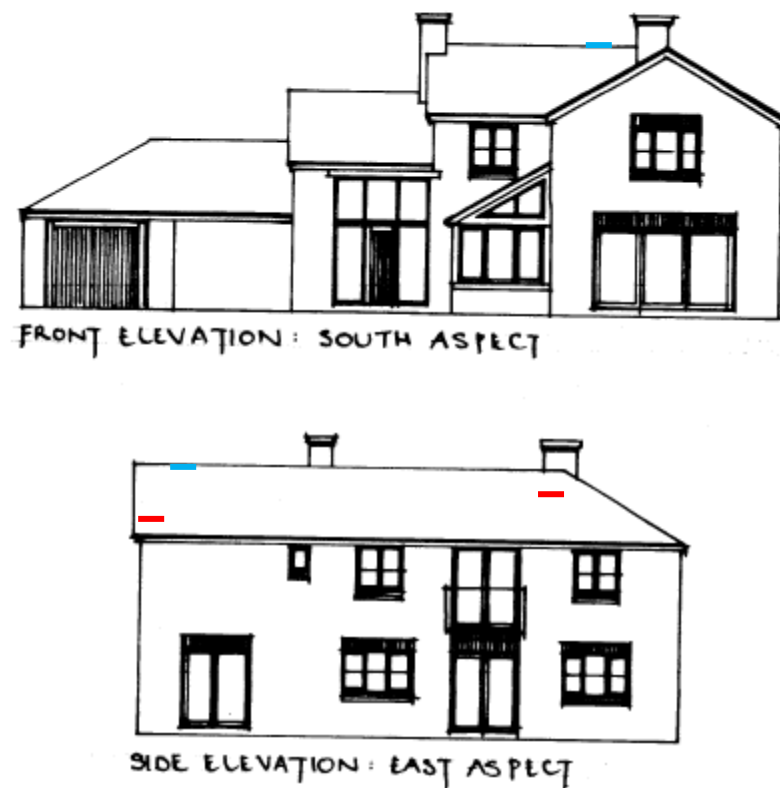
The building will then be thoroughly inspected by a licenced bat ecologist (both externally and internally), through the use of an endoscope to check for any anecdotal presence of bats. This will check all cracks/crevices around the affected areas and around the tiles. A soft strip of the tiles will also be undertaken under the supervision of the licenced ecologist.

Compensation

To compensate for the loss of the existing loft space, access into the new loft will be facilitated. Access into this loft will be facilitated through [Bat Access Tiles](#) and purposely lifted ridge tiles, the location of which are shown in Figure 4. Type 1F Bitumen felt will need to be used as underlay. The loft space will cover the entire structure and meet the measurements specified within the mitigation guidelines. This will be suitable for both species identified within the structure so far, and also accommodate any alterations during the summer 2021 survey.

A number of additional measures should be included to ensure that the roost is of the highest value possible to the target species. These measures include incorporating two [Schwegler 2F bat boxes](#) should be placed along the ridge board. Finally, a ply-board lining should be introduced [approximately] half way up the roof (heading towards the apex) in order to provide further roosting opportunities for the bat species present.

Figure 4: Annotated site plans for the location of the access points. The Bat Access Tiles are shown by the red markings, with the blue markings showing the location of the purposefully lifted ridge tiles. **Please note** – the annotations on this image are not to scale.





Post Development Maintenance

The bat compensatory features should be maintained indefinitely.

Post Development Monitoring

At the completion of the works, up to two bat emergence surveys of the compensatory features will be undertaken. These are required to be undertaken on years 2 and 4 following the completion of the works. The years and number of surveys may be altered if Natural Resources Wales deem necessary.

Reporting

A letter statement will be produced following each site visit to report actions taken and the survey findings.

Enhancements

The proposed enhancements for the site are to incorporate at least one [Eco Bat Boxes](#), [Integrated Eco Bat Boxes](#) or [Bat Access Tiles](#) on the redeveloped property. **Please be aware** that all bat features need to avoid artificial lighting and no modern breathable felt should be used.

Bat Activity Survey

The site can be enhanced by introducing a bat friendly planting scheme in the soft landscaping plan. The table below outlines species recommended by the Bat Conservation Trust, all of which could be incorporated into the site post development.

