griffin ecology ltd.

Preliminary Ecological Appraisal
Land at Hornton Grounds Quarry, Banbury Oxfordshire

Project Reference: HGQ0001

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Survey Date 26st and 28th May 2020

Report Version	Date	Author:	Quality check by:	Approved by:
Final Report	10th June 2020	Casey-Ruth Griffin BSc (Hons) MCIEEM Principal Ecologist	Ian Griffin, Commercial Director	Casey-Ruth Griffin BSc (Hons) MCIEEM, Principal Ecologist

EXECUTIVE SUMMARY

Griffin Ecology Ltd. have been instructed by Framptons Town Planning Ltd. on behalf of the client, to undertake a Preliminary Ecological Appraisal of an area of land associated with Hornton Grounds Quarry, Banbury in Oxfordshire.

When considering the extent and scale of the proposals, no direct or indirect impacts to any statutory or non-statutory designations are foreseen.

The hedgerows and waterbody, identified on site, are considered priority habitats (NERC, 2006) and as such, this report seeks to recommend the retention and protection of these habitats through the establishment of suitable protective buffer zones during the construction phase of works.

The site is dominated by ephemeral vegetation and bare ground of limited ecological distinctiveness as a result of its historic use and existing ambient levels of disturbance. The habitats on site do, however, offer some value to densities of common and widespread invertebrates, particularly when associated with the southern boundary hedgerow, waterbody and tall ruderal vegetation. This value subsequently offers a foraging resource to dispersing species such as grass snake, common amphibians, badger and bats. In consideration of this identified ecological suitability, this report seeks to recommend a precautionary approach to disturbing works in an effort to ensure commuting species are not directly or indirectly impacted by the proposals.

The site is located within an identified "amber risk zone" for GCN as dictated by the NatureSpace Partnership. In addition, a small accumulation of water exists within the south-eastern corner of the site within a deep gully. This accumulation of water appears to have been present for some time as indicated by the presence of established bulrush and common reed. Further investigation into GCN presence or likely absence on site has been undertaken through eDNA sample analysis. This analysis returned a negative result, greatly reducing the likelihood of GCN presence within this waterbody and subsequently their likely presence on site.

Terrestrial habitat on site offers limited opportunities for foraging and sheltering amphibians, confined to the southern boundary, however, GCN are known to disperse, radially from a breeding pond. Therefore there remains a small risk that should environmental conditions change, GCN may, if present within the wider landscape, make use of the aquatic habitat on site. As such, a precautionary approach to works should be adopted and maintained for the length of the development. Further details on such measures are outlined within Section 5 of this report.

Opportunities for biodiversity enhancements as part of the proposals have been identified with the provision of scrub planting within the south-eastern corner of the site and adjacent to the existing waterbody. Such scrub planting will enhance the existing habitat mosaic present on site, providing enhanced sheltering and foraging opportunities for invertebrates, herpetofauna and terrestrial mammals. Further details are provided within Section 5 of this report.

Contents

1. Introduction

1.1 Background

Griffin Ecology Ltd. have been instructed by Framptons Town Planning Ltd. on behalf of the client, to undertake a Preliminary Ecological Appraisal of an area of land at Horton Grounds Quarry, Banbury in Oxfordshire. This survey and report are provided in support of the proposed planning application for a small administration building and plant associated with the storage of diesel oil and the filling of distribution tankers.

1.1.1 Site description

The site (grid reference: SP 38155 44620), sits within open countryside some 7.8km to the north-west of the Town of Banbury in Oxfordshire. Accessed off Stratford Road, the site forms part of the wider Hornton Ground Quarry and stone cutting yard.

Figure 1: Survey boundary

1.1.2 Survey Purpose

The purpose of this survey is to identify and provide a condition assessment of the habitats present at the site, and to identify the potential for the presence of protected and notable species as well as the potential for them to use the habitats identified on the site. This information would then serve to determine the ecological constraints and opportunities and inform the need for any further ecological surveys, if required, with the aim of fully understanding the potential ecological impacts which may result from the proposed development in line with legislation (details in appendix 1 of this report).

1.1.3 Proposed Plans

No detailed plans were available at the time of compiling this report, however, it is understood that proposals will include a small administration building and the siting of a fuel store facility set atop an area of hardstanding.

1.2 Relevant Planning Policies

The National Planning Policy Framework (NPPF) section 15 sets out applications to conserve and enhance the natural environment.

Paragraph 170 of the NPPF states:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;"

c) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;"

Paragraph 175 states:

"When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;"

"d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity."

