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Chirk
Wrexham
LL14 5AB

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Author: Chloe Sheil MZool (Conservation)
chloe@greenscape.pm



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Author:	C. Sheil MZool (Conservation) Assistant Consultant		3 rd September 2020
Reviewed by:	B. Jones BSc(hons) MSc Lead Consultant		4 th September 2020

Greenscape Environmental Ltd.
Registered Office: Long Acres, Lyth Bank, Shrewsbury, Shropshire, SY3 0BW
Company Reg number: 5364283

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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 the 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 Executive Summary

1.1 Purpose of the Report

Greenscape Environmental Ltd was commissioned by Helen and Alan Rogers to undertake a preliminary ecological appraisal of 2a Llwyn Y Cil to provide supporting information for a planning application for the demolition of the existing bungalow and the construction of a new dwelling.

The survey report has three principal aims:

- To provide an assessment of the ecological value of the site in local context.
- To provide details of bat activity surveys that were conducted.
- To identify potential ecological constraints relating to the development, and recommend measures to avoid, reduce or manage negative effects, and to provide a net ecological gain.

1.2 Methodology

The appraisal included a desktop study and a site visit undertaken at the site, OS grid reference SJ28073788 on 27th July 2020 by C Sheil. Bat surveys were conducted on 3rd and 18th August 2020, and 1st September 2020 by C Sheil and B Jones.

1.3 Key Impacts and Mitigation Measures

The desktop study included a search for nearby designated sites and previously recorded protected species. Considered of potential significance for this site was bats and nesting birds.

The site extends to 0.1ha and comprises a bungalow, garage and kennels, an allotment, trees, hedgerows and fences all set in a garden of amenity grassland and hardstanding.

Bat droppings were found in the loft space which prompted further surveys for bats. A maternity roost of soprano pipistrelles (peak count of 12 individuals) was recorded emerging from four separate access points on the southwest gable end. **The demolition of the bungalow must be done under a mitigation licence from NRW and will follow a strict method statement.** The demolition of the garage and kennels can be done as soon as planning permission has been granted.

The hedgerow removal is likely to have a negative impact on nesting birds. It is recommended that these works are done outside of the bird nesting season which is February to August inclusive.

1.4 Conclusion

It is recommended the biodiversity value of the site will be enhanced with the inclusion of bat and bird boxes. The landscaping will also be improved by planting new native species hedgerows and trees around the garden. The method statements provided in this report will be followed, and work will be conducted at a suitable time of year to minimise potential impacts. There are no ecological constraints, other than those mentioned above, to the development as currently proposed.

Table 1.1. Timing of Works

Action	Timing	Justification
Update phase 1 survey	After 18 months from survey issue date	Ecological features can change and develop over time
Update emergence/re-entry survey	If work is to commence more than 12 months after the survey if complete	To ensure site conditions have not significantly altered prior to commencement
Removal of hedgerows	September to January inclusive	This avoids nesting birds
Apply for mitigation licence	Once planning permission has been granted	To avoid committing a wildlife offence by destroying a known bat roost
Demolition of bungalow	October to March, after the licence has been granted	Bats are least likely to be present at this time

2 Introduction

This report has been compiled by Chloe Sheil MZool (Conservation) who has 2 experience conducting ecological appraisals. It has been reviewed in line with Greenscape's Quality Management System.

For full details of surveyors and licences please see Appendix A.

2.1 Project Background

Greenscape Environmental Ltd was commissioned by Helen and Alan Rogers to conduct a survey to determine the presence of protected species and potential for the damage or destruction of habitats of value. This forms part of the planning application for the proposed development at 2a Llwyn Y Cil.

The project involves the demolition of the existing bungalow, garage and kennels and the construction of a larger dormer bungalow.

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 priority species which may be disturbed or lost in the event of development.

The purpose of this report is to:

- Identify the key ecological constraints to the proposed development.
- Inform planning to allow significant ecological effects to be minimised or avoided where possible.
- Allow any necessary mitigation or compensation measures to be development following the mitigation hierarchy.
- Identify any additional surveys that may be required to inform the assessment.
- Identify the opportunities offered by a project to deliver ecological enhancement under NPPF Section 15.

The Local Planning Authority will require further information regarding bats because the development involves the demolition of a building with hanging tiles that is within 200m of woodland and water.

2.3 Site Context and Location

The site is located to the east of Chirk, OS grid reference SJ28073788. It is set in a rural environment surrounded by open fields and woodland. There is high connectivity to the surrounding countryside via hedgerows and woodland. The surrounds provide potential foraging, resting, hibernating and commuting opportunities for mammals, including bats, and nesting birds.

3 Methodology

Broad methodologies for data collection and interpretation were informed by guidance outlined in CIEEM (2017) – Guidelines for Preliminary Ecological Appraisals.

3.1 Desk Study

The desk study provides contextual information such as the site's proximity to designated areas and known records of protected or notable species. This assists with the evaluations of the ecological value of the site in the wider landscape. This study was undertaken in August 2020.

The data search for protected species was conducted using NBN Atlas and focussed on the area within 2km of the site.

This level of desk study is considered adequately proportionate to the development proposals, the complexity of the site, the type of planning permission being sought, and the site's landscape context.

3.2 Field Survey

3.2.1 Date and Survey Conditions

The phase 1 ecological appraisal was undertaken at the site on 27th July 2020 by C Sheil. The conditions were optimal for the type of survey conducted.

Phase 2 bat surveys were conducted by C Sheil and B Jones in August and September 2020 under optimal conditions for assessing bat activity.

3.2.2 Habitats

An assessment of habitats was conducted following the JNCC Handbook for Phase 1 Surveys (2010).

3.2.3 Hedgerows

The aim of the assessment is to ascertain whether the hedgerows could be classified as important according to the definitions listed in the Hedgerow Regulations (1997).

3.3 Species Survey

Features on site were assessed for potential for bat roosts, foraging and commuting. This was conducted in accordance with Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition, BCT, Collins (ed.) (2016).

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

Features on site were assessed for potential for nesting birds.

The terrestrial habitats at the application site were surveyed and assessed with respect to suitability and potential value for great crested newts.

Phase 2 bat activity surveys were conducted to ascertain the presence/absence of any bat roosts and their nature.

3.4 Constraints of the Survey

All areas were accessible for this survey. It was conducted at an optimal time of year for the assessment of flora and fauna. Techniques were followed as outlined in Appendix B. No specific constraints have been identified. The internal search revealed that the buildings had not been subjected to any form of specific cleaning and was in a natural redundant state.

The identification of calls and species using sonogram analyses are dependent on the clarity of the sonogram recording, which may be affected by the distance from the bat and background noise. Species of *Myotis* bats are identified to genus level on the basis of the inherent difficulty in distinguishing between species from their echolocation calls.

