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Ecological Impact Assessment: Proposed Barn Conversion at Markshall Farm, Markshall Lane, Markshall, Norwich, NR14 8QP



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Client	George Daniels
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Declaration of Compliance

This report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct and British Standard Institution's BS 42020:2013 Biodiversity – Code of practice for planning and development. We confirm that the opinions expressed within this document are our bona fide professional opinions.

The information which is being provided is a true representation of the survey methods used and the results assembled, with respect to the stated dates of survey and assessment. The future validity of this report is conditional on any changes which occur to the assessment site, and in any case will be limited by professionally accepted survey lifespans^{1,2}.

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¹ <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf>

² Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust London. Section 2.6.3 Age of survey data (pg 20).

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1. Non-Technical Summary

Norfolk Wildlife Services was commissioned by the developer, Mr. George Daniels, to assess the potential impacts of a proposed barn conversion at Markshall Farm, Markshall Lane, Markshall, Norwich, NR14 8QP. The conversion would create a one-bedroom single-storey dwelling with parking spaces.

The purpose of this report is to describe the current ecological baseline of the survey area and detail a summary of potential impacts to ecological receptors.

The proposal site was inspected on 09/10/2020 by Seth Lambiase MCIEEM (Natural England bat survey class licence registration #s 2015-11812-CLS-CLS and 2015-11813-CLS-CLS, great crested newts survey class licence registration # 2015-19173-CLS-CLS). Dusk bat roost emergence surveys of the barn were completed on 07/05/2021 and 02/06/2021. The emergence surveys were completed by Seth Lambiase and either James Allitt or John Harris MCIEEM (Natural England bat survey class licence registration # 2015-13039-CLS-CLS).

A neutral impact has been determined for potential direct or indirect impacts to designated sites from the conversion works.

The proposed development would only affect an existing building and track and c.145m² of semi-improved grassland / ruderal vegetation. A neutral impact on valued natural habitats is expected.

The targeted barn supports very small non-breeding roosts of common pipistrelle and brown long-eared bat. A mitigation licence will be required prior to any works taking place to the barn; the proposal may be eligible for a low impact bat mitigation licence (WML-CL21). Should the proposed development be delayed beyond May 2022, additional bat activity survey(s) may be required to confirm the bat roost status for licensing purposes. Compensation will be given in the form of two bat boxes on the new dwelling.

Minor and temporary negative impacts on nesting birds are not predicted but are conceivable. The risk will be mitigated by either timing the start of the works to avoid the main nesting season, or by using watching briefs to confirm nest absence.

Possible impacts to hedgehogs and common toads during the construction phase of the development will be mitigated by applying precautionary working methods.

Modest biodiversity enhancement can be supplied by a bird nest box fitted on a mature tree location at the side of the access track and by using native trees and shrubbery in the landscaping of the new dwelling garden.

2. Introduction

2.1. Description of the project

Norfolk Wildlife Services was commissioned by the developer, Mr. George Daniels, to assess the potential impacts of a proposed barn conversion at Markshall Farm, Markshall Lane, Markshall, Norwich, NR14 8QP (grid reference TG 2340 0423). The conversion would create a one-bedroom single-storey dwelling with parking spaces.

2.2. Purpose

The purpose of this ecological impact assessment report is to:

- Describe the ecological baseline of the survey area (as shown in Figure 1);
- Evaluate the habitats within the survey area for their ecological value in a geographic context;
- Identify and describe all potentially significant ecological effects as a result of the proposal;
- Outline appropriate avoidance or mitigation measures for significant effects as a result of the proposal and how these could be secured;
- Clearly identify requirements to ensure compliance with nature conservation legislation;
- Identify potential ecological enhancement measures beyond avoidance or mitigation;
- Set out any requirement for post-development monitoring.

Figure 1: Markshall Farm barn location



3. Methods

3.1. Zone of Influence

The Zone of influence (Zoi) is defined by the CIEEM Guidelines for Ecological Impact Assessment (2018) as: *“The areas/resources that may be affected by the biophysical changes caused by activities associated with a project”*.

