

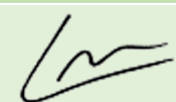


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The report should be read in its entirety

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 Dave Parker on behalf of the client, Mr S Huxley, to undertake a preliminary ecological appraisal of Glebe Farm to provide supporting information for a planning application for the demolition of existing buildings and the construction of three new dwellings.

The survey report has three principal aims:

- To provide an initial assessment of the ecological value of the site in local context.
- 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 of the site included a desktop study of the area and a phase 1 ecological appraisal undertaken at the site, OS grid reference SJ44604132 on 12th March 2020 by C Sheil. A precautionary phase 2 bat activity survey were conducted on the 28th May 2020 by C Sheil with the assistance of B Jones, L Maggs and M Hoggs.

1.3 Key Impacts and Mitigation Measures

A desktop data search including a search for nearby designated sites, EPS licences and previously recorded protected species was conducted. Of significant for this site is bats, nesting birds, and great crested newts.

The site extends to 0.2ha and is comprised of three buildings, a field of semi-improved grassland, hedges, trees and an access track.

The buildings on site have low to negligible roost potential for bats. A precautionary activity survey was conducted on buildings 1 and 3. No bats were seen roosting in any of the buildings, and so no further surveys are necessary. These buildings will be demolished under a method statement.

Potential habitat for nesting birds was found in the buildings, trees and hedgerows and evidence was found in building 1. The removal of these is to be done outside the bird nesting season (February to August inclusive) or an ecologist will conduct a check within the 24 hours prior to work commencement to ensure no nesting birds will be affected.

There are seven ponds within 250m of the site. The nearest is pond 3 which is 50m away and scored 0.57 – Below average on the HSI assessment. However, this pond is separated from the site by poor terrestrial habitat. The site comprises mostly negligible value habitat to newts in their terrestrial phase. The works are to be done under a method statement and an ecologist is to be employed as the Ecological Clerk of Works.

1.4 Conclusion

It is recommended that the biodiversity value of the site will be enhanced post-construction with the inclusion of bat and bird boxes. The landscaping will also be improved by planting new native species hedgerows and trees in the new gardens. Method statements outlined in this report are to be followed during works.

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

Table 1.1. Timing of Works

Action	Timing	Justification
Update phase 1 survey	After 1.5 years from survey issue data	Ecological features can change and develop over time
Cut trees and hedges down to stumps ~30cm	September to January inclusive	No birds will be nesting within the hedges or trees at this time. Stumps left to protect any reptiles or amphibians sheltering in the base
Removal of stumps	March/April	Any amphibians sheltering in the roots will have dispersed naturally and will be found in ponds at this time of year
Demolition of buildings	October to January inclusive	To reduce the potential to disturb nesting birds. Timing will also reduce risk to transitory bats
Begin groundworks	December to February	There is no hibernation potential within the field itself. Beginning groundworks when newts are hibernating elsewhere will preclude the chance of damage or destruction of individuals as they will not be mobile.

2 Introduction

This report has been compiled by Chloe Sheil MZool (Conservation) who has 2 years' 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 Dave Parker 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 construction of dwellings at Glebe Farm.

The project involves the demolition of the existing buildings and the construction of three new dwellings. Entrance to the site is currently gained from a lane leading to an unnamed road and will not be changed.

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 site meets one of the trigger points for bat activity surveys. The trigger point in question is the demolition of an agricultural building of traditional brick or stone.

2.3 Site Context and Location

The site is located to the north of Horseman's Green, OS grid reference SJ44604132. It is set in a rural environment surrounded by open fields and residential areas. There is moderate connectivity to the surrounding countryside via hedgerows and trees. The surrounds provide potential foraging, resting, hibernating and commuting opportunities for local wildlife.

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 February 2020. The data search was purchased from Cofnod and focused on the area within 1km 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 12th March 2020 by C Sheil. A precautionary bat activity survey was conducted at dawn on 28th May 2020 by C Sheil with the assistance of B Jones, L Maggs and M Hoggs. On all visits, the conditions were optimal for the type of survey conducted.

3.2.2 Habitats

An assessment of habitats was conducted following the JNCC Handbook for Phase 1 Surveys (2010). Target notes were used where appropriate to identify potential for protected or notable species or habitats, and to give more details 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 phase 2 surveys.

3.2.3 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).

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 assessment of aquatic habitat for great crested newts is based on the Habitat Suitability Index.

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

3.4 Constraints of the Survey

All areas were accessible for this survey. It was conducted at a suboptimal time of year for the assessment of flora and fauna, but this was not considered a constraint because evidence of bats can be seen year-round. Standard techniques were followed as outlined in Appendix B.

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

Glebe Farm

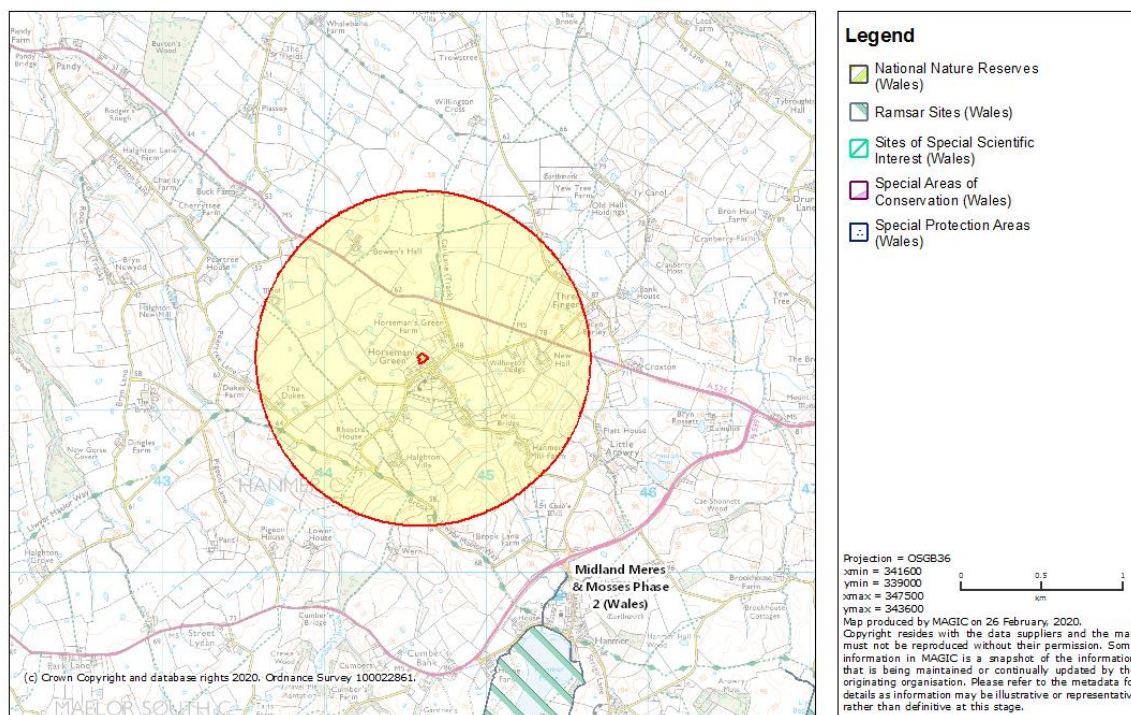


Figure 4.1. Identifying any designated areas near site, a 1km buffer is shown

The map from Natural England presented in Figure 4.1 indicated that the site is not within 1km of any designated area.

The nearest nature reserve is approximately 1.6km to the southeast. This is Midland Meres & Mosses Phase 2 Ramsar and is a series of open water and peatlands designated for biological reasons. This overlaps with the nearest SSSI which is Hanmer Mere, approximately 1.8km away.