Policy ESD10 of the adopted Cherwell Local Plan (2011-2031) states;

"In considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources.
The protection of trees will be encouraged, with an aim to increase the number of trees in the District
The reuse of soils will be sought
If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or as a last resort, compensated for, then development will not be permitted.
Development which would result in damage to or loss of a site of international value will be subject to the Habitats Regulations Assessment process and will not be permitted unless it can be demonstrated that there will be no likely significant effects on the international site or that effects can be mitigated.
Development which would result in damage to or loss of a site of biodiversity or geological value of national importance will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site and the wider national network of SSSIs, and the loss can be mitigated to achieve a net gain in biodiversity.

Development which would result in damage to or loss of a site of biodiversity or geological value of regional or local importance including habitats of species of principal importance for biodiversity will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site, and the loss can be mitigated to achieve a net gain in biodiversity.

Development proposals will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site. Existing ecological networks should be identified and maintained to avoid habitat fragmentation, and ecological corridors should form an essential component of green infrastructure provision in association with new development to ensure habitat connectivity

Relevant habitat and species surveys and associated reports will be required to accompany planning applications which may affect a site, habitat or species of known or potential ecological value..."

2. Methodology

2.1 Desk Study

A biological record search has been undertaken by Thames Valley Environmental Records Centre (TVERC). This search sought to gain an understanding of statutory and non-statutory designations as well as protected and notable species within a 1km radius of the site.

The MAGIC website has also been accessed for information on notable habitats and statutory designated sites within a 1km radius of the site.

2.2 Site Visit

The site has been visited by a suitably experienced and licensed surveyor, Casey Griffin (Principal Ecologist, MCIEEM, level 2 bat survey licence: 2016-23916; GCN survey licence: 2015 – 17059 CLS - CLS) on Tuesday 26th May 2020 and Thursday 28th May 2020. Weather conditions at the time of surveys have been recorded.

2.3 Phase 1 Habitat Survey and Condition Assessment

A walkover survey of the site has been carried out in accordance with standard Phase 1 Habitat Survey methodology detailed within JNCC Phase 1 Habitat Survey Handbook (JNC, 1993). The survey has covered all accessible areas of the site as well as surrounding habitats where accessible. This survey seeks to identify, describe and map habitats present within the site. A list of botanical species has been compiled, with relative abundances recorded using the DAFOR scale (see appendix 3).

The habitats identified during the Phase 1 survey have then been evaluated against the IEEM EIA evaluating habitats and species guidelines (2006) in order to give them a scale of importance from low to high value in the context of the site (unless otherwise stated). Such criteria include size, species diversity, and presence of species or habitats.

2.4 Protected Species Survey

A general walkover survey was undertaken to cover the extent of the site and the adjoining habitats where accessible. This walkover survey enabled the ecologist to search for any evidence of protected species activity or potential for the site to support protected and/or notable species.

Bats – The site has been assessed for its suitability to support roosting, foraging and commuting bats, in accordance with the BCT guidelines (BCT, 2016).

Nesting birds – the site has been searched for areas of habitat and structures that could be used for constructing a nest or for foraging, as well as any evidence of current or historic nesting.

Reptiles – the site has been searched for areas that could be used for sheltering, hibernating, basking, foraging and breeding (Froglife, 1999).

Amphibians – a single waterbody is noted within the bounds of the site with no other waterbodies recorded within a 500m radius of the site. This waterbody has been assessed for its suitability to support GCN through the use of a Habitat Suitability Index (Oldham et. al, 2000) and eDNA sampling where appropriate. In addition, terrestrial habitat on site has been assessed for its suitability to support amphibians during terrestrial phases of their lifecycle.

[redacted]

Hedgehog – the site has been searched for areas that might be used for foraging and nesting. Incidental foraging signs, droppings or paths have been recorded if found.

Other protected and notable species such as brown hare and hazel dormice have been scoped out of this assessment due to an absence of records and a lack of suitable habitat within the surrounding area.

2.4.1 Habitat Suitability Index Assessment

All ponds within the site and within a 500 m radius of the site boundary have been assessed utilising the great crested newt Habitat Suitability Index (HSI) (Oldham et al, 2000). The HSI is a numerical index, wherein a score of 1 represents optimal habitat for great crested newts. The HSI score is used to indicate the suitability of a waterbody on a categorical scale. It should be noted, however, that this HSI is not precise enough to conclusively define that a pond with a high HSI score will support great crested newts whilst those with a low score will not.

HSI Score Pond Suitability
< 0.5 Poor
0.5 – 0.59 Below average
0.6 – 0.69 Average
0.7 – 0.79 Good
> 0.8 Excellent

HSI Scoring is done by assigning a quantitative figure to each of 10 variables, e.g. pond area, water quality, level of shading. The tenth root of the product of these variables is then calculated, giving a figure for habitat suitability.