The Zoi for this project considers multiple areas for the potential changes to ecological features as a result of the proposed development. The extents of these areas are:

- Within the application site boundaries (as per Figure 2) and immediately adjacent habitats for direct impacts to valued ecological features (e.g. habitats and protected species).
- Within a 2km radius of a roughly central grid reference (TG 2340 0423) for designated nature conservation sites which may be indirectly impacted as a result of the proposed development.
- Within 250m of the proposed development site for water-bodies (potential amphibian breeding sites).

3.2. Desktop study

A detailed desktop study was made of the survey area using the search criteria and sources described in the Table 1 below. A local biological records search with the Norfolk Biodiversity Information Service was returned on 14/06/2021.

Table 1: Desktop study searches

Search	Sources
A 2km search radius for designated sites and features of interest	Natural England Magic Map Application (www.magic.gov.uk) Norfolk Biodiversity Information Service LPA Planning Search Tool (https://www.planningfinder.co.uk/)
A 2km radius for significant records of protected and priority species and European Protected Species mitigation licences	Natural England Magic Map Application (www.magic.gov.uk) Norfolk Biodiversity Information Service
A 250m radius for extant waterbodies	Natural England Magic Map Application (www.magic.gov.uk) Google Earth Pro Ordnance Survey maps (1:10,000)

3.3. Field survey and establishment of baseline ecological conditions

The survey area was inspected on 09/10/2020 by Seth Lambiase MCIEEM (Natural England bat survey class licence registration #s 2015-11812-CLS-CLS and 2015-11813-CLS-CLS, great crested newts survey class licence registration # 2015-19173-CLS-CLS). The weather was 13°C, 90% cloud cover and light winds at Beaufort Wind Scale 1-2.

Photographs of the barn and pond are referenced within the Results section and are shown in Appendix 2.

3.3.1. Habitats

A Phase 1 habitat assessment was completed based on JNCC 2010 methods.

3.3.2. Species

Mammals

The proposed development area and its adjacent surrounds was evaluated for its potential value for protected or otherwise conservation concern mammal species, particularly roosting bats and hedgehogs.

Torches, and endoscope and a ladder were used to investigate the barn for bat roosting potential (e.g. wall cavities, partially-open timber joints, crevices between timbers) and any actual evidence of bat use (droppings and feeding remains).

Dusk bat roost emergence surveys of the barn were completed on 07/05/2021 and 02/06/2021.

The 07/05/2021 survey was undertaken by Seth Lambiase MCIEEM (Natural England bat survey class licence registration #s 2015-11812-CLS-CLS and 2015-11813-CLS-CLS) and James Allitt, with an infra-red (IR) camcorder and lighting positioned inside the east end of the barn (below the partly missing gable) facing west. The surveyors used Echo Meter Touch 2 Pro and Anabat SD1 bat detectors, and the IR camcorder was paired with an SM4ZC bat detector.

The 02/06/2021 survey was undertaken by Seth Lambiase MCIEEM and John Harris MCIEEM (Natural England bat survey class licence registration # 2015-13039-CLS-CLS). The surveyors used Echo Meter Touch 2 Pro bat detectors.

Birds

An assessment was made of the features likely to support breeding birds and Schedule 1 birds within the survey area.

Reptiles

An assessment was made of the features likely to support reptiles within the survey area.

Amphibians

A desktop search for ponds within 250m of the survey area was conducted using the Natural England Magic Map Application (Magic Maps) and Google Earth Pro, and an assessment was made of the features likely to support great crested newts within the survey area.

The pond 30m north-west of the barn was assessed for great crested newt potential by Seth Lambiase MCIEEM (great crested newts survey class licence registration # 2015-19173-CLS-CLS).

3.4. Assessment of impact potential / risk

Potential impacts on ecological features are characterized using the following criteria.

Positive or Negative

The definition of a positive or negative impact/effect is as per CIEEM (2018):

- *“Positive – a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. This may also include halting or slowing an existing decline in the quality of the environment.*
- *Negative – a change which reduces the quality of the environment e.g. destruction of habitat, removal of foraging habitat, habitat fragmentation, pollution.”*

Spatial Extent

The spatial extent of an impact’s predicted effects is estimated according to the following categories: international and European; national; regional / river basin district; county; local planning authority district; local (≈ parish); site (within the proposed development boundaries).