4 Baseline Ecological Conditions

4.1 Nearby Features of Importance

4.1.1 Designated Sites

MAGiC

2a Llwyn Y Cil

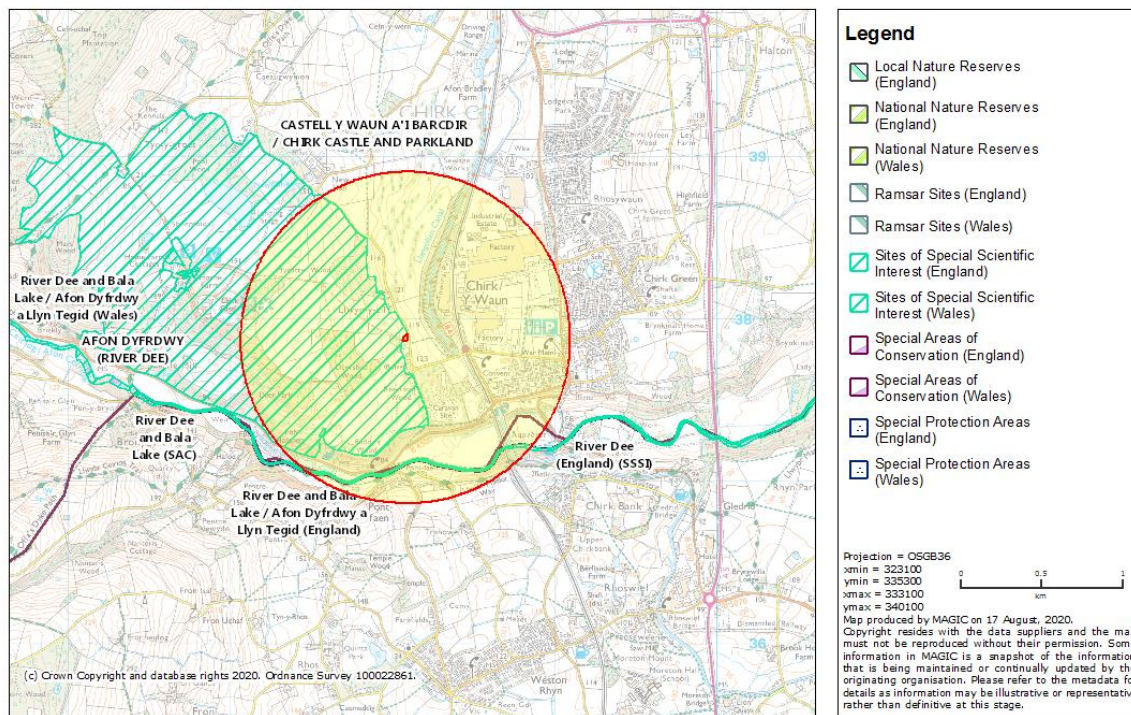


Figure 4.1. Identifying any designated areas near site, a 1km buffer is shown

The map from Natural England presented in Figure 4.1 indicated that the site is within 1km of two designated areas.

Table 4.1. Details of statutory designated sites within 1km

Type of Designation	Site Name & Ref	Reason for Designation	Distance & Direction
Statutory - SSSI	Chirk Castle and Parkland	Mixed – Ancient wood pasture and parkland with diverse range of species, roosts of several bat species including lesser horseshoe bats	Immediately west
Statutory - SSSI	River Dee (Ref: 1008731)	Mixed – Range of protected species including otter and Atlantic salmon. Transitions through range of river types	700m south

4.1.2 Nearby European Protected Species Licences

MAGiC

2a Llwyn Y Cil

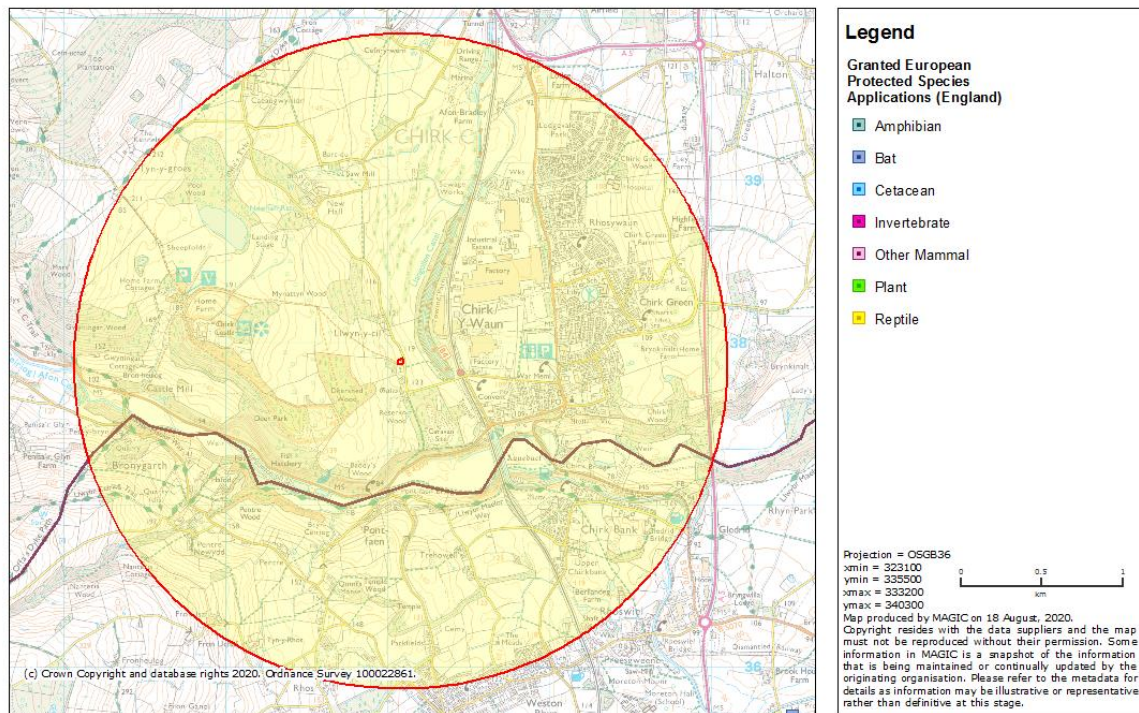


Figure 4.2. Identifying any previous EPS licences near site, a 2km buffer is shown

European Protected Species Licence data was gathered from Magic on the Map and was provided by Natural England.

No EPS licences have been granted within 2km of the site. The nearest licence began in 2011 for brown long-eared bats and Natterer's bats 2.9km to the south.

4.2 Habitats on Site

The site comprises a bungalow, garage and kennels in a garden of amenity grassland and hardstanding. An allotment lies in the western corner and boundaries consist of lines of trees, hedgerows and fences.