2.4.2 Environmental DNA Analysis

The waterbody on site has been tested for GCN eDNA by Casey Griffin MCIEEM on 28th May 2020, following standard protocols set out by the testing laboratory (ADAS) whereby 20 water samples were taken from different locations around the pond margin, taking care to sample as much of the perimeter of the pond as possible. Appropriate precautions have been put in place to prevent contamination of samples between ponds e.g. wearing gloves, not standing in the water etc. Each of the 20 samples have then been pooled and 15ml has then been transferred into each of the six ethanol-filled tubes. This method has been repeated for both ponds. Samples have then been transferred to the laboratory by special courier for analysis.

2.5 Survey limitation

No significant constraints have been noted.

3. Results

3.1 Desk Study

The desk study has revealed the site to sit within an "amber risk zone" for GCN as dictated by the NatureSpace Partnership who operate the Natural England District Licencing scheme for this region.

The data search, undertaken by TVERC, reveals no designated sites but does indicate a number of Conservation Target Areas around the 1km search radius. Some 600m to the north-east of the site lies the Northern Valleys CTA which is described as follows:

Wooded pasture and valley slopes with small areas of pasture hills. Biodiversity includes lowland meadow, acid grassland, limestone grassland, fenn and swamp.

(See map overleaf)

Species:

A wide range of birds as would be associated with these habitats have been recorded. There are recent records of common pipistrelle (*Pipistrellus pipistrellus*) and noctule bats (*Nyctalus noctula*) foraging within the 1km search radius of the site.

[redacted]

Horton Grounds Quarry
Designated Sites Map

Conservation Target Area Oxfordshire Local Geological Site

3.2 Phase 1 Habitat Survey

An annotated Phase 1 habitat survey map is provided in appendix 2 of this report. This illustrates the location of all habitat types recorded at the site together with target notes depicting features of ecological interest. Habitats are classified using Phase 1 methodology (JNCC, 1993) and then evaluated against the IEEM EIA evaluating habitats and species guidelines (2006) in order to give them a scale of importance from low to high value in the context of the site (unless otherwise stated).

3.2.1 Weather Conditions

The weather conditions recorded during the site visit are as follows:

Table 1: Weather conditions recorded during the survey on 26th May 2020

Parameter	Recorded Figure
Temperature	23°C
Cloud cover	0%
Precipitation	none
Wind speed (Beaufort scale)	1

Table 2: Weather conditions recorded during the survey on 28th May 2020

Parameter	Recorded Figure
Temperature	20°C
Cloud cover	40%
Precipitation	none
Wind speed (Beaufort scale)	1

3.2.2 Habitats

Ephemeral vegetation

The site is dominated by ephemeral vegetation, patchy in nature, with frequent areas of exposed bare earth. This habitat has likely established on site as a result of its historic and ongoing function as part of the wider stone cutting and quarry facility.

The average vegetation height is less than 25cm and composed of occasional hedge mustard (*Sisymbrium officinale*), germander speedwell (*Veronica chamaedrys*), broadleaved dock (*Rumex obtusifolius*), lesser trefoil (*Trifolium dubium*), creeping buttercup (*Ranunculus repens*), willowherb sp. (*Epilobium sp.),* red campion (*Silene dioica),* white campion (*Silene latifolia*), weld (*Reseda luteola*), nipplewort (*Lapsana communis),* ribwort plantain (*Plantago lanceolata*) and colts foot (*Tussilago farfara*) with rarely occurring toadflax (*Linaria vulgari*), woody nightshade (*Solanum dulcamara*), st john's wort (*Hypericum perforatum),* yarrow (*Achillea millefolium*), teasel (*Dipsacus fullonum)* false oat grass (*Arrhenatherum elatius*) and cocksfoot grass (*Dactylis glomerata*).

This habitat offers limited structure or sheltering opportunities with frequent patches of exposed bare earth and as such generally considered to offer **low** ecological value both within the site and local context.

Hedgerows

A managed hedgerow runs the length of the southern site boundary (H1), with a newly planted hedgerow running the length of the northern boundary (H2). These features also offer a raised earth bank on the internal edge of the site.

H1, appeared subject to regular management as it adjoins the neighbouring arable field to the south, offering an average width of 1.5m with an average height of 2m. H1 is dominated by hawthorn (*Crataegus monogyna*) with rarely occurring elder (*Sambucus nigra*) and rose (*Rosa canina).*

H2, which extends along the northern boundary, offers a better species diversity containing hawthorn, oak (*Quercus robur*), field maple (*Acer campestre*), privet (*Ligustrum vulgare*), dog rose (*Rosa canina*), apple (Malus sp.) and hazel (*Corylus avellana*).

