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Preliminary Ecological Appraisal Report

Land at Green End Farm, Green End,
Granborough, Buckinghamshire, MK18 3NT

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1	02/07/2021	Issued to the client.

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The summary of wildlife legislation provided is for general guidance only and does not in any way provide legal opinion or a definitive statement of the law. For detailed information, the legislation itself should be reviewed and a legal professional consulted.

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The evidence in this document is based upon the field survey(s) detailed. Due to the changing nature of ecology the list of species present cannot be considered comprehensive and Smart Ecology cannot guarantee that other protected/notable species and habitats are not present.

The ecology of a site is constantly changing and therefore the information provided in this document is only relevant at the time of survey. **If it has been over 12 months since this survey was undertaken advice should be sought on whether an updated survey is necessary.**

The evidence which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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Non-Technical Summary

Purpose of Report	<p>Smart Ecology was commissioned by Mark Doodes Planning to undertake a Preliminary Ecological Appraisal of Land at Green End Farm, Green End, Granborough, Buckinghamshire, MK18 3NT.</p> <p>The purpose of the appraisal was to inform a planning application for the erection of two equestrian barns and arenas (21/00976/APP).</p>
Methodology	A desk study and an Extended Phase 1 habitat survey were undertaken.

Ecological Feature	Potential Impacts without Mitigation (refer to Section 5)	Proposed Mitigation (refer to Section 6.2)
Birds	If long sward grassland is removed during the nesting season (which is typically March to August inclusive) then there is potential for killing/injury of birds and destruction of active nests.	Removal of long sward grassland will be undertaken outside of the nesting season, or if this is not possible then the grassland will be checked for active nests by an ecologist no more than 48 hours before cutting/removal. If active nests were present these would be left undisturbed until the young had fledged.
Amphibians & reptiles	Injury/death during site clearance and construction.	Reasonable Avoidance Measures will be implemented during site clearance and construction to avoid disturbance and injury/death (including of great crested newts).

Conclusions	<p>The proposed development would not impact upon any statutory designated sites or ecologically important or protected habitats.</p> <p>No significant impacts on protected or notable species are considered likely if the mitigation measures provided in this report are implemented.</p> <p>Enhancements are proposed to provide a biodiversity gain for roosting bats and nesting birds.</p>
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1 Introduction

1.1 Background

- 1.1.1 Smart Ecology was commissioned by Mark Doodes Planning to undertake a Preliminary Ecological Appraisal of Land at Green End Farm, Green End, Granborough, Buckinghamshire, MK18 3NT (central national grid reference SP 7721 2501). Refer to Figure 1, Section 9 for a location map, which shows the survey area delimited by a blue-line boundary and the footprint of the proposed development delimited by a red-line boundary (hereafter referred to as the “site”).
- 1.1.2 The purpose of the appraisal was to inform a planning application to Buckinghamshire Council for the erection of two equestrian barns and arenas (21/00976/APP); see Appendix 1 for the proposed site plan.
- 1.1.3 This report has been prepared by Robert Dunn, director at Smart Ecology and an associate member of the Chartered Institute of Ecology and Environmental Management (CIEEM), with reference to CIEEM’s Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017a), Guidelines for Ecological Report Writing (CIEEM, 2017b), and BS42020 Biodiversity – a code of practice for planners and developers (BSI, 2013).

1.2 Site Context

- 1.2.1 The site comprised improved grassland, bare ground, and disturbed ground which is in the process of being colonised by vegetation. The wider survey area comprised further improved grassland, arable crop, hedgerows, a wet ditch, and pond. The local landscape predominantly comprises arable and pasture fields with boundary hedgerows.

1.3 Aims

- 1.3.1 The purpose of the survey and report was to:
- Identify any statutory¹ designated sites on or close to the site.
 - Provide an ecological baseline for the site including habitats² and the presence of, and potential for, legally protected³ and invasive non-native species.
 - Identify any potential impacts on designated sites, habitats, and species.
 - Provide recommendations for further required surveys, mitigation, and enhancements.

¹ Statutory designated sites are those protected by legislation and include Ramsar, Special Protection Areas (SPA), Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), and Local Nature Reserves (LNR).

² Including priority habitats listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

³ Legally protected species include species afforded protection by the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended).



2 Legislation and Planning Policy

2.1 Legislation

2.1.1 Certain species and habitats are legally protected in the UK by legislation. The key pieces of legislation are:

- The Conservation of Habitats and Species Regulations 2017 (as amended).
- Wildlife and Countryside Act 1981 (as amended).
- Protection of Badgers Act 1992.
- Wild Mammals (Protection) Act 1996.
- The Hedgerows Regulations 1997.

2.1.2 The implications of legislation with regard to species are provided in Table 2-1.

2.1.3 Only a brief summary of wildlife legislation is provided here for general guidance and should not be considered a definitive statement of the law. For detailed information the legislation itself should be consulted.

The Conservation of Habitats and Species Regulations 2017 (as amended)

2.1.4 These Regulations transpose the EU Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. The Regulations require the designation and protection of European Sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA) and the protection of European Protected Species (EPS).

2.1.5 A EPS mitigation licence is required if works affect EPS (e.g. bats) or their places of rest or breeding sites. EPS licences are issued by Natural England only after the following three tests have been satisfied:

- The proposed works must be for the purpose of preserving public health or safety or other imperative reasons of overriding public interest.
- There is no satisfactory alternative to the proposed works.
- The proposed works will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range.

2.1.6 **It will be necessary to determine whether any European Sites or EPS may be impacted, either directly or indirectly, by the proposed development.**

Wildlife and Countryside Act 1981 (as amended)

2.1.7 This Act implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Directive) and the EU Directive 79/409/EEC on the conservation of wild birds (Birds Directive).

2.1.8 The Act provides protection to a range of animal and plant species. It also requires sites with special wildlife or geological interest to be designated nationally as Sites of Special Scientific Interest (SSSI).

2.1.9 **It will be necessary to consider whether the proposed development would have any direct or indirect impacts on any SSSI or species listed in relevant schedules of the Act.**



Natural Environment and Rural Communities (NERC) Act 2006

2.1.10 Section 40 of this Act places a duty on public authorities to 'have regard' to conserving biodiversity when determining planning applications. Section 41 of the Act requires the Secretary of State to publish a list of species and habitats of principal importance to biodiversity (priority species and habitats). The local planning authority must 'have regard' to conserving these species and habitats when determining a planning application. The development would need to mitigate for any impacts on priority habitats and species.

2.1.11 **The proposed development would need to mitigate for any impacts on priority habitats and species.**

Protection of Badgers Act 1992

2.1.12 This Act provides specific protection for badgers and their setts from harm and disturbance.

2.1.13 **The proposed development would need to mitigate any impacts on badgers and setts.**

Wild Mammals (Protection) Act 1996

2.1.14 This Act makes it an offence to intentionally inflict unnecessary suffering on a wild mammal through mutilation, kicking, beating, nails, impaling, stabbing, burning, stoning, crushing, drowning, dragging, or asphyxiation.

2.1.15 **Care would have to be taken during the construction phase of the proposed development to ensure that unnecessary suffering is not inflicted.**

The Hedgerows Regulations 1997

2.1.16 These Regulations protect most hedgerows from removal unless permissioned by a local planning authority. They also provide historic and ecological criteria for defining important hedgerows. A local planning authority can only refuse permission to remove a hedgerow under the Hedgerows Regulations 1997 if a hedgerow is assessed to be important.

2.1.17 **The proposed development should aim to retain and protect hedgerows and mitigate for impacts.**

Table 2-1: Implications of legislation with regard to species

Legislation	Species	Legal Implications
The Conservation of Habitats and Species Regulations 2017 (as amended)	<ul style="list-style-type: none"> Bats Hazel dormouse Otter Great crested newt 	It is illegal to: <ul style="list-style-type: none"> Deliberately capture, injure or kill these species. Deliberately disturb¹ these species. Damage or destroy a breeding site or resting place used by these species.
Wildlife and Countryside Act 1981 (as amended) – sub-sections 9(4) b and c and 9(5) only	<ul style="list-style-type: none"> Bats Hazel dormouse Otter Great crested newt 	It is illegal to: <ul style="list-style-type: none"> Intentionally or recklessly disturb these species while they are occupying a structure or place of shelter or protection. Intentionally or recklessly obstruct access to a structure or place of shelter or protection.