4.2 Habitats on Site

The site comprises a field of semi-improved grassland, three farm buildings, bare ground, hedgerows and lines of trees.

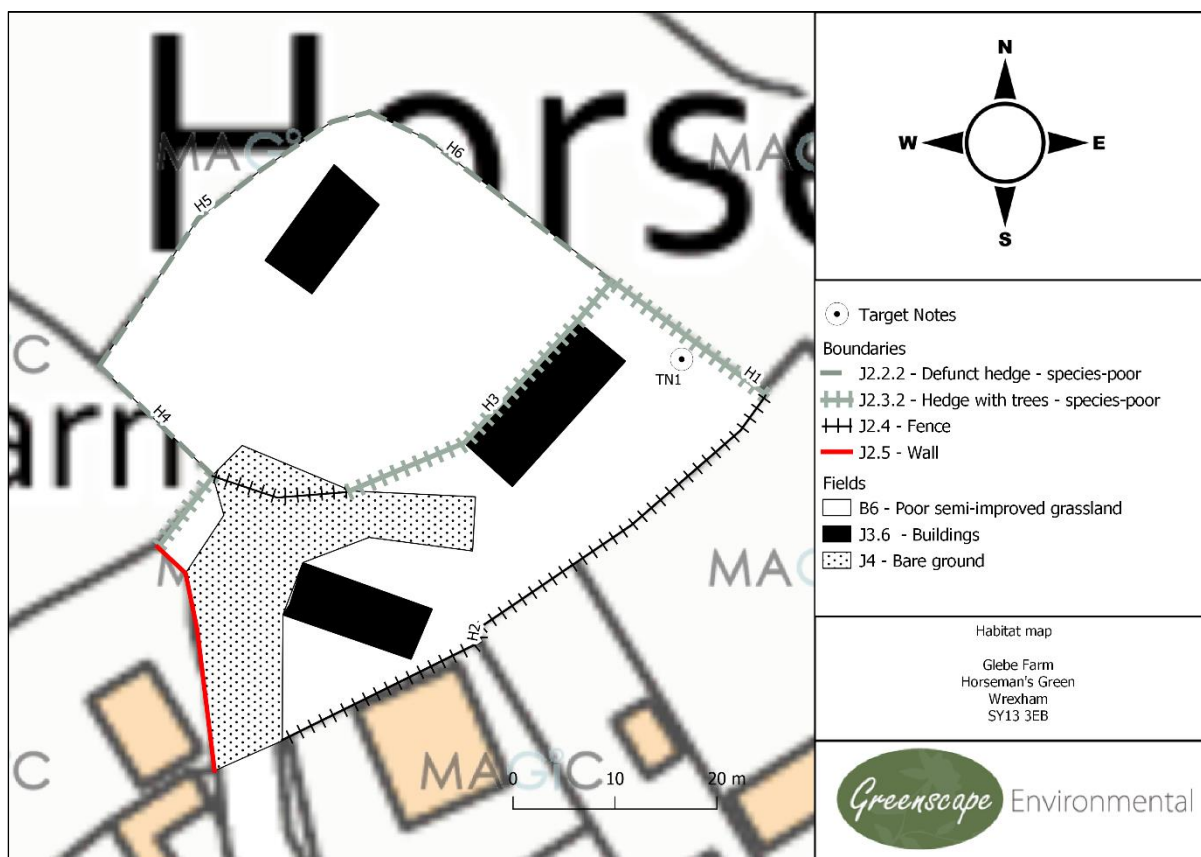


Figure 4.2. A map showing the JNCC phase 1 habitat classification codes for the site

Table 4.1. Target Notes

Target Note	Description
TN1	Tyres

Building 1 is a ruin of a brick barn with a severely damaged slate tile roof. Some of the walls are rendered and the roof was once supported by wooden timbers. Almost all of the roof is now missing, and walls are becoming unstable. A large elder (*Sambucus nigra*) tree and brambles (*Rubus fruticosus*) were found throughout the building.



Figure 4.3 Building 1 from south



Figure 4.4 Internal view of building 1

A small coal shed was found on the northern aspect of the building which has an unlined roof of cement-bonded fibreboard.



Figure 4.5 Coal shed

Building 2 is a Dutch barn constructed of corrugated sheet metal. It is bright and open to the elements.



Figure 4.6 View of building 2 from south

Building 3 is a cowshed of red brick with unlined roofs of slate tile and cement-bonded fibreboard. The roofs are supported by wooden beams. Both areas of the cowshed are open to the elements and are bright.



Figure 4.7 View of building 3 from northwest



Figure 4.8 Internal view of building 3

The site is accessed via a narrow track of gravel and mud.



Figure 4.9 Access track

The field comprises semi-improved grassland which is currently grazed. Species include cow parsley (*Anthriscus sylvestris*), nettle (*Urtica dioica*) and broadleaf dock (*Rumex obtusifolius*).



Figure 4.10 Overview of field

To the southeast of building 2 is an area of semi-improved grassland. Species include meadow buttercup (*Ranunculus acris*), broadleaf dock, nettle, cleavers (*Galium aparine*), cow parsley and thistle (*Cirsium* spp.). Pieces of tarpaulin were found in several places in this area.



Figure 4.11 Overview of grassland near building 2

Spare tyres were found at TN1. The underside of these were checked for any evidence of protected species.



Figure 4.12 Underside of tyres

The site boundaries consist of fences, hedgerows and trees. Some hedgerows have gaps and are defunct.

H1 is a hedgerow with trees and barbed wire fencing. Species include holly (*Ilex aquifolium*), hawthorn (*Crataegus monogyna*) and alder (*Alnus glutinosa*).



Figure 4.13 Hedge with trees along north eastern boundary (H1)

H2 is a post and wire mesh fence with trees. Species include rose (*Rosa canina*) and hawthorn.



Figure 4.14 Wire mesh and line of trees along south eastern boundary (H2)

H3 is a hedgerow with trees. It is approximately 1.5m high and some trees are unidentifiable as they are completely covered in ivy. Species include ash (*Fraxinus excelsior*) and hawthorn.



Figure 4.15 Hedgerow with trees along (H3)

H4 is a defunct hedgerow 1m high with trees and a barbed wire fence. Species include hawthorn and ash.



Figure 4.16 Defunct hedge with trees along south western boundary (H4)

H5 is a defunct hedgerow with large gaps. It is 1m high and consists of holly and hawthorn.



Figure 4.17 Defunct hedge along north western boundary (H5)

H6 is a defunct hedge less than 1m high. Species include blackthorn (*Prunus spinosa*), hawthorn and holly.



Figure 4.18 Defunct hedge with trees along north eastern boundary (H6)

4.3 Bats

4.3.1 Records

No records of bats were found within 2km.

4.3.2 Field Observations

Building 1 has multiple potential roost features found throughout the building, in gaps and cracks between the brickwork. However, these are very exposed reducing their suitability slightly.



Figure 4.19 Crack and crevices in walls

A hearth was found in the building which has a chimney above it. However, this chimney was blocked off by the collapsed brickwork and does not extend further than 2ft upwards.



Figure 4.20 Hearth with chimney



Figure 4.21 Blocked chimney

The north eastern section of building 2 has an unlined slate roof which contains gaps between the tiles. Potential roost features were identified under the ridge beam, and the ivy obscures the view of large portions of the roof.



Figure 4.22 Gaps between tiles

4.3.3 Phase 2 Bat Survey

Four surveyors were used for the dawn survey on 28th May 2020. Details of surveyor location and sonograms can be found in Appendix D.

