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ECOLOGY • FORESTRY • LAND USE



ECOLOGICAL IMPACT ASSESSMENT

FURNACE BARN

Project name: Furnace Barn, Furnace Lane, Newent,
Gloucestershire, GL18 1DD

Grid Reference: SO71862648

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Requested by: The Rural Planning Co.

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1 INTRODUCTION

1.1 BACKGROUND TO DEVELOPMENT

Planning permission will be sought for the conversion of a redundant livestock building at Furnace Lane in Newent.

Arbor Vitae were commissioned by The Rural Planning Co. to undertake an Ecological Impact Assessment in order to assess the impact of the development on habitats and protected species.

1.2 SCOPE OF SURVEY

The survey is primarily designed to:

- Identify and record habitats and important ecological features on site;
- Evaluate the potential of the proposed development site to provide opportunities for protected species;
- Determine any likely impact which the development and landscape proposals may have on these.
- Identify opportunities for the enhancement of habitats and biodiversity features on site.

1.3 KEY PRINCIPLES

All ecological surveys conducted by Arbor Vitae Environment Ltd are underpinned by the following key principles, as outlined by CIEEM (2018):

Avoidance - Seek options that avoid harm to ecological features (for example, by locating on an alternative site).

Mitigation - Adverse effects should be avoided or minimized through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.

Compensation - Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.

Enhancements - Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

2 SITE DESCRIPTION

2.1 LOCATION, LANDSCAPE, AND BACKGROUND

Furnace Barn is located at the northern edge of Newent, along Furnace Lane which is accessed from Lambs Barn Pitch road (Figure 1). The barn sits at the western edge of a range of farm buildings and extensive concrete yard, set within permanent pasture. The Ell Brook lies to the south of the site which comprises a mature riparian corridor, under the same ownership (Figure 2).

The proposals will include the conversion of the existing structure into a residential dwelling with separate annex, an outdoor patio area and formation of a garden area.

3 SURVEY METHODOLOGY

3.1 DESK STUDY

An initial desk study was composed to gain background information regarding any protected species or designations within the area. The main sources of information were MagicMap, Gloucestershire Centre for Environmental Records and NBN Atlas.

3.2 SITE SURVEY

A site visit was made on 13/05/2022. The survey was carried out in accordance with CIEEM (2017) best practice guidelines. The objective of the survey was to find and record any signs of use by protected species and to note the habitat features present.

An assessment of the available habitats both on and adjacent to the site led to consideration of the potential of the site for the following protected species:

- Bats
- Breeding birds
- Great Crested Newt
- Otter

The survey methodology was tailored to evaluate the area for these species in the following ways:

Bats

The objective of the survey was to find and record any signs of use by bats, for example:

- Droppings, sometimes in concentrations below roost sites
- Feeding signs such as butterfly and moth wings

- Staining of timber, brickwork around access points

The general structure of the building was assessed for its potential to provide bats with roosting opportunities. The site was assessed in terms of its suitability to support bat species. Hedgerow habitat and nearby potential habitat were assessed and recorded and potential impacts from the proposals considered.

Breeding birds

The site was assessed in terms of its suitability to support breeding bird populations. Hedgerow habitat and nearby potential habitat were assessed and recorded.

Great crested newt

A desk study and a ground search were conducted to search for any areas of open water within 250 metres. Waterbodies were then assessed based on the Habitat Suitability Index for great crested newts (Oldham et al., 2000 and ARG UK, 2010).

Otter

Any water courses within the area and appropriate terrestrial land were searched for the following field signs:

- Spraint,
- Footprints,
- Feeding remains.

3.3 PERSONNEL

The survey was carried out by Phillipa Stirling MSc ACIEEM: Ecologist.

Natural England bat licence number: 2021-52205-CLS-CLS and GCN licence number: 2019-42631-CLS-CLS.

3.4 CONSTRAINTS

There were no constraints to the survey being carried out.