Legislation	Species	Legal Implications
Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none"> Birds 	<p>It is illegal to intentionally:</p> <ul style="list-style-type: none"> Kill, injure or take any wild bird. Take, damage or destroy a wild bird's nest while it is in use or being built. Take or destroy the eggs of any wild bird. <p>There is additional protection for birds listed on Schedule 1 (S1) of the Act, which includes barn owls, whereby it is an offence to intentionally or recklessly disturb a S1 bird while building a nest or in or near a nest containing eggs or young, and disturb dependent young of a S1 bird.</p>
Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none"> Water vole 	<p>It is illegal to:</p> <ul style="list-style-type: none"> Intentionally kill, take, or injure water voles. Intentionally or recklessly damage or destroy a place of shelter or protection. Intentionally or recklessly disturb water voles while they are occupying a structure or place of shelter or protection. Intentionally or recklessly obstruct access to a structure or place of shelter or protection.
Wildlife and Countryside Act 1981 (as amended) – sub-sections 9(1) (partial) and 9(5) only	<ul style="list-style-type: none"> Common reptile species 	<p>It is illegal to:</p> <ul style="list-style-type: none"> Intentionally or recklessly kill or injure common lizard, slow worm, grass snake, and adder.
NERC Act 2006	<ul style="list-style-type: none"> Priority species 	<p>Local planning authorities must 'have regard' to conserving priority species. Priority species include several bat and bird species, otter, hazel dormouse, water vole, hedgehog, brown hare, harvest mouse, polecat, common reptile species, great crested newt, and common toad.</p>
Protection of Badgers Act 1992	<ul style="list-style-type: none"> Badger 	<p>It is illegal to:</p> <ul style="list-style-type: none"> Wilfully capture, kill or injure a badger. Damage, destroy or obstruct access to setts. Disturb badgers in setts.

¹ Disturbance under the Conservation of Habitats and Species Regulations 2017 (as amended) is defined as impairing the ability of an animal to survive, breed, reproduce, rear or nurture their young, hibernate or migrate, or to significantly affect the local distribution or abundance of the species.

2.2 Planning Policy

National Planning Policy Framework (NPPF) 2019

2.2.1 Paragraph 170 states that planning decisions should protect sites of biodiversity value, minimise biodiversity impacts, and contribute to net biodiversity gains.

2.2.2 Paragraph 175 states that planning permission should be refused if significant harm to biodiversity resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for.



2.2.3 The NPPF emphasises the need to consider biodiversity at a landscape scale, conserving, restoring and enhancing priority habitats and ecological networks, and protecting priority species. The NPPF also specifies the need to protect designated sites from adverse harm and to protect irreplaceable habitats (e.g. ancient woodland and veteran trees).

2.2.4 **The proposed development would need to mitigate for impacts on biodiversity and provide net biodiversity gains where possible.**

Local Planning Policy

2.2.5 The presence of EPS, including bats, is a material consideration in the planning process and local planning authorities will refuse planning permission where a EPS licence is unlikely to be granted and a criminal offence relating to an EPS is likely to result from a development.



3 Methodology

3.1 Desk Study

3.1.1 The Multi-Agency Geographic Information Centre (MAGIC)¹ website was consulted for existing information on:

- Statutory designated sites within 1 km of the site.
- Priority habitats and ancient woodlands within 500 m of the site.
- Granted EPS mitigation licences within 1 km of the site.
- Statutory designated sites for bats within 6 km² of the site.
- Great crested newts licence returns and pond survey results within 1 km of the site.
- Mapped waterbodies within 250 m of the site.

3.1.2 The search areas are considered sufficient to take into account ecological receptors which could potentially be impacted by the proposed development.

3.1.3 A data search was not obtained from the Local Records Centre as it was considered that this would not provide any significant additional information to inform the assessment.

3.2 Field Survey

Personnel

3.2.1 The field survey was carried out by Robert Dunn; see Table 3-1 for details of the surveyor's experience and qualifications.

Table 3-1: Surveyor information

Surveyor	Natural England Survey Licences	Experience
Robert Dunn BSc, MSc, ACIEEM	Bats level 1 (2016-23966) Great crested newt level 1 (2016-23661) Hazel dormouse level 1 (2016-26867)	Eight years' experience in ecological consultancy. MSc Environmental Biology: Conservation and Resource Management (University of Swansea - Merit). BSc Biological Sciences with Environmental Resources (University of Warwick - 1 st).

¹ <https://magic.defra.gov.uk/MagicMap.aspx> (accessed June 2021).

² 6 km is the largest known bat Core Sustenance Zone (CSZ) (Collins, 2016).



Survey Weather Conditions

- 3.2.2 The survey was undertaken on the 8th of June 2021. See Table 3-2 for details of weather conditions during the survey.

Table 3-2: Survey weather conditions

Variable	Weather Conditions
Cloud cover	40 - 50 %
Temperature	20°C
Wind	Light breeze (BWS 2)
Precipitation	None

Extended Phase 1 Survey

- 3.2.3 A Phase 1 habitat survey was undertaken following the methodology outlined in the 'Handbook for Phase 1 Habitat Survey' (JNCC, 2010). This involved a walkover of the site to map habitats present against Phase 1 categories. As an extension to the Phase 1 habitat survey, any priority habitats within the site were identified and habitats assessed for evidence of, and potential to support, legally protected, notable and invasive non-native species. Any evidence of, and potential for, such species was recorded. Target Notes (TN) were made for any evidence of, or features with particular suitability for legally protected, notable and non-native invasive species; these are provided in Appendix 2 and plotted on the Phase 1 Habitat Map (Figure 2, Section 9).
- 3.2.4 Specifically, the site was surveyed for evidence of, and potential for, the species/groups detailed in Table 3-3:

Table 3-3: Typical habitat requirements and field signs for surveyed species/groups

Species/Group	Typical Habitat Requirements	Field Signs
Bats	Roost in buildings, trees, other structures, and underground sites. Foraging and commuting habitat include watercourses, waterbodies, hedgerows, tree-lines, scrub, woodland, pasture, and meadows.	Direct sighting, carcasses, droppings, urine, grease marks, feeding remains, squeaking.
Birds	Woodland, trees, scrub, hedgerows, moorland, heathland, wetlands, cavities within buildings, waterbodies, grassland.	Direct sightings, nests, droppings, feathers, eggs.
Hazel dormouse	Deciduous and mixed woodland (especially coppice managed with a successional stage of vegetation). Also hedgerows, conifer plantations, and dense scrub.	Direct sighting, nests, gnawed nuts.



Species/ Group	Typical Habitat Requirements	Field Signs
Otter	Holts in tree cavities, roots, rabbit burrows and bank-side rocks. Rivers, wetland, wet ditches, drains, ponds, lakes, coastal and marshland.	Direct sightings, anal jelly, spraint (dung), footprints, paths/tracks through vegetation, feeding remains, slides into and out of the water, couches (above ground resting places), holt entrances (below ground shelters).
Water vole	Vegetated banks on slow moving watercourses, reed beds, ponds, lakes, marshland, upland.	Direct sightings, latrines, droppings, feeding stations, burrows, feeding remains, lawns, nests, footprints.
Brown hare	Open farmland, grassland, woodland edges. Favours a mosaic of arable (cereal crops), grassland (with long areas for shelter) and hedgerows. Hare forms (resting places) may be in a grass tussock or behind a rock to give some protection. Hayfields provide better habitat than silage grassland as leverets are vulnerable to earlier cutting.	Direct sightings, footprints, droppings, forms, paths (tracks),
Hedgehog	Grassland, heathland, moorland, farmland, woodland, gardens	Direct sightings, footprints, droppings.
Polecat	Woodland, riverbank, marsh and farmland with hedgerows and small woods. Generalist species with wide ranges. Feed on rabbits, small rodents, birds, insects, frogs when gathered to spawn in the spring. Dens often in rabbit burrows in summer and move to farmyards (hay bales, under sheds, rubbish tips) in winter.	Direct sightings, footprints, droppings.
Harvest mouse	Long tussocky grassland, cereals, roadside verges, reedbeds, hedgerows, farmland and around woodland edges. Feed on seeds, berries, insects, cereal grains, also moss, roots and fungi. Nests found in dense vegetation (grasses, rushes, cereals, grassy hedgerows, ditches and brambles).	Direct sighting, nests.
Amphibians	Waterbodies for breeding. Terrestrial habitat includes most semi-natural environments including rough grassland, marsh, scrub, woodland, hedgerows, brownfield and low-intensity farmland. Tree stumps, mammal burrows, stone piles, log piles, compost heaps for shelter and hibernation.	Direct sightings, eggs attached to vegetation in waterbodies.



