

Greenscape Environmental Ltd

CARTER JONAS

ECOLOGICAL APPRAISAL

**BUILDING TO REAR OF
HAFOD ADAMS
LLANARMON-DYFFRYN-CEIRIOG
LLANGOLLEN
LL20 7LB**

MAY 2018

1982 002R

Report by Ben Jones BSc (hons) MSc

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The report should be read in its entirety.

Questions arising from the survey report should be directed to the author of this report who will be pleased to clarify any technical issues raised.

Whilst the surveyors make every reasonable effort, Greenscape Environmental Ltd cannot guarantee that all protected species have been identified and survey results are definitive. Many species are cryptic and transitional in habit.

Reports are considered valid for one year for planning purposes after which time further survey information may be required.

Greenscape Environmental Ltd can provide advice and support for recommendations and planning conditions.

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1 Summary

1.1 Purpose of the Report

Greenscape Environmental Ltd was commissioned by Ms C Sussums-Lewis of Carter Jonas to conduct a survey determining the presence of protected species and potential for the damage or destruction of valuable, ecologically significant habitats as part of the planning application for the renovation of a building to the rear of Hafod Adams. This project involves the conversion of an old bakery into a dwelling.

This document outlines the potential impacts as ascertained from the preliminary ecological assessment, and recommends measures to avoid, reduce or manage negative effects.

1.2 Methodology

The appraisal of the site included a desk study of the area, reviews of other surveys previously conducted in the area by Greenscape Environmental and a phase 1 environmental appraisal.

The phase 1 ecological appraisal was undertaken at the site, OS grid reference SJ1644 3395 on 3rd April 2018 by B Jones. A precautionary bat survey was undertaken on the 17th May 2018 by L Maggs.

1.3 Key Issues

One designated site passes through the 1km area around the site, though no negative impact is expected from the development.

Records of protected species within 2km include common pipistrelle and typical passerine bird species.

The site is a run-down building with no roof. No evidence of bats or nesting birds was found inside the building. There is potential for both bats and nesting birds inside the gappy stonework on the exterior of the building.

The stream running alongside the development is a direct tributary of a nearby SSSI. It will be protected from contamination by a method statement. It is considered unsuitable for species such as water vole and great crested newts.

1.4 Impacts and Mitigation Measures

It is recommended that the biodiversity is enhanced post-construction with the inclusion of bat and bird boxes.

1.5 Conclusions

Activity was limited to only a few common pipistrelle passes, and no roosting activity was seen. A method statement outlining reasonable avoidance measures for birds will be followed. A method statement will be followed for site biosecurity and prevention of contamination of the water course.

The client has agreed to install bat and bird boxes around site.

There are no other ecological constraints to the development as currently proposed.

2 Introduction

This report has been compiled by Ben Jones BSc (hons) MSc who has 3 years' experience conducting ecological appraisals. It has been reviewed in line with Greenscape's Quality Management System.

For details of surveyors and licences please see Appendix A.

Greenscape Environmental Ltd was commissioned by Ms C Sussums-Lewis of Carter Jonas on behalf of the client to conduct a survey to determine the presence of protected species and potential for the damage or destruction of habitats of ecological value, as part of the planning application for the building conversion at Llanarmon.

2.1 Project Background

The project involves the installation of a new roof followed by complete internal refurbishment and repurposing of the building into a dwelling.

2.2 Purpose of the Report

The aim of this survey is to locate and describe, as far as reasonably practicable, evidence of wildlife, including all protected and BAP species, which may be disturbed or lost in the event of development.

The purpose of the report is to:

1. Identify the key ecological constraints to the proposed development
2. Inform planning to allow significant ecological effects to be minimised or avoided wherever possible
3. Allow any necessary mitigation or compensation measures to be developed

The Local Planning Authority (LPA) will require further information regarding bats as it meets at least one of the trigger points set out in section 1.2.3.2 of the Good Practice Guidelines, BCT (2016).

2.3 Planning Policy and Legislation

The relevant planning policy and legislation to the current development is:

The Wildlife and Countryside Act 1981 – as listed in:

- Schedule 1. Birds protected by special penalties at all times
- Schedule 5. Protected animals

The Conservation of Habitats and Species Regulations 2017 – as listed in:

- Schedule 2. European protected species of animals

Countryside and Rights of Way Act (2000)

The Protection of Badgers Act 1992

Natural Environment and Rural Communities Act 2006 (NERC 2006)

National Planning Policy Framework (2012):

- Policy 11. Conserving and Enhancing the Natural Environment.

Section 7 of the Environment Act (Wales) 2016

2.4 Site Context and Location

The site is located north of Llanarmon-Dyffryn-Ceiriog in the Berwyn valley, OS grid reference SJ1644 3395. It is set in a rural environment surrounded by open farmland on all sides. There is good connectivity to the surrounding countryside via a stream running immediately adjacent to the house which connects into the River Dee SSSI.