4 SURVEY RESULTS

4.1 DESK STUDY

The desk study found that within 1km of the site there were the following designated sites:

Name	Designation	Distance from site
Ell Brook Meadows LWS	Local Wildlife Site	0.27km
Hereford & Gloucester Canal LWS	Local Wildlife Site	0.4km
Newent Lake Park LWS	Local Wildlife Site	0.59km
Mantley Chase Orchard LWS	Local Wildlife Site	0.74km
Stonybridge Cottage Meadows LWS	Local Wildlife Site	0.96km
The search included Ramsar, SSSI, SAC, SPA, LWS, NNR and LNR. ¹		

Results from the desk study revealed that within a 1km radius of the proposed development site the following protected species have been recorded:

Species	Distance	Map reference	Protection
Otter	0.5km	25, 105, 106.	European Protected Species, Wildlife and Countryside Act 1981.
Great crested newt	0.7km	5, 6, 7, 8, 9, 19, 24, 103.	
Lesser horseshoe	0.4-1km	3, 55, 64, 70, 76.	
Noctule	0.1-1km	3, 45, 55, 85.	
Common and soprano pipistrelle	0.1-1km	3, 55, 64.	
Brown long-eared	0.1km	3, 15, 45, 55.	
Natterer's bat	0.1km	55	
Daubenton's	0.5km	85, 98.	
Badger	0.7km	10, 80, 87, 99.	Protection of Badgers Act 1992,

¹ SSSI: Site of Special Scientific Interest, SAC: Special Area of Conservation, SPA: Special Protection Area, LWS: Local Wildlife Site NNR: National Nature Reserve, LNR: Local Nature Reserve.

			Wildlife and Countryside Act 1981.
Grass snake	0.3-1km	12, 15, 23, 35	Wildlife and Countryside Act 1981.
Slow worm	0.3km	42.	
Kingfisher Brambling Fieldfare Barn owl	0.5-1km		

4.2 HABITATS ON SITE

All habitats are classified using JNCC's Phase 1 Habitat Survey Handbook (JNCC, 2010).

Buildings

Furnace Barn is a modern steel framed agricultural building. The base of the structure is block infill with the top half covered with Yorkshire boarding, forming an open structure. There are large steel doors at the north and south elevation of the building which cover half of the apertures, leaving the top half open for ventilation. There are corrugated tin sheets fixed at the north and south elevations, above the blockwork. The entire construction is 'single skin' and there are no cavity walls or voids built into the design.

The large pitched roof is covered with fibre cement sheets and numerous Perspex sky lights. Modern planed timber purlins rest on the steel frame with fibre cement capping at the verges of the roof. The floor is concreted throughout and there are PVC gutters and down pipes fixed around the barn.

Hardstanding

The barn is surrounded by concrete at the north, east and immediate south.

Improved grassland

Permanent pasture fields surround the barn with the land to the immediate west consisting of agriculturally improved grassland. The field is grazed and the sward consisted of the following species at the time of the survey: perennial ryegrass, annual meadow grass, meadow buttercup, white clover, chickweed, dandelion, common daisy and concentrations of nettle along the edge of the building. The field contains a pig and several sheep.

4.3 ADJACENT HABITATS

Buildings

There are a range of other buildings to the east of the barn which include brick under clay barns and also brick out buildings with fibre cement roof coverings. There is a Dutch barn with tin roof covering and cladding.

Grassland

Permanent pasture surrounds the site and extends west within the same ownership.

Watercourse and woodland

The Ell Brook runs from west to east below the site before eventually joining the River Leadon to the south east of Newent. The length of brook adjacent to the barn sits within a shallow valley basin with permanent pasture either side and mature broadleaved woodland forming a corridor along the water course.

4.4 PROTECTED SPECIES

Bats

The barn to be converted does not provide any suitable loft spaces or voids in which bats would readily roost. There are no cavities or areas which might be used by crevice dwelling species and the high light levels due to the Perspex sky lights and open elevations make the building unsuitable for roosting by horseshoe bats. The construction style and design of the barn mean that there are no suitable roosting features present.

