



Preliminary Ecological Appraisal Stairfoot Glassworks, Barnsley

ISSUE RECORD

Client name	Potters Ballotini Ltd.	
Project name	Stairfoot Glassworks	
Project number	PottIn01.1	
Report title	Preliminary Ecological Appraisal	
Issue number	1	2 (amended with client comments)
Date	18/12/2023	09/01/2024
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ISO9001	QMF 32	Issue 1	Reviewed 04/03/2016
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EXECUTIVE SUMMARY

Overview

This report has been prepared by Peak Ecology Ltd on behalf of Potters Ballotini Ltd. It details the results of a Preliminary Ecological Appraisal in relation to the proposed redevelopment of the site which will see the construction of a waste glass recycling and repurposing facility.

The survey was undertaken on 27th June 2023, with an additional site visit undertaken 21st November 2023. The broad habitat types were identified, mapped and assessed for their ecological importance and the potential of the site was assessed to support protected species.

Designated sites

Located adjacent to the eastern boundary of the site is the Stairfoot Brickworks Site of Special Scientific Interest (SSSI), with approximately 60m² of the SSSI overlapping the north eastern corner of the site. The development site falls within the SSSI Impact Risk Zone (IRZ) with proposed works meeting the identified risk category. As such, the Local Planning Authority (LPA) will be required to consult with Natural England prior to granting planning permission for any development on site. It is recommended that a working standoff zone is implemented during proposed work, as detailed in Section 5.

The site also falls within the SSSI IRZ for Dearne Valley Wetlands. The LPA should consider whether consultation with Natural England will be required.

No impacts envisaged on Dearne Valley Park Local Nature Reserve (LNR), or the six identified Local Wildlife Sites (LWS), therefore no further actions required.

Habitats

Woodland on the sites northern and eastern boundary was considered to fall within the Lowland Mixed Deciduous Woodland Priority Habitat due to their structure, composition and size. All areas of woodland will be retained and should also be adequately protected during the works, through demarcation of Root Protection Areas (RPA's) and/or incorporation of Precautionary Working Method Statements as per the Arboricultural Method Statement (Wharnccliffe Trees and Woodland Consultancy, 2023).

Protected species

Feature	Recommendations	Further survey required?
Protected and Notable Species		
Amphibians	Great crested newt presence/absence surveys undertaken by Peak Ecology Ltd in 2021, identified an absence of GCN within 500m of the site although one pond (P5) was not assessed. Reasonable Avoidance Measures (RAMs) therefore be taken during any vegetation removal, and during construction. RAMs detailed within Section 5.	No further surveys required.
Badgers and hedgehogs	A pre-commencement check should be carried out on site to ensure no new badger setts have been excavated prior to works. RAMs to be adhered to during the construction phase as detailed within Section 5.	A pre-commencement check, ideally 3-4 weeks prior to works starting on site.
Bats	As works will largely be confined to existing hard standing areas, with no proposed removal of woodland areas, trees or scrub, no further surveys are required as the impact of the development on foraging and commuting bats is anticipated to be low, further reduced through the implementation of a sensitive lighting scheme. Further details within Section 5.	No further surveys required
Willow Tit	Removal of any scrub and immature trees onsite should be carried out avoiding the most sensitive periods for breeding willow tits which is generally considered to be February to September (inclusive). Vegetation clearance should be carried out under ecological supervision. The overseeing Ecological Clerk of Works (ECoW) will select deadwood/newly cut wood for use as nesting features. Replacement planting/compensatory planting to be incorporated into the scheme.	No further surveys. Ecological supervision during onsite vegetation removal and ECoW to oversee creation of nesting features.
Breeding birds	It is recommended that scrub and immature tree removal is undertaken outside of the main breeding bird season, which is generally considered to be March to September (inclusive), to minimise the risk of damaging active nests. If this is not possible, a suitably experienced ecologist should search all areas for active nests no longer than 48hrs prior to vegetation removal. Any identified active nests must be protected from disturbance until the chicks have fledged, using suitable barriers where necessary.	Pre-commencement check where scrub and immature trees are required to be removed in March to September (inclusive)
Reptiles	Onsite habitat is of value for reptiles. Construction works should take place following Reasonable Avoidance Measures (RAMs) as detailed within Section 5.	No further surveys.
Invasive species	Snowberry <i>Symphoricarpos albus</i> was recorded within woodland onsite. While this species is not a Schedule 9 species under the Wildlife and Countryside Act, its invasive properties will warrant future site management.	Pre-commencement invasive species survey and management plan.

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1 INTRODUCTION

1.1 Scope of Report

This report has been prepared by Peak Ecology on behalf of Potters Ballotini Ltd. It provides the results of a Preliminary Ecological Appraisal (PEA) associated with the proposed construction of a waste glass recycling and repurposing facility at Stairfoot Glassworks, Wombwell Lane, Barnsley site. The purpose of this report is to:

- Describe the ecological baseline of the site, including existing habitats, presence of protected and priority species (see Appendix A for description) and nearby designated sites;
- Highlight potential significant ecological impacts and constraints associated with the proposals;
- Confirm any further ecological surveys required, for example to confirm presence / likely absence of a specific protected species.
- Provide outline recommendations for mitigation and/or avoidance measures where appropriate; and
- Highlight opportunities for ecological enhancement where appropriate.

In relation to planning and development, this report provides all relevant details to support a planning application, however, it should be read in conjunction with any other ecological surveys that have been undertaken for the site.

The approach to this assessment follows best practice published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2013 & 2017) and the British Standards Institution (BSI, 2013). Details of individual survey methods and associated supporting information are provided in Section 2.

1.2 Site Description

The site extends to approximately 6.6ha of land (shown by the blue line boundary in Figure 1) located to the north east of Wombwell on the south eastern outskirts of Barnsley (central grid reference: SE 37915 04997). The site is dominated by brownfield where the historic brickwork buildings had been demolished and rubble piles left across the site. The Trans Pennine Trail defines the northern boundary of the site with Wombwell Lane (A633) located adjacent to the southern boundary. The immediate surrounding landscape was dominated by industrial and agricultural use; however, restored quarries lie adjacent to the north east of the site. Low density residential is located along Wombwell Lane, with the larger residential developments of Ardsley and Kendray located approximately 200m north east and 800m west of the site respectively.

The location of the site is shown on the plan in Figure 1 below.

Figure 1: Location Plan*



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1.3 Previous Surveys Undertaken

Peak Ecology Ltd has undertaken the following previous surveys onsite;

- Preliminary Ecological Appraisal – September 2020
- Breeding Bird Surveys including Willow Tit – March to May 2021
- Great Crested Newt eDNA pond sampling – April 2021
- Reptile Presence/Absence Surveys – September 2021

This report will draw on data obtained during previous surveys as well as providing new information.