When assessed in line with the Hedgerow Regulations, 1997, H2 hedgerow offered an average of five woody species within the average 30m section and therefore is considered species rich.

Figure 2: Hedgerows

Hedgerows are a priority habitat (NERC Act, 2006) and provide valuable connectivity through the landscape and between habitats, making them a valuable resource for a range of wildlife. Following the walkover survey undertaken on the 26th May 2020, it is concluded that the hedgerows on site offer valuable connectivity across the site. With H1 additionally offering value to sheltering and foraging species.

As such, the hedgerows, which bound the site are afforded ***high to moderate*** ecological value within the context of the site.

Tall ruderal

A small area of tall ruderal vegetation encroachment exists against the southern boundary hedgerow. This habitat comprised frequent broadleaved dock, cow parsley (*Anthriscus sylvestris*), common nettle (*Urtica dioica*) and hogweed (*Heracleum sphondylium*) with occasional cleavers (*Galium aparine*), false oat grass (*Arrhenatherum elatius*) and cocksfoot grass. The vegetation present is in excess of 25cm tall, however, is limited in botanical diversity.

This habitat is common and widespread being easily recreated, however, is likely to offer value to a range of common invertebrates and commuting species when associated with the adjacent boundary hedgerow and waterbody. As such, this habitat afforded ***low to moderate*** ecological value within the context of the site.

Standing water

A small accumulation of water exists within a deep gully present on the internal edge of the southern boundary hedgerow. It is likely that this accumulation of water has been present on site for some time, given the presence of established bull rush (*Typha latifolia*) and reed (*Phragmites sp.*) along its margins.

Waterbodies and ponds, such as that on site, are a priority habitat (NERC Act, 2006) and provide a valuable resource to a range of species including invertebrates, herpetofauna and mammals.

The presence of good densities of invertebrates as well as smooth newt (*Lissotriton vulgaris*) were noted within this waterbody at the time of the survey. As such, this habitat afforded ***high*** ecological value within the context of the site.

Hardstanding and bare ground

Hardstanding and bare ground extends along the existing access road, which enters the site to the south-west corner. This habitats offers no structural diversity and is subject to frequent levels of disturbance as a result of its use and function.

This habitat is considered to offer ***low*** ecological value.

3.2.3 Species

Nesting birds

The data search reveals that a wide range of farmland birds within the 1km radius.

The southern boundary hedgerow offers typical structure and canopy foliage suitable for bird nest construction, however, no active or historic bird nests have been observed at the time of the survey. The wider site's ongoing use and function is likely to result in general level ambient disturbance through vehicle movement, given the close proximity of a functioning stone cutting yard.

Overall when considering the habitats present on site, along with their quality and size, the site is considered to offer ***low to moderate*** suitability to support nesting birds.

Bats

The data search reveals records of common pipistrelle (*Pipistrellus pipistrellus*) and noctule bats (*Nyctalus noctula*) foraging within the 1km search radius.

No suitable structures or features, offering bat roosting opportunities, are present on site.

The ephemeral vegetation and standing water on site is likely to support communities of common and widespread invertebrates and subsequently provide a forage resource for bats, however, this would be limited by the extent and size of the habitat present.

Commuting bats are generally associated with connective vegetative corridors, allowing sheltered passage through the landscape and between roosting and foraging habitat further afield. Such opportunities only exist along the southern boundary. Species such as, noctule, are known to exploit open areas where invertebrates may gather as a forage resource and it is possible that the habitat on site may offer such opportunities, however, these would be limited by the size and extent of the habitat present.

When considering the habitats on site in line with the Bat Conservation Trust's "Bat Surveys for Professional Ecologists, Good Practice Guidelines" and Table 4.1 which attributes suitability for bat roosting and foraging based on features offered and habitat present within the locality, the site is afforded ***negligible*** suitability as a resource to roosting bats and ***low*** suitability for use by foraging bats.

Amphibians

The data search reveals no records for amphibians within the 1km search radius, however, the site sits within an "amber risk zone" for great crested newt suggesting their presence within the surrounding landscape likely.

A single waterbody has been noted within the bounds of the site with no other waterbodies recorded within a 500m radius of the site boundary. 500m is considered the extent of the terrestrial range in relation to a breeding pond of GCN.

The location of this pond is illustrated within the phase 1 habitat map contained in appendix 2 of this report.