The barn was closely searched for the presence of bat droppings, in particular along the base of the walls and beneath the ridge beam. No evidence of bats was found. As per Table 4.1 of the BCT Bat Survey Guidelines (2016) the barn provides 'negligible' potential as a bat roost and no further survey work is required.

The nearby riparian corridor is likely to be of high significance to bats in the landscape who rely on this type of habitat for commuting, feeding and also roosting. The land owner has carried out additional planting along the brook to create a well-developed and connected woodland habitat. The woodland continues both east and west, linking up to other areas of broadleaves and hedgerows within the wider landscape.

Breeding birds

There was no evidence of nesting birds found within the barn at the time of the survey nor any evidence of previous nesting.

Great Crested Newt

There is a single garden pond located approximately 50m to the south of the barn. The pond does not appear on any OS maps and provides ‘poor’ suitability as a breeding site for GCN.

No other areas of standing water are present within 250m of the site.

Otter

The habitats on site do not provide any suitable terrestrial opportunities for otter and its unlikely that the species would be found in the vicinity.

GCN HSI Calculator		
	Pond Name	POND 1
	Position	SO71872641
SI No	SI Description	
1	Geographic location	1
2	Pond area	0.05
3	Pond permanence	0.9
4	Water quality	0.33
5	Shade	0.3
6	Water fowl effect	0.67
7	Fish presence	0.33
8	Pond Density	0.7
9	Terrestrial habitat	1
10	Macrophyte cover	0.3
HSI Score		0.43
Pond suitability (see below)		<i>POOR</i>

5 POTENTIAL ECOLOGICAL IMPACT

5.1 HABITAT ASSESSMENT

The proposals will result in the conversion of a modern barn and the use of a small area of improved grassland to form a garden area. The habitats on site are of low ecological significance and the proposals will have no impact upon protected or priority habitats.

5.2 PROTECTED SPECIES ASSESSMENT

Bats

The barn to be converted provides ‘negligible’ potential as a roosting site for bat species and there is no evidence to suggest that bats have ever used the structure. The internal conditions are light and breezy with no potential roosting features identified within. The conversion of the barn itself will have no impact upon bats or their roosting sites and no further survey work is required.

The proposals will have no impact upon hedgerow, mature trees or larger field systems and will therefore have no impact upon the landscape.

There is a known ‘functionally linked’ lesser horseshoe roost present within 500m of the site (Forest of Dean District Council, 2021) and a well-established wooded watercourse approximately 50m south of the building. This area is likely to be in use by a number of

bat species for various reasons. The use of the barn as a residential property is unlikely to have any impact upon the wooded corridor or indeed bats in the landscape.

There is a brown long-eared and Natterer's bat roost known to be present approximately 100m away from the site.

One possible impact could arise through the installation of additional artificial lighting at the site although fluorescent tube lighting is already in place and would have been used regularly during the night when the barn housed cattle. In order to ensure that the proposals have no impact upon bats in the landscape, a Wildlife Sensitive Lighting Plan (WSLP) will be adopted.

Breeding birds

No evidence of breeding birds was found in association with the barn and the proposed conversion is unlikely to have any impact upon them. Precautionary measures will be adopted.

Great crested newt

Pond 1 provides 'poor' suitability as a breeding site and the proposals will mainly impact areas of hardstanding, a habitat of sub-optimal terrestrial opportunity for GCN.

Otter

The proposals will have no impact upon the nearby brook or other terrestrial habitats which might be used by otter. The WSLP will ensure that otter remain unaffected by the proposed development, if present in the area.

6 AVOIDANCE, MITIGATION AND ENHANCEMENT

6.1 HABITAT MITIGATION

The conversion of a modern farm building and loss of a small amount of improved grassland will not require mitigation.