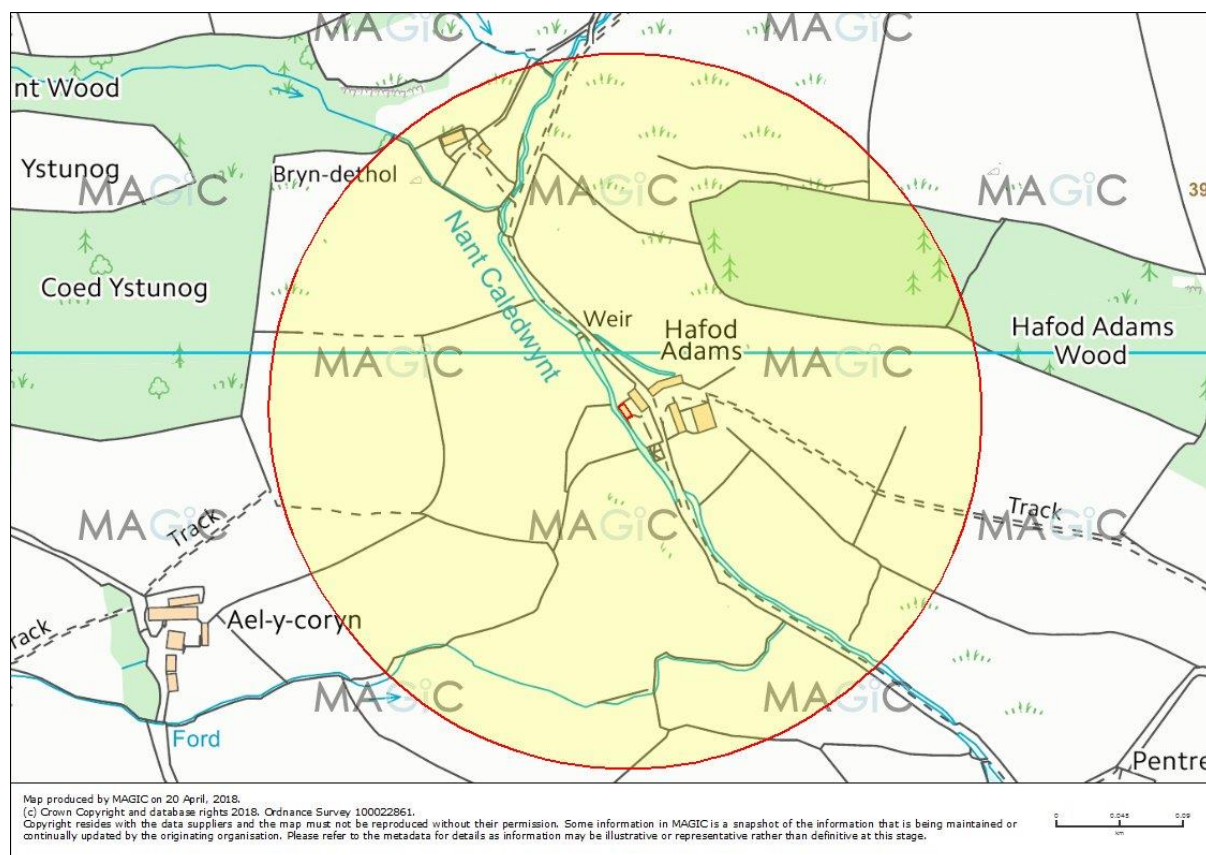


Figure 2.1. An OS map showing the site (centre, highlighted) with 250m buffer

2.4.1 Date and Survey Conditions

The phase 1 ecological appraisal was undertaken at the site on 3rd April 2018 by B Jones. A phase 2 survey for bats was conducted on the 17th May 2018 by L Maggs BSc (hons). The conditions on the survey dates were optimal for the type of survey conducted, i.e. the temperature at sunset before the bat survey was above 10°C.

Table 2.1: Survey date and conditions

Date	Time	Temp °C Start- Finish	Sunset / Sunrise	Condition
03/04/18	11:00	8	n/a	Clear sky, damp underfoot
17/05/18	03:41 05:20	3 -1	05:11	Light cloud cover, dry, winds of 0.8m/s, sunset temps were 13°C

3 Methodology

3.1 Desk Study

The desk study provides contextual information such as the site's proximity to designated areas and known records of protected/notable species. This assists with the evaluation of the ecological value of the site.

The appraisal of the site included a desk study which took place in April 2018.

3.2 Field Survey

3.2.1 Habitats

An assessment of habitats was conducted following the "Extended Phase 1 Methodology" (Institute of Environmental Assessment 1995) and broadly the JNCC Handbook for Phase 1 Surveys 2010. Target notes were used to identify potential for protected or notable species or habitats, and to give more detailed site descriptions.

The level of survey is aimed to identify field signs of or habitats with the potential to support protected species and therefore assist in the determination for detailed phase 2 surveys.

3.3 Species Survey

The building assessed for potential for bat roosts, foraging and commuting. A phase 2 dawn survey was conducted using an Anabat Walkabout as well as Anabat SD1 and SD2. In accordance with Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition, Collins (2016).

An assessment of habitat suitability for water vole and otter was conducted by methods adapted from Harris *et al.*, (2009).

The building was assessed for potential for nesting birds.

3.4 Constraints of the Survey

All areas were accessible for this survey. It was conducted at an optimal time of the year for the assessment of flora and fauna. Standard techniques were followed, as outlined in Appendix B. No specific constraints have been identified.

4 Site Description

4.1 Desk Study

4.1.1 Designated Sites

The map from Natural England presented in Appendix C indicates that the site is within 1km of a designated area, this being the River Dee SSSI and River Dee and Bala Lake SAC.

4.1.2 Records

The relevant records for this site are swallows within 500m and historic records of common pipistrelles approximately 300m away.

Full records from the desk study can be found in Appendix C.

4.2 Field Survey-Phase 1 Description and Observations

The site comprises a run-down building with no roof. It has previously been used as a bakery and is sited immediately adjacent to a stream tributary of the River Ceiriog. Two bridges had been made over this stream prior to the survey to provide access to the building.