Habitat Suitability Index Assessment:

A Habitat Suitability Index assessment of the waterbody on site has been undertaken. The results of this assessment are detailed below:

Table 3: HSI assessment results P1

HSI of Pond 1		
Factor	***Result***	***Suitability Index***
SI1 – Location	A	1
SI2 – Area	77m^2	0.2
SI3 – Drying	rarely	1
SI4 - Water Quality	moderate	0.67
SI5 – Shade	30%	1
SI6 – Fowl	absent	1
SI7 – Fish	absent	1
SI8 – Ponds	3	0.6
SI9 – Terrestrial	poor	0.33
SI10 – Macrophytes	40%	0.7

$(SI1 \times SI3 \times SI4 \times SI5 \times SI6 \times SI7 \times SI8 \times SI9 \times SI10)^{1/9}$ = Suitability for GCN

$(0.0185)^{1/10}$= average

This equates to 0.67 and therefore is assessed to offer ***average*** suitability for GCN

Environmental DNA Analysis:

As a result of the HSI assessment and as the site lies within an "amber risk zone" for GCN a dictated by NatureSpace Partnership, P1 has been subject to a further eDNA sampling assessment to confirm presence or likely absence of great crested newt. The results of the eDNA assessment of P1 are provided below:

Sample ID: 2020-0363	Condition on Receipt: Good		Volume: Passed
Client Identifier: Not supllied	Description: pond water samples in preservative		
Date of Receipt: 01/06/2020	Material Tested: eDNA from pond water samples		

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control†	2 of 2	Real Time PCR	02/06/2020
Degradation Control§	Within Limits	Real Time PCR	02/06/2020
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	02/06/2020
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)#	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	03/06/2020	Date of issue:	03/06/2020

Figure 2: eDNA results

Terrestrial Habitat Assessment:

The short perennial vegetation and bare ground, which dominates the site, offers limited opportunities for foraging and commutating amphibians with frequent areas of exposed bare ground. The patchy nature of the habitat present on site, reduces the opportunities within this habitat for safe dispersal of amphibians. As such, opportunities for amphibians are confined to the southern boundary within the hedgerows, waterbody and associated tall ruderal vegetation.

The site is afforded *negligible* suitability for use by GCN and *moderate* suitability, confined to the limited habitat present, for use by common amphibians.

Reptiles

The data search reveals no records of reptiles within the 1km search radius. This is probably as a result of under recording rather than their absence within suitable habitats.

Suitable reptile habitat, on site, is limited in size and generally confined to the southern boundary, within the hedgerow and waterbody with associated tall ruderal. The site's general ambient disturbance levels, as a result of its function and proximity to the active stone cutting yard, would likely limited the overall suitability for use of the site by reptiles. Basking opportunities for reptiles are present within the ephemeral vegetation present, particularly along the earth banks, although the clear lack of adjacent sheltering opportunities reduces this value, with any basking reptiles unable to seek immediate cover should predation or disturbance occur.

Grass snake commute over larger distances and are reliant on habitats associated with watercourse or waterbodies for foraging such as those present on site and within the surrounding landscape. It is considered likely that this species would commute through the site as they disperse between foraging resources and breeding

habitats further afield. The site does not offer habitats typically suitable for breeding grass snake and therefore it is concluded that the site is unlikely to support a reliant population of reptiles.

As such, the site is afforded ***moderate*** suitability for use by reptiles.

Hedgehog

The data search returned a no records for hedgehog within the 1km search radius.

A search of the habitat on site revealed no evidence of this species, in addition the regularly disturbed nature of the habitat on site further reduced the site's suitability for use by this species. Opportunities for sheltering hedgehog are present within the southern boundary hedgerow.

Overall the site is afforded ***low*** suitability for hedgehog.

4. Conclusions and Evaluation

When considering the extent and scale of the proposals, no direct or indirect impacts to any statutory or non-statutory designations are foreseen.

The hedgerows and waterbody, identified on site, are considered priority habitats (NERC, 2006) and as such, this report seeks to recommend the retention and protection of these habitats through the establishment of suitable protective buffer zones during the construction phase of works.

The site is dominated by ephemeral vegetation and bare ground of limited ecological distinctiveness as a result of its historic use and existing ambient levels of disturbance. The habitats on site do, however, offer some value to densities of common and widespread invertebrates, particularly when associated with the southern boundary hedgerow, waterbody and tall ruderal vegetation. . In consideration of this identified ecological suitability, this report seeks to recommend a precautionary approach to disturbing works in an effort to ensure commuting species are not directly or indirectly impacted by the proposals.

The site is located within an identified "amber risk zone" for GCN as dictated by the NatureSpace Partnership. In addition, a small accumulation of water exists within the south-eastern corner of the site within a deep gully. This accumulation of water appears to have been present for some time as indicated by the presence of established

bulrush and reed. Further investigation into GCN presence or likely absence on site has been undertaken through eDNA sample analysis. This analysis returned a negative result, greatly reducing the likelihood of GCN presence within this waterbody and subsequently their likely presence on site.