The first bat seen was a *Myotis* bat at 03:07, approximately 1h 48min before sunrise. The bat call was not recorded on the Echometer Touch detector so the species cannot be identified. The bat was seen flying over the site, towards the southwest. It did not enter any buildings. A *Myotis* bat call was later recorded at 03:09. This was identified by its echolocation calls as a Whiskered/Brandt's bat (*Myotis mystacinus/brandtii*) but could not be seen.

The first pipistrelle was recorded at 03:18. This was a common pipistrelle (*Pipistrellus pipistrellus*) which foraged around the buildings. At 03:39 soprano pipistrelles (*P. pygmaeus*) were recorded. Both species foraged around the buildings throughout the survey.

At 03:54 a noctule was seen flying overhead towards the east.

No bats were seen entering any roost spaces in either of the buildings.

4.4 Other Mammals

4.4.1 Records

Records of other mammals within 2km include badger (*Meles meles*).

The nearest records are within 800m, from 2012.

4.4.2 Field Observations

The site had limited features for terrestrial mammals. Hedgerows provide commuting opportunities. No evidence of any terrestrial mammals was found.

4.5 Birds

4.5.1 Records

Records of birds within 2km include house martin (*Delichon urbicum*), kestrel (*Falco tinnunculus*), swallow (*Hirundo rustica*), house sparrow (*Passer domesticus*) and barn owl (*Tyto alba*).

The nearest records are of house sparrow and swallow approximately 200m to the northwest, from 2009. The nearest records of kestrel and house martin are approximately 1.2km to the north, from 2013. The nearest records of barn owl are within 1.3km, from 2017.

4.5.2 Field Observations

The site had several features for birds. The buildings, trees and hedgerows provide potential nesting habitat. The only bird's nest which was found on site was in building 1.



Figure 4.23 Bird's nest in building 1

Bird species seen on site, but not nesting, are sparrow (*Passer* sp.), pigeon (*Columba palumbus*), blackbird (*Turdus merula*), blue tit (*Cyanistes caeruleus*), a finch (*Carduelis* sp.) and buzzard (*Buteo buteo*).

4.6 Amphibians

4.6.1 Records

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

The nearest records are of great crested newt approximately 300m to the northwest, from 2008. The nearest records of smooth newt and common frog are approximately 400m to the northwest, from 2008. The nearest records of palmate newt are approximately 600m to the north, near Cai Lane, from 2008.

4.6.2 Field Observations

The site had few features for amphibians. The sheets of tarpaulin and tyres (TN1) provide potential refugia although a search underneath them found no evidence. Hedgerows and trees provide opportunity for commuting but the remaining habitats around site are of no value to newts in their terrestrial phase as there is no shelter or foraging.

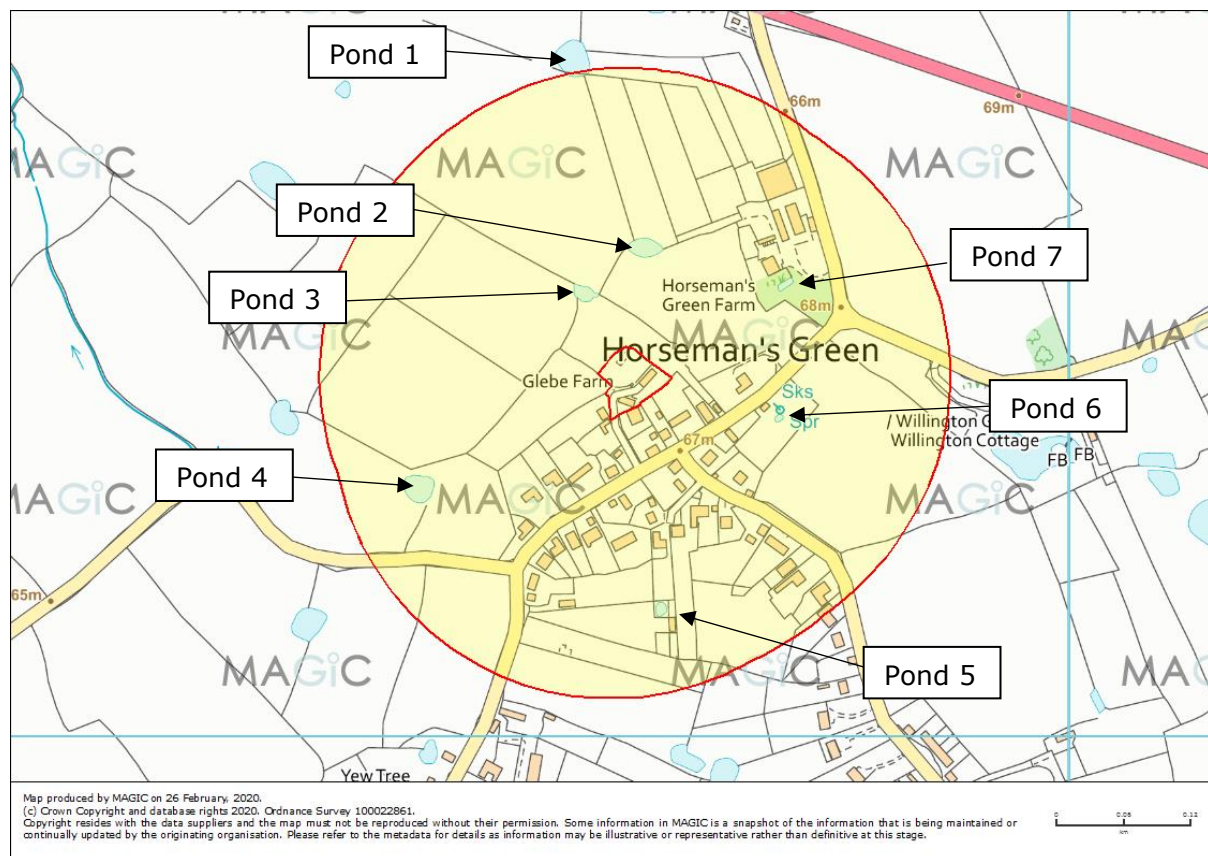


Figure 4.24. OS Map showing a 250m buffer around site, highlighting ponds

Table 4.2 Summary of ponds within 250m

Pond Name	OS Grid Reference	Distance from Site	HSI Score
Pond 1	SJ44554160	250m	-
Pond 2	SJ44624143	80m	-
Pond 3	SJ44564139	50m	0.57 – Below average
Pond 4	SJ44414122	170m	0.70 – Good
Pond 5	SJ44634111	170m	-
Pond 6	SJ44734128	100m	0.45 – Poor
Pond 7	SJ44744140	130m	-

Pond 1

Pond 1 is located in a field and is adjacent to a hedgerow and busy road. It could not be accessed as the landowner could not be found but could be seen from a nearby road. The water level could be seen as well as macrophytes.



Figure 4.25 Pond 1

Pond 2

The landowner of pond 2 could not be found and the pond could not be seen from any public viewpoint.

Pond 3

Pond 3 is located at the northern corner of the field adjacent to the site. It is connected to several drains and appears to be an area where the drains overflow. No clear banks could be seen. Mallards were seen on the water, but no fish were seen. No invertebrates were found when netting.



Figure 4.26 Pond 3



Figure 4.27 Drain leading to pond 3

Pond 4

Pond 4 is located in the middle of a field. The landowner could not be found but the pond could be seen from the nearby road. It appears to be relatively large and has very few macrophytes. No waterfowl could be seen.