The habitats on and around the site can be summarised as follows:

Table 4.1: Summary of habitats on and around site

	Habitat	JNCC code
i.	Buildings	J3.6
ii.	Hard Standing	J4
iii.	Running water	G2

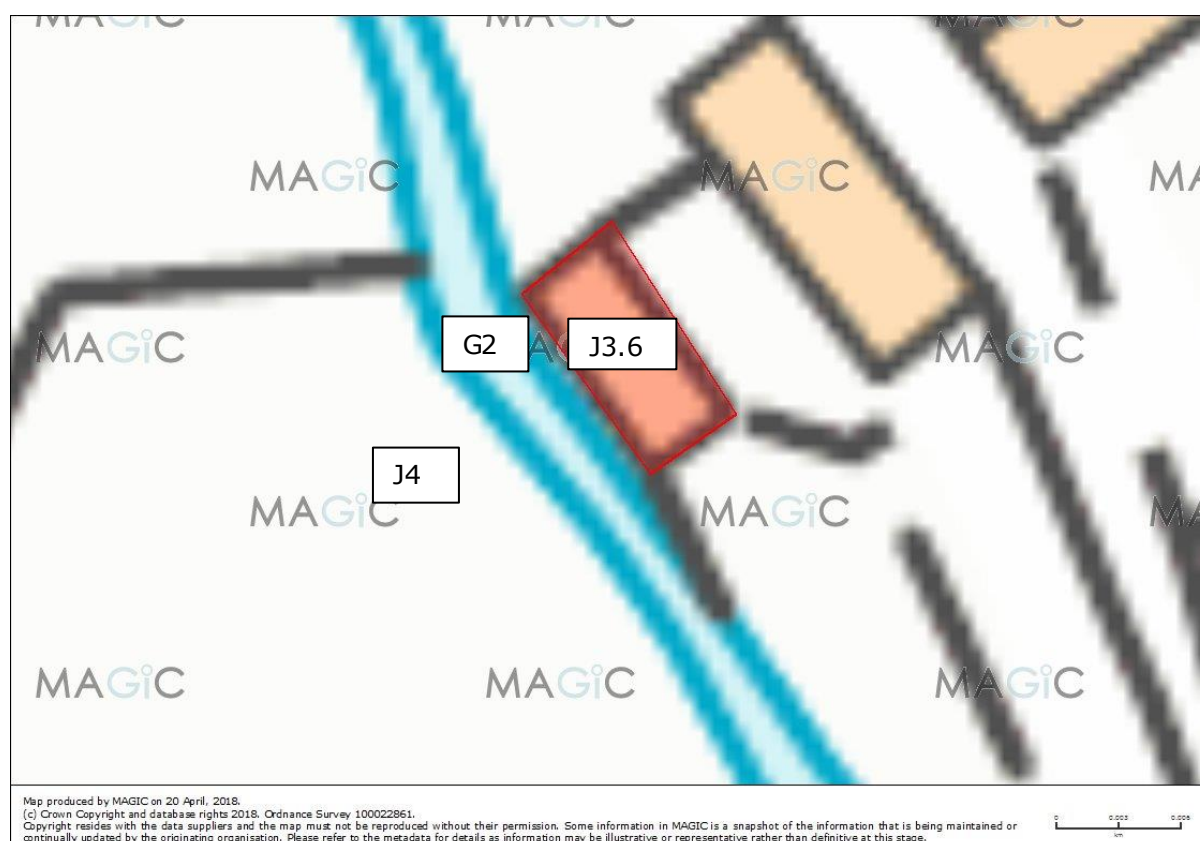


Figure 4.1. A map showing the JNCC phase 1 habitat classification codes for the site

4.2.1 Building

The building to be renovated is a typical welsh borders dwelling comprising double-skin stonework. At the time of survey it had no roof at all.



Figure 4.2. The building

The stonework has several mortar gaps which lead into large cavities behind the outer stonework, these could be used by individual bats in the summer, though no evidence was found during this survey. These gaps are currently not impacting the structural integrity or weatherproofing of the rooms inside, and so it is not an urgent job to re-point. Some of the major gaps are located in areas planned for removal to create new windows, such as that shown below.



Figure 4.3. Gap shown in brickwork

The building was thoroughly searched internally for evidence of bats but none was found. This is likely due to the highly open nature of the building owing to the lack of roof. There is a very large fireplace and chimney on the southeast gable. This chimney was checked for bats and none found.



Figure 4.4. Fireplace



Figure 4.5. Inside the chimney

The exterior of the chimney is much the same as the rest of the building – constructed of stone with significant mortar gaps which might offer refuge for individual bats.



Figure 4.6. Chimney exterior

No other potential for bat species was found inside the building.

There was no evidence of nesting birds such as swallows inside the building. This is likely to be due to the lack of roof allowing significant water ingress into the whole building.

4.2.2 Stream

The stream running along the house was very fast flowing at the time of survey, most likely due to recent snow melt. The banks were checked for evidence of species such as water vole, but no evidence was found and the water course is generally unsuitable for the species. The water is always flowing and so is considered unsuitable for species such as great crested newts.



Figure 4.7. Fast-flowing stream

Two bridges have already been constructed over this stream, allowing vehicular access to the land west of the building, and will be used as the private access once the conversion is complete. These bridges are corrugated metal concreted in to the banks on either side. The only further amendment regarding these bridges will be railings along the sides, which will have no impact on the biodiversity of the area.



Figure 4.8. Bridges



Figure 4.9. Underneath a bridge



Figure 4.10. Stone driveway leading to a bridge

The stone driveway is not planned for alterations.

4.2.3 Surrounds

The site is surrounded on all sides by the Berwyn Valley. This is comprised of grazed pasture and blocks of woodland on rolling hills. There are three trees to the immediate west of the site, these are located to the north of the existing driveway and have some potential for roosting bats. There is limited ecological value in the lands immediately around the development.



Figure 4.11. Land to the west

No evidence of species such as badger was seen in the immediate surrounds.

4.2.4 Open Water

Scrutiny of the OS map (Fig 2.1) and a walk around the locality showed there are no ponds within 250m of the site.

No further survey with respect to great crested newts is considered necessary.

4.3 Phase 2 Surveys for Bats

A precautionary survey was conducted on the 17th May 2018. This was a dawn survey chosen as having the best potential to identify roosting behaviour in a stone wall.