1.4 Proposed Development

The proposed works include the erection of perimeter security fencing, construction of a clad building for internal processing works, construction of a workshop and admin office, construction of; a gatehouse and weighbridge, external cullet bays, external processing area, lorry park, storage areas, car park and access. Works will be largely confined to existing hard standing areas. The proposed development plan has been included in Appendix D.

1.5 Zone of Influence

The geographical extent of the potential impact of a proposed development is known as the Zone of Influence (ZOI). The ZOI is determined by the nature of the development, the habitat requirements and mobility of individual species relevant to the site, and the distances they typically cover as indicated in best practice guidelines.

In relation to great crested newts (GCN) *Triturus cristatus*, and badgers *Meles meles* the zone of influence is considered to be up to 500m and 30m respectively from the development boundary. In regards to bats, the zone of influence is considered to be the site itself and any connecting habitat links suitable for use as commuting and foraging corridors.

1.6 Planning Context and Legislation

The National Planning Policy Framework 2023 requires that when assessing a planning application all Local Planning Authorities (LPAs) must consider potential impacts on biodiversity that may result from the proposals. In addition to this, county and borough councils typically have biodiversity policies within their Local Development Frameworks that they must also comply with.

In practice, this means that potential impacts on designated sites, priority species and habitats such as those listed on the UK Post-2010 Biodiversity Framework (formerly the UK Biodiversity Action Plan) and species that receive legal direct protection (typically via the Conservation of Habitats and Species Regulations 2017 (as amended) and/or the Wildlife and Countryside Act 1981 (as amended)) are all material planning considerations.

In relation to European Protected Species, the LPA requires sufficient information about likely impacts and mitigation or compensatory measures to satisfy the three Habitats Directive tests, the most relevant to ecological reports being that which relates to the Favourable Conservation Status of the species in question.

Appendix A provides a definition of “protected or priority species” for the purposes of this report, and Appendix B provides details on the legislation for species relevant to this site.

2 METHODOLOGY

2.1 Desk Study

The desk study comprised a review of existing information held by the local biological records centre and other specialist groups, as appropriate. Sheffield Biological Records Centre was contacted to obtain locations of designated sites and any existing records of protected or priority species within 2km of the site.

In addition, a site-specific check has been carried out using the online interactive mapping tool MAGIC (Multi-Agency Geographic Information for the Countryside) to identify any statutory designated sites within the search radius and any previously granted European Protected Species (EPS) Applications.

2.2 Surveyors

The survey was undertaken on 27th June 2023 by Senior Ecologist, Helen Staton, BSc (Hons), Natural England Class Level 1 licence holder for bats and great crested newts (2015-14490-CLS-CLS, 2015-18041-CLS-CLS, respectively). Helen has been a professional ecologist for 12 years and is experienced in the use of the UK Habitat Classification survey methodology, identification of vascular plants and scoping assessments for protected species.

An update habitat assessment/breeding bird assessment was undertaken on 21st November 2023 by Chloe Pritchard, assisted by Emily Stephenson. Chloe is Principal Ecologist with 18 years ornithological experience. Emily is a Graduate Ecologist.

2.3 Habitat Survey

Following standard methodology (Butcher *et al*, 2020), the survey comprised a walkover of the site to classify and map the extent of recognised habitat types under the UK Habitat Classification (UKHab, 2023), based on the identification of individual plant species. Any evidence of invasive plants such as Japanese knotweed *Reynoutria japonica* was also noted. Nomenclature for vascular plant species follows the New Flora of the British Isles (Stace, 2019).

The extent of the habitats recorded is illustrated on the Habitat Plan in Figure 2, with target notes to provide supplementary information regarding any features of particular ecological interest.

The fine-scale Minimum Mapping Unit (MMU) was used throughout the survey area to allow the capture of small features and present any finer grain or mosaic of habitats. Minimum mapping units used were:

- 25m² for areas of habitat; and
- 1m wide and 5m length for linear habitat.

Features smaller than the MMU are denoted as point features.

2.4 Scoping for Protected and Priority Species

The habitats present were assessed for their potential to support any legally protected or otherwise notable species. Any incidental sightings or field signs discovered during the survey were also recorded.

All British wildlife and countryside legislation, policy and guidance were taken into consideration, including:

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- EC Council Directive on the Conservation of Wild Birds 79/409/EEC;
- The Protection of Badgers Act 1992;
- The Countryside and Rights of Way Act 2000;
- The Hedgerow Regulations 1997;
- The Natural Environment and Rural Communities Act 2006; and
- The UK Post-2010 Biodiversity Framework (formerly known as UK BAP).

Appendix B provides greater detail on the legislation context relevant to this site.

In the case of great crested newts and bats, specific assessment methods have been adopted as the industry standard and these were followed during the survey, see Appendix C for detailed methodologies.

2.5 Limitations

2.5.1 3rd Party Data

Desk study data obtained for this assessment is provided and validated by third parties therefore Peak Ecology have no control over any errors within the dataset. The data represents the information available at the date of request and a lack of records for any particular species does not necessarily indicate absence from the local area as many species are under-recorded.

2.5.2 Survey Methods

Based on the identification of individual plant species, the survey provides sufficient information to enable classification of broad habitat types; however, it does not constitute a detailed botanical survey. Plant species lists compiled by this type of survey should not be considered definitive as not all species will be apparent at all times of year.

The scoping assessment for protected species highlights habitats and features suitable for protected species and notes any incidental sightings or field signs discovered; however, it

should not be interpreted as providing a comprehensive presence/ likely absence survey for individual species.

It should be noted that if there were no records or observations of certain protected or rare species, this does not preclude their presence on site. There is always a risk of species being overlooked, either owing to the timing of the survey or the scarcity of the species occupying the site.

2.6 Lifespan of Data

The results and recommendations contained within this report are considered to be valid for up to two years from the date of survey, assuming that there are no significant changes to the site condition or management within this period. After this period, or should the site conditions change, an update may be required in order to inform ecological constraints to development proposals and/or accompany a planning submission.

3 **RESULTS**

3.1 **Desk Study**

3.1.1 ***Designated Sites***

Three statutory designated sites were identified within the search area; Stairfoot Brickworks Site of Special Scientific Interest (SSSI), Dearne Valley Wetlands SSSI and Dearne Valley Park Local Nature Reserve (LNR).

Stairfoot Brickworks SSSI

Approximately 60m² of Stairfoot Brickworks SSSI overlaps onto the site, with the south eastern corner of the site falling within the SSSI Impact Risk Zone. Proposed works meet identified risk category of “all planning applications – except householder applications” as defined by Natural England and is considered, by definition, likely to cause an impact to the SSSI. As such, the Local Planning Authority (LPA) will be required to consult with Natural England prior to granting planning permission for any development on site.