Figure 4.28 Pond 4

Pond 5

Pond 5 is located next to a stable. The landowner could not be found but the location of the pond could be seen from a nearby public right of way. The pond itself could not be seen.

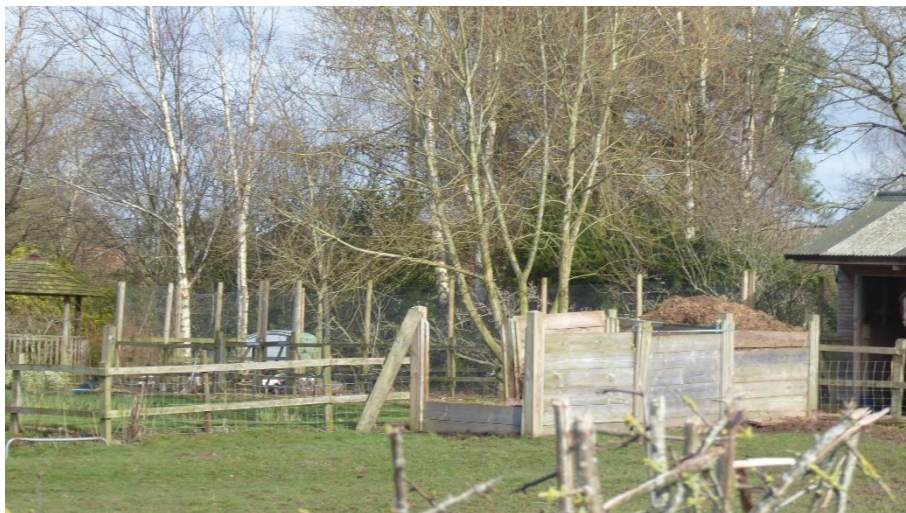


Figure 4.29 Location of pond 5

Pond 6

Pond 6 is located in a field containing a horse, ducks and chickens so the pond is poached. The pond is small and is overshadowed by an oak tree. Netting revealed backswimmers, bloodworm and fly larvae.



Figure 4.30 Pond 6

Pond 7

The landowner of pond 7 could not be found. It is located in a garden of amenity grassland.

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 sheets of tarpaulin and tyres provide potential refugia, although no evidence of any reptiles was found.

4.8 Invertebrates

4.8.1 Records

No records of invertebrates were found within 2km.

4.8.2 Field Observations

The site had few features for invertebrates. The trees and hedgerows provide foraging and egg laying material.

4.9 Invasive Species

4.9.1 Records

Records of invasive species within 2km include rhododendron (*Rhododendron ponticum*).

The nearest records are approximately 200m to the northwest, from 2014.

4.9.2 Field Observations

No evidence of any invasive species was found.

5 Description of Proposed Development

The current plans are for the demolition of the existing buildings and the construction of three new dwellings with associated parking. The access is currently from an unnamed road and will be extended to lead to the new houses. Boundary H3 is to be removed as it is in the place of the footprint for the new building. It is assumed that the remaining boundaries are to be retained.

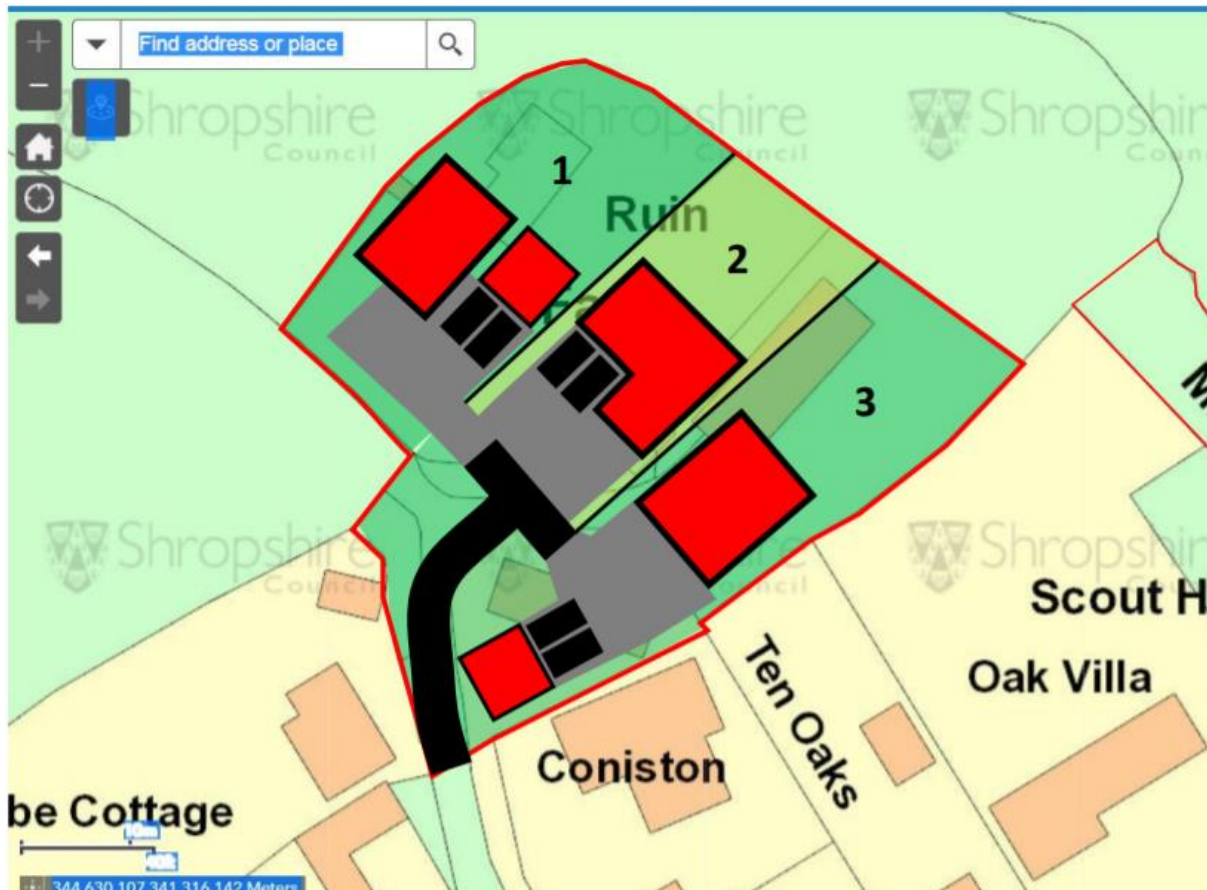


Figure 5.1 Proposed site plan

6 Impacts, Enhancements and Mitigation

6.1 Nearby Features of Importance

6.1.1 Impacts

Figure 4.1 shows that the nearest SSSI is 1.8km away. This is Hanmer Mere. Given the distance to the site no negative impact is expected from the development.

6.1.2 Mitigation

No mitigation is required.

6.2 Habitats on Site

6.2.1 Impacts

The development as proposed will see the loss of the buildings, hedgerows and trees which have potential nesting habitat for birds. The clearance of the tyres and tarpaulin will cause the loss of potential refugia for amphibians and reptiles.

Table 6.1. Summary of potential impacts on habitats recorded

Habitat	Value to Protected Species	Impact Without Consideration
Buildings	No value to bats	Negligible negative impact on bats
	Potential habitat for nesting birds. Evidence found in building 1	Negative impact on bird sin building 1. Potential negative impact in buildings 2 and 3.
Semi-improved grassland	No ecological value	No negative impact
Bare ground	No ecological value	No negative impact
Hedgerows	Potential habitat for nesting birds. No evidence found. Not protected by the Hedgerow Regulations.	Potential negative impact on birds
Fence	No ecological value	No negative impact
Wall	No ecological value	No negative impact

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

The new houses will have garden to the rear. 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%

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 6.3. 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 precautionary phase 2 bat survey was conducted and found no bats using the building. No further surveys are considered necessary.