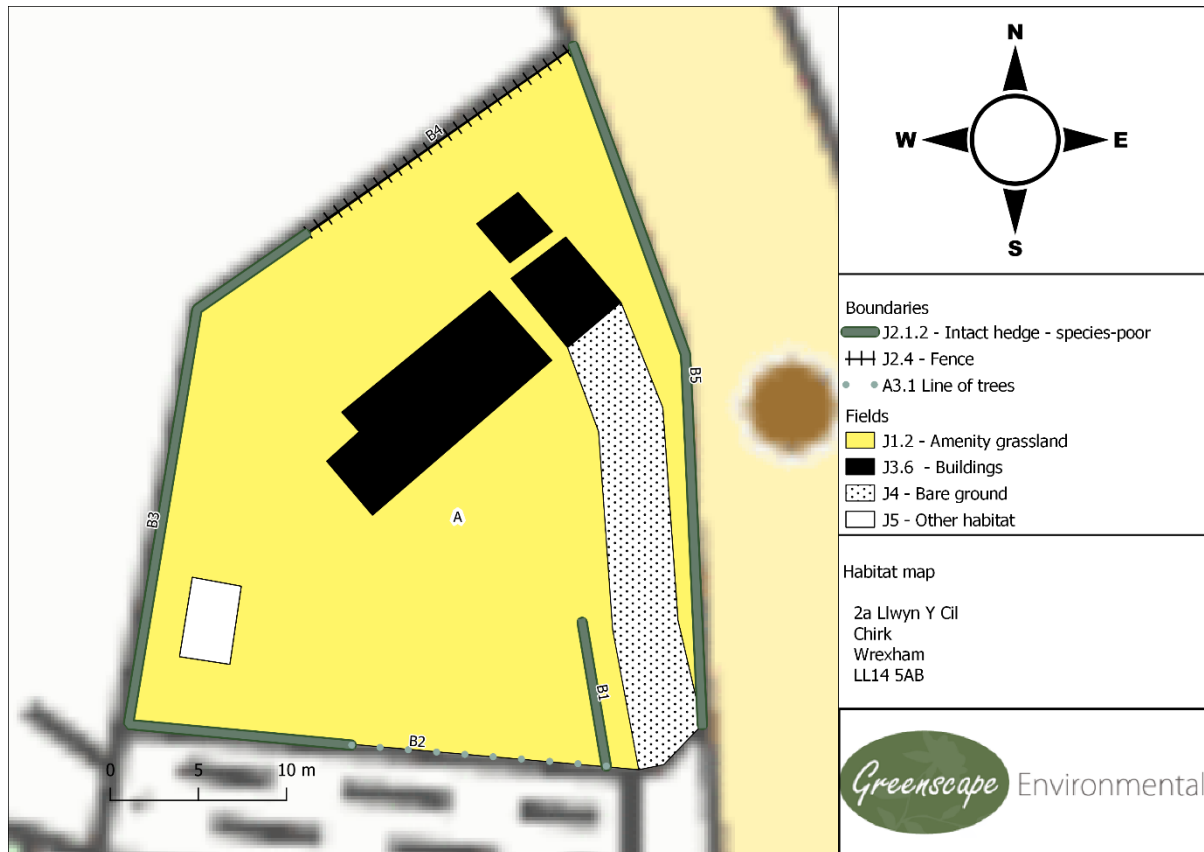


Figure 4.3. A map showing the JNCC phase 1 habitat classification codes for the site

The bungalow is constructed of concrete with a concrete tile pitched roof as well as a felted flat roof. Hanging tiles lie on each gable end.



Figure 4.4. View of bungalow from west

The bungalow has one continuous loft space insulated with fibreglass wool. The roof is supported by wooden trusses and a central ridge beam. Both the roof and the gable ends are lined with bitumen hessian.



Figure 4.5. Loft space

The garage is built of timber panelling, concrete and breeze block. The roof is built of corrugated metal sheeting.



Figure 4.6. Garage from south

The kennels are built of timber panelling and metal bars. The have felted roofs.



Figure 4.7. Kennels from east

The garden comprises amenity grassland. Species include white clover (*Trifolium repens*), daisy (*Bellis perennis*), creeping buttercup (*Ranunculus repens*), ground ivy (*Glechoma hederacea*), dandelion (*Taraxacum officinale*), ragwort (*Senecio jacobaea*) and greater plantain (*Plantago major*).



Figure 4.8. Overview of garden

The allotment is bound by wire mesh fencing and is well tended with a variety of plants growing.



Figure 4.9. Overview of allotment

Access to the site is from via a gravel driveway.



Figure 4.10. Driveway

Boundaries

B1 is an intact hedgerow 1m high and 1m deep. Species include privet (*Ligustrum* sp.) and sycamore (*Acer pseudoplatanus*).



Figure 4.11. Hedgerow along driveway (B1)

B2 is a line of trees including cypress (*Cupressus x leylandii*), elder (*Sambuca nigra*) and holly (*Ilex aquifolium*)



Figure 4.12. Line of trees along south (B2)

B3 is an intact hedgerow 1.5m high and 1m deep. Species include ash (*Fraxinus excelsior*), holly, sycamore, hazel (*Corylus avellana*), privet, hawthorn (*Crataegus monogyna*) and cypress.

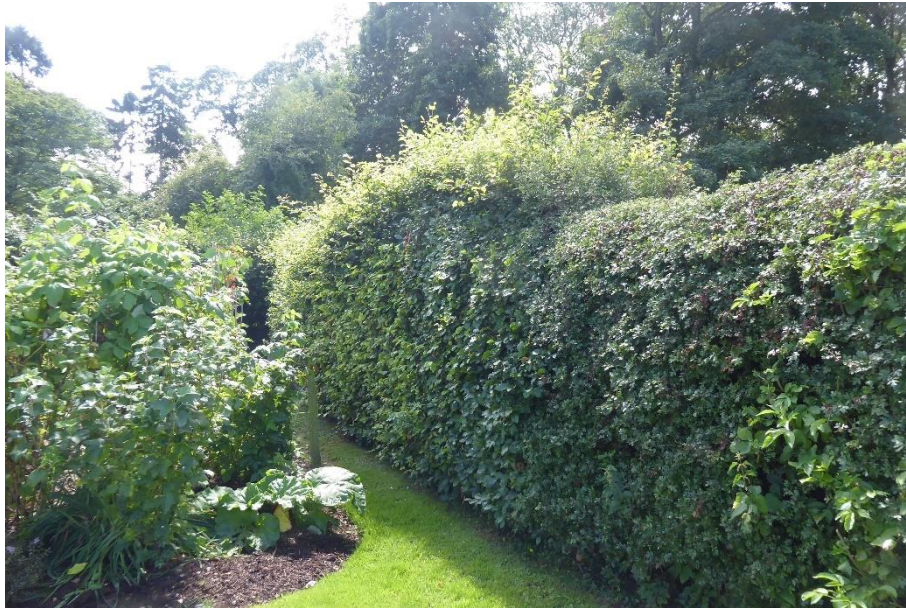


Figure 4.13. Hedgerow along the south and west (B3)

B4 is a wooden post and wire mesh fence.



Figure 4.14. Fence along north (B4)

B5 is an intact hedgerow. Species include hawthorn and sycamore.



Figure 4.15. Hedgerow along eastern boundary (B5)

4.3 Bats

4.3.1 Records

Greenscape Environmental have recorded several bat species within the vicinity, including a maternity (100+) of lesser horseshoe bats (*Rhinolophus hipposideros*) at Chirk Castle, approximately 1.2km west, and a maternity (~100) of soprano pipistrelles in a redundant building in Chirk Castle grounds approximately 1.5km northwest. Work has been conducted under licence, obtained from NRW by Greenscape Environmental, for lesser horseshoe at Chirk Castle and Brynkinalt, approximately 2.2km to the east.

The NBN Atlas was used to supplement Greenscape's own records. The NBN Atlas holds records as follows: Daubenton's bat (*Myotis daubentonii*), Natterer's bat (*M. nattereri*), noctule (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), brown long-eared bat (*Plecotus auritus*) and lesser horseshoe bat.

The nearest records on the NBN Atlas of lesser horseshoe bats, Daubenton's bats, Natterer's bats, noctule and brown long-eared bats are approximately 700m to the southwest, from 2009. The nearest records of common pipistrelle and soprano pipistrelle are approximately 400m to the south, from 2009.

Bat species data was provided to the NBN Atlas by NRW Regional Data, Waterway Survey, Mammal Records Captured from Licence Returns Submitted to NRW, NRW North Wales Bat Roosts, Roost Count and Ad-hoc Bat Records from Across Wales. Unless stated otherwise, all records are provided to the NBN Atlas under licences CC-BY or OGL.

4.3.2 Field Observations

The site had several features for bats and evidence was found on the floor of the loft space. These were in low numbers but were found on the southwest side of the loft, next to the gable end.



Figure 4.16. Bat droppings in loft

Few potential access points were found on the roof but several were found on the gable ends under gaps between hanging tiles or where tiles are missing.



Figure 4.17. Potential access point

Phase 2 Bat Surveys

A peak count of 12 soprano pipistrelles were recorded emerging from the southwest gable end of the bungalow. Access points included missing tiles and a gap at the peak of the hanging tiles directly under the ridge. For full details see Appendix D.



Figure 4.18. Emergence points

Table 4.2. Evaluation of survey results

Structure	Species	Count	Roost Location	Site Status Assessment (e.g. maternity)	Conservation Significance
Bungalow	Soprano pipistrelle	12	Southwest gable end	Maternity	Moderate

4.4 Other Mammals

4.4.1 Records

Records of other mammals within 2km include water vole (*Arvicola amphibius*), hedgehog (*Erinaceus europaeus*), hare (*Lepus europaeus*), otter (*Lutra lutra*), badger (*Meles meles*) and polecat (*Mustela putorius*).