Dearne Valley Wetlands SSSI

The site falls within Dearne Valley Wetlands SSSI Impact Risk Zone which is located 870m to the SSE. The proposed development does not strictly meet the listed risk categories, although Rural Non-Residential developments whose footprints exceed 0.2ha have been highlighted. The site is located in a semi-rural location so further action may not be required, although consideration should be given as to whether consultation with Natural England should proceed as a safeguard.

Sheffield Biological Records Centre (SBRC) provided details of six Local Wildlife Sites (LWS). This a non-statutory local designation, further details of which are provided in the table below. There are two ponds within a 500m radius.

There are also five different Priority Habitats identified, most notably areas of deciduous woodland throughout the search area, including 200m N and 300m E. Other Priority Habitats include semi-improved grassland approximately 1.8km NE and 1.8km SW; open mosaic habitat approximately 500m W, 270m NE and 400m N; traditional orchards 1.6km E and 1.4km NE; and ancient and semi-natural woodland 1.5km NE and 1.8km SW.

Table 1: Designated sites identified during the desk study

Name	Status	Reason for Designation	Approximate distance & Direction from site
Statutory Designated Sites			
Stairfoot Brickworks	SSSI	Internationally important for geological interest.	Onsite and adjacent to the SE site boundary
Dearne Valley Wetlands	SSSI	Nationally important for the diverse assemblages of breeding birds of Lowland broadleaved, mixed and yew woodlands, and of Lowland fen, marsh and swamp.	0.8km to SSE

Name	Status	Reason for Designation	Approximate distance & Direction from site
Dearne Valley Park	LNR	Acidic Oak woodland with mosaic of wetland habitats.	2km to NW
Non-statutory Designated Sites			
Horse Carr Wood	LWS	Ancient woodland, Lowland mixed deciduous woodland, some unimproved neutral grassland.	1.5km NE
Pearson Wood	LWS	Ancient woodland, Lowland mixed deciduous woodland, some unimproved neutral grassland.	1.9km NE
Stairfoot Railway Disused	LWS	Habitats of Lowland mixed deciduous woodland, ponds, rivers, grasslands, and scrub.	1.2km NNW
Sunny Bank	LWS	Ancient woodland, Lowland mixed deciduous woodland, some unimproved neutral grassland.	1.9km NNE
Sunny Bank Wood	LWS	Ancient woodland, Lowland mixed deciduous woodland, some unimproved neutral grassland.	1.9km NNE
Wombwell Wood	LWS	Ancient woodland, Lowland mixed deciduous woodland, ponds. Remnants of heath.	1.8km SW

3.1.2 Protected / Notable Species

Table 2: Summary of Granted European Protected Species Applications

Reference Number	Species	Dates	Distance and Direction from Site	Licence Allows:
2016-26581-EPS-MIT (1-3)	Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	2016 & 2017-2021	600m NE	Destruction of a breeding site
2017-32557-EPS-BDX	Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	2018	1.9km SW	Damage and destruction of a breeding site; damage and destruction of a resting place.

The table below provides a summary of the species records received from the Sheffield Biological Records Centre that are considered most relevant to the site and/or proposals. The full dataset is not included here but is available on request.

Table 3: Summary of protected and notable species records relevant to the site

Species	Approximate location of closest record	Date of most recent record	Total No. of Records	Designation
Mammals				
Badger <i>Meles meles</i>	*Within search area*			PBA
European hedgehog <i>Erinaceus europaeus</i>	0.76km NE 2018	1.52km E 2020	3	UKBF; LBAP
<i>Myotis</i> sp.	0.59km NE 2016		1	WCA Sch5 UKBF; LBAP
Noctule <i>Nyctalus noctula</i>	0.59km NE 2016		4	WCA Sch5 UKBF; LBAP

Species	Approximate location of closest record	Date of most recent record	Total No. of Records	Designation
<i>Pipistrellus</i> sp.	0.59km NE 2016		10	WCA Sch5 UKBF; LBAP
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	0.59km NE 2016		6	WCA Sch5 UKBF; LBAP
Birds				
Bullfinch <i>Pyrrhula pyrrhula</i>	0.35km SW 2013	1.11km SSE 2021	50	BoCC Amber; UKBF
Dunnock <i>Prunella modularis</i>	0.57km SW 2014	1.91km SW 2021	38	BoCC Amber; UKBF
Fieldfare <i>Turdus pilaris</i>	0.80km SSW 2016	1.89km S 2016	4	BoCC Red; WCA Sch1.1
Greenfinch <i>Chloris chloris</i>	0.71km NW 2014	0.78km NW 2018	9	BoCC Red
Grey wagtail <i>Motacilla cinerea</i>	1.25km ESE 2019	1.89km NNE 2021	12	BoCC Amber
House sparrow <i>Passer domesticus</i>	0.64km SE 2016	1.11km SSE 2021	8	BoCC Red; UKBF
Kingfisher <i>Alcedo atthis</i>	1.25km ESE 2014	1.29km SSW 2020	8	WCA Sch1.1
Lesser redpoll <i>Acanthis cabaret</i>	0.98km SSE 2016		2	BoCC Red; UKBF
Little ringed plover <i>Charadrius dubius</i>	1.34km SW 2010		6	WCA Sch1.1; LBAP
Meadow pipit <i>Anthus pratensis</i>	0.89km S 2016		1	BoCC Amber
Mistle thrush <i>Turdus viscivorus</i>	1.20km WSW 2015	1.42km SSW 2021	12	BoCC Red
Redshank <i>Tringa totanus</i>	0.75km SSE 2016		2	BoCC Amber
Redwing <i>Turdus iliacus</i>	0.53km SSW 2016	1.61km N 2016	12	BoCC Amber; WCA Sch1.1
Reed bunting <i>Emberiza schoeniclus</i>	1km S 2016	1.26km SSE 2020	6	BoCC Amber; UKBF
Snipe <i>Gallinago gallinago</i>	0.89km S 2016	1.61km N 2017	13	BoCC Amber
Song thrush <i>Turdus philomelos</i>	0.8km SE 2016	1.42km SSW 2021	40	BoCC Amber; UKBF
Whitethroat <i>Sylvia communis</i>	1.35km NW 2015	1.42km N 2021	4	BoCC Amber
Willow tit <i>Poecile montanus</i>	0.69 SSE 2016	1.09km NW 2021	25	BoCC Red; UKBF
Willow warbler <i>Phylloscopus trochilus</i>	1.41km N 2019	1.94km NW 2019	15	BoCC Amber
Woodpigeon <i>Columba palumbus</i>	0.31km WSW 2015	1.98km NW 2018	21	BoCC Amber