6.3.2 Mitigation / Enhancements

The Dutch barn can be demolished as soon as planning permission is granted.

The ruins and the cowshed will not need to be demolished under licence from Natural Resources Wales, although it will need to follow a method statement to protect transitory bats. This is because transitory bats can use features sparingly throughout the year and are therefore hard to confirm. The presence of suitable features cannot be ignored, and this method statement will ensure no transitory bats are harmed.

Working Method Statement

1. 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 slate roof. 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.
2. The work around the slate tile roof will occur when bats are least likely to be present, from October to January.
 - a. These months are more precise than typical bat recommendations due to timing restrictions regarding birds, explained in section 6.5.2
3. If a bat is found when the ecologist is not present, work will stop immediately, and the ecologist contacted for advice.
4. The bat can only be handled by the ecologist 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.
5. 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.
6. 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.

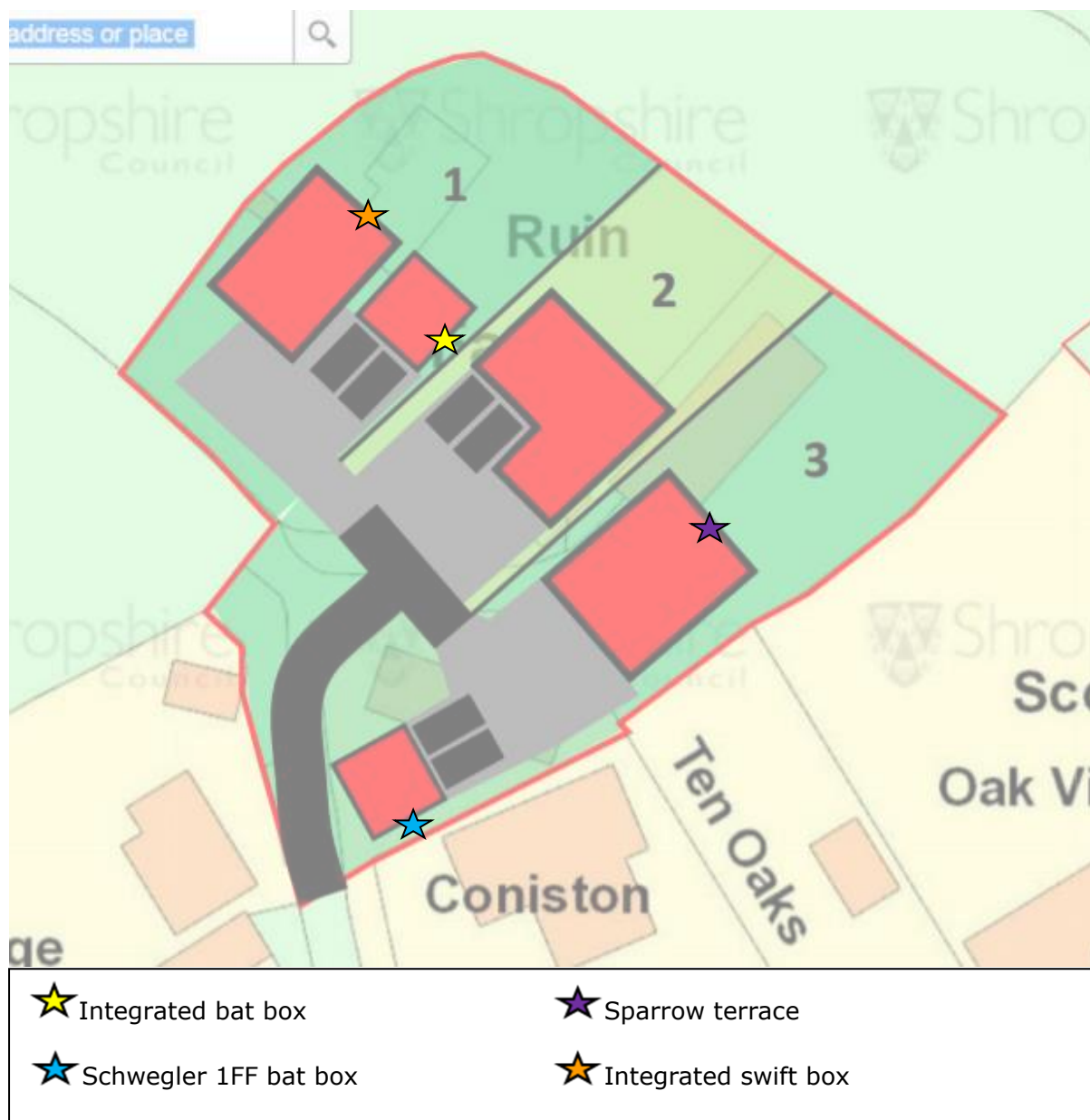


Figure 6.1 Proposed locations of enhancements

Artificial Habitats

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



Figure 6.2. Example woodcrete bat box: Schwegler 1FF

It is recommended that permanent provision be made for roosting opportunities for bats with the inclusion of an integral bat box in one of the new buildings. 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 6.3. Example integral bat box

Lighting

- A lighting scheme will be drawn up in line with ILP and BCT Guidance Note 08/18.
- All newly proposed external lighting will be directed away from any vegetated boundary features to retain dark corridors for commuting bats.
- There will be no direct illumination of any enhancement features erected for bats.
- 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

Any enhancements erected for bats will be monitored in the summer following the completion of development to determine the level of success. This will be at the cost of the developer.

6.4 Other Mammals

6.4.1 Impacts

Without consideration there is likely to be no loss of habitat for terrestrial mammals.

6.4.2 Mitigation / Enhancements

No mitigation or monitoring is required.

6.5 Birds

6.5.1 Impacts

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

6.5.2 Mitigation / Enhancements

Any tree or 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.

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.

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. The location for these boxes was provided in Figure 6.1.