4.3.1 1st Activity Survey

One surveyor was used, with views of the southeast, southwest and northwest elevations with an Anabat SD2 being left on the first floor of the building throughout the survey.

No bat activity was observed during the survey. Examination of the Anabats revealed two common pipistrelle (*Pipistrellus pipistrellus*) passes, one at 03:54 and one at 04:18. Given the orientation of the bat detectors and lack of passes seen by the observer these were likely to be off-site to the southwest.

No bats were seen to enter the building or to enter any cracks in the stone walls.

5 Evaluation of Results

5.1 Potential Impacts on Designated Sites and Recorded Species

5.1.1 Designated Areas

The nearest SSSI is approximately 760m away. This is the River Dee SSSI and River Dee and Bala Lake SAC. The stream running alongside the building is a direct tributary of the River Ceiriog, itself a tributary of the River Dee. As such, any contamination of the stream will flow directly towards the SSSI.

Prior to, and During Development

Clearance of site and the development work itself might result in increased dust and silt contaminating the stream toward the river and this would cause a minor negative impact on the protected species recorded in this area. Careful working practices and a simple method statement will be utilised to prevent contamination.

Post-Development

Post-development no negative impact is considered likely on the River Dee SSSI. The new house will only be a very minor increase in local footfall and is not considered likely to contribute to a negative impact on the habitat.

Given the type of works planned little to no impact is expected from this development, recommendations will be made outlining any possible impacts, including preventative measures.

5.2 Habitats on Site

Table 5.1: Summary of habitats on site

Habitat type	Is the habitat capable of supporting protected species	Impact without consideration
Buildings	Building without roof. Access between stones on exterior of building for small animals	Potential negative impact
Hardstanding	Stone driveway, no potential for protected species	No negative impact
Stream	Stream is a direct tributary of a SSSI river. No potential for protected species in the stream itself.	No negative impact

5.3 Ecologically Important Species

Table 5.2: Summary of protected species on site with recommendations

Species	Observations	Impact without consideration	Recommendations
Mammals			
Bats	Some potential habitat in stonework	Potential negative impact	No evidence of use, but still some potential. New roost box provision.
Badgers	No evidence found around site	No negative impact	No action required
Birds			
Barn Owl	No evidence on site	No negative impact	No action required
Nesting birds	Some suitable habitat around site in building and exterior stonework, no evidence seen	Low negative impact	All work to seal the building to be undertaken outside nesting period Feb-Aug inclusive. New nest box provision
Herpetofauna			
Reptiles	Potential suitable habitat around site, none to be affected by development	No negative impact	No action required

5.3.1 Bats

All bat species are protected under the Conservation of Habitats and Species Regulations 2017 which implements the EC Directive 92/43/EEC in the United Kingdom. It is an offence, with certain exceptions, to:

- deliberately capture or kill any wild animal of a EPS.
- deliberately disturb any such animal.
- damage or destroy a breeding site or resting place of such a wild animal.
- keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal or plant of a EPS, or any part of, or anything derived from such a wild animal or plant.

A person found guilty of an offence is liable on summary conviction to imprisonment for a term not exceeding six months or to an unlimited fine or to both.

To allow a development that might result in an offence, a derogation licence can be sought via the implementation of a European Protected Species Licence. This is provided by Natural Resources Wales.

Work can be conducted under a derogation licence from Natural England providing suitable compensation and mitigation is provided and the “three tests” can be met. These are:

1. Regulation 55(2)(e) states: a licence can be granted for the purposes of “preserving public health or public safety” or other imperative reason of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.
2. Regulation 55(9)(a) States: the appropriate authority (Natural England) shall not grant

a licence unless they are satisfied "that there is no satisfactory alternative"

3. Regulation 55(9)(b) states that the appropriate authority shall not grant a licence unless they are satisfied "that the action licensed will not be detrimental to the maintenance of the population of the species concerned at favourable conservation status in its natural range."

There is potential for individual bats to utilise the gaps in the stonework on the exterior of the building. A precautionary bat activity survey did not reveal any active roosts, but such roosts can be transitory in nature and hard to identify. It will be recommended that the work be done at a time of year when bats are least likely to be present to minimise the risk to individual bats.

Three trees to the west of the site have some potential features for bats, but these will not be directly affected by the proposed development. The trees will be protected with a lighting plan.

The site will be enhanced for bats with the erection of an artificial bat roost box on the building, or other buildings adjacent to the east which are also owned by the client.

5.3.2 Other Mammals

Badgers

Badgers and their setts are specifically protected under the Protection of Badgers Act 1992. The act was primarily brought into force to prevent the deliberate injury to or death of badgers. Some aspects of the act affect developers. It is important that developers are aware of any badger setts located on the land they intend to develop.

All personnel working on sites where there are badgers should be aware of the Protection of Badgers Act 1992. Under this legislation it is an offence to:

- Damage a badger sett or any part of it.
- Destroy a badger sett.
- Obstruct access to, or any entrance of a badger sett.
- Causing a dog to enter a badger sett.
- Disturbing a badger when it is occupying a badger sett.

A badger sett is defined by the Act as "any structure or place, which displays signs indicating current (within the last 12 months) use by a badger".

No evidence of badgers was found on a walk around the site. The building itself has stone or clay tile floors which are of no value to badgers. Woodlands in the wider landscape are likely to be used by badgers, but no evidence was found in areas to be developed.

Water vole

The water vole is protected by law and is a conservation priority within the UK's Biodiversity Action Plan (BAP). Under the Wildlife and Countryside Act 1981 (as amended by Variation of Schedule 5) (England) Order 2008 it is an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place that water voles use for protection of shelter.
- Disturb a water vole whilst it occupies such a place.
 - Section 10 of the Act requires that "reasonable" steps are taken to avoid unnecessary damage to such structures.