Magnitude

- *Major* – an impact which is predicted to have a crucial effect (positive or negative) on a designated conservation site, habitat or species population within a specified spatial extent. Normally the effect will be considered either long-term (potentially reversible) or permanent.
- *Moderate* – an impact which is predicted to have a modest effect (positive or negative) on a designated conservation site, habitat or species population within a specified spatial extent. Normally the effect will be considered temporary in either the short- or medium-term, and reversible.
- *Minor* – an impact which is predicted to result in a slight but unimportant effect (positive or negative) on a designated conservation site, habitat or species population within a specified spatial extent. Normally the effect will be considered to be short-term and reversible.
- *Neutral* – a ‘non-impact’, with no appreciable effects on a designated conservation site, habitat or species population.

Duration

The duration of an impact’s predicted effect may be quantified, or else broadly defined as either short-term, medium-term, long-term or permanent.

4. Results

4.1. Local context

The proposal site is approximately 0.6km south-west of the A47 dual carriageway. The Markshall Farm barn is within an arable landscape, but it is also within 70m of the River Tas and the extensive grasslands along the river corridor from Caistor St Edmund to the A47.

4.2. Desktop study results

The only statutory designated nature conservation site located within 2km is the Caistor St. Edmund Chalk Pit SSSI, which is designated for geological reasons. There are 12 non-statutory designated nature conservation sites (11 County Wildlife Sites and one Roadside Nature Reserve) within 2km; see Figure 3. The nearest CWS is the Long Plantation CWS (#271) located 445m south of the Markshall Farm barn.

Species records from NBIS that are considered relevant to the nature of the proposal are summarised in Table 2.

Table 2: Desktop search results – species

Species	Location details	Dates	Comments
Bats – multiple species	128 records, none from Markshall	2002-2017	The great majority of records based on auditory data, most collected by the Norfolk Bat Survey. 7 records of roosts.
Hedgehog	80 records	2005-2018	-
Reptiles	None	-	-
Amphibians	3 great crested newt records from Dunston	2017-2018	~ 1.8km distant from proposal site.

4.3. Field survey results

4.3.1. Habitats

The proposal site comprises existing bare earth track, a barn, c.145m² of semi-improved grassland / ruderal vegetation and 10m of garden hedge that will be retained.

4.3.2. Species

Mammals

The barn is a single-storey brick structure with a lined (grey plastic membrane) pantile roof (Photos 1-3). The upper portion of the east gable is missing (Photos 3 and 5), and the barn is split into a small bay at the west end and a larger east bay. The partition wall between the bays is blockwork for the bottom half and timber sheeting for the top half.

The 09/10/2020 inspection found 10 large droppings (presumed of brown long-eared bat) that had been deposited recently below the ridge within the small western bay (see Photos 6 and 7). No other roosting evidence was noted, but the overall roost potential was rated as moderate.

The 07/05/2021 dusk emergence survey was completed in suitable conditions (dry, mostly calm with occasional light winds, mostly clear skies, 10-6.5°C) from 20:15 to 21:40 (sunset 20:33). There was regular early noctule activity overhead and later passing common pipistrelles and at least one soprano pipistrelle. The survey observed a single common pipistrelle emerging from a roost inside the east

bay of the barn at 21:01. The IR camcorder video suggests that the bat was roosting in a feature of the timber partition wall (Photo 8).

The 02/06/2021 dusk emergence survey was completed in suitable conditions (dry, mostly calm with occasional light winds, mostly overcast, 17-15°C) from 20:55 to 22:30 (sunset 21:10). There was regular noctule activity overhead throughout and passing common pipistrelles and soprano pipistrelles. The survey observed one brown long-eared bat fly into the east bay of the barn via the damaged east gable at 21:35, followed by single brown long-eared bat emergences from the barn at 21:36 and 21:37 (hence one being a roost emergence from inside).

See Figure 4.

Birds

The barn has conceivable nesting potential, but no evidence of nesting was observed.