Species	Approximate location of closest record	Date of most recent record	Total No. of Records	Designation
Wren <i>Troglodytes troglodytes</i>	0.23km WNW 2016	1.98km SW 2021	65	BoCC Amber
Invertebrates				
Cinnabar moth <i>Tyria jacobaeae</i>	0.65km NW 2013	1.79km NW 2018	8	UKBF
Dingy skipper <i>Erynnis tages</i>	0.65km NW 2013	1.80km NW 2018	13	UKBF; LBAP
Shaded broad-bar <i>Scotopteryx chenopodiata</i>	1.65km ESE 2017		1	UKBF
Small heath <i>Coenonympha pamphilus</i>	0.42km W 2021		7	UKBF
White-letter hairstreak <i>Satyrrium w-album</i>	1.76km NNE 2017		1	WCA Sch5, UKBF
Reptiles				
Common lizard <i>Zootoca vivipara</i>	1.65km SW 2016	1.69km SW 2017	5	WCA Sch5, UKBF
Grass snake <i>Natrix helvetica</i>	1.86km NW 2018		1	WCA Sch5, UKBF
Flowering Plants				
Bluebell <i>Hyacinthoides non-scripta</i>	0.8km SSW 2016	1.76km NNE 2021	30	WCA Sch 8; LBAP
Invasive Non-Native				
Giant Hogweed <i>Heracleum mantegazzianum</i>	1.37km NNW 2018	1.41km NNW 2020	91	WCA Sch9
Himalayan balsam <i>Impatiens glandulifera</i>	0.31km WSW 2015	0.82km WSW 2021	52	WCA Sch9
Japanese knotweed <i>Fallopia japonica</i>	0.55km W 2021		54	WCA Sch9

*NB. Due to the risk of persecution of this species any records, if present, remain confidential.

Legislation Key:

WCA Sch5: Wildlife and Countryside Act (1981) Schedule 5	Sch1.1: WCA Schedule 1.1	BOCC: Birds of Conservation Concern Review
UKBF: UK Post-2010 Biodiversity Framework	LBAP: Local Biodiversity Action Plan	PBA: The Protection of Badgers Act (1992)
WCA Sch8: Wildlife and Countryside Act (1981) Schedule 8	WCA Sch9: Wildlife and Countryside Act (1981) Schedule 9	

3.2 Habitat Survey

The individual habitat types recorded at the site are described under the sub-headings below, with the location and extent of each illustrated on the Habitat Plan (Figure 2). Representative photographs of the site are provided in Appendix E, full botanical list and scientific name for flora species shown in Appendix F.

3.2.1 *u1b developed land; sealed surface*

Located centrally was a large area of hard standing with little or no vegetative cover (<10%).

3.2.2 *u1c artificial unvegetated, unsealed surface*

Two areas of artificial unvegetated, unsealed surface were present onsite, towards the southern boundary and adjacent to a woodland area. Here vegetation cover was <10% and substrate comprised bare ground which showed recent evidence of disturbance.

3.2.3 *u1f, 80 sparsely vegetated urban land, open mosaic on previously developed land*

A 0.6ha area of sparsely vegetated urban land is present towards the NW side of the site, with vegetation cover 10-50% comprising largely ephemeral/short perennial with evidence of recent vehicular disturbance noted.

3.2.4 *g3c, 80 other neutral grassland, open mosaic on previously developed land*

Areas of other neutral grassland were present across the site, primarily around site edges and within the northern section of the site. Onsite ephemeral/short perennial had succeeded into other neutral grassland with a dominance of grass species which included dense patches of false oat grass interspersed with red fescue, Yorkshire fog and timothy. Perennial rye grass with occasional cock's-foot also noted onsite. No management was evident within the areas, as with the rest of the habitats on site.

Forb species that were also recorded in these areas were dominated by greater plantain, creeping buttercup, white clover, common ragwort, herb-Robert and ribwort plantain. Abundant coltsfoot and groundsel. Occasionally occurring species also included red clover, toadflax, bush vetch, curled leaf dock, cinquefoil and fox and cubs. Species that were rarely occurring, mainly in the grassland in the northern section of the site included oxeye daisy, shepherds' purse, hawkbits, common daisy, creeping thistle, dandelion, common mouse-ear, sweet melilot, bird's-foot trefoil, dove's-foot cranesbill and wild strawberry.

3.2.5 *g3c, 80, 81 other neutral grassland, open mosaic on previously developed land, ruderal or ephemeral*

Around the northern and western boundaries were earth bunds vegetated with dominant other neutral grassland, species as listed above, interspersed with low growing plants such as frequent greater plantain, creeping buttercup, common fumitory, nettle, occasional cleavers, oxeye daisy, fox and cubs, weld, creeping thistle, common hogweed, rosebay willowherb and hairy willowherb.

3.2.6 *g3c, 16 other neutral grassland, tall forbs*

Other neutral grassland with interspersed tall ruderal vegetation was present in the south east of the site due to the lack of management in the grassland field. Species were dominated by rosebay willowherb, mugwort, hogweed and common nettle with rarely occurring spear thistle, goat willow saplings and cow parsley.

3.2.7 *w1g other broadleaved woodland*

Areas of woodland were located along the edges of the southern, eastern and northern boundaries of the site. The planted woodland along the south westerly boundary of the site was dominated by sycamore. The woodland has a canopy, approximately 15m-18m high. A line of planted hawthorn was growing on the inside edge (north eastern) of the woodland. All trees were mature and in good health with no missing limbs, cracks or deadwood.

The woodland on the south easterly side of the site was generally above site level, growing on bunds and providing screening for residential areas. The woodland was of a varying canopy height ranging from approximately 8m-15m. Species diversity was greater in these areas of woodland with additional species including alder, ash, field maple, oak, common lime, aspen and silver birch. Species present on the outskirts of the woodlands included rowan and elder.

The woodland sections towards the northern sections of the site, and along the boundaries were of varying canopy height from approximately 10-12m. these sections were elevated above site by approximately 1m. Species diversity was similar in these areas of woodland with additional species including crack willow and sessile oak.

The understories of all the woodland areas were sparsely vegetated with heavy leaf litter and areas of bare ground. Scrub level vegetation was present including dogwood, bramble, snowberry and dog-rose.

3.2.8 *h3h mixed scrub*

Scattered scrub was present throughout the site where a lack of disturbance had allowed progression of habitats. Denser patches of scrub were apparent in areas often adjacent to areas of scattered scrub. The largest section of dense scrub divided the tall ruderal field in the west of the site, from the adjacent woodland. Scrub areas were dominated by bramble with occasional species including blackthorn, hawthorn, dog-rose and elder.

3.2.9 *Scattered broad-leaved trees and coniferous trees*

Scattered immature trees were present in many of the areas of dense and scattered scrub. Species were dominated by silver birch. Scattered trees were also present along the tops of the earth bunds in the western areas of the site.