Species/ Group	Typical Habitat Requirements	Field Signs
Reptiles	Mosaic of habitats with potential for shelter and basking including rough grassland, scattered scrub, hedgerows, heathland, moorland, woodland glades, wetland, gardens and brownfield. Tree stumps, mammal burrows, stone piles, log piles, compost heaps for shelter and hibernation.	Direct sightings, sloughed skin.
Invertebrates	Diverse range of habitats including mature trees, deadwood, flower-rich grassland, tussocky grassland, waterbodies, wetlands, scrub, hedgerows and brownfield sites.	Direct sightings.
Fish	Running and standing water.	Direct sightings.
Plants	Waterbodies, woodland, grassland, hedgerow bases.	Direct sightings.
Invasive non-native species	All habitats.	Direct sightings.

3.2.5 An assessment was made of the likelihood that the protected, notable, and non-native invasive species/groups detailed in Table 3-3 occur on or close to the site with reference to the criteria provided in Table 3-4.

Table 3-4: Criteria for the assessment for the presence of species/groups

Likelihood of Occurrence	Assessment Criteria
Confirmed	Field signs and/or records confirm the presence of species/group.
High	Presence of species concerned not confirmed by field signs or records, but high quality suitable habitat present on site and connected to further suitable habitat AND/OR field signs present indicative of presence of species but presence not definitely proven. Site within known geographic distribution for the species/group.
Moderate	Presence of species concerned not confirmed by field signs or records, but moderate quality suitable habitat present on the site and some connectivity to further moderate or high quality suitable habitat in the wider landscape. Site within known geographic distribution for the species/group.
Low	Presence of species concerned not confirmed by field signs or records. Low quality suitable habitat on the site AND/OR poor connectivity to further suitable habitat in the local landscape. However, possible presence of the species/group cannot be completely discounted. Site within known geographic distribution for the species/group.
Negligible	No field signs and/or records of species. No suitable habitat present on or close to the site. Site not within known geographic distribution for the species/group.



3.2.6 The Extended Phase 1 Habitat survey included great crested newt habitat suitability index (HSI) assessments of waterbodies within 250 m of the site, as follows:

Habitat Suitability Index (HSI)

3.2.7 Waterbodies 2 and 3 (see Figure 3, Section 9 for a map showing the locations) were surveyed and assessed for their potential to support great crested newts using the HSI (Oldham et al., 2000). Waterbody 1 could only be viewed from a public footpath and therefore precautionary measures were given in the HSI assessment of this waterbody. Waterbody 4 was found to not to be extant.

3.2.8 The HSI is calculated using measures of ten environmental factors known to impact great crested newts. It is a numerical index between 0 to 1, where 0 indicates unsuitable (poor) habitat and 1 indicates optimum (excellent) habitat. HSI categories are provided in Table 3-5.

Table 3-5: HSI categories

HSI Score	Category
<0.5	Poor
0.5 - 0.59	Below average
0.6 - 0.69	Average
0.7 - 0.79	Good
>0.8	Excellent

3.3 Evaluation of Ecological Features

3.3.1 A valuation of ecological features (designated sites, species, and habitats) was undertaken in accordance with CIEEM guidance (CIEEM, 2018). Valuation is determined using the geographic framework provided in Table 3-6.

3.3.2 The value of an ecological feature is based on a professional ecologist's judgement and takes into consideration various characteristics including any site designations, species records, priority species and habitats, species rarity, the quality of the resources (e.g. habitat diversity, species population size), and location within the landscape context.

3.3.3 Sometimes it is not possible to provide a valuation of ecological features in the absence of data, which would have to be provided by further ecological surveys. Important ecological features, which may pose a constraint to the proposed development, are those with an ecological value which could be impacted by the development. These are the features which may require further survey work and mitigation.



Table 3-6: Framework for assessing the value of ecological features

Geographic Scale	Example of Ecological Feature
International (most important)	An internationally designated site e.g. Special Areas of Conservation (SAC), Special Protection Area (SPA), Ramsar sites. Regularly occurring populations of internationally important species.
National	Site of national importance e.g. Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR). Regularly occurring populations of nationally important species.
Regional	Non-statutory site e.g. Local Wildlife Site (LWS), Key Wildlife Site (KWS), Country Wildlife Site (CWS) supporting a regionally significant area of priority habitat or regionally significant population of legally protected/priority species.
County	Non-statutory site e.g. Local Wildlife Site (LWS), Key Wildlife Site (KWS), Country Wildlife Site (CWS), ancient woodland, site supporting priority habitats, priority species, and/or legally protected species of significance for the county.
Local	Habitats which enhance the local habitat resource e.g. old species-rich hedgerow, deciduous woodland, pond, small areas of priority habitat or areas supporting small populations of legally protected/priority species which are not rare within the region, county, or nationally.
Site	Habitats of limited ecological importance e.g. scattered trees, hedgerows, woodland plantations, small areas of non-priority habitats that are of value for wildlife. Species of limited ecological importance.
Negligible (least important)	Hardstanding, bare ground, built environment, and other areas with negligible biodiversity value, including for priority and legally protected species.

3.4 Limitations

- 3.4.1 No permission was granted to access one mapped waterbody located within 250 m of the site (Waterbody 3; see Figure 3, Section 9). Additionally, Waterbody 1 could only be viewed from a public footpath and therefore precautionary measures were given in the HSI assessment of this pond.



4 Baseline Ecological Conditions

4.1 Desk Study

Statutory Designated Sites

4.1.1 No statutory designated sites are located within 1 km of the site.

Priority Habitats and Ancient Woodlands

4.1.2 No mapped priority habitats or ancient woodlands are located within 500 m of the site.

Granted EPS Mitigation Licences

4.1.3 No EPS mitigation licenses have been granted within 1 km of the site.

Statutory Designated Sites for Bats

4.1.4 No statutory protected sites designated for bats are located within 6 km of the site.

Great Crested Newt Licence Returns and Pond Survey Results

4.1.5 There are no records of great crested newt licence returns or pond survey results within 1 km of the site.

Waterbodies

4.1.6 Four mapped waterbodies were identified within 250 m of the site. See Figure 3, Section 9 for a map showing the location of these waterbodies.

4.2 Field Survey - Habitats

4.2.1 The location and extent of habitats within the survey area are shown on the Phase 1 habitat map; see Figure 2, Section 9.

Arable



4.2.1 An arable field with a monoculture of wheat was present in the south-eastern part of the site.



Bare Ground



- 4.2.1 Bare disturbed ground was present in the north-west of the survey area, and formed an access trackway through the survey area and site.

Improved Grassland



- 4.2.1 The grassland within the survey area and the site was dominated by grass species, with a low abundance of forb species present, except along the field margins where forb species were more abundant and diverse. Grass species were predominant and included meadow foxtail, rough meadow-grass, perennial rye-grass, cock's foot, smooth meadow-grass, Yorkshire fog, red fescue and sweet vernal grass. Forb species present in the main field area included a rare distribution of cow parsley, creeping thistle, meadow buttercup, creeping buttercup, spear thistle, and common mouse-ear. Additional forb species within field margins along the northern and southern boundaries of the survey area included common nettle, cleavers, large bindweed, cut-leaved cranesbill, and common field-speedwell.
- 4.2.2 It is understood that the grassland is cut for hay/silage.



Hedgerows



- 4.2.3 Hedgerows were present within the survey area, and are referenced as Hedgerows H1, H2 and H3 in this report and their locations are shown on the Phase 1 Habitat Map (Figure 2, Section 9).
- 4.2.4 The hedgerows are classified as priority habitat as they contained more than 80% coverage of at least one native woody species.



Defunct Species-poor Hedgerow (H1)

- 4.2.5 This was a defunct shrubby hedgerow. Species present in the shrub layer included elder, hawthorn, and sycamore. Ground flora present included common nettle, cleavers, rough meadow-grass, great willowherb, bramble, and hedge woundwort.

Intact Species-poor Hedgerow (H2)

- 4.2.6 This was an intact shrubby hedgerow. Species present in the shrub layer included blackthorn, hawthorn, and dog rose. Ground flora present included bramble, white dead-nettle, wood dock, rough meadow-grass, cock's foot, and meadow foxtail.