6.2 PROTECTED SPECIES MITIGATION

Bats & otter

All artificial lighting will be designed with nocturnal wildlife in mind and kept to a minimum. The following measures will be incorporated into lighting plans for the site:

- All sky lights installed into the roof of the property will be fitted with built-in blinds in order to block upward light spill at night time.
- If security lighting is necessary it will be set on motion sensors with short timers (<1 minute) and will be LED.
- Any external or decorative lights will be hooded and directed toward the ground to reduce upward light spill.
- A warm white spectrum will be adopted throughout the scheme to reduce blue light component (<2700Kelvin).
- Internal luminaires will be recessed where they are installed in proximity to windows to reduce glare and light spill. LED luminaires should be used internally where possible due to their sharp cut-off, lower intensity, and dimming capability.
- Luminaires will always be mounted horizontally with an upward light ratio of 0%.
- No exterior lighting will be mounted on the south facing gable of the barn to ensure that the wooded watercourse remains a dark movement corridor.

Breeding birds

Before conversion works begin a thorough internal and external inspection will be made to search for any signs of breeding birds. If any active nests are found they will be left, with a 5 meter buffer zone, until any young have fledged.

6.3 ECOLOGICAL ENHANCEMENT

The land owner is managing various aspects of the wider site for biodiversity benefit, including:

- Regenerative grazing to improve botanical diversity and re-instate floodplain meadow habitat. The permanent pasture on site will be botanically improved through the spreading of species-rich green hay. These measures will serve to increase invertebrate abundance which in turn provides greater food resources for wildlife, in particular foraging bats.
- Woodland planting along the brook to improve the riparian corridor and increase the tree buffer zone. This will provide additional connectivity and cover for wildlife and also help to alleviate flood issues further downstream by retaining higher volumes of water in situ.
- A nest box scheme will be implemented as follows:
 - Three Woodcrete bat boxes will be installed into mature broadleaved trees along the Ell Brook. The boxes will be at least 3m from the ground with a clear flight path into the area. The boxes will face south or south west.

- Three Woodcrete bird boxes will be installed into mature trees along the Ell Brook. A variety of designs will be installed to cater to different species. The boxes will be at least 2.5m from the ground with their entrance facing away from the prevailing wind.

7 SUMMARY

Planning permission will be sought for the conversion of a redundant livestock building at Furnace Lane in Newent. Arbor Vitae were commissioned by The Rural Planning Co. to undertake an Ecological Impact Assessment in order to assess the impact of the development on habitats and protected species.

The proposals will include the conversion of the existing structure into a residential dwelling with separate annex, an outdoor patio area and formation of a garden area.

The barn to be converted provides 'negligible' potential as a roosting site for bat species and there is no evidence to suggest that bats have ever used the structure. The internal conditions are light and breezy with no potential roosting features identified within. The conversion of the barn itself will have no impact upon bats or their roosting sites and no further survey work is required.

The proposals will have no impact upon hedgerow, mature trees or larger field systems and will therefore have no impact upon the landscape.

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One possible impact could arise through the installation of additional artificial lighting at the site. In order to ensure that the proposals have no impact upon bats in the landscape, a Wildlife Sensitive Lighting Plan will be adopted.

No evidence of breeding birds was found in association with the barn and the proposed conversion is unlikely to have any impact upon them. Precautionary measures will be adopted.

Pond 1 provides 'poor' suitability as a breeding site and the proposals will mainly impact areas of hardstanding, a habitat of sub-optimal terrestrial opportunity for GCN.

Existing and ongoing management of the surrounding land will include: restoration grazing, improvement of botanical diversity of permanent pasture, tree planting along the Ell Brook and a nest box scheme to provide additional opportunities for wildlife.