Figure 6.4. Bird boxes

6.6 Amphibians

6.6.1 Impacts

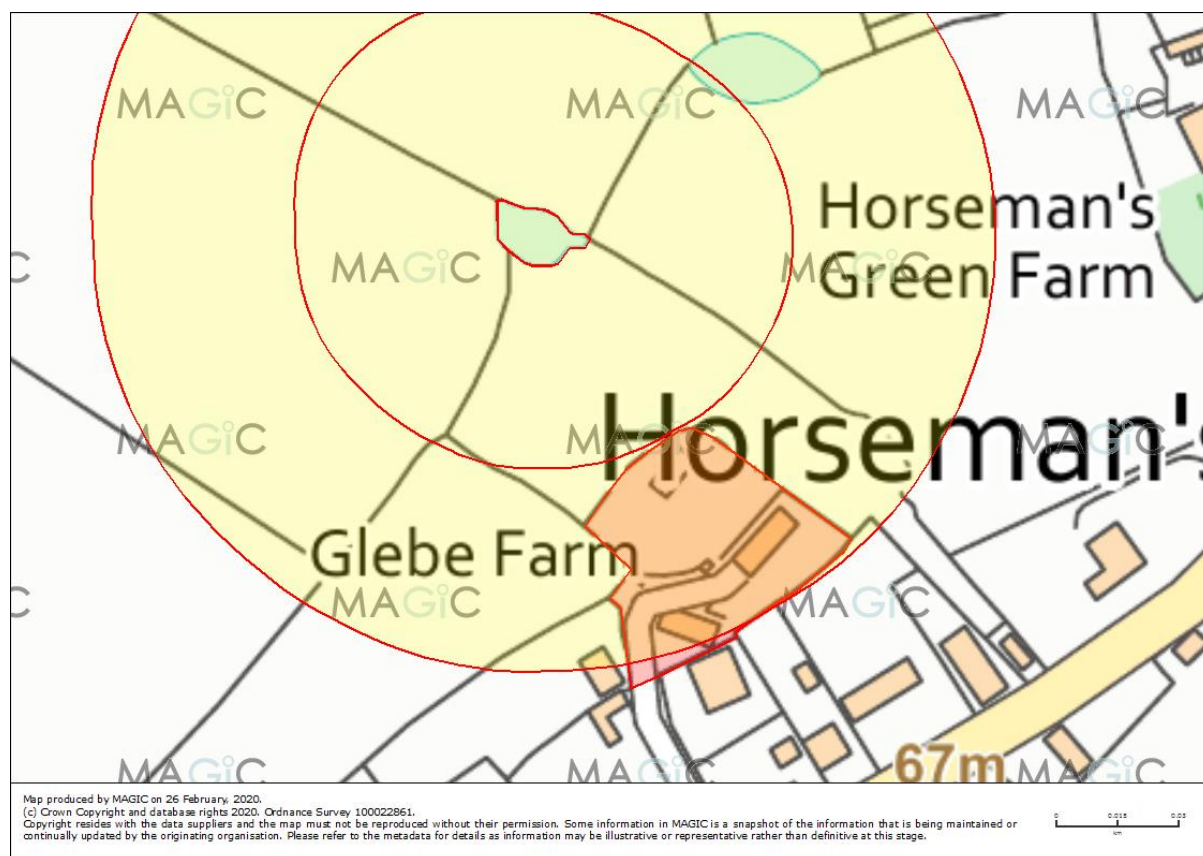


Figure 6.5 50 and 100m buffers from nearest pond

Pre- and mid-development impacts

i. Core Terrestrial Habitat (0-50m)

The area immediately around pond 1 will not be directly affected by the development.

ii. Intermediate Terrestrial Habitat (50-250m)

The entire site falls within this range. The total area of the site is approximately 0.23ha.

The demolition of the buildings could kill and injure individual newts, which would present a moderate negative impact on the population.

The removal of the trees and hedgerows could lead to killing and injury of individual newts and the loss of terrestrial habitat for foraging and hibernacula, which would present a moderate negative impact on population.

iii. Distant Terrestrial Habitat (>250m)

The wider terrestrial habitat will not be directly affected by the development.

Long-term Impacts

The intermediate terrestrial habitat consisting of trees and hedgerows will be lost and is likely to reduce the terrestrial habitat for newts.

There is not likely to be a loss of connectivity with any newts in the area in the long term.

Post-development Interference Impacts

Post-development there is unlikely to be any interference with the population of newts.

6.6.2 Mitigation / Enhancements

The Mitigation Solution

The residential development would lead to a net loss of habitat. This has been taken into consideration at the planning stage and an area for compensation and enhancement has been identified. Work will follow a strict method statement outlining reasonable precautions for securing the safety of individual newts. This will create a scenario by which the risk to individual newts is negated.

Summary

Great crested newts are known to be in the Horseman's Green area and the nearest pond is 50m away. This is pond 3 which scored 0.57 – Below Average on the HSI assessment. However, the site is separated from the nearest pond by poor terrestrial habitat which newts are unlikely to cross. The site itself is mostly of negligible value to newts in their terrestrial phase. The tyres, tarpaulin and vegetation are to be removed under a method statement to further minimise the risk to individual newts. An ecologist is also to be employed as the Ecological Clerk of Works to ensure there are no newts on site before work commences.

Working Method Statement

Pre-Construction

1. The site will be kept under management prior to construction. This will reduce the potential for newts to cross the land and reduce the potential for the terrestrial features to improve. All plants will be kept short (<10cm) to ensure there is no shelter for great crested newts on the site

Site Setup

2. A consultant will be employed as the ECoW to oversee the work in areas sensitive to great crested newts on site. This person will need to be licensed and an experienced surveyor for great crested newts.
3. The ECoW will provide contractors with a toolbox talk prior to work commencing. This will include information about the legal status of newts and responsibilities of the construction company to ensure no offence is committed. A document to assist with the identification of newts will be left on site.
4. The site will be checked thoroughly by the ECoW prior to construction commencing. This will confirm there are no newts present and that there are no potential places of shelter.
5. Soil and vegetation will be stripped prior to setting up the site compound to ensure the compound contains no vegetation which could potentially attract great crested newts

6. All cabins and equipment will be located on firm compacted ground, preferably a stone or concrete base.
7. Contractors are advised not to handle newts at any time.

Construction Phase

8. The site foreman will be responsible for ensuring all contractors are aware of the potential to find newts, and that they are familiar with the appearance of newts. If in doubt the ECoW will be contacted.
9. Contractors are advised to avoid handle newts at any time.
10. Stored subsoil must not be tipped onto any tall vegetation. The location of the storage area will be checked by the ECoW immediately before use.
11. Any plants around the site will be kept short to stop the development of an area of terrestrial habitat more suitable for newts.
12. Removal of any unwanted plants will be conducted between February and May when there is least opportunity for newts to be hibernating in the roots. The ECoW will be on site when this occurs.
13. All work will be conducted during daylight hours as newts are least likely to move during this time.
14. Major construction work within 100m of Pond 3 – this includes trenches for services, footings and other groundworks will be conducted between December to February when there is least movement of newts between ponds.
15. Trenches will be dug and filled in on the day created or will be covered over with close-fitting boards at the end of each working day, and then checked the following morning. This is particularly important when newts are most active, between March and November.
16. If necessary, a ramp will be placed in trenches to allow newts and small mammals to escape.
17. Any heavy machinery will be stored on an area of hardstanding to avoid refugia being created.
18. Stored material will be raised on pallets to reduce the potential they might act as a temporary resting place. This reduces the potential for damage or destruction of individual newts.
19. All waste will be placed straight into skips to reduce the potential of creating refugia.
20. If a newt is found, then work will stop immediately and the ECoW contacted for advice.

21. Great crested newts will not be handled or moved without express permission from Natural Resources Wales as this would constitute an offence.

22. It is recommended that regular site visits are carried out by the ECoW to ensure compliance with the legislation and the Method Statement. A record of these visits will be made as part of the audit trail.

Enhancements for Newts

1. The landscaping features will be designed to enhance the terrestrial features for newts. This will include new hedges and trees and wildflower planting.

6.7 Reptiles

6.7.1 Impacts

Working without due consideration for reptiles may result in the killing or injuring of individual newts when the vegetation, tarpaulin and tyres are removed.

6.7.2 Mitigation / Enhancements

The mitigation measures for great crested newts will also protect reptiles.

6.8 Invertebrates

6.8.1 Impacts

Without due consideration, removal of vegetation may affect local invertebrates by causing the loss of foraging habitat.

6.8.2 Mitigation / Enhancements

Invertebrate bricks will be incorporated into the new buildings to enhance the area for nesting bees.



Figure 6.6. Invertebrate brick and bug house

6.8.3 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.

6.9 Invasive Species

6.9.1 Impacts

There was no evidence of any invasive species on site.

6.9.2 Management

No management is required.

7 Concluding Remarks

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

The buildings on site have low to negligible roost potential for bats. A precautionary bat activity survey was conducted on the ruins and the cowshed to determine whether the low-value features are being used by bats. No bats were seen using the buildings so no further surveys are necessary. The demolition of these buildings does not need to be done under a licence from Natural Resources Wales but will need to be done under a method statement. It is recommended that the site is enhanced via the erection of bat boxes.