Native Species-rich Hedgerow and Trees (H3)

- 4.2.7 This was an intact shrubby hedgerow with several mature trees, which included mature ash and domestic apple. Species present in the shrub layer included hawthorn, small-leaved elm, blackthorn, ash, elder, and dog rose. Ground flora species present included ivy and bramble.

Other Habitat



- 4.2.1 Areas where the ground appeared to have been relatively recently disturbed and was in the process of being colonised by vegetation were present in the north-west of the survey area. Species present included abundant common orache, red dead-nettle, common nettle, broad-leaved dock, large bindweed, creeping thistle, garlic mustard, cow parsley, great willowherb, meadow foxtail, cleavers, lesser swinecress, bristly oxtongue, and pineapple weed. Grass species were more frequent in the north-western corner of this area, where rough meadow-grass was abundant.



Standing Water



- 4.2.1 A ditch was present alongside the southern side of hedgerow H1. The ditch had steep earthen banks and contained little water at the time of the survey. In-channel vegetation present included celery leaved buttercup, common reed, and great willowherb.
- 4.2.2 A pond was located in the south-east corner of the survey area (Waterbody 2).

4.3 Field Survey – Species

4.3.1 Table 4-1 provides details of an assessment of the suitability of habitats on and close to the site and survey area for protected, notable, and invasive non-native species/groups, details of any evidence of these species/groups, and an assessment of the likelihood that these species/groups occur on or close to the site and survey area.

Table 4-1: Suitability for protected and notable species/groups and invasive non-native species

Species/Group	Habitat Assessment	Evidence	Likelihood of Presence/Occurrence
Bats (foraging and commuting)	Improved grassland and other habitat (colonising ground vegetation) provided a small extent of low value foraging habitat on the site. Boundary hedgerows within the wider survey area provided suitable foraging and commuting habitat and the pond within the wider survey area provided foraging habitat.	None	LOW Bats may occasionally forage over the grassland within the site, and could more regularly forage and commute along the hedgerows and over the pond in the wider survey area.
Bats (roosting)	Trees within the southern boundary hedgerow could potentially contain roosts.	None	NEGLECTIBLE (site) No potential for roosting within the site LOW (survey area) Potential for roosts in trees in the southern boundary hedgerow within the wider survey area.
Birds	Improved grassland and (colonising ground vegetation) provided a small extent of lower value foraging habitat on the site. Hedgerows provided suitable nesting and foraging habitat within the site and wider survey area. Long sward grassland within the site and wider survey area provided suitable habitat for ground nesting birds. The pond in the wider survey area provided potential habitat for waterfowl.	None	LOW (site) Long sward grassland on the site provided potential habitat for ground nesting birds, and a small extent of suitable foraging habitat. HIGH (survey area) Habitats within the wider survey area (grassland, hedgerows and pond) likely to be used by common and widespread species for foraging and nesting.



Species/ Group	Habitat Assessment	Evidence	Likelihood of Presence/Occurrence
Hazel dormouse	The hedgerows provided suitable habitat, and some connected to further hedgerow habitat. However, the hedgerows did not have connectivity to sufficiently extensive suitable habitat in the local landscape, with 20 ha of suitable habitat considered the minimum area required to support viable populations (Bright et al, 2006), and therefore dormice are considered unlikely to be present on the site.	None	NEGLIGIBLE
Otter	The wet ditch did not connect to further watercourses, and is considered highly unlikely to be used by otters. No other suitable habitat on or close to the survey area.	None	NEGLIGIBLE
Water vole	The wet ditch and pond provided suitable habitat, but did not have connectivity to further suitable watercourses or waterbodies in close proximity.	None	NEGLIGIBLE Pond and wet ditch within the wider survey area provided suitable habitat, but lacked connectivity to further suitable habitat, and therefore this species is considered unlikely to be present.



Species/ Group	Habitat Assessment	Evidence	Likelihood of Presence/Occurrence
Other mammals	<p>Hedgehogs could forage and disperse through the site and survey area, and the base of hedgerows within the survey area provided suitable foraging, dispersal and refuge habitat.</p> <p>Brown hare could potentially occur on the site and survey area, with further suitable habitat in close proximity.</p> <p>Polecat could potentially occur on the site and survey area; this is a species with non-specific habitat requirements and wide territories which often predate on rabbits which were present on the site.</p>	None	<p>MODERATE</p> <p>Suitable foraging and dispersal habitat on the site for hedgehog, brown hare, and polecat. Habitats within the wider survey area also provided potential for foraging, refuge and dispersal.</p>
Amphibians	<p>The base of hedgerows within the wider survey area provided suitable foraging, refuge, hibernation (brumation), and dispersal habitat. The long-sward grassland on the site and within the wider survey area provided suitable foraging and dispersal habitat, although is considered sub-optimal due to its lack of structural diversity. Additionally, the grassland is regularly cut for hay/silage and would provide lower suitability habitat when cut short. The bare ground on the site and within the wider survey area provided negligible suitability for foraging and refuge, but could be used for dispersal.</p> <p>Waterbody 2, located within the survey area, was assessed to have average suitability for great crested newts, and Waterbody 1, located within 250 m of the site, was assessed to have average suitability for great crested newts (see Appendix 2 for full details of the HSI assessments). Access to survey Waterbody 3 was not obtained, and Waterbody 4 was found to not be extant.</p>	None	<p>LOW</p> <p>Possible use of on-site habitats for foraging and dispersal. Habitats within the wider survey area also provided potential for foraging, refuge and dispersal.</p>



Species/ Group	Habitat Assessment	Evidence	Likelihood of Presence/Occurrence
Reptiles	The base of hedgerows provided suitable foraging, refuge and brumation (hibernation) habitat. The long sward grassland provided suitable foraging and dispersal habitat, although is considered sub-optimal for reptiles due to its lack of structural diversity. Additionally, the grassland is regularly cut for hay/silage and would provide lower suitability habitat when cut short. The bare ground provided negligible suitability for foraging and refuge, but could be used for dispersal. Waterbody 2 in the south-east corner of the survey area provided suitable habitat for amphibians which are a prey species for grass snake.	None	LOW Possible occasional use of on-site habitats for foraging and dispersal. Habitats within the wider survey area also provided potential for foraging, refuge and dispersal.
Invertebrates	Waterbody 2 in the south-east corner of the survey area provided suitable habitat for a range of species, potentially including rare and notable species. Other habitats within the site and survey area provided low value habitat for invertebrates. Fallen deadwood (TN2) within the survey area provided suitable habitat for saproxylic species.	None	LOW (on-site) Site provides suitable habitat for common and widespread species only. MODERATE (survey area) Pond and hedgerows within the wider survey area provided potentially higher value habitat for invertebrates.
Fish	Waterbody 2 in the south-east corner of the survey area provided suitable habitat, although this was not connected to any watercourses.	None	LOW
Plants	With the exception of Waterbody 2, habitats within the site and survey area provided negligible potential for rare or notable species to be present.	None	NEGLIGIBLE (site) LOW (survey area)
Invasive non-native species	N/A	None	LOW None noted during the survey, but possible presence cannot be completely ruled out.



5 Ecological Constraints

- 5.1.1 It is proposed to erect two equestrian barns and arenas; see Appendix 1 for the proposed site plan. The proposals would require the removal of approximately 0.5 ha of improved grassland and other habitat (colonising ground vegetation). It is understood that no external artificial lighting is proposed to be installed.

5.1 Great Crested Newt Rapid Risk Assessment

- 5.1.1 Natural England Rapid Risk Assessments (RRA) were undertaken (see Figure 5-1), which are an assessment of the likelihood that the proposed development would result in an offence with respect to great crested newts. These RRAs assume that great crested newts are present within all three extant ponds located within 250 m of the site (Waterbodies 1, 2 and 3; see Figure 3, Section 9), and that careful methods of working would be implemented during site clearance and works to avoid impacts on individual great crested newts.
- 5.1.2 Waterbody 1: no suitable terrestrial habitat within 100 m of the pond would be impacted by the proposed development. The area of suitable terrestrial habitat that would be impacted within 100 m - 250 m of Waterbody 1 is approximately 0.3 ha (improved grassland and other habitat), and approximately 0.2 ha (improved grassland) would be impacted more than 250 m from Waterbody 1. See Figure 5-1 for the RRA for Waterbody 1, which indicates that it is highly unlikely that the proposed development would result in an offence being committed with respect to great crested newts, if great crested newts were present in this waterbody.