Flowers for borders	Trees, shrubs & climbers
Aubretia	Bramble
Candytuft	Buddleia
Cherry pie	Common alder
Corncockle	Dogrose
Corn marigold	Elder
Corn poppy	English oak
Echniacea	Gorse
English bluebell	Gelder rose
Evening primrose	Hawthorn
Field poppies	Hazel
Honesty	Honeysuckle (native)
Ice plant 'pink lady'	Hornbeam
Knapweed	Ivy
Mallow	Jasmine
Mexican aster	Pussy willow
Michaelmas daisy	Rowan
Night-scented stock	Silver birch
Ox-eye daisy	Wild flowers for pond edges & marshy areas
Phacelia	Bog bean
Poached egg plant	Bugle
Primrose	Creeping Jenny
Red campion	Flag Iris
Red valerian	Hemp agrimony
Scabious	Lady's smock
St. John's Wort	Marsh mallow
Sweet William	Marsh marigold
Tobacco plant	Marsh woundwort
Verbena	Meadowsweet
Wallflowers	Purple loosestrife
Wood forget-me-not	Water avens
Yarrow	Wood forge-me-not
Herbs	Water mint
Angelica	
Bergamot	
Borage	
Coriander	
English marigolds	
Fennel	
Feverfew	
Hyssop	
Lavenders	
Lemon balm	
Marjoram	
Rosemary	
Sweet Cicely	
Thyme	

5.2 Birds:

Due to the presence of nesting birds, no works can be undertaken on the structures during the bird breeding season (March to August, inclusive). If this timescale cannot be achieved, the structures are required to be assessed by a suitably qualified ecologist no more than 24 hours prior to the commencement of works to confirm the presence or absence of active nests. If active nests are located, exclusion zones around the nest will be required until the chicks have fledged the nest.

To compensate for the loss of the bird nests, it is recommended that two [Large Bird Nest Boxes](#) are installed on the site post-development. For the swallow (*Hirundo rustica*) nests, it will be necessary to incorporate [eaves/ridge](#) overhangs or easily accessible loft spaces. This will give these specimens the necessary internal opportunities to continue to nest at the site. These features should be located in the southern section of the re-developed site. These should be enhanced with the inclusion of two [No.10 Schwegler Swallow Nest](#) boxes per feature.

In addition to this, a number of additional [bird boxes](#) could be installed around the site to enhance its value to the local bird populations.

6 Summary

6.1 Bat presence/absence

It has been confirmed that both common pipistrelle (*Pipistrellus pipistrellus*) and whiskered (*Myotis mystacinus*) bats are using the site. One further activity survey are required in order to assess the type of roosts present and the numbers during the optimal survey season.

6.2 Bird presence/absence

From the survey visit undertaken on the site, it can be concluded that B2 contains evidence of nesting birds. Additionally, the surrounding landscape provides all of the necessary habitat elements that birds require, and their presence can be assumed.

6.3 Ecological value of building units

The ecological value of the building has been deemed as 'high' to bats due to the identification of common pipistrelle (*Pipistrellus pipistrellus*) and whiskered (*Myotis mystacinus*) bat use. The ecological value of the buildings to birds has been deemed 'moderate' due to the presence of a small number of nests from the previous bird nesting season.

6.4 Recommendations

The recommendations for 'Oakfields, Isycoed' can be summarised as follows (please refer to section '5 – Recommendations' for a more in-depth description):

- One further activity survey is required during the bat survey season of May and September. Three surveyors are required to cover all elevations.
- Compensation to include features mentioned in 5.1.1.
- No works can be undertaken during the bird breeding season of March to August (inclusive), unless the structure has been inspected by a suitably qualified ecologist no more than 24 hours prior to the commencement of works.
- Install two [Large Bird Nest Boxes](#).
- Incorporate [eaves/ridge](#) overhangs or easily accessible loft spaces for the swallow (*Hirundo rustica*) populations. These should be enhanced with the inclusion of two [No.10 Schwegler Swallow Nest Boxes](#) per feature.
- Optional: Install a variety of [bird boxes](#) around the site post development to replace for the local bird populations.