- Capture, kill, disturb or injure water vole (on purpose or by not taking enough care).
- Damage or destroy a breeding or resting place (deliberately or by not taking enough care).
- Obstruct access to their resting or sheltering places (deliberately or by not taking enough care).
- Possess, sell, control or transport live or dead water vole, or parts of water vole.

No evidence of water vole was found along the banks of the stream running past the site. No negative impact would be expected from this development.

5.3.3 Birds

Under Section 1 of the Wildlife and Countryside Act 1981 (as amended), birds, their nests and young are all protected from damage, particularly during the breeding season. The Act allows for fines or prison sentences for every bird, egg or nest destroyed. It makes it an offence to:

- Intentionally kill, injure or take any wild bird.
- Take, damage or destroy the nest of any wild bird whilst it is in use or being built.
- Take damage or destroy the egg of any wild bird.
- To have in one's possession or control any wild bird, dead or alive or egg or any part of a wild bird or egg.

No evidence of nesting birds was seen in the building, though the abnormally long and cold winter may have delaying nesting behaviour in exposed places such as this site. There is potential for species such as house sparrows inside the stonework on the exterior, and for species such as swallow to nest on the timbers inside the ground floor. It will therefore be recommended that the work to seal the building will be conducted out of the bird nesting season (February to August inclusive) and there will be enhancements in the form of the erection of nesting boxes post-construction.

5.3.4 Reptiles

All species of reptiles receive a measure of protection under legislation.

The Wildlife and Countryside Act 1981 has been amended by the Countryside and Rights of Way Act (CROW) 2000. This applies to England and Wales only. The key relevant fact is:

- Section 9(4) is amended to create an additional offence of reckless damage to, destruction of, or obstruction of access to, any structure or place used for shelter or protection; and reckless disturbance while occupying such a structure or place.

This means that any application for planning permission has to offer mitigation to the planners to alleviate any potential damage (i.e. provide reasonable avoidance).

There is some suitable habitat for reptiles in the land around the site, but no suitable habitat was found in the areas to be affected by the proposed development. No negative impact would be expected on reptiles from this development.

6 Impacts and Mitigation Measures

To reduce or minimise negative impact on biodiversity, the following recommendations have been made. The client has agreed to install bat and bird boxes around site once developed.

6.1 Bats

It is recommended that work on repairing the stone walls and creation of a new window be conducted between the end of September and March to minimise the risk to individual bats that might use the gaps as a transitory roost.

6.1.1 Enhancements for Bats

1. It is recommended that provisions will be made for increasing roosting opportunities for bats, via the erection of at least one Schwegler 3FF bat box / Kent-style bat box on one of the nearby buildings owned by the client or on the building to be converted. These will be erected at a height of 3-4m and in a southerly, westerly or easterly facing direction.



Figure 6.1. Schwegler 3FF bat box

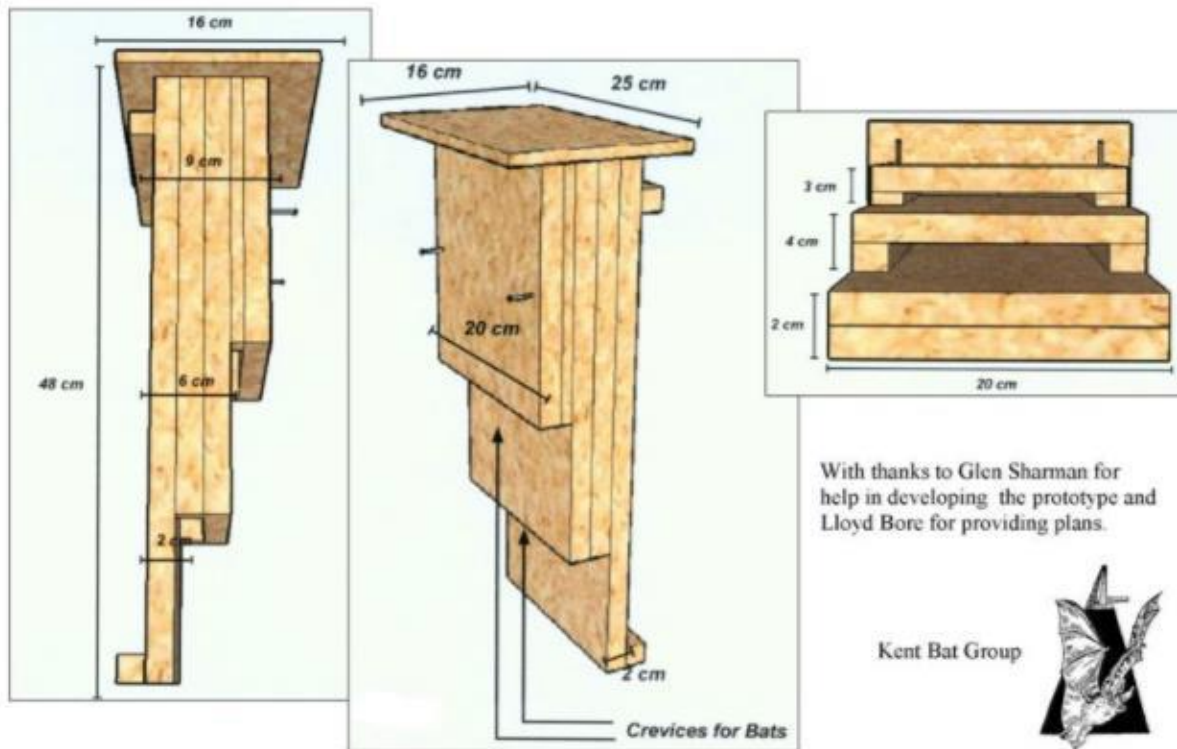


Figure 6.2: Designs for a Kent-style bat box

6.1.2 Lighting

1. A lighting scheme will be drawn up in line with BCT Guidance.
2. All of the newly proposed external lighting will be directed away from any vegetated boundary features to retain dark corridors for commuting bats across the site.
3. There will be no illumination of the trees to the west of the site.
4. All domestic external lighting will be below 1 lux, orientated towards the ground and set on a short timer, controlled by PIR (Passive Infra-Red).