Component	Likely effect	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100 m of any breeding pond(s)	No effect	0
Land 100 - 250m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.1
Land >250 m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.005
Individual great crested newts	No effect	0.1
	Maximum:	0.1
Rapid Risk Assessment result:		GREEN: HIGHLY UNLIKELY

Figure 5-1: Rapid Risk Assessment (Waterbody 1)

- 5.1.3 Waterbody 2: no suitable terrestrial habitat within 100 m of the pond would be impacted by the proposed development. The area of suitable terrestrial habitat that would be impacted within 100 m - 250 m of Waterbody 2 is approximately 0.25 ha (improved grassland and other habitat), and the area of suitable terrestrial habitat that would be impacted more than 250 m from Waterbody 2 is approximately 0.25 ha (improved grassland and other habitat). See Figure 5-2 for the RRA for Waterbody 2, which indicates that it is highly unlikely that the proposed development would result in an offence being committed with respect to great crested newts, if great crested newts were present in this waterbody.



Component	Likely effect	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100 m of any breeding pond(s)	No effect	0
Land 100 - 250m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.1
Land >250 m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.005
Individual great crested newts	No effect	0.1
	Maximum:	0.1
Rapid Risk Assessment result:	GREEN: HIGHLY UNLIKELY	

Figure 5-2: Rapid Risk Assessment (Waterbody 2)

- 5.1.4 Waterbody 3: no terrestrial habitat within 100 m of the pond would be impacted by the proposed development. The area of suitable terrestrial habitat that would be impacted within 100 m - 250 m of Waterbody 3 is approximately 0.42 ha (improved grassland and other habitat), and the area of suitable terrestrial habitat that would be impacted more than 250 m from Waterbody 3 is approximately 0.08 ha (improved grassland). See Figure 5-3 for the RRA for Waterbody 3, which indicates that it is highly unlikely that the proposed development would result in an offence being committed with respect to great crested newts, if great crested newts were present in this waterbody.

Component	Likely effect	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100 m of any breeding pond(s)	No effect	0
Land 100 - 250m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.1
Land >250 m from any breeding pond(s)	0.01 - 0.1 ha lost or damaged	0.001
Individual great crested newts	No effect	0.1
	Maximum:	0.1
Rapid Risk Assessment result:	GREEN: HIGHLY UNLIKELY	

Figure 5-3: Rapid Risk Assessment (Waterbody 3)

5.2 Evaluation of Potential Impacts

- 5.2.1 Statutory designated sites, protected and ecologically valuable habitats, and protected and notable species may pose a constraint if there is potential for them to be impacted by a proposed development. Invasive non-native species may also pose a constraint to development, and provide opportunities to enhance the biodiversity value of a site by their removal or control.



5.2.2 Table 5-1 provides a valuation of features on and close to the site which could be impacted by the proposed development, justification for the valuation, and details of potential impacts upon these features in the absence of mitigation. Only species which were present or assessed to have potential to be present on or close to the site are included in the valuation. Features highlighted in blue have the potential to pose a constraint to the proposed development of the survey area and would require further surveys and/or mitigation (see Section 6).

Table 5-1: Valuation and potential impacts on ecological features

Ecological Feature	Value	Justification for Value	Potential Impacts Without Mitigation
Statutory designated sites	International/ National	Sites of international or national importance for biodiversity.	No impacts anticipated due to the distance of statutory designated sites from the proposed development site.
Mapped priority habitats	County	Habitats of importance at the county level.	No impacts.
Ancient woodland	National	Irreplaceable habitat.	No impacts.
Arable	Site	Monoculture crop. Low value for wildlife.	No impacts.
Bare ground	Negligible	Negligible ecological value.	None.
Improved grassland	Site	Common and widespread habitat.	Loss of a small area would have no significant biodiversity impacts. See potential impacts on ground nesting birds, amphibians and reptiles.
Hedgerows	Site/Local	Priority habitat. Provides suitable habitat for a range of species, including foraging and commuting bats and foraging and nesting birds.	No impacts anticipated.
Other habitat	Site	Common and widespread habitat.	Loss of a small area would have no significant biodiversity impacts. See potential impacts on amphibians and reptiles.
Standing water (pond)	Local	Provides suitable habitat for a range of species, including amphibians and invertebrates.	No impacts anticipated.
Standing water (wet ditch)	Site	Provides suitable habitat for range of species including amphibians and reptiles.	No impacts anticipated.



Ecological Feature	Value	Justification for Value	Potential Impacts Without Mitigation
Bats (roosting)	Unknown	Trees within southern boundary hedgerow H3 could potentially contain roosts.	No impacts anticipated.
Bats (foraging and commuting)	Site	Improved grassland and other habitat provided a small extent of low value foraging habitat. Hedgerows provided higher potential value foraging and commuting habitat.	No impacts anticipated as hedgerows would not be impacted by the proposed works and no external artificial lighting is proposed.
Birds	Site	Small extent of suitable foraging and nesting habitat.	Loss of a small area of lower value suitable habitat is unlikely to have a significant impact on local bird populations. Further extensive suitable habitat present in the local landscape. If long sward grassland is removed during the nesting season (which is typically March to August inclusive) then there is potential for killing/injury of birds and destruction of active nests.
Other mammals	Site	Suitable foraging, dispersal and refuge habitat for hedgehog, brown hare and polecat.	Loss of suitable habitat on the site considered unlikely to have a significant impact on local populations. Further extensive suitable habitat present in the local landscape. Injury/death if animals are trapped in any open excavations or open pipework during construction.



Ecological Feature	Value	Justification for Value	Potential Impacts Without Mitigation
Amphibians	Site	Small extent of lower value suitable terrestrial habitat on the site.	<p>Loss of a small area of suitable habitat considered unlikely to have a significant impact on local populations. Further extensive suitable habitat present in the local landscape.</p> <p>Injury/death during site clearance and construction.</p>
Reptiles	Site	Small extent of lower value suitable habitat on the site.	<p>Loss of a small area of suitable habitat considered unlikely to have a significant impact on local populations. Further extensive suitable habitat present in the local landscape.</p> <p>Injury/death during site clearance and construction.</p>
Invertebrates	Site	Improved grassland and other habitat provided a small extent of low value habitat. Pond and hedgerows provided greater potential value for invertebrates, potentially including notable species.	No significant impacts anticipated.



6 Surveys, Mitigation and Enhancements

6.1 Surveys

6.1.1 No further surveys are considered necessary.

6.2 Mitigation

6.2.1 The following mitigation will be implemented to avoid impacts on species.

Birds

6.2.2 The long sward grassland will either be cut/removed outside of the nesting season (which is generally March until the end of August), or a check will be carried out by an ecologist for active nests no more than 48 hours before vegetation cutting/removal. If active nests were then found these would be left undisturbed until the young had fledged.

Amphibians and Reptiles

6.2.4 Reasonable Avoidance Measures (RAMs) will be implemented during site clearance and construction to avoid disturbing, killing or injuring amphibians and reptiles. Suitable RAMs are provided in Appendix 4.

6.3 Enhancements

6.3.1 In line with the NPPF, biodiversity enhancements are proposed for roosting bats and nesting birds' see Table 6-1 for details.

Table 6-1: Proposed biodiversity enhancements

Opportunity	Details
Provision of bird nest boxes	Two nest boxes will be mounted on the external walls of the proposed buildings (e.g. Vivara Pro Seville 28 mm or 32 mm WoodStone nest box). The nest boxes will be installed 3 - 4 m above ground level, and face between the north and east to avoid direct sunlight and prevailing wind and rain. Birds will have a clear flight path to and from the boxes.
Provision of bat boxes	Two bat boxes will be installed on mature trees within the southern boundary hedgerow H3 (e.g. 2F Schwegler bat box, Low Profile WoodStone bat box, 1FF Schwegler bat box). The bat boxes will be installed at least 3 - 4 m above ground level, facing to the south, south-west and/or south-east, and with a clear flight path to and from the entrance.



7 Conclusions

- 7.1.1 It is proposed to erect two equestrian barns and arenas; see Appendix 1 for the proposed site plan. The proposals would require the removal of approximately 0.5 ha of improved grassland and other habitat colonising ground vegetation. It is understood that no external artificial lighting is proposed to be installed.
- 7.1.2 The proposed development would not impact upon any statutory designated sites or ecologically important or protected habitats. No significant impacts on protected or notable species are considered likely if the mitigation measures detailed in this report are implemented.
- 7.1.3 A summary of potential impacts which could arise from the proposed development and details of proposed mitigation are provided in Table 7-1.