Terrestrial habitat on site offers limited opportunities for foraging and sheltering amphibians confined to the southern boundary, however, GCN are known to disperse, radially, for 500m from a breeding pond. Therefore there remains a small risk that should environmental conditions change, GCN may, if present within the wider landscape, make use the aquatic habitat on site. As such, a precautionary approach to works should be adopted and maintained for the length of the development. Further details on such measures are outlined within Section 5 of this report.

Opportunities for biodiversity enhancements as part of the proposals have been identified with the provision of scrub planting within the south-eastern corner of the site and adjacent to the existing waterbody. Such scrub planting will enhance the existing habitat mosaic present on site, providing enhanced sheltering and foraging opportunities for invertebrates, herpetofauna and terrestrial mammals. Further details are provided within Section 5 of this report.

5. Recommendations and Opportunities for Biodiversity Enhancement

Recommendations

The boundary hedgerows on site will be protected in accordance with BS 5837:2012 trees in relation to design, demolition and construction – Recommendations.

The habitats of most ecological value, observed during the preliminary ecological appraisal, are recorded within the boundary hedgerows and waterbody. These features will be retained and protected for the duration of potentially disturbing works with the provision of a protective buffer. This buffer will extend for some 2m along the internal edge of the hedgerows and waterbody. This buffer zone will, not only seek to protect the retained most valuable habitats on site but also secure continued connectivity for species such as grass snake and terrestrial mammals which would likely commute across the site. This corridor will be fenced off and secured against any accidental vehicle movement or disturbance for the duration of disturbing work with “heras” typed fencing. Figure 3 below, aims to illustrate the extent of this suggested protective buffer in relation to habitats on site.

Figure 3: Indicative 2m protective buffer zone

Any proposed lighting both during works and permanent lighting once the proposed development has been completed should be LED type within the warm-white spectrum and cowled to direct light towards the ground and away from potential bat foraging and commuting areas within neighbouring habitats.

Any trenches, should be backfilled overnight to avoid animals becoming trapped as a result of works. If this is not possible, sloping boards should be provided within these excavations to ensure animals do not become trapped.

Should non-protected animals be found during works these should be moved carefully by hand to an area of long grass or hedgerow that is to be left undisturbed by the works.

Should evidence of protected species, such as great crested newt be discovered during works, works should temporarily stop while Griffin Ecology Ltd. or the local office of Natural England are contacted for advice on the best way to proceed.

Opportunities for Biodiversity Enhancement

In order to offer a measurable enhancements to biodiversity post development in line with the NPPF, an area appropriate for scrub planting has been identified adjacent to the southern boundary. The provision of such habitat will enhance the existing mosaic of habitats present on site offering enhanced opportunities for herpetofauna, invertebrates and terrestrial mammals. Species should include fruiting shrubs of local provenance such as dogwood (*Cornus sanguinea*), dog rose and hawthorn Figure 4, aims to illustrate the indicative location of suggested scrub planting.

Figure 4: Suggested Location of scrub planting

Further enhancements to amphibian and reptile habitat adjacent to the waterbody can be created with the provision of an amphibian and reptile hibernacula as illustrated within figure 5 below:

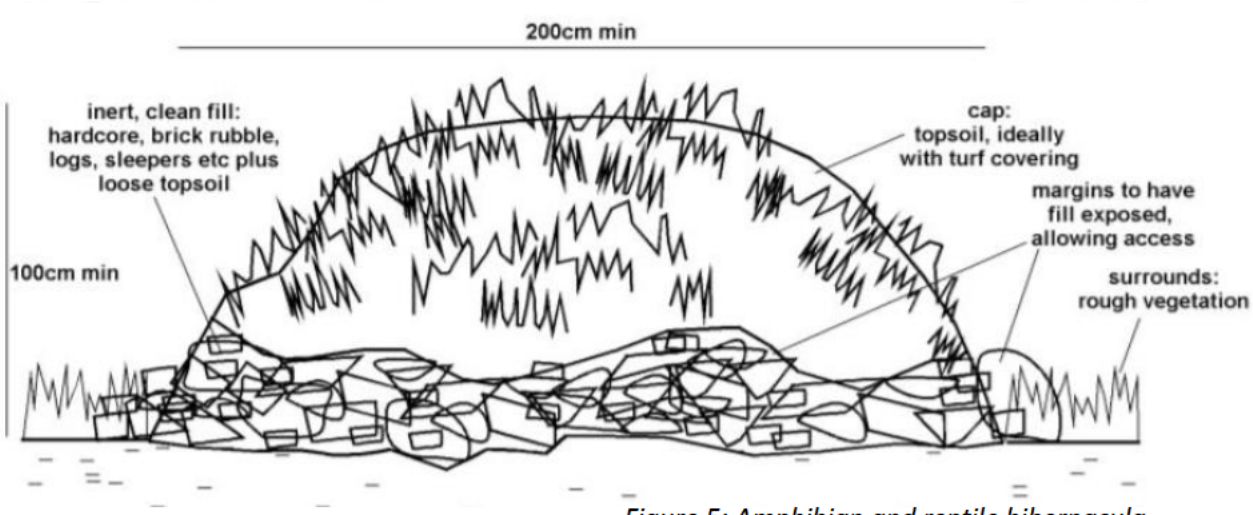


Figure 5: Amphibian and reptile hibernacula

Care will be taken during the creation of the hibernacula to ensure no existing herpetofauna habitats are damaged. Only clean, inert materials are to be used for the creation of the hibernacula. Timber collated during any tree removal / crown lifting work, for example, can be used to create refuges.

6. References

Birds of Conservation Concern 3: The Population Status of Birds in the UK, Channel Islands and the Isle of Man (Various, 2009).

CIEEM, 2015. Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester

Cresswell WJ, Birks J, Dean M, Pacheco M, Trewhella WJ, Wells D and Wray S (2012) UK BAP Mammals: Interim Guidelines for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.

Harris S, Cresswell P and Jefferies D, 1989. Surveying Badgers. Mammal Society.

Institute of Environmental Assessment, 1995. Guidelines for Baseline Ecological Assessment. London: E & FN Spon.

Google Earth Pro.

2016. Bat Surveys: Good Practice Guidelines. 3rd edition. London: Bat Conservation Trust.

JNCC, 2004. Bat Workers Manual. 3rd edition.

Thames Valley Environmental records Centre

MAGIC, 2013. Available from: http://www.magic.gov.uk/.

National Planning and Policy Framework, 2018.

The Conservation of Habitats and Species Regulations, 2012.

Stace, C., 1997. New flora of the British Isles. Cambridge: Cambridge University Press.

Southwood, T.R.E. (1961) The numbers of species of insect associated with various trees. J. Animal Ecology 30: 1-8

Appendix 1 – Legislation

Legislation & Planning Policies

A number of UK and European policies and legislation deal with the conservation of biodiversity.

Protected habitats & species

The Wildlife and Countryside Act 1981 (as amended by the Countryside Rights of Way Act 2000) Section 9 protects great crested newt and all UK species of bat and their resting places from disturbance, damage and destruction. The Conservation of Habitats and Species Regulations 2010 additionally lists great crested newt and all UK species of bat as European Protected Species, and additionally prohibits killing or injury of individuals, as well as protecting their resting places from disturbance and destruction.

Common reptiles (grass snake, adder, common lizard and slow worm) are listed under Schedule 5 of the Wildlife and Countryside Act (as amended) and are protected from killing and injury.

The Wildlife and Countryside Act 181 (as amended) provides protection to all species of wild bird and their nests. Under Section 1 it is an offence to intentionally or recklessly take, damage, destroy, or otherwise interfere with nests or eggs, or to obstruct or prevent any wild bird from using its nest.

Under the Protection of Badgers Act 1992 it is an offence to disturb, kill, injure or take a badger or to disturb, damage, obstruct access to, allow a dog to access or destroy a sett.