Potential habitat for nesting birds was found in the buildings, trees and hedgerows. The only evidence found was in building 1. The demolition of the buildings and the removal of trees and hedgerows is to be done outside the bird nesting season (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. It is recommended that the site is enhanced via the erection of bird boxes.

There are seven ponds within 250m of the site. The nearest is pond 3 which is 50m away and scored 0.57 – Below average on the HSI assessment. However, this pond is separated from the site by poor terrestrial habitat. The site also comprises mostly negligible value habitat to newts in their terrestrial phase. The tarpaulin and tyres are to be removed under a method statement. An ecologist is also to be employed as the Ecological Clerk of Works. No further surveys for newts are needed. These mitigation measures will also protect any reptiles on site.

No impact is expected on terrestrial mammals or invertebrates. No evidence of invasive species was found on site.

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 Low Impact 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 - 78716:OTH:SA:2018
Brian Marshall	Technical Director FIEMA CEnv PEA Consultant with over 35 years in the Environmental Sector	
Chloe Sheil MZool (Conservation)	Chloe has a master's degree in Zoology with Conservation from Bangor University. She has two years' experience assisting with surveys.	
Marcus Hoggs Bsc (hons) MSc	Marcus has a degree in Biology and master's degree in Advanced Wildlife Conservation in Practice. He has been assisting with bat surveys throughout the 2020 season.	

Appendix B – Methodology

Desk Study

Table B.1. Data sources

Organisation/Resource	Information Assessed
Cofnod	Protected/UK BAP Species records (1km)
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)

A data search was purchased from Cofnod on the 27th February 2020.

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 (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.

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 a Natural Resources Wales licensed 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 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 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 frequency division bat detectors (Anabat SD2, 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. Dawns surveys are begun at least 1h30m before sunrise and continue until gone sunrise.

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 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.

Egg searches were conducted by checking aquatic vegetation for folded leaves. Where possible, these leaves were unfolded to check for the presence of an egg. This is a destructive search, and so if a great crested newt egg was found the search was considered complete and no more leaves unfolded.

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.

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.

Barn Owls

Barn owls are listed on Schedule 1 which gives them special protection.

It is an offence to:

- Intentionally kill, injure or handle any wild barn owl.
- Intentionally take, damage or destroy any wild barn owl nest whilst in use or being 'built'.

- Intentionally take or destroy a wild barn owl egg.
- Have in one's possession or control a wild barn owl (dead or alive) or egg (unless one can show it was obtained legally).
- Intentionally or recklessly disturb any wild barn owl whilst 'building' a nest or whilst in, on, or near a nest containing young.
- Intentionally or recklessly disturb any dependent young of wild barn owls.

It is not an offence to:

- Take a disabled wild barn owl solely for the purpose of tending it until fully recovered and then returning it to the wild.
- Kill, injure, take or disturb barn owls if these were incidental results of a lawful operation and could not reasonably have been avoided.

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.

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.

Work can be conducted under 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."

Invasive Species

Himalayan Balsam

Himalayan Balsam is identified as an invasive non-native plant. It is listed under Section 9 schedule 14 of The Wildlife and Countryside Act. It is illegal to plant or otherwise cause Himalayan Balsam to grow in the wild in the UK.

Japanese Knotweed

The management of Japanese knotweed (*Fallopia japonica*) is regulated by several pieces of legislation:

- The Wildlife and Countryside Act (as amended) 1981
- The Environment Protection Act 1990
- The Waste (England & Wales) Regulations 2011
- Third party litigation where damages may be sought for allowing Japanese knotweed to spread onto other properties.

Japanese Knotweed is listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to plant, cause the plant, or allow the plant to grow in the wild.

Giant Hogweed

Giant hogweed is a non-native invasive species originally introduced as an ornamental plant. It is now listed under Schedule 9 of the Wildlife and Countryside Act 1981. This means it is an offence to plant or otherwise cause this species to grow in the wild.

Appendix D – Bat Activity Survey

Conditions

The precautionary bat activity survey was conducted at dawn on 28th May 2020. The survey began at 03:00 and ended at 04:55. Sunrise was at 04:55.

The weather conditions were optimal for the survey. The temperature was 11°C at the beginning and 12°C at the end of the survey, the temperature at sunset on the previous day was 18°C. There was no wind or rain and cloud cover was less than 10%.