Table 7-1: Summary of potential impacts and proposed mitigation

Ecological Feature	Potential Impacts without Mitigation (refer to Section 5)	Proposed Mitigation (refer to Section 6.2)
Birds	If long sward grassland is removed during the nesting season (which is typically March to August inclusive) then there is potential for killing/injury of birds and destruction of active nests.	Removal of long sward grassland will be undertaken outside of the nesting season, or if this is not possible then the grassland will be checked for active nests by an ecologist no more than 48 hours before cutting/removal. If active nests were present these would be left undisturbed until the young had fledged.
Amphibians & reptiles	Injury/death during site clearance and construction.	Reasonable Avoidance Measures will be implemented during site clearance and construction to avoid disturbance and injury/death (including of great crested newts).



8 References

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- Natural England (2015).** *Method Statement for Great Crested Newt Mitigation*. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/478847/gcn-method-statement.xlsm
- Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000).** Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4), 143-155.



9 Figures

Figure 1 - Location Map

Figure 2 - Phase 1 Habitat Map

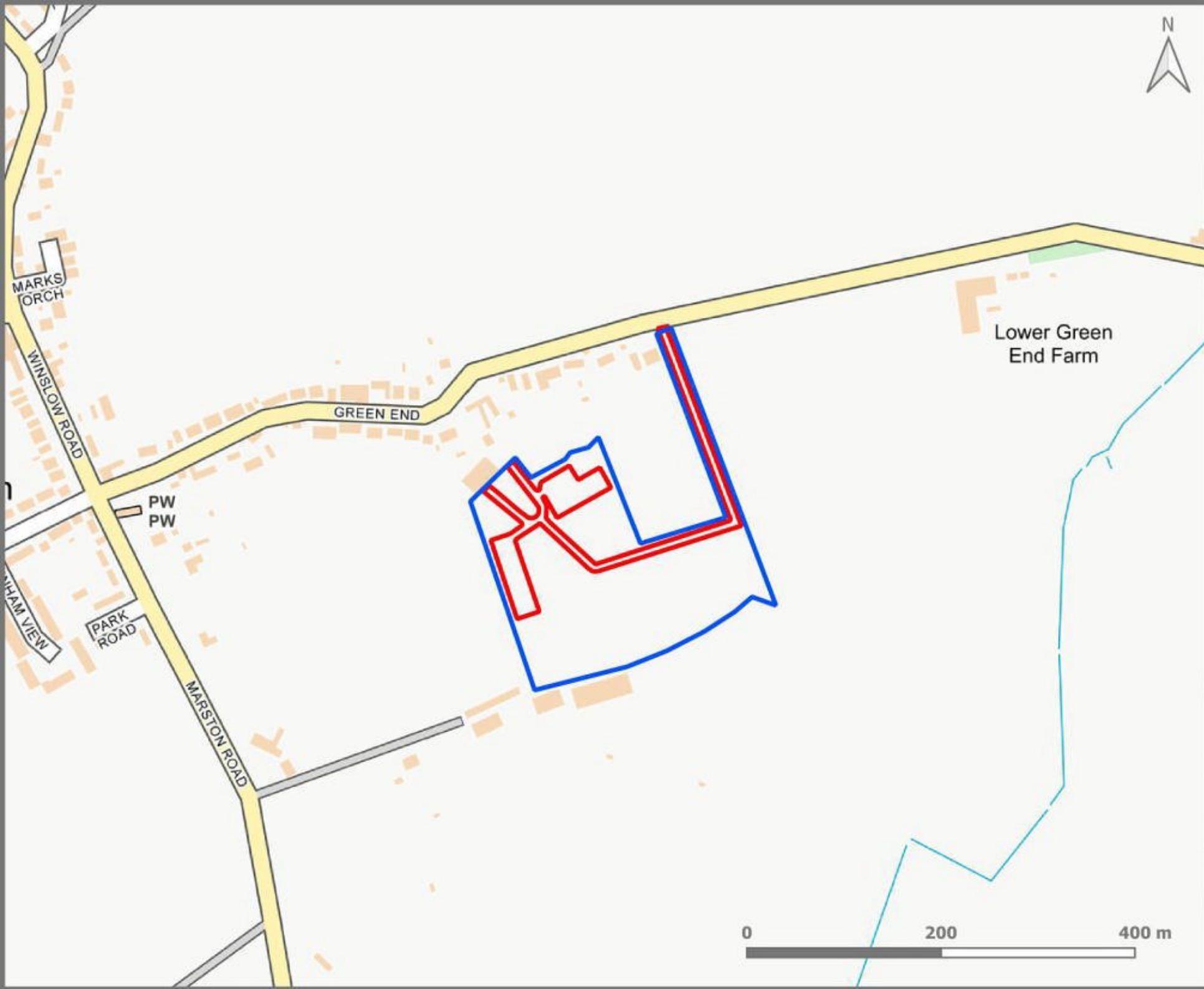
Figure 3 - Waterbody Location Map



**Figure 1 -
Site Location Map**
Land at Green End
Farm, Green End,
Granborough,
Buckinghamshire,
MK18 3NT



-  Site Boundary
-  Survey Area



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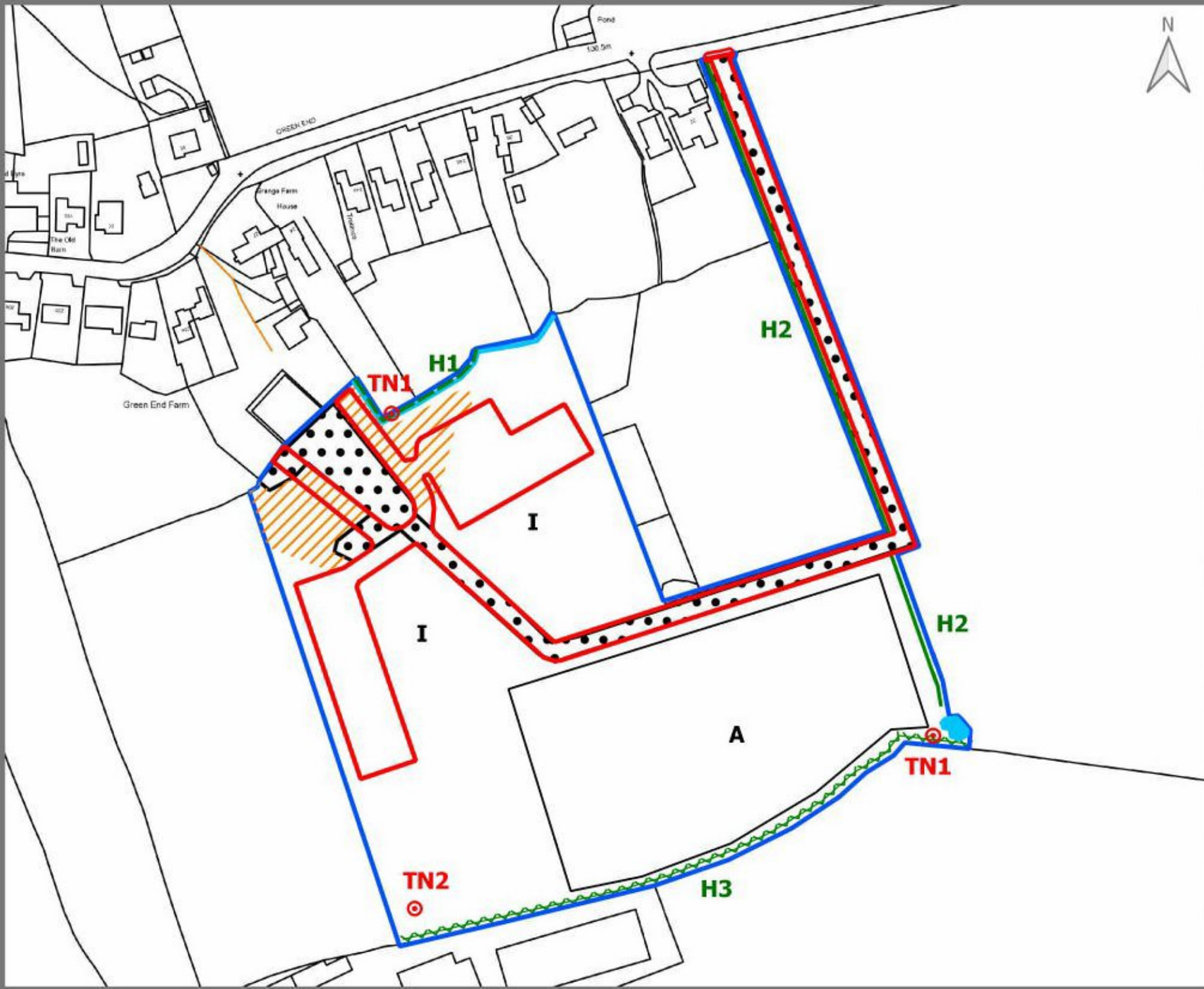
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Drawn by:	Joseph Wilkie
Checked by:	Robert Dunn