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8 Appendices

Appendix A: Site Plans

Appendix B: Eco Data Map

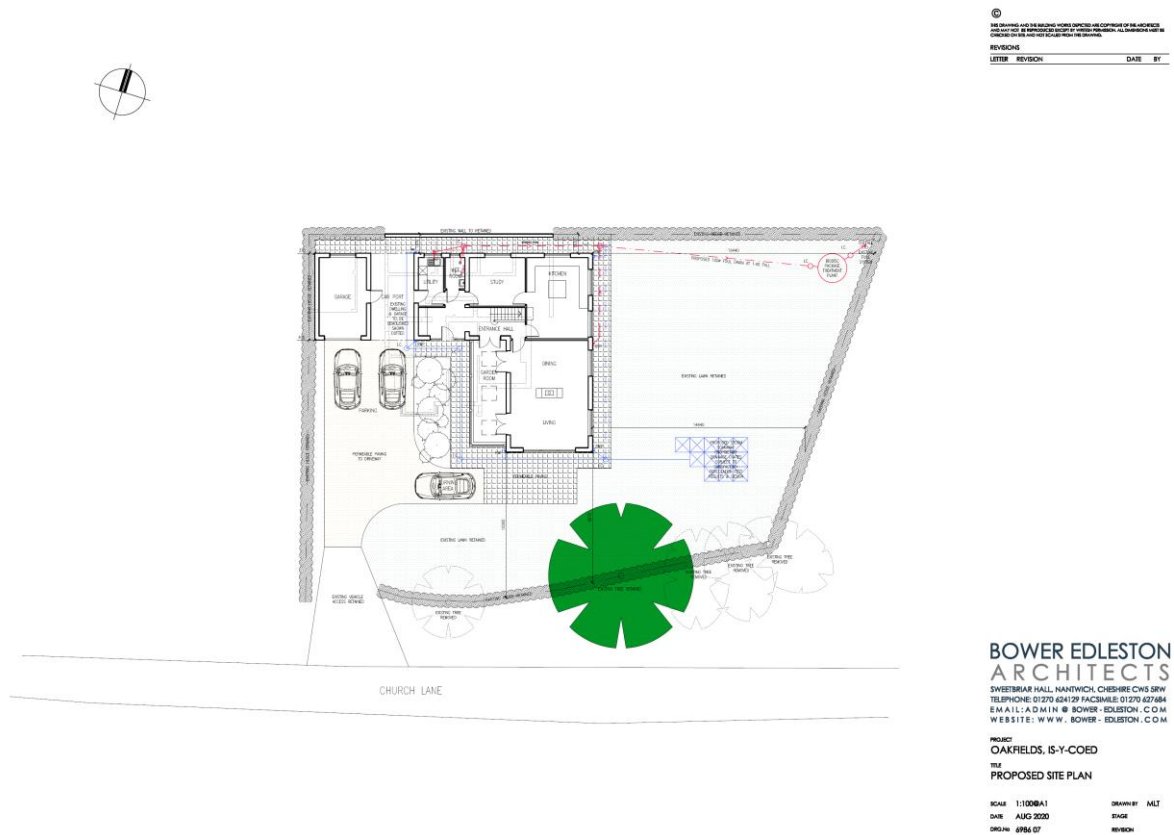
Appendix C: Artificial Light and Bats

Appendix D: Photographic Records

Appendix E: The Annual Bat Year (BCT)

Appendix F: Legislation

Appendix G: Bat DNA Results

Appendix A: Site Plans

Appendix B: The Ecological Data Search Maps

No ecological data search map was produced for this project.

Appendix C: Artificial Lighting and Bats

Artificial lighting is known to affect bat's roosting and foraging behaviour, with lighting resulting in a range of impacts that includes roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs et al., 2003), increased activity of some bat species and decreased activity by others (Stone et al., 2012).

An experimental approach using LED units, demonstrated that relatively fast-flying bat species, including the common pipistrelle, showed no significant impacts as a result of new artificial lighting, even when lighting was set at relatively high levels close to 50 lux.

In contrast, slow flying bats such as the myotis bats (*Myotis* spp.) showed sharp reductions in presence, even at low light levels of 3.6 lux (Stone et al., 2012).

Current recommendations for all bat species specifies that no bat roost should be directly illuminated.

Due to the impacts of lighting, mitigation and sensitive lighting design schemes are required for projects where bats are present. These should include bat friendly lighting plans that should aim to avoid lighting wherever possible. If this is not possible, then the minimisation of any lighting impacts is required by adopting the following measures:

➤ **To introduce lighting curfews or use of PIR sensors.**

Lighting curfews can be an effective way of avoiding impacts on bats. These curfews may involve either turning off lighting or dimming light units at specific times of the night, dimming units at key times of the year, providing the luminaire allows for this option via a control unit. Lighting to be triggered by PIR sensors can be expected to be illuminated only when required and for a low proportion of time.

➤ **To consider no lighting solutions where possible.**

Options such as white lining, good signage and LED cat's eyes should be considered as preferable. Reflective fittings may help make use of headlights to provide any necessary illumination in some areas.

➤ **To use only high pressure sodium or warm white LED lamps where possible.**

High pressure sodium and warm white LED lamps emit lower proportions of insect attracting UV light than mercury, metal halide lamps and white LED lighting. Generally, lamps should have a lower proportion of white or blue wavelengths, with a colour temperature <4200 kelvin recommended (BCT, 2014).

➤ **To minimise the spread of light.**

The light spread should be kept at or near horizontal to ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Baffles, hoods, louvres and shields should be used where necessary to reduce light spill.