Reptiles

The proposal site has negligible reptile potential.

Amphibians

The pond (Photo 9) was observed to be turbid and filled with hundreds of small fish, with possibly larger ones being out of sight. The great crested newt breeding potential for the pond is rated as negligible.

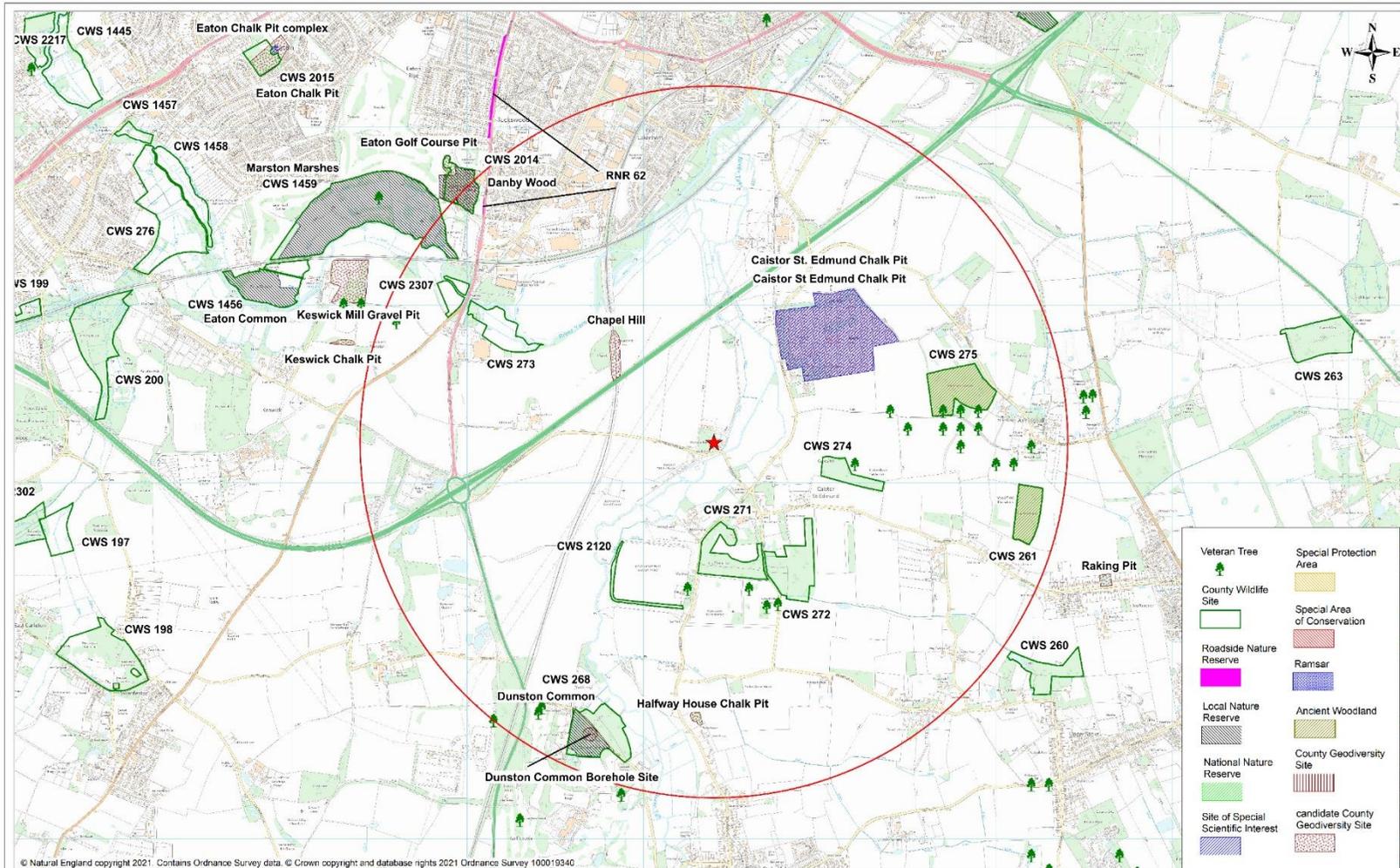
4.4. Limitations

The survey effort was reasonable and appropriate given the limited bat roost potential of the building. No significant survey limitations are recognized.