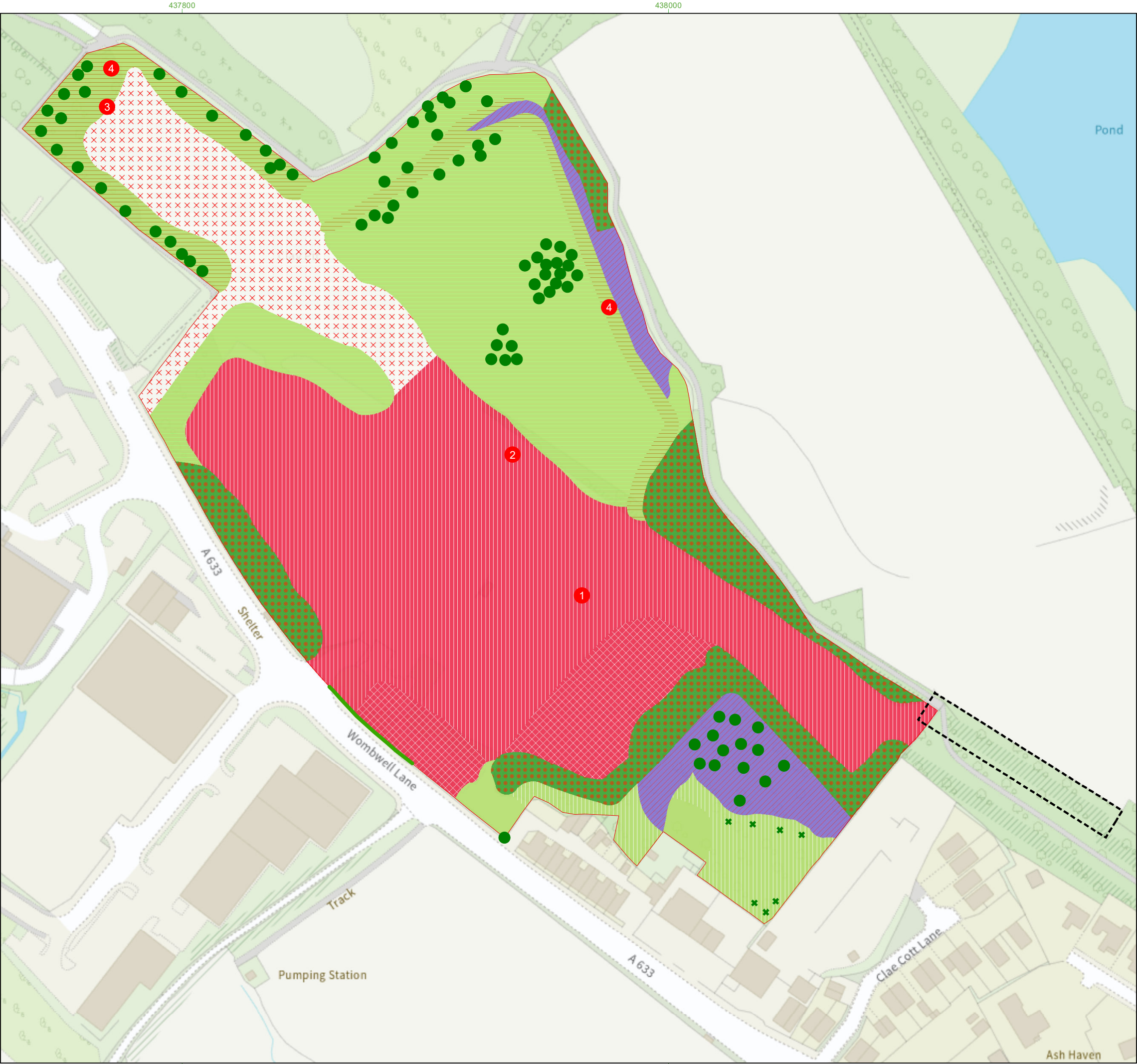
3.2.10 *h2a native hedgerow*

A hawthorn dominated hedgerow was located on the sites' south western boundary. It measured approximately 20m in length and was approximately 2.5m in height. It was semi mature, largely unmanaged and gappy at the base.

3.2.11 *Invasive species*

Snowberry was recorded onsite within the woodland, while this species is not a Schedule 9 species under the Wildlife and Countryside Act, its invasive properties will warrant future site management.

Figure 2: Phase 1 Habitat Map



Survey Information	
	Site boundary (63,627.0m ²)
UKHab Habitat Survey	
	g3c - Other neutral grassland (731.9m ²)
	g3c - Other neutral grassland, 80 (14,081.5m ²)
	g3c - Other neutral grassland, 16, 80 (2,338.7m ²)
	g3c - Other neutral grassland, 80, 81 (4,570.7m ²)
	h3h - Mixed scrub (3,473.3m ²)
	u1b - Developed land; sealed surface (21,703.2m ²)
	u1c - Artificial unvegetated, unsealed surface (3,890.7m ²)
	u1f - Sparsely vegetated urban land, 80 (6,231.9m ²)
	w1g - Other broadleaved woodland (6,605.1m ²)
	h2 - Hedgerows (46.5m)
	10 - Scattered scrub
	32 - Scattered trees
	Target note
	Stairfoot Brickworks SSSI

Secondary Codes:

16 - Tall forbs
80 - Open mosaic habitats on previously developed land
81 - Ruderal or ephemeral

Target Notes:

1 – Standing water – pool over hard standing
2 – Ephemeral pool
3 – Rubble pile
4 – Earth bund

Source:
Ordnance Survey © Crown copyright 2023, All rights reserved. License Number 100049837.

PROJECT TITLE

STAIRFOOT GLASSWORKS

DRAWING TITLE				
Figure 1. UKHab Habitat Plan				
VER	DATE	REMARKS	Drawn	Checked
3.3	13/12/23	UKHab	MP	HS

DRAWING NUMBER:

PeakEcology/ShepherdsGrove/UKHab

peakecology

CONSULTANTS

peakecology

LIMITED

Arden House,
Deepdale Business Park,
Bakewell,
Derbyshire.
DE45 1GT.
www.peakecology.co.uk

DATUM	OSGB
PROJECTION	BNG
PLOT SIZE	A3
SCALE	1:1,550

3.3 Protected and Priority Species

3.3.1 *Amphibians*

SBRC returned no amphibian records, including great crested newts *Triturus cristatus* within the 2km search area.

During the survey on 27th June 2023 no waterbodies were present onsite. Noted during the habitat assessment carried out on 21st November 2023 were two areas of standing water, both recorded within the hard standing (TN1 and TN2). TN1 was attributed to heavy rainfall in the weeks prior to the survey. TN2 had qualities indicating its identification as a shallow ephemeral pool which seasonally dries out. Given its complete absence in June, it was assessed to be of sub-optimal value for supporting breeding great crested newts and likely present only over winter months.