The nearest records of badger are within 800m, from 2004. The nearest records of hedgehog are approximately 700m to the southwest, from 2016. The nearest records of polecat are approximately 1.8km to the northwest but a date is not given.

Mammal data (not including bats) was provided to the NBN Atlas by the SEDN, the Atlas of Mammals, Non-avian taxa, NRW Licence Return Dataset and Wales Otter Survey Database. Unless stated otherwise, all records are provided to the NBN Atlas under licences CC-BY or OGL.

4.4.2 Field Observations

The site had several features for mammals other than bats. The trees and hedgerows provide shelter and dark corridors for commuting and foraging. The amenity grassland also provides potential foraging for hedgehogs and badgers. No evidence of any mammals other than bats was found.

4.5 Birds

4.5.1 Records

Records of birds within 2km include swift (*Apus apus*), house martin (*Delichon urbicum*), swallow (*Hirundo rustica*), house sparrow (*Passer domesticus*) and starling (*Sturnus vulgaris*).

The nearest records of all species above are approximately 1.3km away, from 2013.

Bird species data was provided to the NBN Atlas by the SEDN. Unless stated otherwise, all records are provided to the NBN Atlas under licences CC-BY or OGL.

4.5.2 Field Observations

The site had several features for birds. The trees and hedgerows both provide potential nesting habitat, although no evidence of nesting was found.

Bird species seen on site include doves (*Streptopelia decaocto*), buzzard (*Buteo buteo*), crows (*Corvus corone*) and magpies (*Pica pica*). Evidence was also found of a bird of prey feeding on site. An area of plucked feathers were found in the garden.



Figure 4.19. Evidence of birds of prey

4.6 Amphibians

4.6.1 Records

Records of amphibians within 2km include smooth newt (*Lissotriton vulgaris*), common frog (*Rana temporaria*) and great crested newt (*Triturus cristatus*).

The nearest records of all species above are 1.1km to the northwest, near New Hall, from 2008.

Amphibian species data was provided to the NBN Atlas by NRW Regional Data and Great Crested Newt Sites in Wales. Unless stated otherwise, all records are provided to the NBN Atlas under licences CC-BY or OGL.

4.6.2 Field Observations

The site had several features for amphibians. However, no ponds were found within 250m.

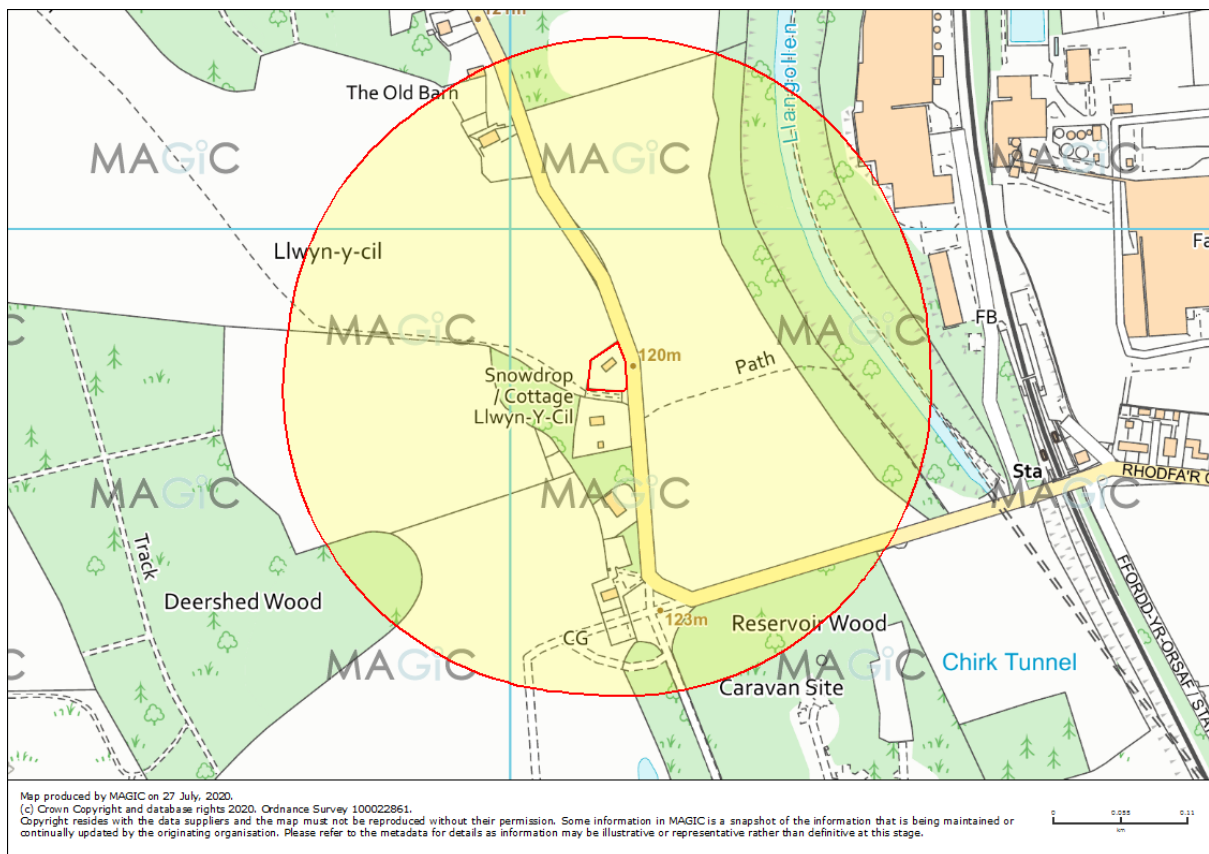


Figure 4.20. OS Map showing a 250m buffer around site, showing lack of ponds

4.7 Reptiles

4.7.1 Records

No records of reptiles were found within 2km.

4.7.2 Field Observations

The site had few features for reptiles. The amenity grassland provides little cover and no potential refugia was found on site. The trees and hedgerows provide cover but few basking opportunities.

4.8 Invertebrates

4.8.1 Records

Records of invertebrates within 2km include brown spot pinion (*Agrochola litura*), dusky thorn (*Ennomos fuscantaria*) and powdered quaker (*Orthosia gracilis*).

The nearest records of brown spot pinion and dusky thorn are 1.9km to the south, in Weston Rhyn, from 2006. The records of powdered quaker are historic and are from 1996.

Invertebrate species data was provided to the NBN Atlas by the SEDN and the Welsh Invertebrate Database. Unless stated otherwise, all records are provided to the NBN Atlas under licences CC-BY or OGL.

4.8.2 Field Observations

The site had several features for invertebrates. The plants in the allotment and the trees and hedgerows provide nectar and larval foodplants as well as shelter. Species seen on site include a hawkmoth (*Hemaris* or *Macroglossum* sp.), tortoiseshell (*Aglais urticae*), large white (*Pieris brassicae*), meadow brown (*Maniola jurtina*), buff-tailed bumblebee (*Bombus terrestris*.) and a dronefly (*Eristalis tenax*). No BAP or protected species were seen.