4.5. Further survey recommendations

An update to the bat survey effort may be required to inform a bat mitigation licence (e.g. WML-CL21 low impact bat licence) if the application is made after May 2022.

Figure 3: Map of nearby designated nature conservation sites

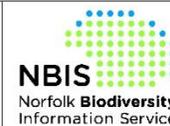


2km Data Search Around TG2340 0423, Marshall Farm

for Norfolk Wildlife Services

Scale 1:20000

Compiled by L. Oddy on 14 June 2021



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County Hall
Martineau Lane
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Figure 4: Bat activity survey results



5. Ecological Impact Risk Assessment

5.1. Potential impacts

5.1.1. Designated nature conservation sites

The proposed development presents no credible risk of impacts to any statutory or non-statutory designated nature conservation site. A *neutral* impact on designated nature conservation sites is predicted for the construction and occupation of the barn conversion.

5.1.2. Habitats

The habitats to be affected by the development (bare earth track, a barn and a c.145m² of semi-improved grassland / ruderal vegetation) have very limited value aside from the bat roost significance of the barn. Redevelopment of the proposal site as a residence with garden is judged as having a *neutral* impact on valued habitats (not considering the bat roost value of the barn).

5.1.3. Protected species

Mammals

The barn conversion would have *minor negative* roost displacement impacts on the local populations of common pipistrelle and brown long-eared bat. Mitigation is required.

There is a potential for *minor negative* impacts on a local hedgehog population by way of accidents occurring to transient hedgehogs during the site construction, but the long-term impact on hedgehogs from the new residence is expected to be *neutral*. Mitigation is advised.

Birds

The proposal site has very minor songbird nesting potential. Site preparation/clearance within the breeding season (March to end August) could conceivably result in active nest disturbance/destruction, resulting in *minor negative* impacts on local bird populations. The finished development has the potential to mitigate this impact by providing potential nesting habitat (for common species) as the garden matures.

Reptiles

Neutral impact predicted.

Amphibians

A *neutral* impact on great crested newts is expected, but there may be a possibility of *minor negative* impacts on a local common toad population by way of accidents occurring to transient toads during the site construction. The long-term impact on common toads from the new residence is expected to be *neutral*. Mitigation is advised.

5.2. Cumulative effects

The farmhouse adjacent to the barn appears to have had recent roof repair work, but the significance of that for roosting bats is unknown.

5.3. Mitigation measures

5.3.1. Habitats

The garden hedge on the east boundary of the site will be retained, and the current semi-improved grassland / ruderal vegetation area will be lawn and plantings.

5.3.2. Protected species

Mammals

A mitigation licence will be acquired prior to the barn conversion. The development is expected to qualify for the bat low impact licence (WML-CL21). Under the conditions of a licence there would be no seasonal constraint on the timing of the works other than an avoidance of destructive searches during the hibernation period (typically December to mid-March). The dismantling of the partition timber wall and stripping of the pantile roof will need to be done under the supervision/advisement of a licenced bat worker. Roost compensation is not obliged under a WML-CL21 licence, but to satisfy planning policy, single bat boxes should be provided on each of the gable ends of the new dwelling. External bat boxes (e.g. 2FE Schwegler Wall-Mounted Bat Shelter, Beaumaris Woodstone Bat Box or equivalent) or integrated boxes (e.g. Ibstock Enclosed Bat Box 'C', Vivara Pro Build-in WoodStone Bat Box or equivalent) would be appropriate.

To mitigate the potential for negative impacts on bat foraging and commuting from the lighting of a new dwelling, a wildlife-sensitive lighting scheme should be adopted as per recent Institution of Lighting Professionals and Bat Conservation Trust guidance (Ferguson et al. 2018). Any new lighting for the development should be unobtrusive and downcast/directional to prevent direct illumination of bat flight paths and foraging areas as best as possible. Exterior lighting should be PIR activated and on short timers (≤ 1 minute). Lighting on site is also recommended to avoid blue-white short wavelength and lights with high UV contents, as these have a negative impact on insect so reduce foraging for bats (Stone, 2013).