Previous great crested newt surveys undertaken by Peak Ecology Ltd in 2021, identified the presence of a permanent waterbody, referred to as Pond 1 (P1), within the centre of the site which has since been removed following the repair of underground drainage systems. No evidence of the former pond exists onsite (i.e. no aquatic vegetation, or water tolerant terrestrial vegetation present).

Following a search of aerial photography and OS mapping, and based on previous site surveys, an additional five waterbodies were found within a 500m radius as shown on Figure 2.

Figure 2: Pond Location Plan and Approx. distance away



During the June 2023 survey, P2 and P4 were subjected to a Habitat Suitability Index (HSI) assessment (Oldham *et al*, 2000) with results summarised in Table 4 (methodology shown in Appendix C, full results shown in Appendix G). It was not possible to access P5 at the time of the survey due to its location within private land. P3 was inaccessible due to dense scrub vegetation preventing surveyor access, although where access points were made into the vegetation, no water was visible suggesting that it may be dry.

P6 was discounted due to its location over Wombwell Lane which is considered to be a major barrier to dispersal for great crested newts.

Table 2: Habitat Suitability Index Assessment of Ponds on Site, photo and pond description

Pond ref	Pond description and HSI score	Pond photo
P2	Large waterbody measuring approximately 12,000m² located within Oaks Plantation. At the time of the survey, the waterbody had significantly dried, appeared shallow with an algae bloom present. Waterfowl noted although not envisaged to have a major impact, fish possible. Marginal and aquatic vegetation present. HSI score: 0.71 Good	
P4	Drainage ditch located to the south east. At the time of the survey the pond was dry and densely vegetated with bullrushes. No standing water present. HSI score: 0.62 Average	

The HSI calculation takes into account a number of factors to produce a final score between 0 and 1, which can be translated into a suitability rating. Whilst the HSI score cannot be used to confirm presence/likely absence of GCN, it can provide an indication of habitat quality.

Although dominated by hardstanding and bare ground, the rubble piles, tall ruderal, scrub and areas of undisturbed grassland provided suitable opportunities for commuting and foraging amphibians, including GCN in their terrestrial phase. In addition, the rubble piles and woodland, tree and scrub habitat have been assessed as suitable hibernaculum for overwintering amphibians.

3.3.2 **Badger**

No evidence of badger *Meles meles* was identified on site during the survey e.g. snuffle holes, latrines, mammal trails or active setts. However, several areas of the site were inaccessible due to dense vegetation, in particular the dense scrub located towards the south eastern side of the site, and along the bunds on the north eastern boundary.

The embankments and woodland areas across the site were considered suitable to support potential sett excavations, however, all other habitats were considered unsuitable due to the flat nature and dominance of hardstanding of the site.

3.3.3 **Bats**

3.3.3.1 *Roosting Bats*

No buildings present onsite. All trees assessed to be of **negligible roosting** value (based on ground level assessments).

3.3.3.2 *Foraging and Commuting Bats*

The woodland edge habitat and tree lines on site provide suitable commuting and foraging habitat for bats. In addition, the areas of tall ruderal, scrub, grassland and ephemeral/ short perennial vegetation are likely to support a good invertebrate assemblage for foraging bats. The site is well connected with the wider habitats including a network of hedgerows and woodland edge habitats. Additional linear features of note for commuting bats include the tree lined Trans Pennine Trail adjacent to the northern site boundary and the Dob Sike (a tributary of the River Dove) and the River Dearne located 125m and 1km to the south and north respectively. As such, the site was assessed as having **High** potential for foraging and commuting bats.

3.3.4 **Breeding Birds**

The woodland, scattered trees and dense scrub all provide suitable nesting opportunities for birds, with nesting material recorded in the sycamore dominant woodland in the south of the site. Goldfinch *Carduelis carduelis*, chaffinch *Phylloscopus collybita*, house sparrow *Passer domesticus*, robin *Erithacus rubecula*, great tit *Parus major*, nuthatch *Sitta europaea*, blackbird *Turdus merula*, long-tailed tit *Aegithalos caudatus*, magpie *Pica pica* and wood pigeon *Columba palumbus* were seen and heard onsite at the time of the survey. In addition, the areas of grassland, tall ruderal and ephemeral/short perennial vegetation offer extensive foraging opportunities for birds.

Although there are suitable habitats for ground nesting birds on site, the use of the site by local dog walkers, motorbikes and BMX riders means the high level of disturbance caused by these activities reduces the suitability for ground nesting species.

Willow tit

The data search returned records of willow tit *Poecile montanus* within the search area. A total of 24 records were returned, the closest of which is for a site located 0.75km SSE. The most recent record dates 2020, for a site located 1.05km NNW. Dearne Valley and Dearne Valley Wetlands SSSI, located 2.9km SSE, is a stronghold for the nationally rare and declining willow tit.

Willow tit will occupy habitat which is generally damp and can support thickets of dense scrub; wet woodland, former industrial sites (gravel pits, quarries, spoil pits) and scrubby margins to drier woodland, upland heath and mires, wet grassland, wetland and wooded areas within farmland are all potential areas for willow tit to colonise.

Rotting deadwood is a critical element of breeding willow tit habitat, as they require this to excavate their nests. Structure is also important within breeding territories. A low canopy with a dense understory comprising thorny scrub and standing deadwood and young trees is ideal (Willow Tit Conservation Handbook 2021).

Given the habitat connectivity between the application site and areas of favourable habitats for this species, its presence onsite cannot be discounted although breeding onsite is considered less likely due to an absence of deadwood.

Little ringed plover

The data search returned six historic records of little ringed plover *Charadrius dubius*, the most recent record dating 2010.

Little ringed plover is a Schedule 1 ground nesting, summer visitor to the UK, arriving in mid-March. They are protected from disturbance whilst breeding or with dependant young. They breed in a range of open habitats which provide suitable bare or sparsely vegetated ground conditions, this includes the edges or islands within rivers or lakes, coastal flats, quarries and mosaics of disturbed ground resulting from development works.

Nests are typically created as scrapes, in particular on sand or gravel, or bare mud, especially where fresh water is available, which can include inland lakes or ephemeral pools.

While elements of the site meet the habitat requirements for this species (ephemeral pools, disturbed ground, sparsely vegetated ground), the small size of these habitats coupled with regular site disturbance from walkers/motorbikes etc, renders it unlikely that breeding of this species occurs onsite. Therefore, no further surveys are required in relation to this species.

3.3.5 Reptiles

Common lizard *Zootoca vivipara* and grass snake *Natrix helvetica* records were returned during the data search, although records were all for sites over 1.6km away.

The woodland, tall ruderal, scrub and grassland habitats scattered across the site offer suitable shelter for foraging and commuting reptiles, with the adjacent open habitat of bare ground and hardstanding providing suitable basking opportunities. In addition, the rubble piles provided suitable opportunities for hibernating reptiles. Frequent site disturbance from local dog walkers, motorbikes and by BMX riders does however reduce overall suitability.