8 REFERENCES

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FIGURE 1 LOCATION. 1:50,000



FIGURE 2 AERIAL PHOTOGRAPH



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FIGURE 3 PONDS WITHIN 250M

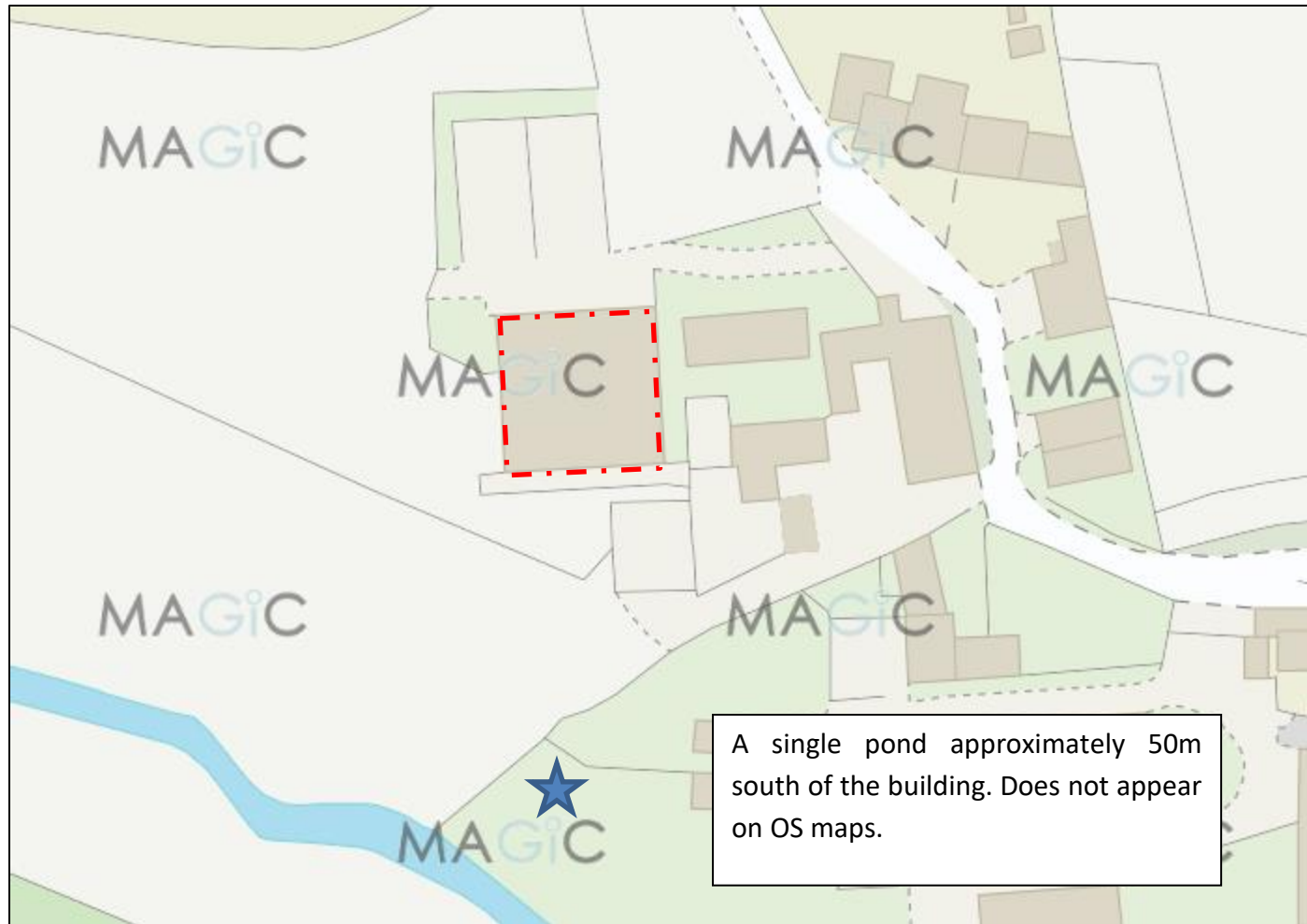


FIGURE 4 DESIGNATED SITES WITHIN 1KM

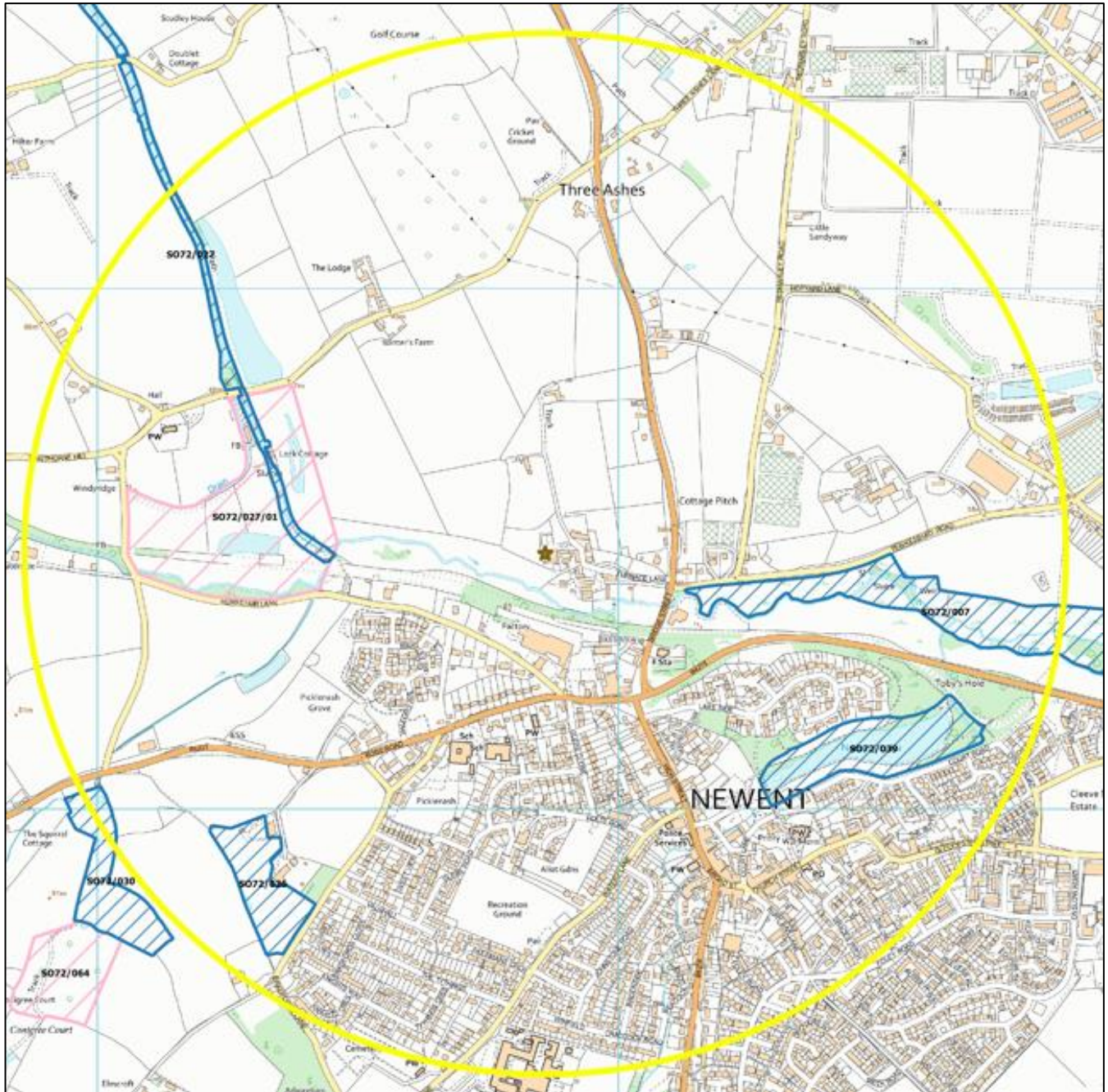


FIGURE 5 PROTECTED SPECIES WITHIN 1KM