6.2 Birds

6.2.1 Reasonable Avoidance Measures

1. Any work to seal the building will occur out of the bird nesting season, which is February to August inclusive. If this is not possible, a suitably experienced ecologist will conduct a check within the 24 hours prior to work commencement to ensure no nesting birds will be affected.
 - a. Note that a new roof can be installed sooner than this as it will ensure the future use of the building through adverse weather. The doors and windows will provide access into the building on the lower levels for birds. These will be left open throughout the summer.
2. All nesting birds will be left undisturbed until young have fledged. A 4m buffer will be left.

6.2.2 Enhancements for Birds

1. It is recommended that a range of artificial woodcrete boxes are erected around the site to provide an enhancement for passerine birds. A selection of the following nest boxes is recommended.



Cedarwood Sparrow Terrace



Schwegler 16S Integral
Swift Box



Schwegler 1b Bird Box



Schwegler 1ZA Roundhouse
Wren Box



Schwegler 2H Robin Box



Swallow Nest Cup

Figure 6.3: Provision for bird boxes

6.3 Biosecurity and Protecting the Stream

1. Biosecurity measures will be installed at the site entrances prior to work commencing. This will include a disinfectant mat for boots and a disinfectant wash for tools and equipment. These will be mandatorily used when entering and leaving the site.
2. A fence will be erected between the stream and the building with a plastic skirt attached to the base to prevent spills from entering the stream

3. Work involving the mixing of materials such as mortar will be conducted on a large plastic sheet with the edges turned up to contain any spillages and prevent contamination of the stream.

7 Concluding Remarks

The survey has focused on the potential of the building for bats and nesting birds.

The habitat for bats was limited to the gaps in the outer stonework of the building. A precautionary bat activity survey was conducted which did not identify any roosting activity. It is recommended that work on the walls will be conducted when bats are least likely to utilise the gaps as roosts. The site will be enhanced for bats with the erection of artificial roost boxes on the building.

No evidence of nesting birds was found on site, but the building did have potential. The gappy stonework on the exterior of the building could be utilised by species such as house sparrow, which do have records in the area. Work on sealing the building will be conducted outside of bird nesting season to avoid a potential offence.

The stream alongside the development is a direct tributary of a SSSI river, and so must be protected from contamination. Site biosecurity measures will be implemented, and barriers will be installed to prevent spillage contamination.

The method statements provided in this report will be followed, and works will be done at a suitable time of year.

Appendices

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A Details of Surveyors

Table A.1: Surveyor experience and licences

Name	Membership of associations/ experience	Licenses
Peta Marshall BSc(hons)MA	Principal Consultant MCIEEM PIEMA Peta has a degree in Applied Biology and has been working in commercial environmental assessment for over 10 years. She has 10+ years' experience surveying for protected species. As a member of the CIEEM she is bound by professional conduct.	Holder of survey licenses for bats and newts in England and Wales. Registered Consultant for Low Impact Class Licence for Bats England: 2015-12200-CLS-CLS Bats RC084 BLICL 2015-18939-CLS-CLS GCN Dormice-2017-29225-CLS-CLS Wales: Bats-77554:OTH:CSAB:2017 GCN-77574:OTH:SA:2017
Logan Maggs BSc(hons)	Lead Consultant Logan has a degree in Conservation and Land Management. He has 9 years' experience conducting environmental appraisals and phase 2 surveys for bats and newts in England and Wales.	Holder of survey licenses for bats and newts in England and Wales. England: Bats - 2016-24901-CLS-CLS GCN - 2017-29218-CLS-CLS Wales: Bats - 75748:OTH:CSAB:2017 Newts - 75963:OTH:SA:2017
Ben Jones BSc(hons) MSc	Consultant Ben has a degree in Marine and Freshwater biology and a Master's degree in "Managing the Environment". He has 3 years' experience conducting environmental appraisals and phase 2 surveys for bats and newts in England and Wales.	Holder of survey licenses for bats and newts in England and Wales. England: Bats - 2017-29112-CLS-CLS GCN - 2016-25209-CLS-CLS Wales: Bats - 76324:OTH:CSAB:2017 GCN - 78716:OTH:SA:2018
Brian Marshall	Technical Director CEnv PEA MIEMA Consultant with over 30 years in the Environmental Sector	

B Detailed Methodology

Desk Study

Table B.1: Data sources

Organisation/Resource	Information Assessed
Freely available online species datasets (NBN Atlas)	Statutory Designation (2km) Non-statutory designations (2km) • Local Nature Reserves Protected/UK BAP Species records (2km)
MAGIC website	International statutory designations (1km) • Special Protection areas (SPA) • Special Areas of Conservation (SAC) • RAMSAR sites National statutory designations (1km) • Sites of Special Scientific Interest (SSSI) • National Nature Reserves (NNR) EPS Licenses for protected species (2km)
Local Records Centre - Cofnod	Protected/UK BAP Species records (2km)

A data search was purchased from Cofnod. This would identify the protected species that have formally been recorded in the area.

A search on Multi Agency Geographic Information for the Countryside (Magic Maps) determined nearby designated areas. The map is presented in Appendix C.

Field Survey

Species Survey

Bats

The building was assessed for potential for bat roosts, foraging and commuting.

An external assessment of all structures on site was undertaken to determine potential roost features (PRF). The potential suitability of the structures assessed was assigned a rating of low to high in accordance with table 4.1 of Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition, Collins (2016).

An internal assessment of all structures was undertaken by a Natural England licensed surveyor for evidence of roosting bats such as droppings, feeding remains and staining.