3.3.6 *Water Vole, Otter and White-clawed Crayfish*

Due to the lack of watercourses, the habitats on site were considered unsuitable to support white-clawed crayfish *Austropotamobius pallipes*, water vole *Arvicola amphibious* or otter *Lutra lutra*. The River Dearne provides suitable habitat for otter although given its distance away (over 1.2km) it is highly unlikely otter would be present on site. As such, no further consideration has been given to any of these three species in this report.

3.3.7 *Other Protected and/or Priority Species*

The habitats offered some suitability for hedgehog *Erinaceus europaeus*, which is a Priority Species under the UK Post-2010 Biodiversity Framework (formerly UKBAP) and also a Local Biodiversity Action Plan (LBAP) species.

The site is not considered likely to support any other protected or priority species.

4 EVALUATION

4.1 Impact Assessment of Development Proposals

The proposed works include the erection of perimeter security fencing, construction of a metal clad building for internal processing works, construction of a workshop and admin office, construction of; a gatehouse and weighbridge, external cullet bays, external processing area, lorry park, storage areas, car park and access.

Works will be largely confined to existing hard standing areas although removal of some onsite vegetation will be required namely grassland and sparsely vegetated urban land and small areas of tall ruderal, ephemeral/short perennial and scrub around the site's perimeter. The perimeter fence will traverse along the edges of two woodland sections (on the eastern boundary and north eastern boundary) although no trees will be removed.

4.2 Designated Sites

Stairfoot Brickworks SSSI

Located adjacent to the eastern boundary of the site is the Stairfoot Brickworks SSSI, with approximately 60m² of the SSSI overlapping the north eastern corner of the site. The development site falls within the SSSI Impact Risk Zone (IRZ). Proposed works meet identified risk category of "all planning applications – except householder applications" as defined by Natural England and is considered, by definition, likely to cause an impact to the SSSI. As such, the Local Planning Authority (LPA) will be required to consult with Natural England prior to granting planning permission for any development on site. It is recommended that a general working standoff zone is implemented during proposed works with the exception of the creation of a proposed Sustainable Urban Drainage System (SuDs), as detailed in Section 5.

Dearne Valley Wetlands SSSI

The site falls within the SSSI Impact Risk Zone for Dearne Valley Wetlands SSSI. Direct impacts on this ecological feature are not envisaged, however Natural England may need to be consulted to ensure proposals do not meet identified risk criteria. Further details within Section 5.

The proposed site works are not envisaged to have any impact on Dearne Valley Park LNR or any of the six identified LWS's, largely due to distance away and lack of connectivity.

4.3 Habitats & Botanical Interest

4.3.1 Lowland Mixed Deciduous Woodland

The woodlands along the eastern and northern boundaries of the site are considered to fall within the Lowland Mixed Deciduous Woodland Priority Habitat, due to their structure, composition and size. In addition, Mixed Deciduous Woodland is also listed as a Priority Habitat under the Barnsley LBAP. All areas of woodland will be retained and should also be adequately protected during the works, through demarcation of Root Protection Areas (RPA's)

and/or incorporation of Precautionary Working Method Statements as per the Arboricultural Method Statement (Wharnccliffe Trees and Woodland Consultancy, 2021).

4.3.1.1 *Open Mosaic Habitats on Previously Developed Land*

Habitats recorded on site (bunds, ephemeral/short perennial, tall ruderal, other neutral grassland and bare ground) are representative of Open Mosaic Habitats on Previously Developed Land and meets the definition under UK Habitat Classification.

The habitat structurally meets the criteria within JNCC UK Biodiversity Action Plan Priority Habitat Descriptions, although lacks suitable indicator species, with only nine out of fifty-two characteristic species (for Northern England) recorded onsite. Therefore, the onsite Open Mosaic Habitats on Previously Developed Land is not currently considered to be a UK BAP Priority Habitat.

4.4 Protected and Priority Species

4.4.1 *Amphibians*

GCN are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are protected as European Protected Species (EPS) under The Conservation of Habitats and Species Regulations 2017 (as amended). Additionally, GCN and common toads *Bufo bufo*, are included on the UK Post-2010 Biodiversity Framework.

No GCN were identified within the desk study. GCN eDNA sampling of P1, P2, P3 and P4 was undertaken by Peak Ecology Ltd in 2021 (results shown in Appendix H). All four ponds sampled for GCN eDNA were recorded as 'negative', which confirmed the likely absence of GCN from the ponds sampled in 2021. No further surveys for GCN Population Size Class were undertaken as a result.

While the results of the 2021 eDNA sampling are now considered out of date, the removal of onsite P1, and the natural habitat degradation of P3 and P4, renders it unlikely that the results from the 2021 surveys would differ were they to be repeated. There have been no changes to surrounding terrestrial habitats, and the aquatic value of the ponds identified within the 500m radius have decreased in value.

Nevertheless, given the absence of data for P5, a precautionary approach should be undertaken during any vegetation removal and construction within potential terrestrial habitat. Reasonable Avoidance Measures should be implemented as detailed in Section 5.

4.4.2 *Badger and Hedgehogs*

No evidence of badger was recorded during the survey. However, badgers have been recorded within 2km of the site in the desk study. In addition, the habitats within the woodland and earth bunds, were considered suitable for future sett excavation. Although all woodland habitat is to be retained, some of the earth bunds in the west will be reduced in size and all works may fall within 30m (Zone of Influence) of these habitats, should future sett excavation occur on site.

It is recommended that a pre-commencement check for new setts is carried out prior to works starting and a precautionary method of works is adhered to throughout construction, as detailed in Section 5.

Although no evidence of hedgehog was recorded during the site visit, habitats present on site are considered suitable to support foraging, commuting and hibernating hedgehog. As such, the precautionary methodology outlined in Section 5 should be followed during all construction works.

It is currently unknown the type of boundary fencing that will be used surrounding the site, but due to the retention of the woodland and all of the northern and western sections of the site, it is highly unlikely that the site, when complete, would form a significant barrier to commuting mammals, including badgers and hedgehogs.

4.4.3 **Bats**

Bat species and their roosts are fully protected under the Conservation of Habitats and Species Regulations 2017 and under the Wildlife and Countryside Act 1981 (as amended) through inclusion in Section 1 (Schedule 5). Bats are also a UK Post-2010 Biodiversity Framework species.

The site was assessed as having **Negligible** potential for roosting bats. As such, no further surveys are required.

The site was assessed as having **High** potential for foraging and commuting bats, with common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, noctule *Nyctalus noctula* and *Myotis myotis* sp. all previously recorded within 0.6km of the site. Proposed works included the retention of all linear commuting features on site. As such, it is considered that no negative impact to the favourable conservation status of any bat species will result from the proposed works and therefore no further surveys are required at this time.