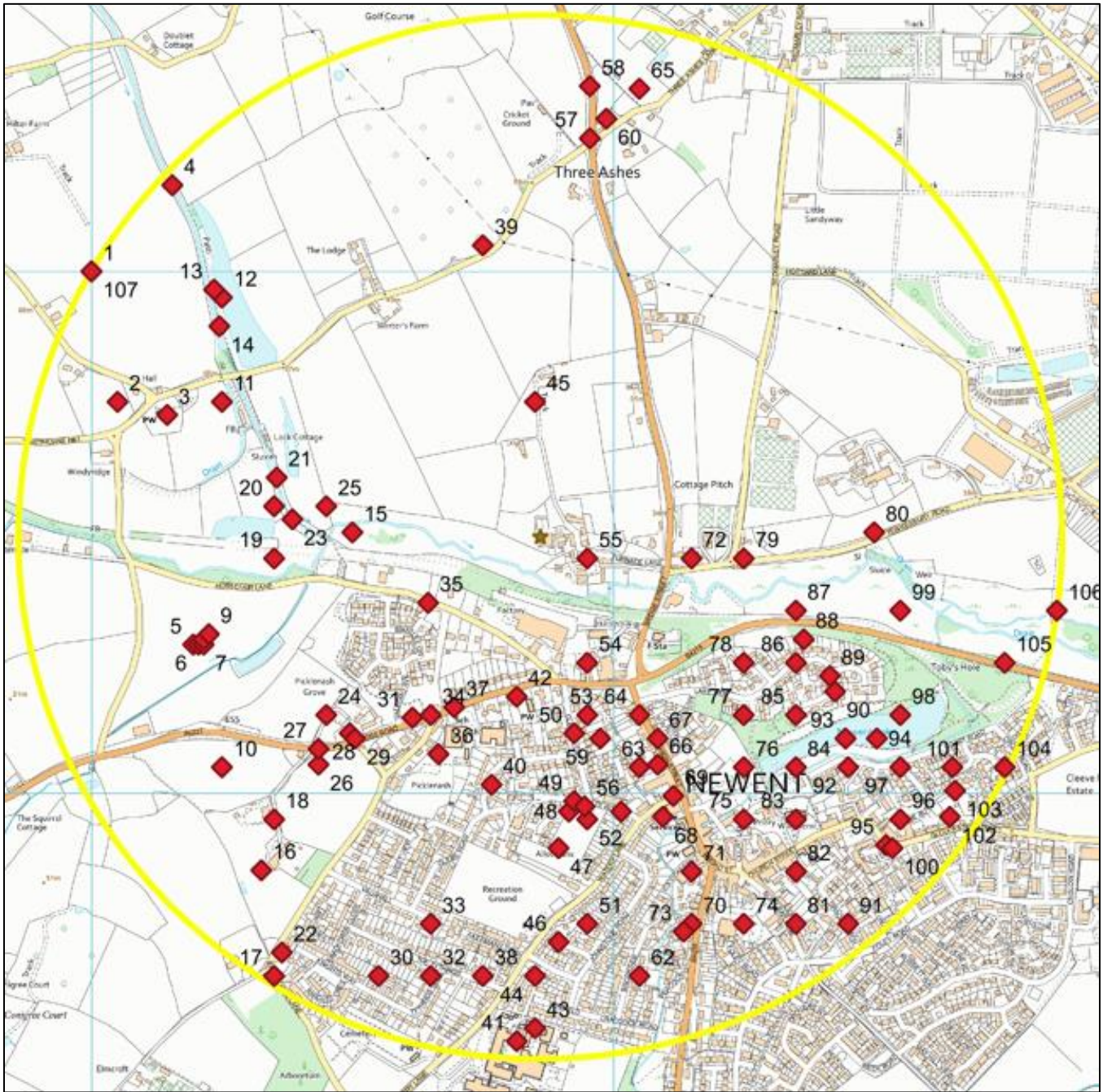
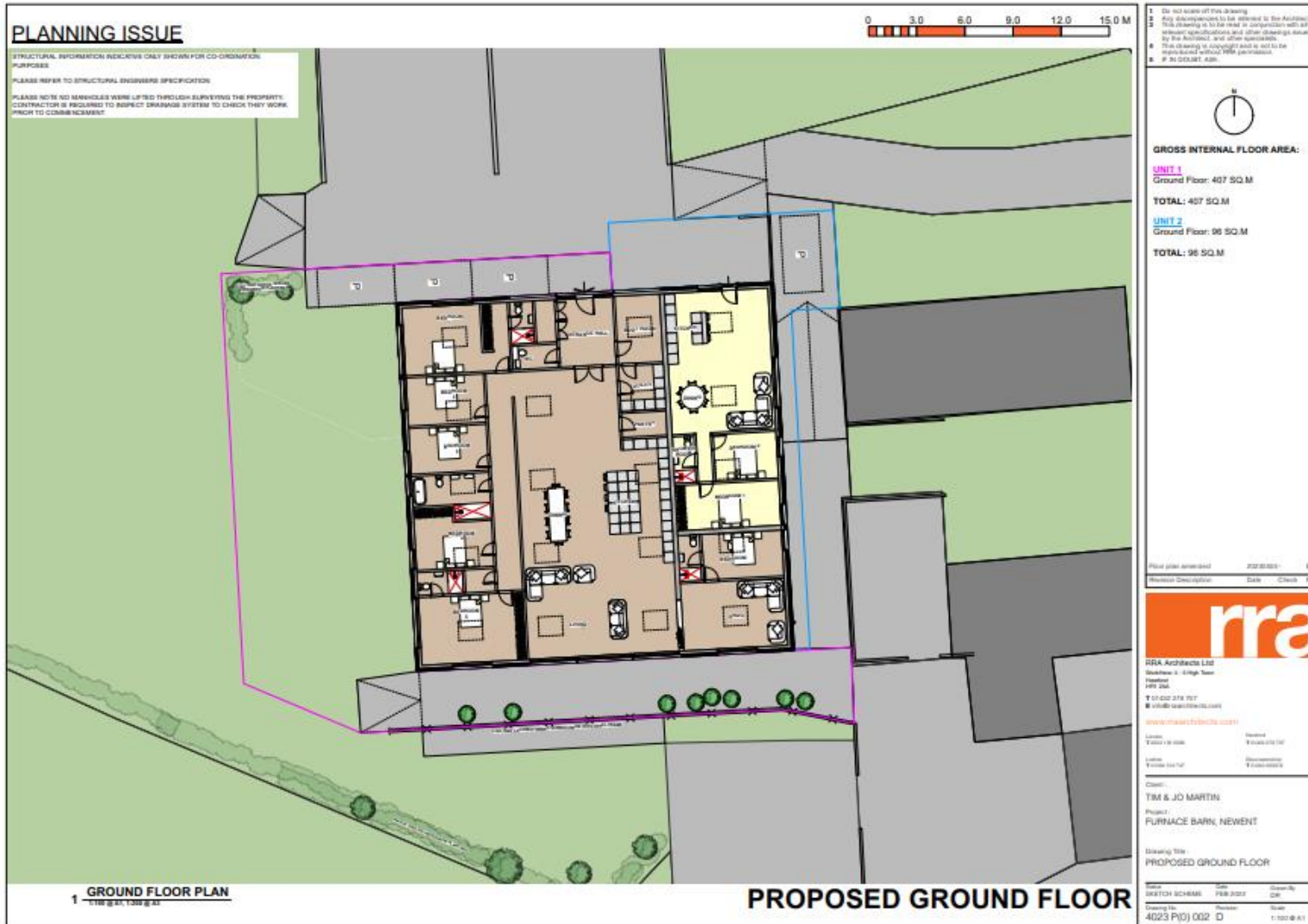


FIGURE 6 PROPOSED SITE PLAN



APPENDIX 1 PHOTOGRAPHS



Exterior of the barn. South facing gable pictured.



West facing elevation and grassland.



Interior of barn.



Hardstanding surrounds.



Riparian corridor on adjacent land.



Other buildings adjacent to the site.