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Figure 2 - Phase 1 Habitat Map

Land at Green End Farm, Green End, Granborough, Buckinghamshire, MK18 3NT



- Arable
- Bare Ground
- Improved Grassland
- Other Habitat
- Standing Water (Pond)
- Defunct Species-poor Hedgerow
- Intact Species-poor Hedgerow
- Native Species-rich Hedgerow and Trees
- Standing Water (Wet Ditch)
- Target Note (TN)
- Survey Area
- Site Boundary

Not to scale. Indicative positions shown. Base map supplied by the client.

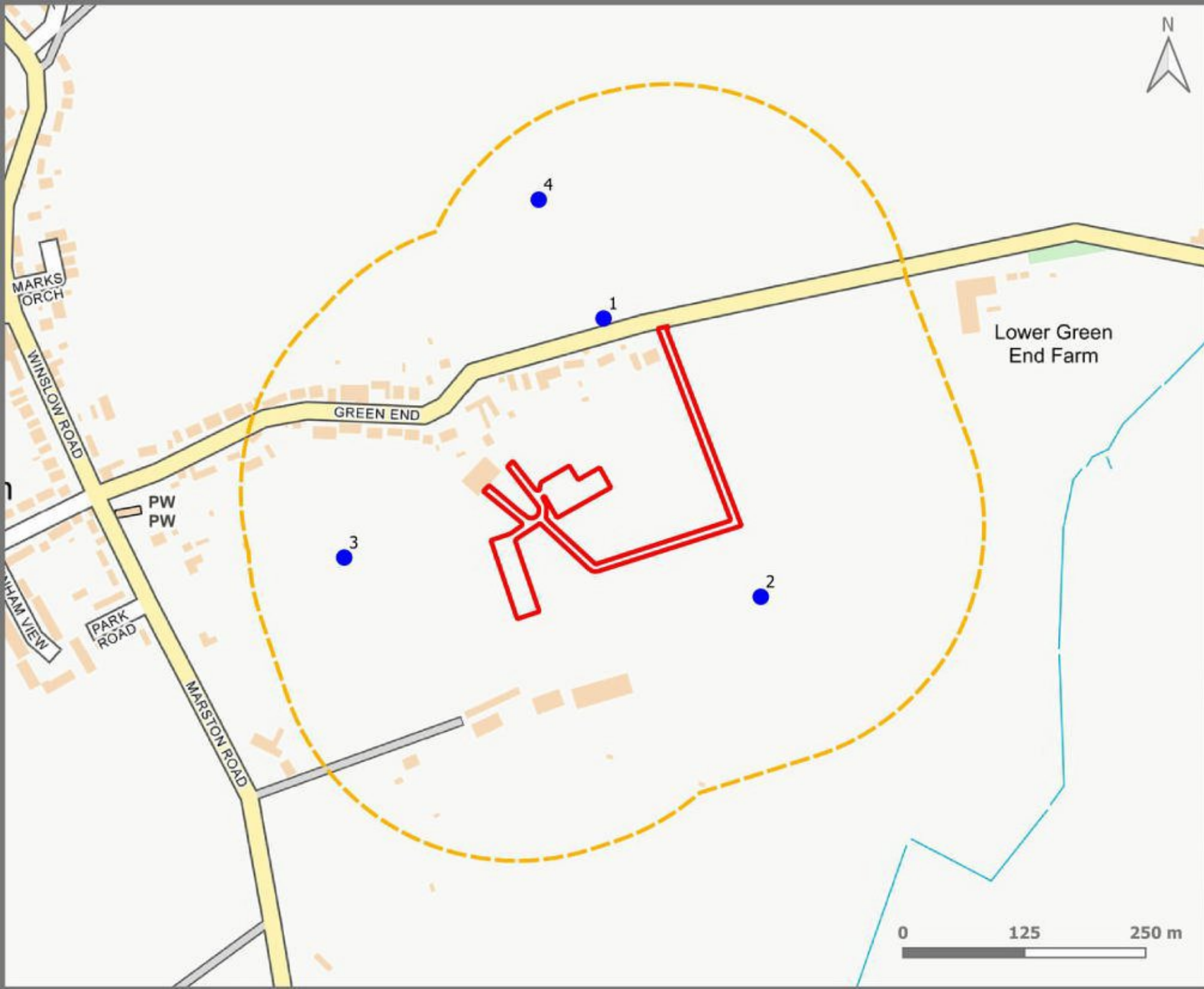
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Drawn by:	Robert Dunn
Checked by:	Rachel Barber

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**Figure 3 -
Waterbody Location
Map**
Land at Green End
Farm, Green End,
Granborough,
Buckinghamshire,
MK18 3NT

-  Site Boundary
-  250 m Buffer




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Appendix 2 – Target Notes

Number	Description	Photographs
TN1	Mammal paths.	



TN2	Fallen deadwood.	
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Appendix 3 – HSI Data

Waterbody	1	Survey by	Robert Dunn
Grid Reference	SP 77259 25202	Survey date	08/06/2021

HSI Factor	Assessment	HSI Value	Rationale
Location	Zone A	1.00	-
Area (m ²)	Approximately 80	0.16	-
Pond drying	Rarely	1.00	Precautionary value.
Water quality	Good	1.00	Precautionary value.
Shade (%)	90	0.40	-
Waterfowl	Absent	1.00	Precautionary value.
Fish	Absent	1.00	Precautionary value.
Pond density	14 ponds/ π = 4.46	1.00	All known and mapped ponds within 1 km counted.
Terrestrial habitat	Poor	0.33	Predominantly arable and pasture fields within 250 m of pond. Less than 25 % of available area provides good quality terrestrial habitat (hedgerows, gardens).
Macrophyte cover (%)	80	1.00	Precautionary value.
HSI Score		0.68	AVERAGE

Photograph



Waterbody	2	Survey by	Robert Dunn
Grid Reference	SP 77426 24910	Survey date	08/06/2021

HSI Factor	Assessment	HSI Value	Rationale
Location	Zone A	1.00	-
Area (m ²)	Approximately 90	0.18	-
Pond drying	Rarely	1.00	Fed by ditch (dry at time of the survey).
Water quality	Good	1.00	Diverse assemblage of invertebrates including dragonfly and damselfly larvae and water beetles.
Shade (%)	40	1.00	-
Waterfowl	Absent	1.00	No signs of waterfowl use.
Fish	Possible	0.67	No fish noted, but possibility of presence cannot be excluded.
Pond density	12 ponds/ π = 3.82	1.00	All known and mapped ponds within 1 km counted.
Terrestrial habitat	Poor	0.33	Predominantly arable and pasture fields within 250 m of pond. Less than 25 % of available area provides good quality terrestrial habitat (hedgerows).
Macrophyte cover (%)	10	0.41	-
HSI Score		0.66	Average

Photograph



Appendix 4 – Reasonable Avoidance Measures

To minimise the risk of killing or injuring amphibians (including great crested newts) and reptiles and disturbing great crested newts during site clearance and construction the following Reasonable Avoidance Measures (RAMs) will be implemented. A suitably qualified and licensed ecologist will supervise site clearance works. Implementation of these RAMs should be secured by means of a planning condition.

Site Induction

Before clearance works begin, an ecologist will meet contractors and provide a site induction. This talk will provide information on great crested newts and other amphibians and reptiles, including their legal protection, identification, where they could be found on the site, what to do if amphibians or reptiles are found during works, and an explanation of these RAMs and the importance of adhering to them.

An identification guide for great crested newts is provided at the end of these RAMs and will be printed out and displayed on site for all contractors to see.

Site Clearance

Vegetation clearance and soil stripping will be supervised by a suitably qualified and licensed ecologist.