Construction impacts to hedgehogs are to be mitigated by barricading wet/drying concrete, fitting any open excavations with escape ramps and having precautionary methods of green waste and building material storage and movement.

Birds

The commencement of the works will either need to avoid the main nesting season (March – August) or else undergo a prior watching brief to check for established territories and possible nesting activity. Any identified active nests must be given a suitable works exclusion buffer (as determined by the ecologist) until the nesting attempt reaches a natural conclusion.

Amphibians

Construction impacts to amphibians (most notably common toads) are to be mitigated by barricading wet/drying concrete, fitting any open excavations with escape ramps and having precautionary methods of green waste and building material storage and movement.

5.4. Mitigation licensing for European Protected Species

There is no anticipated requirement for mitigation licensing for great crested newts.

A mitigation licence derogating from the legal protection afforded to roosting bats the Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019 can only be granted in cases where the activity meets the following three tests.

1. Overriding public interest

The overriding public interest of the proposed development project is derived from it converting a redundant and deteriorating building into a dwelling. This would provide new housing and some economic benefits for local builders and suppliers. The cost would be negative ecological impacts which are rated as being of a minor magnitude at a local level, and amenable to effective mitigation and compensation under a mitigation licence.

2. There is no satisfactory alternative

The proposal is to convert an existing redundant barn into a new one-bedroom single-storey dwelling. The alternatives to the proposed works are:

- a) Do nothing and leave the existing barn as it is. This option would be a disappointment for the property owners, leaving a potentially useful structural asset to continue unused and to further deteriorate (as there would be no purpose to repairing or replacing it). There would be no provision of new housing but also no immediate related impact on bats.
- b) Undertake the works but avoid the bat roosts entirely. This option is unfeasible due to the location of the bat roosts inside the barn.
- c) Undertake the works under the conditions of a mitigation licence. There would be provision of one new housing unit, some economic benefits for local builders and suppliers, and a minor but mitigable negative impact on roosting bats.

A cost vs. benefit analysis concludes that option (c) is the most satisfactory alternative.

3. The resulting permitted actions will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range

The bat roosting use appears to be occasional. Roost compensation may be created for the destroyed roosts and there are alternative roosting opportunities in the locality. There is no conceivable reason why the favourable conservation status of the local common pipistrelle and brown long-eared bat populations would suffer significant impact from the proposal.

5.5. Residual impact assessment

Table 3: Residual impact risk assessment

Receptor	Potential impact	Mitigation	Residual impact
Habitats	Minor negative permanent impact to the local abundance of semi-improved grassland / ruderal vegetation.	Replacement with lawn and landscape plantings.	Short-term minor negative; long-term neutral

Bats	Minor negative roost displacement impact to local common pipistrelle and brown long-eared bat populations	Precautionary works to be undertaken under a mitigation licence. Two bat boxes provided with new dwelling.	Short-term minor negative; long-term neutral
	Minor negative impact on local bat population foraging and commuting from new external lighting.	Follow an approved wildlife-sensitive lighting scheme.	Neutral
Hedgehogs	Minor negative impact on local population from accidental injury/death during construction.	Barricading wet/drying concrete, fitting any open excavations with escape ramps and having precautionary methods of green waste and building material storage and movement.	Neutral
Birds	Minor negative local impact to breeding birds as a result of nest disturbance/destruction during construction.	Timing the start of works outside the main nesting season, or else completing a competent watching brief prior to commencing.	Neutral
Common toads	Minor negative impact from accidental injury/death during construction.	Barricading wet/drying concrete, fitting any open excavations with escape ramps and having precautionary methods of green waste and building material storage and movement.	Neutral

6. Enhancements

One nest box (e.g. Vivara Pro Seville WoodStone Nest Box or equivalent) should be mounted on the mature tree at the south-east end of the access track.

Landscape planting will use native species for trees and shrubbery.