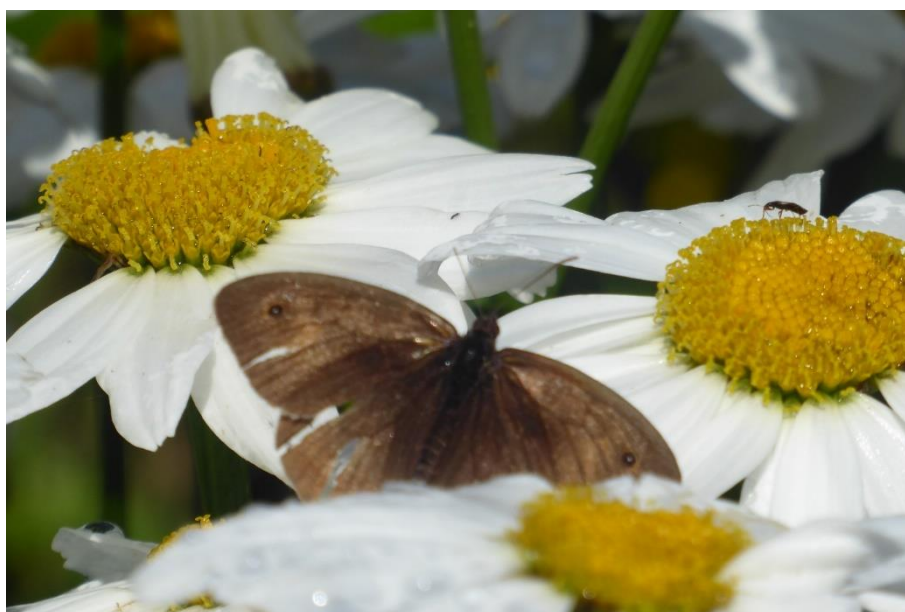


Figure 4.21. Meadow brown



Figure 4.22. Bumblebee



Figure 4.23. Dronefly

4.9 Invasive Species

4.9.1 Records

Records of invasive species within 2km include Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and American mink (*Neovison vison*).

The nearest records of Japanese knotweed and Himalayan balsam are approximately 600m to the southeast, from 2010.

Invasive species data was provided to the NBN Atlas by Vascular Plant Records Verified via iRecord, Records of Invasive Non Native Species held on the Cofnod Database, River Macrophyte Database and the SEDN. Unless stated otherwise, all records are provided to the NBN Atlas under licences CC-BY or OGL.

4.9.2 Field Observations

No evidence of any invasive species was seen on site.

5 Description of Proposed Development

The current plans are for the demolition of the existing bungalow, garage and kennels and the construction of a larger dormer bungalow and garage. Hedgerows are to be removed.

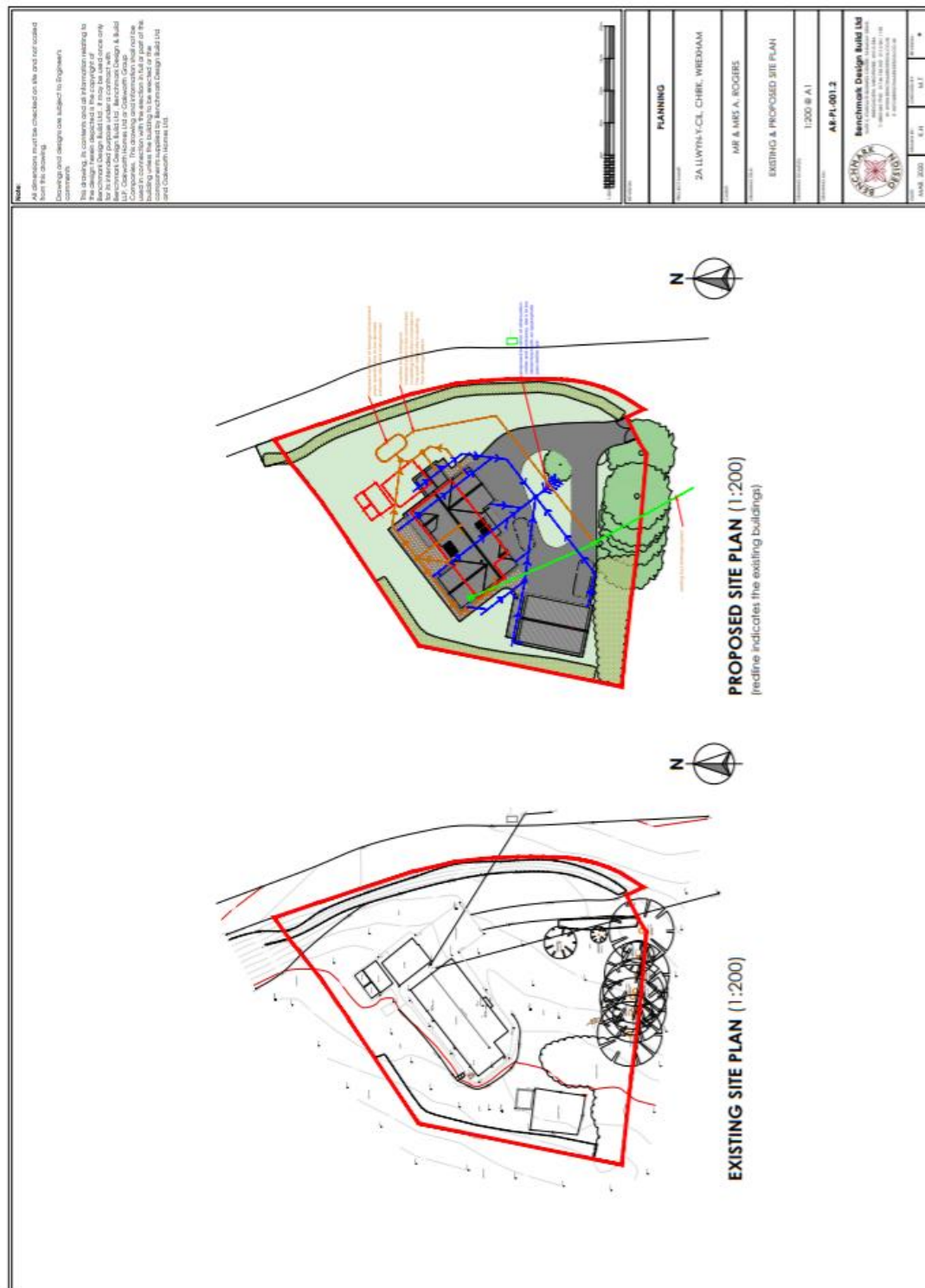


Figure 5.1. Proposed plans

6 Impacts, Enhancements and Mitigation

6.1 Nearby Features of Importance

6.1.1 Impacts

Figure 4.1 shows that the nearest SSSI is adjacent to the site. This is Chirk Castle and Parkland. Potential impacts on this include aerosolised dust blowing into the SSSI. Removed topsoil or chemicals will not spill into the SSSI as it is uphill from the development site. Any spills will flow towards the east.

Pre-Development

Prior to development no impact is expected on the site.

During Development

Development work might result in aerosolised dust blowing towards the SSSI which would cause a problem if it were to settle in the lake or the River Dee. These impacts will be prevented by utilising standard dust suppression techniques throughout the work.

Post-Development

After the development is complete no impact is expected.

6.1.2 Mitigation

- Materials stockpiled on site, such as solid hardcore and sand can pollute air with silt and dust.
 - Materials will be stockpiled away from the canal and kept in bulk bags
 - Once opened, easily dispersible materials such as dry cement will be stored in a sealed bag or storage unit
 - All empty bags will be appropriately stored and disposed of
- Standard dust suppression techniques such as water suppression will be used where necessary.

6.2 Habitats on Site

6.2.1 Impacts

The demolition of the bungalow will see the loss of roosting habitat for bats in the bungalow. The removal of any vegetation will cause the loss of potential nesting habitat for birds.

The construction of the new building will see a gain in potential bird nesting habitat.