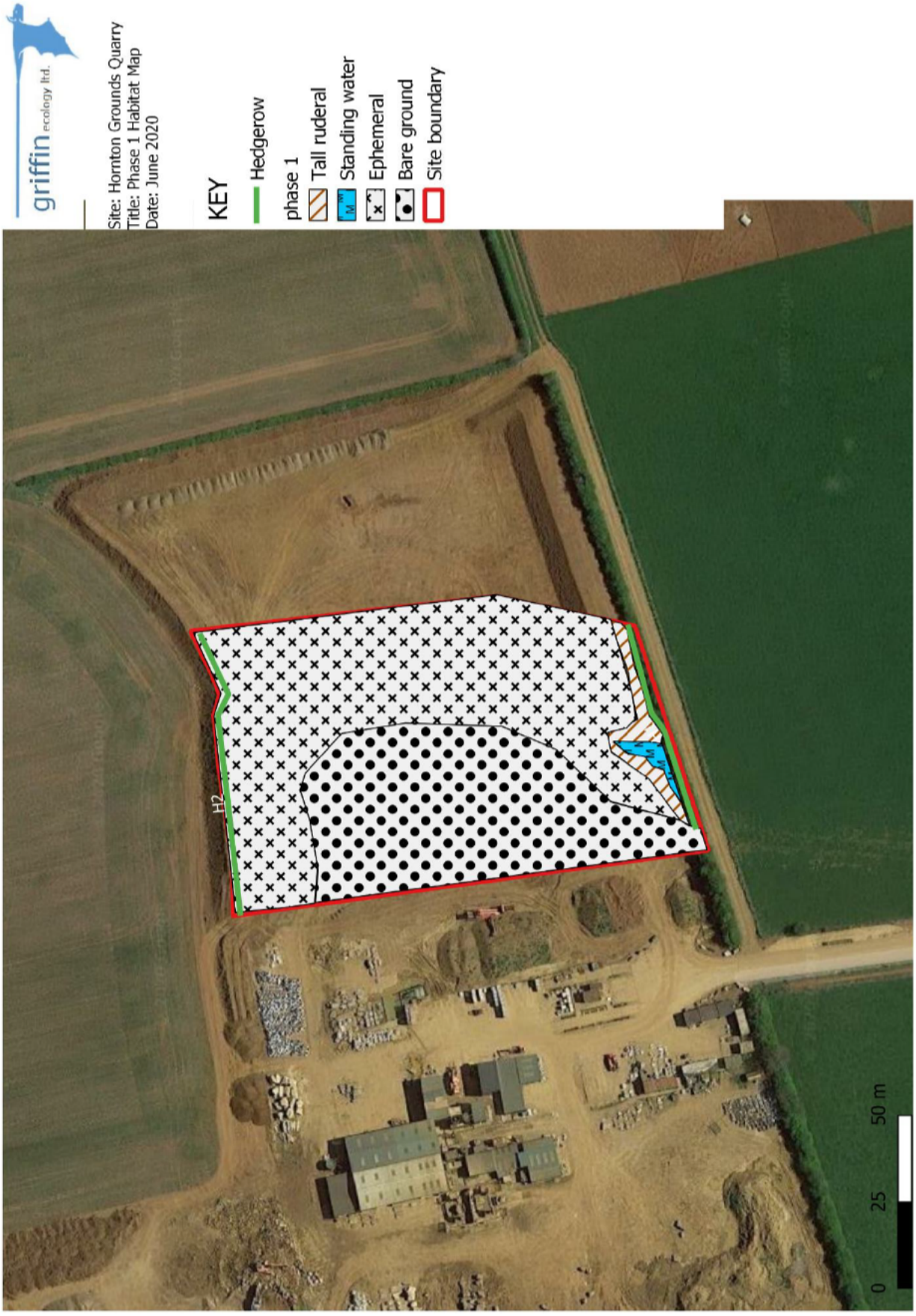
Priority habitats & species

The NERC Act 2006 places a duty on public authorities to conserve biodiversity. Additionally, this Act states that a list of priority species and actions must be drawn up and published, to contain species and habitats of principal importance for the purpose of conserving biodiversity. These lists of Priority Species and Priority Habitats, which encompass the previous UK Biodiversity Action Plan (BAP) habitats and species, are those identified as being the most threatened and requiring conservation action. Priority habitats and species were chosen based on international importance, rapid decline and high risk. The list contains over 1000 habitats and species in total.

Invasive species

Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) contains introduced species which have been identified as having a severe economic and ecological impact through their introduction. It is an offence to release or allow to escape into the wild any species which is listed under Part I or Part II of Schedule 9, or any species which is not native.

Appendix 2 – Phase 1 Habitat Map



Appendix 3 – Species List

Trees

hawthorn (*Crataegus monogyna*)
(*Sambucus nigra*)
dog rose (*Rosa canina).*
oak (*Quercus robur*)
field maple (*Acer campestre*)
privet (*Ligustrum vulgare*)
apple (*Malus sp.*)
hazel (*Corylus avellana*).

Herbs

cow parsley (*Anthriscus sylvestris*)
common nettle (*Urtica dioica*)
hogweed (*Heracleum sphondylium*)
cleavers (*Galium aparine*)
hedge mustard (*Sisymbrium officinale*)
germander speedwell (*Veronica chamaedrys*)
broadleaved dock (*Rumex obtusifolius*)
lesser trefoil (*Trifolium dubium*)
creeping buttercup (*Ranunculus repens*)
willowherb sp. (*Epilobium sp.)*
red campion (*Silene dioica)*
white campion (*Silene latifolia*)
weld (*Reseda luteola*)
nipplewort (*Lapsana communis)*
ribwort plantain (*Plantago lanceolata*)
colts foot (*Tussilago farfara*)
toadflax (*Linaria vulgari*)
woody nightshade (*Solanum dulcamara*)
st john's wort (*Hypericum perforatum)*
yarrow (*Achillea millefolium*)
teasel (*Dipsacus fullonum)*
bulrush (*Typha latifolia*)
reed (*Phragmites sp.*)

Grasses

false oat grass (*Arrhenatherum elatius*)
cocksfoot grass (*Dactylis glomerata*).