➤ **To consider the height of the lighting column.**

While downward facing bollard lighting is often preferable, it should be noted that a lower mounting height does not automatically reduce impacts to bats as bollard lighting can often be designed to provide up-lighting. Where bollard lighting is considered to be the most appropriate system, bollard spacing or unit density should be kept to a minimum and units should be fitted with the appropriate hoods/deflectors to reduce any up-lighting.

➤ **To avoid reflective surfaces below lights.**

The polarisation of light by shiny surfaces attracts insects increasing bat activity (BCT, 2012). Consequently, surface materials around lighting require consideration.

Appendix D: Photographic Records

Plate 1: A photograph of the main house highlighting the area the common pipistrelle (*Pipistrellus pipistrellus*) emerged from.



Plate 2: An image of the loft space of the main house.



Plate 3: A photograph of one of the outbuildings.



Appendix E: The Annual Bat Year (BCT)

A Year in the Life of a Bat			
January		February	
	Hibernating; using up fat reserves.		Still hibernating; few fat reserves left.
March		April	
	Some activity; occasional bat seen feeding.		Awake and feeding at night.
May		June	
	Females looking for nursery sites.		Young born, usually only one.
July		August	
	Young still suckling.		Young start catching insects; females leave nursery to find males.
September		October	
	Mating season begins; start building fat reserves for hibernation.		Search for suitable hibernation site.
November		December	
	Hibernation begins although still some activity in warm weather.		Hibernating.

Appendix F: Legislation and Policy

All species of bat are fully protected under a variety of domestic, European and international legislation and conventions. These include:

- Bern Convention (Appendix II)
- Bonn Convention (Appendix II)
- Conservation Regulations (Northern Ireland) 1995
- Conservation of Habitats and Species Regulations 2017
- Countryside Rights of Way Act 2000
- Eurobats Agreement
- Habitats Directive (Annexes IV and II)
- Habitats Regulations 1994 (as amended) Scotland
- NERC Act 2006
- Wildlife and Countryside Act 1981 (as amended)
- Wild Mammals Protection Act

In addition to this, some species have additional protection by being listed on the UK Biodiversity Action Plan (UKBAP).

The legislation afforded to bats makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.

All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which protects birds, nests, eggs and nestlings from harm. In addition to this, some rarer species, such as barn owls are afforded extra protection.

National Planning Policy Framework, Section 15:

In early 2012, the National Planning Policy Framework (NPPF) replaced much previous planning policy guidance, including Planning Policy Statement 9: Biological and Geological Conservation. The government circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System, which accompanied PPS9, still remains valid. A presumption towards sustainable development is at the heart of the NPPF. This presumption does not apply however where developments require appropriate assessment under the Birds or Habitats Directives. The latest National Planning Policy Framework was updated in February 2019, with the section in relation to conserving the natural environment being located within section 15.

Section 15, on conserving and enhancing the natural environment, sets out how the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and, where possible, provide net gains in biodiversity. Opportunities to incorporate biodiversity gains into a development should be encouraged.

Biodiversity 2020:

This sets out to halt overall biodiversity loss and support healthy well-functioning ecosystems by establishing coherent ecological networks, with more and better places for nature, to the benefit of wildlife and people. The government's policy is aimed at individuals, communities, local authorities, charities, business and government, which all have a role to play in delivering Biodiversity 2020.

Appendix G: Bat DNA Results

23 September 19

Re: Identification Results for Richard Millington, Elite Ecology

Job number 14558, received 09 September 2019

Sample labelled: Oakfields, Isycoed, Clwyd, LL13 9RY. 30/8/19. SJ 403 502.

PCR amplification successful. DNA sequence:

ATCTGATGTAGTGCGCATTATGACCAACATTGAAAGTCCCACCCCTTAGTAAAAATT
ATTAATAGCTCATTTATCGACCTTCTGCCCATCAAATATCTC

Phylogenetic analysis identification: *Myotis mystacinus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

Professor Robin Allaby

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The survey results purport the current status of the site and its potential for protected species utilisation at the time of surveying. It should not be viewed as a complete list of the possible flora and fauna species that could be using the site at different times of the year.

Elite Ecology has been provided with full payment for this report and thus the product has been released to the client(s) for the purpose of their planning application. If any part of the report is lost or altered without the written permission of Elite Ecology, then the entire report becomes invalid. Due to the potential for continual change within the natural world, this report is valid for **2 years only** from the date of the last survey visit. If this report is submitted after the 2 year deadline, then a further updated inspection will be required to ascertain whether the site remains in the same condition as it was when initially inspected.

No reliance should be made on any such comments in relation to the structural integrity of the features located on the surveyed site. All information within the report is based solely on evidence that has been found on site during the service provided. No individual opinion or inference will be made other than that of the suitably qualified ecologist appointed to the project.