Table 6.1. Summary of potential impacts on habitats recorded

Habitat	Value to Protected Species	Impact Without Consideration
Buildings	Maternity bat roost found in Bungalow.	Moderate negative impact on bats
	No evidence of bats in garage or kennels.	Negligible negative impact on bats
	Potential bird nesting habitat in all buildings. No evidence found.	Potential negative impact on nesting birds
Hedgerows	Potential habitat for nesting birds	Potential negative impact on nesting birds
Line of trees	Potential habitat for nesting birds	Potential negative impact on nesting birds
Amenity grassland	Low ecological value	Low negative impact
Hardstanding	No ecological value	No negative impact
Fence	No ecological value	No negative impact
Allotment	Low ecological value	Low negative impact

All hedgerows around the site back onto domestic land and are therefore not protected by the Hedgerow Regulations. No specific permission from the LPA is required prior to their removal.

6.2.2 Mitigation / Enhancements

In order to obtain an ecological net gain for the site, the remaining green spaces and site boundaries will require enhancement for local wildlife.

Hedgerows

It is recommended that the landscaping around the new buildings will include some hedge planting to enhance the area for biodiversity.

Plants to use for landscaping and gapping-up of existing boundaries will include locally sourced native species. These will be planted in accordance with BS3936 (part 1, 1992, Nursery Stock, Specifications for trees and shrubs). Planting will occur between November and April depending on the timing of the development.

Table 6.2. New hedge planting scheme

Common Name	Latin Name	Distribution (%)
Hawthorn	<i>Crataegus monogyna</i>	35%
Blackthorn	<i>Prunus spinosa</i>	35%
Hazel	<i>Corylus avellana</i>	10%
Holly	<i>Ilex aquifolium</i>	10%
Wild Service Tree	<i>Sorbus torminalis</i>	10%

Table 6.3. Fruiting plant enhancement

Common Name	Latin Name
Crab Apple	<i>Malus sylvestris</i>
Wild Cherry	<i>Prunus avium</i>
Wild Pear	<i>Pyrus communis</i>

Trees

Trees to be used should be from the list below. These should also be native species, locally sourced where possible. Oak should particularly be encouraged because it supports a large diversity of invertebrates.

Table 6.4. Trees proposed for enhancement

Common Name	Latin Name
English Oak	<i>Quercus robur</i>
Sessile Oak	<i>Quercus petraea</i>
Lime	<i>Tilia cordata</i>
Rowan	<i>Sorbus aucuparia</i>
Silver Birch	<i>Betula pendula</i>

6.2.3 Monitoring

All habitat enhancements will be monitored post-development and any failing plants or features will be addressed as appropriate to maintain the value of the enhancement.

6.3 Bats

6.3.1 Impacts

A maternity roost of soprano pipistrelles (peak count of 12) was found to be roosting in the bungalow. Without consideration there may be a loss or damage of roosts along with the potential for death or damage of individual bats. The roost is of moderate value because it represents breeding numbers of a common species. Determination of conservation significance of roosts was taken from Figure 4: Guidelines for proportionate mitigation (Bat Mitigation Guidelines P. 39).

6.3.2 Mitigation / Enhancements

Work will need to be conducted under European Protected Species Licence (EPSL) from Natural Resources Wales. Construction will need to follow a rigid method statement.

EPSL Working Method Statement

1. A suitably licensed ecologist will be employed as an Ecological Clerk of Works (ECoW) to oversee works in areas sensitive to bats and provide expert advice.
2. The licence can only be applied for when full planning permission has been granted.
3. The developer and the contractors will be made aware that there is a possibility that bats may be found during works, and will be advised to work in a way to ensure bats are not harmed during the soft demolition of the roof; particularly around the southwest gable end. They will be provided with a simple emergency procedure to follow if bats are found at any stage of the work on site. It will be ensured that the method statement is retained on site at all times.
4. A pre-commencement check will be conducted by the ECoW using a strong torch and borescope where appropriate.
5. Bats will always be allowed access to an undisturbed area (bat box) during works.
6. The soft demolition of the bungalow will occur when bats are least likely to be present, from October to March
7. The ECoW will be present on site when work is being conducted in the area of the bat roost, particularly around the ridges, gables and edges.
8. If a bat is found when the ECoW is not present, work will stop immediately and the ECoW contacted for advice.
9. The bat can only be handled by the ECoW or authorised person unless it is in immediate danger. The bat must be carefully placed in a well-ventilated lidded box with a small container (i.e. a plastic bottle lid) with water in it. The container must be kept in a quiet and safe place.
10. Care should be taken to avoid rousing the bat whilst transferring to a suitable location, such as a suitable roost box or alternative roost space that provides a safe, quiet environment with a stable cool temperature and relatively high humidity.
11. If the bat is underweight or injured it will be cared for by an experienced bat carer until such time that it is strong enough to be released into a suitable alternative replacement roost on site.

12. The removal of the roof will not take place if the temperature has been below 6°C for four consecutive days and nights.

13. Once the building has been reroofed, bat access will be limited by sealing all doors and windows, thus reducing the potential for bats to re-enter where they are not expected.

Artificial Habitats

It is recommended that provision be made for roosting opportunities for bats with the erection of one woodcrete bat box suitable for maternity roosts in a nearby tree. These will be erected at a height of 3-4 m and in a southerly, westerly or easterly facing direction.

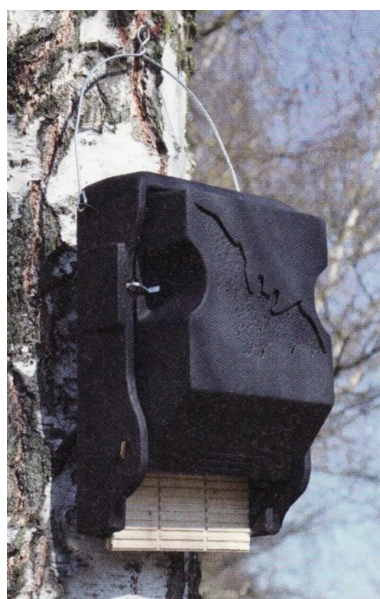


Figure 6.1. Example woodcrete maternity bat box: Schwegler 3FF

It is recommended that permanent provision be made for roosting opportunities for bats with the inclusion of an integral bat box in the new building. This will be erected at a height of 3-4 m and in a southerly, westerly or easterly facing direction.

Enclosed Bat Box (B and C)

- Designed specifically for the pipistrelle bat
- Available in all brick types
- Discrete home for bats
- Various sizes
- Several roosting zones are created inside the box
- Bats are contained within the bat box itself
- Maintenance free with entrance at the base
- Ideal for new build & conservation work



Bat Box B



Bat Box C

Eco Habitats for Bats	Sizes (mm)	Durability
Bat Box Type A	215 x 65	F2 S2 – Fully Frost Resistant
Bat Box Type B	215 x 215 or 215 x 290	F2 S2 – Fully Frost Resistant

Figure 6.2. Example integral bat box

Lighting

1. A lighting scheme will be drawn up in line with ILP and BCT Guidance Note 08/18.
2. All newly proposed external lighting will be directed away from any vegetated boundary features to retain dark corridors for commuting bats.
3. There will be no direct illumination of any enhancement features erected for bats.
4. There will be no direct illumination of the SSSI to the west.
5. All domestic lighting will be below 10 lux, orientated towards the ground and controlled by PIR (Passive Infra-red), set on a short timer.

6.3.3 Monitoring

Failing boxes or enhancements will be replaced at the cost of the developer if deterioration or damage is noted within five years post-development.

6.4 Other Mammals

No evidence of mammals other than bats was found on site. No negative impact is expected, and no mitigation is required.

6.5 Birds

6.5.1 Impacts

Work at this site will include the removal of hedgerows which could affect nesting birds if conducted during the nesting season.