Daytime surveys were conducted with the aid of a strong torch and a pair of Pentax Papilio 8.5x21 close focus binoculars. Bat species may leave little evidence of their presence. Evidence for the presence of bats includes:

- Holes, cracks and rot holes used as roosts, marked by streaks of urine and faeces.
- Smoothed, darkened edges where bats have rubbed and left natural body oils when entering and exiting a space.
- Faeces under a roof access point, a well-used feeding point or a resting spot.
- Feeding signs such as discarded insect wings under a feeding point.
- Lack of cobwebs around eaves, roof spaces, beams or ceilings where routes are kept clear by bats.
- Presence of roosting or dead bats in or behind any object.

All trees examined were categorised on their potential roost features. These features include cracks, splits in limbs, cavities, loose bark and thick stemmed ivy. Where appropriate these features were assessed using binoculars and/or endoscopes.

Phase 2 bat activity surveys were conducted to reinforce the findings using heterodyne and frequency division bat detectors (Anabat SD1 and 2, Anabat Walkabout). Activity surveys are conducted to establish the presence of bats within a structure, what species they are, approximately how many are present, and if possible, where they are exiting a roost.

Methodology used is in accordance with recommendations by BCT, Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition, Collins (2016).

Bats were identified from the characteristic echolocation calls using appropriate computer sonogram analysis software.

Badgers

Surveys were conducted using guidance from Scottish Natural Heritage commissioned Report No 096 (2003).

Daytime surveys for badgers involved looking for:

- Scrapings where badgers have dug for food or used as latrines.
- Signs of a sett, including signs of use such as presence of badger hair
- Tracks and prints.

Water Vole

An assessment of habitat suitability for water vole and otter was conducted by methods adapted from Harris *et al.*, (2009). The standard survey methodology; Strachan and Moorhouse (2006), was used for surveying for water vole. This involved searching for latrines, burrows, footprints, runs, feeding remains or lawns. Signs of otter and mink are also recorded.

Birds

Evidence of nesting birds, including barn owls using a building involved looking for:

- Presence of nests
- Collections of droppings and/or feathers
- Highly distinctive droppings or splats under roosting points.
- Presence of owl pellets/feathers

Amphibians and Reptiles

The assessment of aquatic habitat is based on the Habitat Suitability Index (HSI) and is applied according to guidance set out by the Oldham 2000, superseded by ARG in 2010, ARG UK Advice note 5. The HSI is a quantitative method of assessing the potential quality of a body of water in terms of its ability to sustain a population of great crested newts.

The terrestrial habitats at the application site were surveyed and assessed for their suitability and potential value for the support of GCN. The general topography, ground conditions and presence or absence of vegetation were recorded. A refugia search was conducted for amphibians and reptiles by looking under any logs, large stones and other debris.

C Desktop Study

Designated Sites

MAGiC

Hafod Adams, Llanarmon

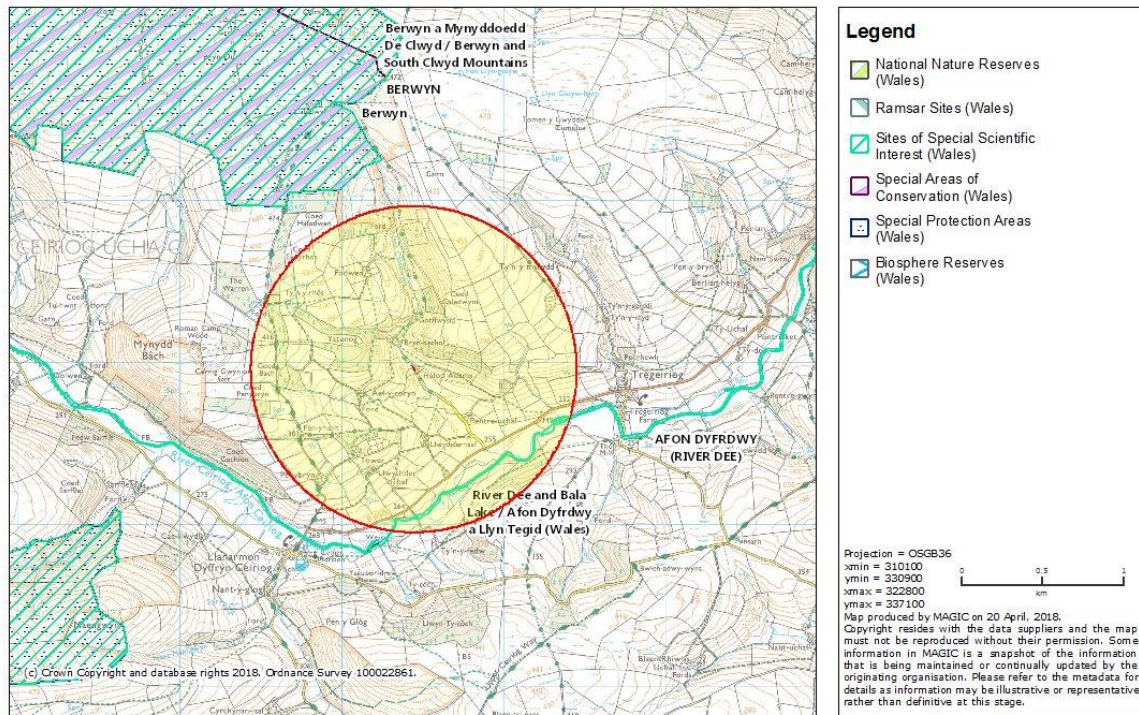


Figure C.1: An Environmental map for Llanarmon taken from - Nature on the Map-Magic Maps. © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2018.

The map from Natural England presented in Figure C.1 indicates that the site is within 1km of a designated area.