7. Conclusions

An ecological impact assessment of the proposed conversion of a redundant barn at Markshall Farm makes the following predictions:

- No impacts on designated nature conservation sites.
- Minor but insignificant impacts on valued habitats.
- A minor negative but temporary impact to the local common pipistrelle and brown long-eared bat populations; to be mitigated by undertaking appropriate mitigation measures under a mitigation licence and compensated by means of two new bat roost boxes.
- Possible minor impacts to a local hedgehog population; to be mitigated by precautionary working methods during the construction phase.
- Possible minor and temporary impacts on nesting birds; to be mitigated by timing of works or by using watching briefs to confirm nest absence.
- Possible minor impacts to a local common toad population; to be mitigated by precautionary working methods during the construction phase.

Minor biodiversity enhancement can be supplied by one bird nest box fitted on a tree and by using native trees and shrubbery in the landscaping of the new dwelling garden.

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Appendix 1: Relevant Legislation and Policy Guidance

Wildlife and Countryside Act 1981

The Wildlife and Countryside Act 1981 (as amended), Section 9, offers protection from intentional or reckless actions upon species listed on Schedule 5 or Schedule 8. Schedule 5 listed species have different degrees of protection depending on whether they are protected by Section 9.1, 9.2, 9.4 or 9.5.

- Section 9.1 - animals protected from killing or injury; includes water vole, grass snake, common lizard, slow-worm and adder.
- Section 9.4a - animals which are protected from intentional damage or destruction to any structure or place used for shelter or protection; includes water vole.
- Section 9.4b - animals which are protected from intentional disturbance while occupying a structure or place used for shelter or protection; includes all bat species, hazel dormouse, otter and water vole.
- Section 9.4c - Animals which are protected from their access to any structure or place which they use for shelter or protection being obstructed; includes all bat species, hazel dormouse, otter, water vole, great crested newt and natterjack toad.

All birds are protected from destruction of their nests (with minor exceptions) under the Wildlife and Countryside Act 1981. A higher level of disturbance protection is extended to Schedule 1 species, such as barn owls, and their active nest sites.

Plants listed under Schedule 9 of the act are invasive and generally need controlling on a development site. It is an offence to “plant or otherwise cause to grow in the wild”, the invasive species listed on this schedule. Disposal of the plants or soil contaminated by them may need to be to a controlled waste site.

Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019

The statutory protection for European Protected Species and Natura 2000 sites (now referred to as ‘National Site Network’ sites) remains unchanged for now, and the status quo is expected to be maintained for some time. The Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019 broadly retains the habitat and species protections that are required under the European Habitats Directive (EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) and the Birds Directive (Council Directive 2009/147/EC on the Conservation of Wild Birds).

The UK legislation affords very strict protection to Annex IV listed species (e.g. all species of bats, hazel dormouse, otter, great crested newt and natterjack toad). Developments that are likely to have a significant impact upon Annex IV listed species (e.g. bats and great crested newts) require a European Protected Species mitigation license from Natural England in order for the development to legally proceed.

Natural Environment and Rural Communities Act 2006

The Natural Environment and Rural Communities Act 2006 (NERC) came into force on 1 October 2006. Under Section 40 of the Act, all public bodies (including planning authorities) now have a legal duty to consider biodiversity in their work (i.e. a material consideration for planning applications). As such, in order to increase the likely success of any planning application, consideration should be given to enhancing the biodiversity value of the site following redevelopment. Section 41 lists priority (Principal Importance) habitats and species which are to be particularly considered with respect to potential impacts, and may include species which are not otherwise protected by UK legislation.

Appendix 2: Photographs



Photograph 1: South and east elevations of barn (left – right)



Photograph 2: North and west elevations of barn (left – right)



Photograph 3: East and north elevations of barn (left – right)



Photograph 4: Interior facing west



Photograph 5: Interior facing east



Photograph 6: Interior apex of the west gable where suspected brown long-eared bat had briefly roosted in 2020.



Photograph 7: Small number of droppings below suspected brown long-eared bat roost shown in Photo 6.



Photograph 8: IR camcorder video still of emergence of common pipistrelle inside the barn on 07/05/21



Photograph 9: Pond located 30m north-west of barn