6.5.2 Mitigation / Enhancements

1. Any hedge removal will be done outside 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.
2. Should a nesting bird be found, a 4m buffer will be left around the nest, and no further disturbance conducted until the young have fledged.
3. It is recommended that a range of woodcrete boxes are erected around the site to provide an enhancement for passerine birds, and a selection of the following would be appropriate.



Cedarwood Sparrow Terrace



House Martin Nest Box



Schwegler 1b Bird Box

Figure 6.3. Bird boxes

6.6 Amphibians

No ponds were found within 250m of the site and the development will involve few groundworks. It is considered unlikely that newts will be found on site during works and offence is highly unlikely to be committed.

6.7 Reptiles

No evidence of reptiles was found on site, so no negative impact is expected. No mitigation is required.

6.8 Invertebrates

6.8.1 Impacts

No BAP or protected invertebrate species were found on site so no negative impact is expected. No mitigation is required.

6.8.2 Enhancements

Invertebrate bricks will be erected in the new bungalow to enhance the area for nesting bees.



Figure 6.4. Invertebrate brick

6.9 Invasive Species

No evidence of any invasive species was found on site, so no negative impact is expected. No management is required.

7 Concluding Remarks

The survey has focussed on the potential habitats or protected species to be damaged or destroyed as part of this development.

The phase1 survey found a small number of bat droppings on the floor of the loft space, next to the southwest gable end. Phase 2 surveys for bats were therefore conducted in August and September 2020 and a maternity roost of soprano pipistrelles were recorded emerging from several access points on the southwest gable end. **The demolition of the bungalow or any work to alter the roosting value must be done under a mitigation licence from NRW.** The site is to be enhanced via the erection of a bat box suitable for maternity numbers of crevice dwelling bats, and by including at least one integral bat box in the new build to accommodate bat species on a permanent basis.

The removal of hedgerows is likely to have a negative impact on nesting birds if it is not done at the correct time of year. It is recommended that these works are done outside of the bird nesting season which is February to August inclusive. If this is not possible an ecologist is to be employed to check the site for nesting birds within 24hrs of the removal. It is also recommended that the site is enhanced post-construction via the erection of bird boxes.

No evidence of non-bat mammals, reptiles, amphibians, protected invertebrates or invasive species was found. No negative impact is expected on these species so no mitigation is required.

The method statements provided in this report will be followed, and works will be done at a suitable time of year. This will result in there being no further ecological constraints to the development as currently proposed.

Appendix A – Surveyor Details

Table A.1. Details of surveyors' experience and licences held

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 Mitigation Class Licence for Bats <u>England:</u> Bats - 2015-12200-CLS-CLS BMCL - RC084 GCN - 2015-18939-CLS-CLS Dormice - 2017-29225-CLS-CLS <u>Wales:</u> Bats – S087133-1 GCN – S087606-1
Logan Maggs BSc(hons)	Lead Consultant Logan has a degree in Conservation and Land Management. He has 10 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. <u>England:</u> Bats - 2016-24901-CLS-CLS GCN - 2017-29218-CLS-CLS <u>Wales:</u> Bats – S086874/1 Newts - 79665:OTH:SA:2018
Ben Jones BSc(hons) MSc	Lead Consultant Ben has a degree in Marine and Freshwater biology and a Master's degree in "Managing the Environment". He has 5 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. <u>England:</u> Bats - 2017-29112-CLS-CLS GCN - 2016-25209-CLS-CLS <u>Wales:</u> Bats – S085098/2 GCN – S087992/1
Brian Marshall	Technical Director FIEMA CEnv PEA Consultant with over 35 years in the Environmental Sector	
Demi Cook BSc(hons)	Demi has a degree in Zoology with Herpetology from Bangor University. She has been assisting with bat activity surveys for four years, and has experience working with bats in England and Wales.	
Chloe Sheil MZool (Conservation)	Chloe has a master's degree in Zoology with Conservation from Bangor University. She has one years' experience assisting with surveys.	

Appendix B – Methodology

Desk Study

Table B.1. Data sources

Organisation/Resource	Information Assessed
Freely available online species datasets (NBN Atlas)	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)

The development is located less than 1km from the border between Wrexham and Shropshire. Greenscape Environmental have records of protected species in the area and the surveyor has local knowledge of species in the area. A data search from COFNOD is therefore not required at this stage. Instead, a search was conducted on NBN for commercially available records to supplement Greenscape's own records. A Cofnod search will be purchased as part of the mitigation licence application.

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

An assessment of habitats was conducted broadly following 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.

Determination of Ecological Value is based on the general criteria provided by IEEM (2006).

Table B.2. Criteria of ecological values

Ecological Value	Description and Examples
High	Habitats or features that have high importance for nature conservation, such as statutory designated nature conservation sites of international or national importance or sites maintaining viable populations of species of international or national importance (e.g. Red Data Book species; European protected species).
Medium	Sites designated at a county or district level, e.g. Local Wildlife Site (LWS), ancient woodland site, ecologically 'important' hedgerows or ecological features that are notable within the context of a region, county or district (e.g. a viable area of a Priority Habitat on the county BAP or a site that supports a viable population of a county BAP species).
Low	Sites of nature conservation value within the context of a parish or neighbourhood, low-grade common habitats, such as arable fields and improved grasslands and sites supporting common, widespread species.

Hedgerows

The aim of the assessment is to ascertain whether the hedgerow could be classified as important according to the definitions listed in the Hedgerow Regulations 1997.

The hedgerow is measured and gaps within a hedge included in the total length as long as the gaps are 20m or less in length.

The total number of woody species present was recorded in the following manner:

- Where the length of the hedgerow did not exceed 30m the total number of woody species present in the hedgerow was recorded
- Where the hedgerow was between 30m and 100m the number of woody species present in the central 30m was recorded
- Where the length was between 100m and 200m the number of woody species in the central 30m stretches of 2 halves of the hedgerow were counted and the mean of the 2 halves calculated
- Where the length of the hedge was over 200m the hedge was divided into thirds and the central 30m of each section counted and the mean calculated

The hedgerow height, width, integrity, structure and management history was recorded.

Notes were made of the following in accordance with the criteria outlined in Schedule 1 of the Hedgerow Regulations 1997:

- Evidence of certain species of birds, animals or plants listed in Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended)
- Number of woody species on average in a 30m length
- Presence of rare tree species such as Black Poplar, Large Leaved lime, Small leaved Lime, Wild Service tree
- Number of standard trees within each 50m length
- Percentage of gaps in the hedge
- Presence of ditches, banks or walls
- Numbers of connections with other hedgerows, ponds or woodland
- Presence of parallel hedgerow within 15m of the hedge
- Presence of bridleways, footpaths, byways of public paths

Non-woody ground flora species listed in Schedule 2 of the Hedgerow Regulations were recorded.

Species Surveys

Bats

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

Features on site were 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 an experienced surveyor for evidence of roosting bats such as droppings, feeding remains and staining.

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

Table B.3. Categorisation of trees for bats

Value for Bats	Example Features
Negligible	Young tree with no potential roost features
Low	Mature enough to have PRF, but no holes in trunk or limbs visible from ground level, very light ivy cover
Moderate	Broken limbs or hazard beams, raised bark, extensive ivy coverage
High	Extensive holes in trunk or limbs, dense ivy coverage, presence of cavities
Confirmed roost	Bat presence has been confirmed

Daytime surveys were conducted with the aid of a strong torch. 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 or presence of droppings in a cobweb.
- Presence of roosting or dead bats in or behind any object.

Phase 2 bat activity surveys were conducted to reinforce the findings using heterodyne and frequency division bat detectors (Anabat SD1 and 2, Anabat Walkabout, Wildlife Acoustics Echo Meter Touch).