Location of Surveyors

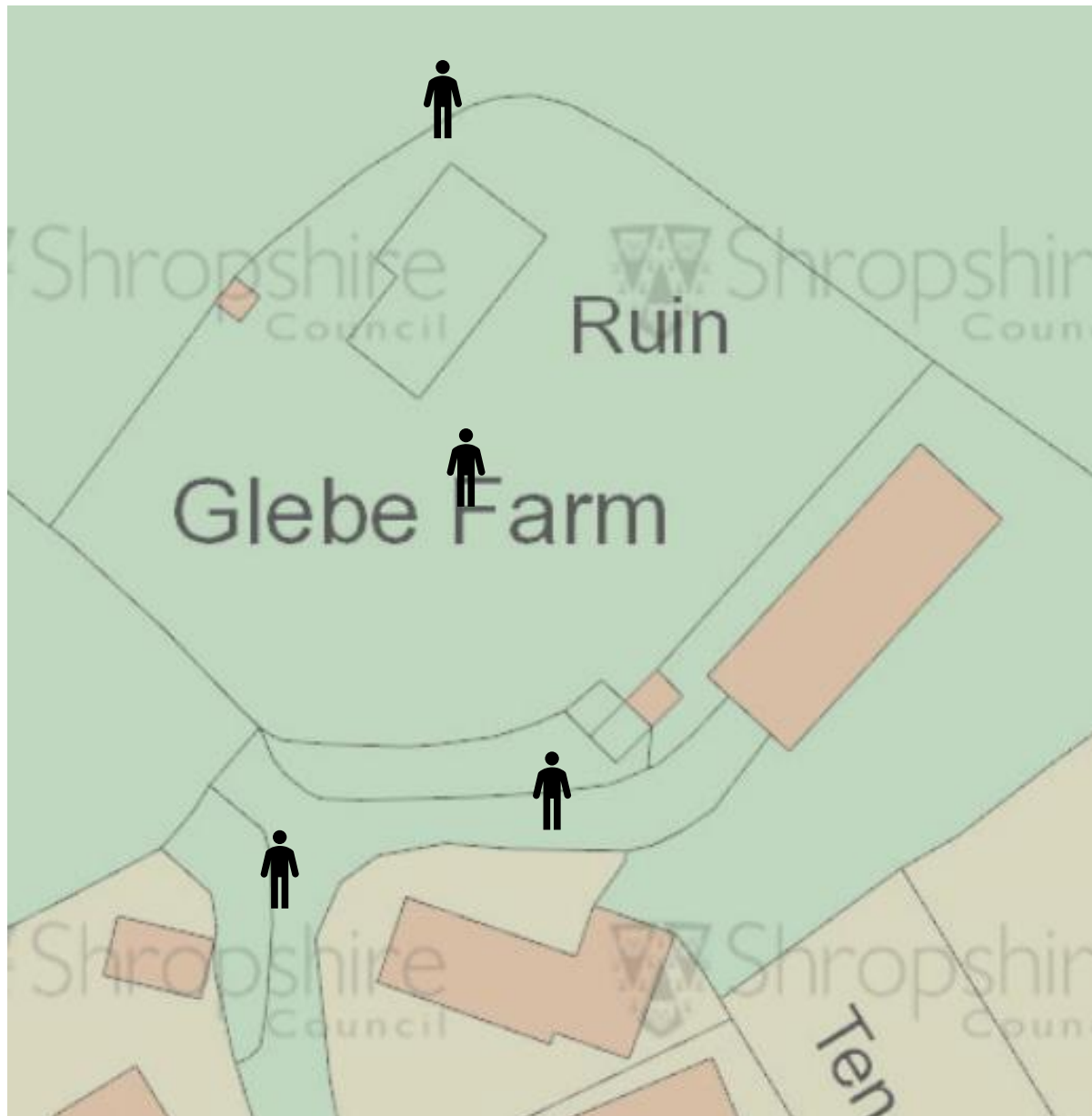


Figure D.1 Location of surveyors

Sonograms

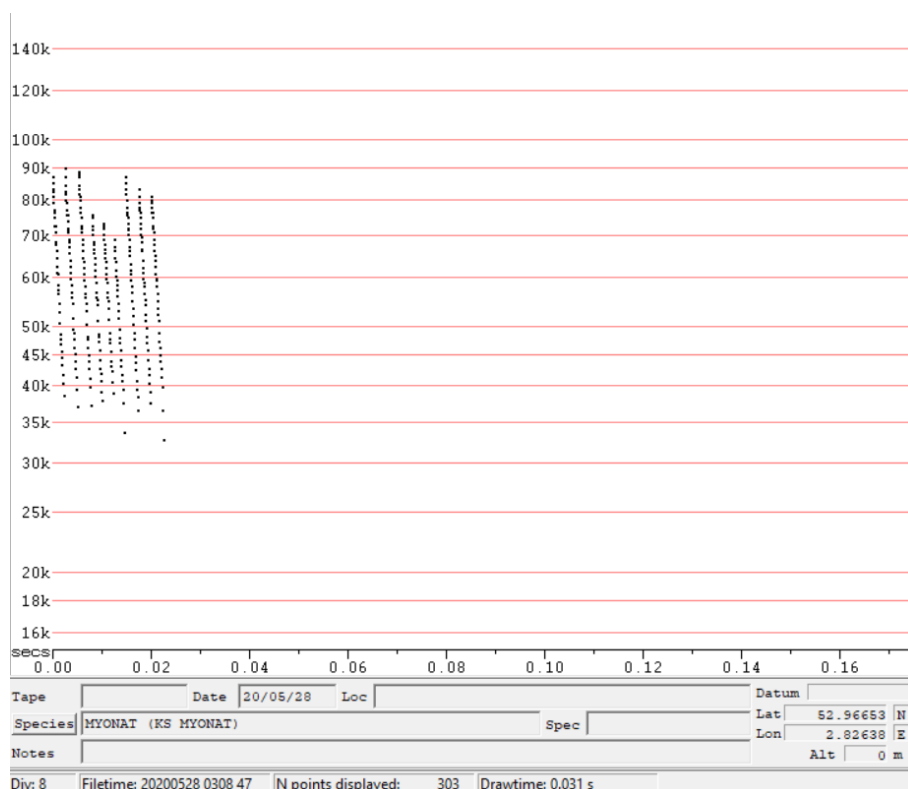


Figure D.2 Whiskered/Brandt's bat recorded at 03:09 (F7 compressed)

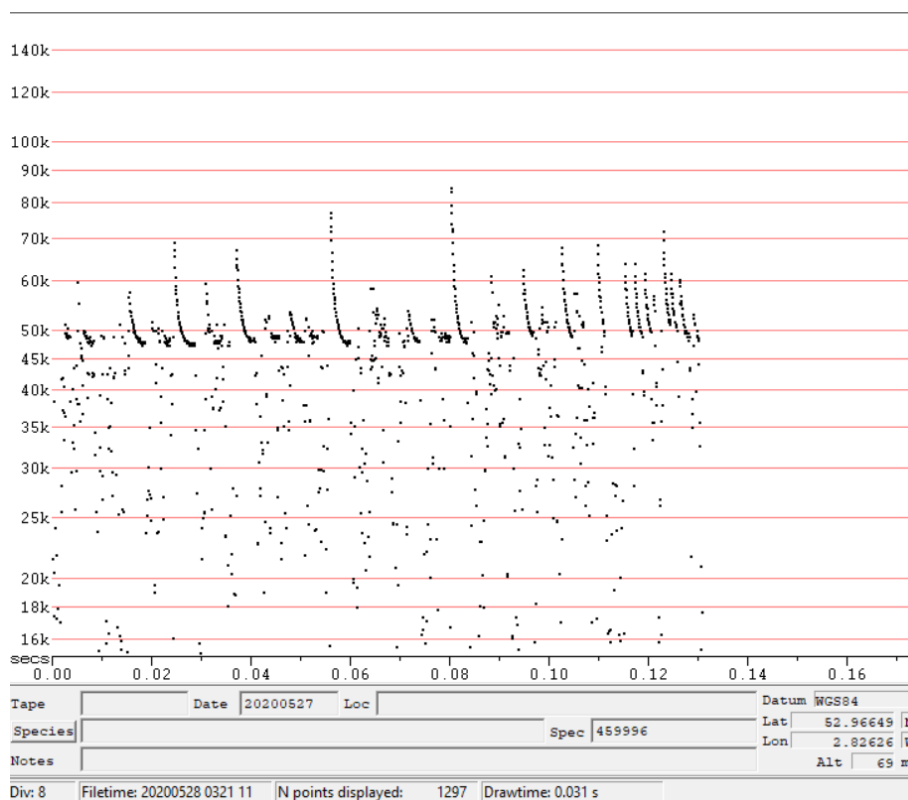


Figure D.3 Common pipistrelle recorded at 03:18 (F7 compressed)

Appendix E – HSI Scores

Table E.1. HSI score and justification for Pond 3

Pond 3 Grid reference: SJ44564139		
Geographic Location	1	Zone A
Pond Area	0.5	The pond is approximately 225m ²
Permanence	0.5	Dries between three years in ten to most years
Water Quality	0.33	Low invertebrate diversity, no submerged plants
Shade	1	There was estimated to be 50% shading of the area within 1m of the perimeter
Waterfowl	0.67	Two mallards were seen on the pond
Fish	0.67	No evidence of fish but local conditions suggest they may be present
Pond Count	1	There are over 20 ponds within a 1km radius not separated by significant barriers
Terrestrial Habitat	0.33	Habitat with poor structure, mostly of grassland covering over 90% of 250m buffer
Macrophytes	0.3	There was no floating or emergent vegetation in this pond
HSI Score	0.57 – Below average	

Table E.2. HSI score and justification for Pond 6

Pond 6 Grid reference: SJ44734128		
Geographic Location	1	Zone A
Pond Area	0.05	The pond is approximately 40m ²
Permanence	1	Dries no more than two years in ten or only in drought
Water Quality	0.33	Low invertebrate diversity including backswimmers, fly larvae and blood-worm, few submerged plants
Shade	0.4	There was estimated to be 90% shading of the area within 1m of the perimeter
Waterfowl	0.67	Two white domestic ducks found on pond
Fish	0.67	No evidence of fish but local conditions suggest they may be present
Pond Count	1	There are over 20 ponds within a 1km radius not separated by significant barriers
Terrestrial Habitat	0.33	Habitat with poor structure, mostly of grassland covering over 90% of 250m buffer
Macrophytes	0.35	There was very little floating or emergent vegetation in this pond, cover was estimated to be <5%
HSI Score	0.45 - Poor	

Appendix F – Bibliography

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