Any amphibians (other than great crested newts) and reptiles found during site clearance and works will be carefully moved outside of the works area using gloved hands or a suitable container.

If a great crested newt is found at any time during works, then work will stop immediately and the ecologist will provide further advice. If an ecologist is not present then an ecologist will be immediately contacted. A guide to newt identification is provided at the end of these RAMs.

Timing

Clearance of ground vegetation and soil strip will be undertaken during the amphibian and reptile active season (i.e. April to September inclusive) and in suitable weather (i.e. temperature between 9°C and 18°C, calm, and no precipitation) to ensure that animals are active and can readily move away from work areas. All works must take place only during daylight hours.

Clearance of ground vegetation will be undertaken using the following phased approach:

- Day 1 – cut vegetation to a height of 150 mm.
- Day 2 – cut vegetation to a height of 75 mm.
- Day 3 – cut vegetation to a height of 30 mm.

Vegetation will be strimmed or brush cut and all cuttings raked and removed from the clearance area on the same day. Cutting will move in one direction to encourage any animals present to move out of the development area into surrounding habitats. After the vegetation has been cut it will be kept short to deter animals from re-entering the area.

Once vegetation has been cut it must be left at least 24 hours before removal of topsoil.



Soil will be carefully excavated using an excavator with a toothed bucket. Use of a larger bucket is optimal as this will require fewer scrapes and therefore reduces the risk of injury to amphibians and reptiles.

Construction

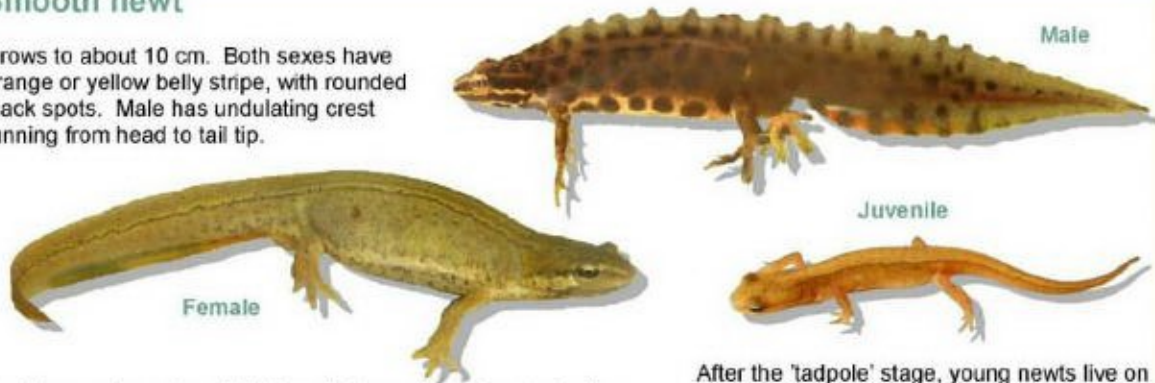
During construction, any building material will be stored on pallets or hardstanding to deter amphibians and reptiles from sheltering underneath. All waste will be stored in skips or containers and not in piles on the ground.

All excavations will be covered overnight, or a ramp installed with an angle no steeper than 40 degrees, to enable animals to escape. Any pipework will be capped overnight. Excavations will be checked every morning to ensure there are no trapped animals; any amphibians (other than great crested newts) and reptiles will be carefully moved outside of the works area by gloved hand or using a suitable container. **However, if a great crested newt is found then work will stop immediately and an ecologist will be contacted to provide advice.**



Smooth newt

Grows to about 10 cm. Both sexes have orange or yellow belly stripe, with rounded black spots. Male has undulating crest running from head to tail tip.

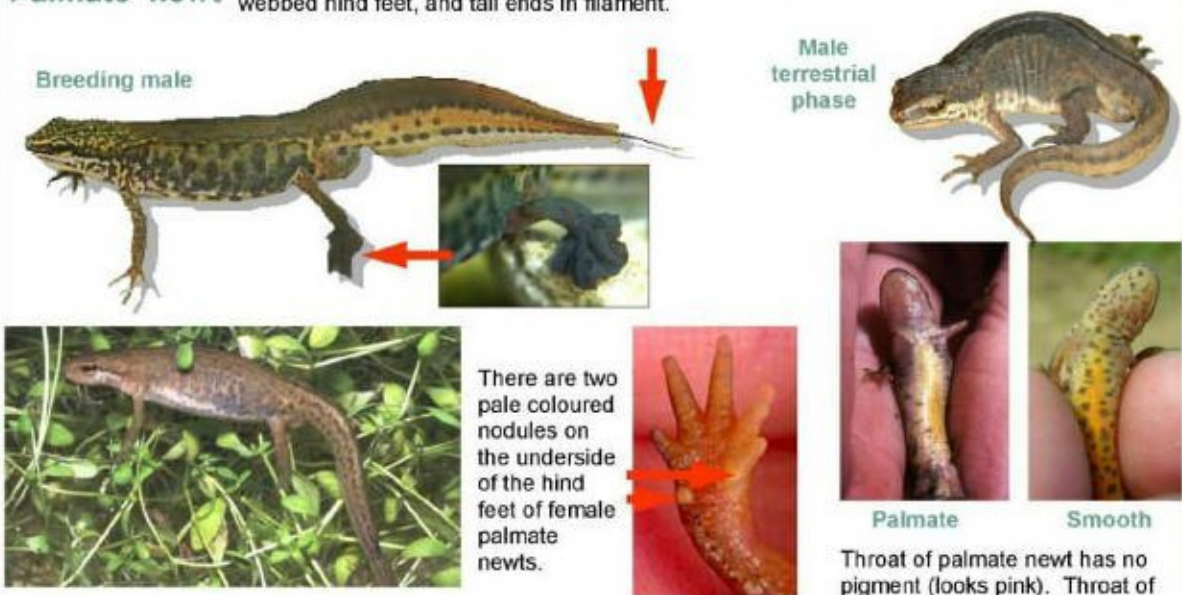


A widespread species which breeds in a variety of water bodies. Often found in garden ponds.

After the 'tadpole' stage, young newts live on land. Most likely to be found from late summer to autumn as they disperse from ponds.

Palmate newt

Grows to 9 cm. Breeding male has ridge running along back, rather than a crest. Dark, webbed hind feet, and tail ends in filament.



Female looks similar to smooth newt.

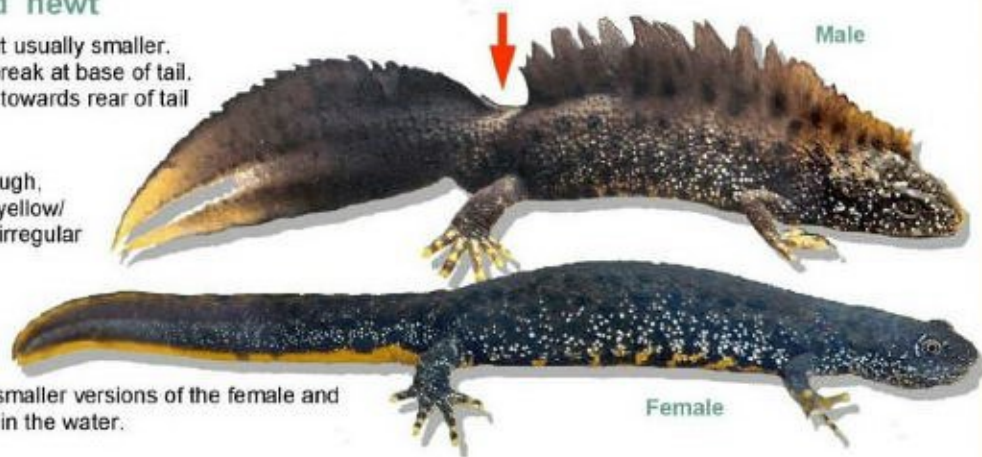
There are two pale coloured nodules on the underside of the hind feet of female palmate newts.

Throat of palmate newt has no pigment (looks pink). Throat of smooth newt is off-white and usually spotted.

Great crested newt

Grows to 16 cm, but usually smaller. Crest in male has break at base of tail. Silvery-white stripe towards rear of tail conspicuous.

Both sexes have rough, granular skins and yellow/orange bellies with irregular black spots.



Juveniles look like smaller versions of the female and may live on land or in the water.

Strictly protected species, requiring a licence to handle or disturb.