Surveys were conducted when the weather conditions were suitable for bat activity, i.e. when the ambient temperature exceeded 10°C at sunset and when there was little or no rain. Dusk surveys were begun approximately 15mins prior to sunset and continued for 90-120mins following sunset depending on visibility and site conditions. Dawn surveys were begun approximately 90-120mins before sunrise, depending on the species expected, to 15 minutes after sunrise. Dawn surveys were only conducted if the temperature at the previous sunset were over 10°C.

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.

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.

Birds

Searching for evidence of nesting birds, including barn owls, 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
- Listening for bird song
- Recording bird activity

Amphibians and Reptiles

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.

Appendix C – Policy

The following areas of policy and legislation are of relevance to ecology and provide context to the surveys conducted. Findings presented in this report are in line with the following:

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

- Schedule 2. European protected species of animals
- Schedule 5. European protected species of plants

The Wildlife and Countryside Act (1981) – as listed in:

- Schedule 1. Birds protected by special penalties at all times
- Schedule 5. Protected animals
- Schedule 8. Protected plants

Countryside and Rights of Way Act (2000)

Hedgerow Regulations (1997)

The Protection of Badgers Act (1992)

Natural Environment and Rural Communities (NERC) Act (2006)

National Planning Policy Framework (2018)

Policy 15 – Conserving and Enhancing the Natural Environment

The Nature Recovery Plan for Wales – Setting the course for 2020 and beyond (2015)

Environment Act (Wales) (2016)

Section 7

Wrexham Unitary Development Plan – EC6 Biodiversity Conservation

Hedgerows

All hedgerows are potentially protected by the Hedgerow Regulations 1997. Under these regulations it is against the law to remove or destroy certain hedgerows without permission from the LPA. These Regulations do not apply to any hedgerow within the curtilage of or marking the boundary of a dwelling house.

Permission is required before removing hedges that are least 20m in length and over 30 years old. Permission is gained by submitting a Hedgerow Removal Notice to the LPA as set out in Schedule 4 of the Regulations.

Permission is not required in the following instances:

- To make a new opening in substitute for an existing one which gives access to land.
- To obtain temporary access to any land in order to give assistance in an emergency.
- To gain access to land where another means of access is not available or is available at a disproportionate cost.
- For National Defence purposes.
- Where planning permission has been authorised except where permission has been granted by the Town and Country Planning General Permitted Development Order 1995.
- To carry out work for the purposes of flood defence or land drainage.
- To prevent spread of or ensure eradication of a plant or tree pest.

- For work undertaken by the Secretary of State in respect of any highway for which he is the highway authority or in relation to which he has the same powers as the Local Highway Authority.
- To prevent obstruction of or interference with electric lines and plant or prevent danger under the Electricity Act 1989.
- For the proper management of the hedgerow.

Hedgerows in areas covered by Historic Landscape Characterisation are often protected on the basis of historical importance and their wildlife value.

Hedgerows are listed as a habitat of principal importance under section 41 of the NERC Act (2004). This draws on the UK Biodiversity Action Plan (BAP) definition of priority habitats. Under the 2007 UK BAP, hedgerow priority habitat includes all hedgerows with at least 80% cover of at least one woody UK Native species (BRIG 2011).

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 European Protected Species.
- 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 European Protected Species, 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.

Seven bat species are on the UK Biodiversity Action Plan and are listed as Species of Principal Importance under the provisions of the Natural Environment and Rural Communities (NERC) Act 2006. The National Planning Policy Framework (NPPF) states that to minimise impacts on biodiversity and geodiversity, *"planning policies should... promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations"*.

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 Resources Wales providing suitable compensation and mitigation is provided and the "three tests" can be met. These are:

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.

Regulation 55(9)(a) States: the appropriate authority (Natural Resources Wales) shall not grant a licence unless they are satisfied "that there is no satisfactory alternative"

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."

The method statement in the EPS licence is a legally binding document which outlines the species, context of the colony, method of mitigating and compensating and ongoing habitat management for ensuring favourable conservation status.

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.

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.

Some bird species are included in the UK and local BAPS and are recognised as species of principal importance for nature conservation in accordance with section 41 of the NERC Act 2006. Such species and their habitats receive protection through the provisions of the NPPF.

Amphibians and Reptiles

All species of amphibians 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.

Great Crested Newts

Great crested newts 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 European Protected Species.
- Deliberately disturb any such animal.
- Deliberately take or destroy eggs of any such wild 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 an European Protected Species, or any part of, or anything derived from such a wild animal or plant.

Great crested newts are listed as a priority species on the UK BAP and Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The National Planning Policy Framework (NPPF) states that to minimise impacts on biodiversity and geodiversity, *"planning policies should... promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations"*.

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.

Appendix D – Bat Survey Data

Table D.1. Survey conditions

Date	Time Start – End (Sunset Time)	Structure	Equipment Used	Weather
27/07/2020	13:00-15:00	Bungalow	Strong torch, camera	21°C, no rain, F1 wind, no cloud cover
Comments:	Visual inspection. One surveyor used. C Sheil			
03/08/2020	20:50-22:31 (21:01)	Bungalow	Strong torch, Anabat SD1, Anabat Walkabout, Echometer Touch	14-12°C, F1 wind, no rain, <10% cloud cover
Comments:	Two surveyors used. C Sheil and B Jones			
18/08/2020	20:05-22:03 (20:31)	Bungalow	Strong torch, Anabat Walkabout, Anabat SD1	19-18°C, <10% cloud cover, F1 wind, no rain
Comments:	One surveyor used.			
01/09/2020	19:45-21:30 (20:00)	Bungalow	Strong torch, Anabat Walkabout, Anabat SD2	16-14°C, F1 wind, no rain, 100% cloud cover
Comments:	One surveyor used.			

Table D.2. Survey results table

Date	Time Start–End	Species and Numbers	Roost Type	Structure	Roost Location	Access Points
03/08/2020	20:50-22:31	Soprano pipistrelle (1)	Day	Bungalow	Southwest gable end	Gap under ridge
Notes/ Observations:	On bat was observed emerging from under the ridge on the southwest gable end at 21:20. This bat did not echolocate but the timing and context suggest it was a soprano pipistrelle. The first bat recorded was a noctule foraging over the site at 21:15, approximately 14 minutes after sunset. Other activity included foraging by soprano pipistrelles and brown long-eared bats.					
18/08/2020	20:05-22:03	Soprano pipistrelle (4)	Day	Bungalow	Southwest gable end	Gap under ridge and via missing tile above flat roof
Notes/ Observations:	The first bat recorded was a soprano pipistrelle emerging from under the ridge on the southwest gable end at 20:50, approximately 19 minutes after sunset. A total of four soprano pipistrelles were seen emerging from the southwest gable end of the bungalow and one was seen re-entering. One bat was seen in the crevice under the ridge but did not emerge. The peak count of soprano pipistrelles roosting in the gable end is four. Other activity included and noctules commuting over site and Daubenton's bats foraging around the garden.					
01/09/2020	19:45-21:30	Soprano pipistrelle (12)	Maternity	Bungalow	Southwest gable end	At least four different access points under hanging tiles, including gap under ridge and missing tile above flat roof
Notes/ Observations:	A total of 12 soprano pipistrelles were seen emerging from the southwest gable end of the bungalow. At least four different access points were used. The first bat recorded was a noctule at 20:03, approximately 3 minutes after sunset. Other activity included a common pipistrelle commuting across the site and a lesser horseshoe bat foraging around the western hedgerow.					



Figure D.1. Survey area

	Static detector (used during single-surveyor surveys, when the surveyor was on the opposite corner)
	Surveyor



Figure D.2. Survey results

	Roost location
	Droppings location
	Flight paths

Appendix E – Bibliography

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