Table C.1: Table of designated sites

Type of Designation	Name of Site	Site Ref	Reason for Designation	Features	Distance & Direction
Statutory - SSSI	River Dee	31WDW	Geological & Biological	Carboniferous geology, range of river types, several species of interest	760m South
Statutory - SAC	River Dee and Bala Lake	UK0030252	Biological	Species including Bullhead, River, Sea & Brook lampreys, Floating water plantain, Otter & Atlantic salmon	760m South

The nearest SSSI is approximately 760m south of the site. This is the River Dee SSSI which also forms the River Dee and Bala Lake SAC.

It is designated as a SSSI for several reasons including the geology, the river type and several species of interest – many of which are the reason behind the SAC designation, including Bullhead (*Cottus gobio*), River and Brook lampreys (*Lampetra fluviatilis* and *L. planeri* respectively), Floating water-plantain (*Luronium natans*), Otter (*Lutra lutra*), Sea lamprey (*Petromyzon marinus*) and Atlantic salmon (*Salmo salar*).

Records

A desk search was conducted focussing on the area within 2km of the site. The following species have official records in that area:

Bat species:

Common pipistrelle (*Pipistrellus pipistrellus*)

Cofnod hold one record for bats in the area, this is a common pipistrelle recorded in 1991 approximately 300m to the north. This record is historic and cannot be considered an accurate depiction of bat populations today.

Other mammals:

Cofnod hold no records of other mammals in the area around this site.

Birds

House Martin (*Delichon urbicum*)

Swallow (*Hirundo rustica*)

House Sparrow (*Passer domesticus*)

Wren (*Troglodytes troglodytes*)

The nearest records of animals likely to use the building are swallows. These are provided to Cofnod with only a four-figure grid reference, accurate only to 1km. The centre of this area is approximately 470m away. The records are provided from between 2013 and 2016.

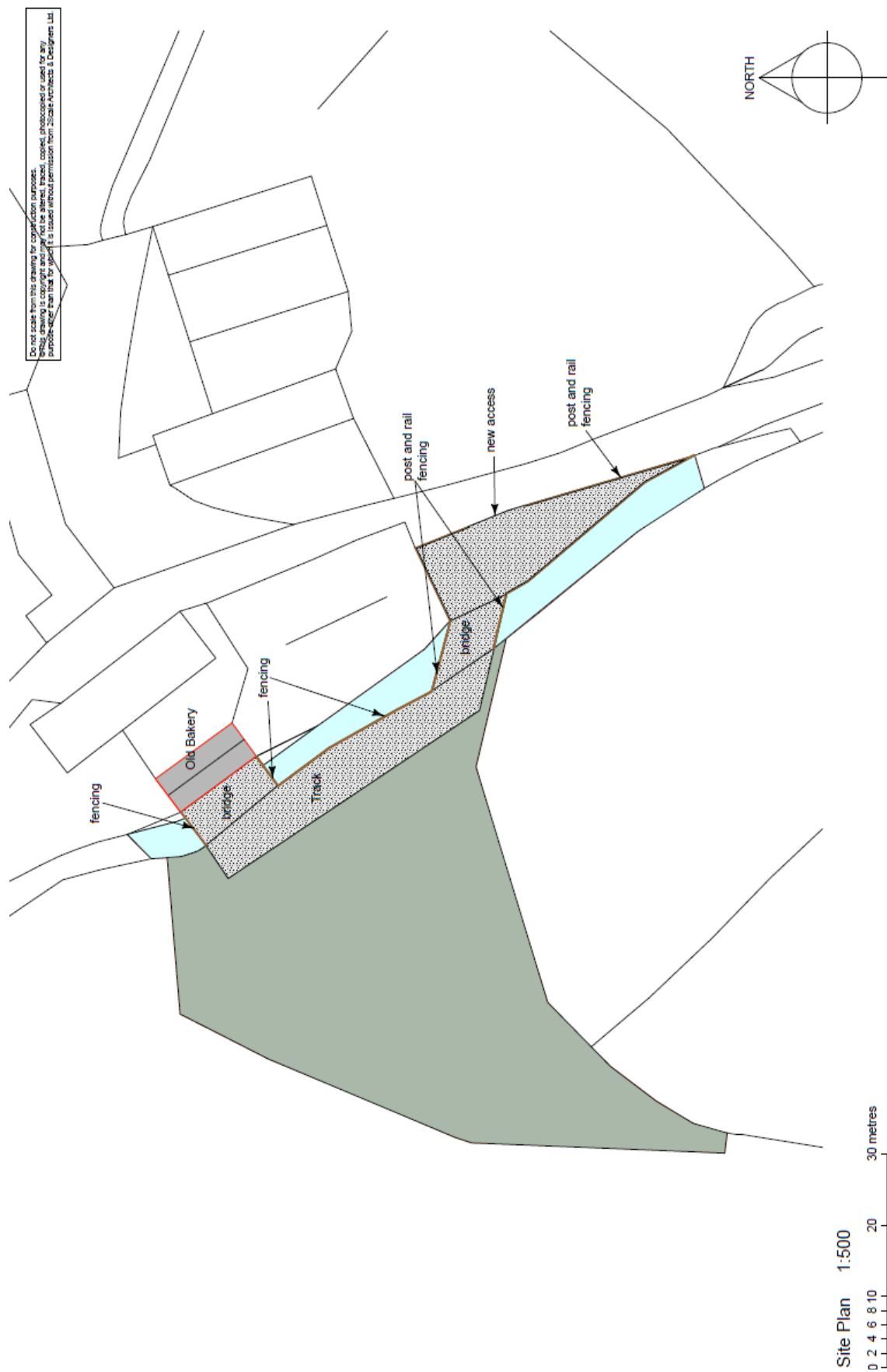
Amphibians and Reptiles

Cofnod hold no records of amphibians or reptiles in the area around this site.

Invasive species

Cofnod hold no records of invasive species in the area around this site.

D Site Plans



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