A sensitive lighting scheme will need to be designed to avoid illuminating habitats used by bats, further details in Section 5.

4.4.4 **Willow tit**

The site has potential for supporting willow tit foraging and commuting. While suboptimal for breeding (given the lack of deadwood), the site falls within the Zone of Influence of bounding and connected habitats which are of optimal value.

A precautionary approach should be undertaken during any vegetation removal and construction within potential habitat. Reasonable Avoidance Measures should be implemented as detailed in Section 5.

4.4.5 **Breeding Birds**

The site has potential to support a range of bird species across a variety of habitats, in particular the woodlands and scrub, but also potentially the open ground areas.

The removal of any habitats which may support breeding birds, such as the areas of dense scrub or immature scattered trees should take place outside the main bird nesting season, which typically runs from March to September (inclusive), however, where this is not possible a pre-commencement check must be carried out, by an appropriately experienced ecologist prior to their removal, as detailed in Section 5.

4.4.6 Reptiles

All reptiles are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and the rarer species are also protected as European Protected Species under The Conservation of Habitats and Species Regulations 2017 (as amended). Additionally, reptiles, are included on the UK Post-2010 Biodiversity Framework.

Suitable habitat was recorded across the site to support commuting, foraging and hibernating reptiles. The site is considered to be well connected to the surrounding habitats to the north, which also provide suitable opportunities for reptiles.

Peak Ecology Ltd undertook presence/likely absence surveys for reptiles during 2021. No reptiles were recorded throughout the survey period (results shown in Appendix I).

A precautionary approach should be undertaken during any vegetation removal and construction within potential habitat. Reasonable Avoidance Measures should be implemented as detailed in Section 5.

4.4.7 Invasive species

The removal of snowberry onsite should be prioritised to prevent further spread and to improve the health and condition of the woodland. Measures detailed within Section 5.

5 **RECOMMENDATIONS**

5.1 **Designated Sites**

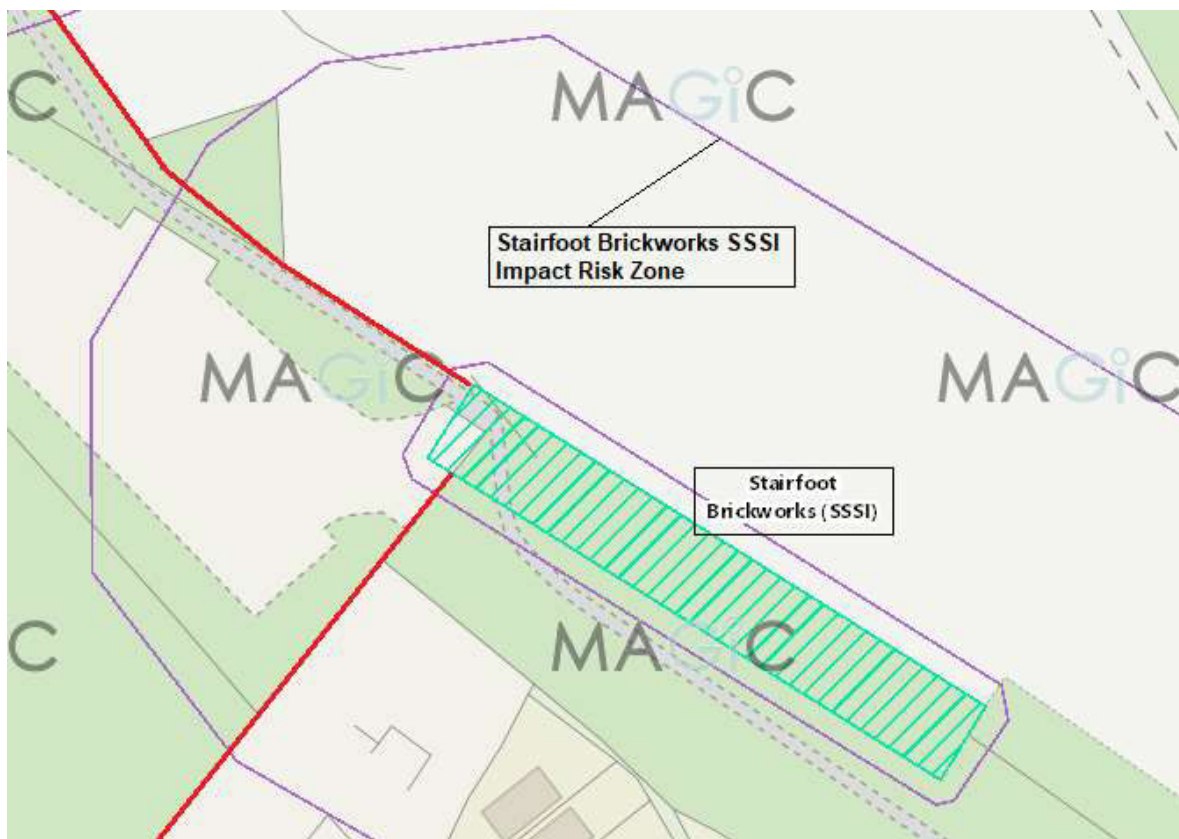
Stairfoot Brickworks SSSI

Due to the proximity of the site to the Stairfoot Brickworks SSSI, it is recommended that no works occur within the small portion of the SSSI that lies within the site boundary in order to avoid direct impacts to the interest of this feature.

A 650m² SuDs pond will be constructed within the IRZ. Measures will need to be in place during construction to minimise impact on the feature including; protective fencing, no ground disturbance within the SSSI, no storage of materials or vehicular/personnel access within the SSSI, no landscape planting within the SSSI. A Risk Assessment report has been produced by Asthon Bennet Ltd (Dec 2023) which will need to be submitted to Natural England for consideration and approval.

An extract from the MAGIC mapping software has been used below to show the location of the SSSI and associated IRZ.

Figure 3: Location of SSSI and Impact Risk Zone, approx site boundary shown in red



Dearne Valley Wetlands SSSI

The proposed development does not strictly meet the listed risk categories, although Rural Non-Residential developments whose footprints exceed 0.2ha have been highlighted. The site is located in a semi-rural location so further action may not be required, although consideration should be given as to whether consultation with Natural England should proceed.

5.2 Habitats & Botanical Interest

5.2.1 Woodland habitats

As all woodland is to be retained throughout works these should also be protected in line with *BS5837:2012 Trees in relation to design, demolition and construction recommendations* and through the incorporation of Precautionary Working Method Statements as per the Arboricultural Method Statement (Wharnccliffe Trees and Woodland Consultancy, 2021).

5.3 Protected and Priority Species

5.3.1 Amphibians

The proposed works will result in the loss of minor areas of suitable terrestrial habitat for GCN. While the 2021 surveys undertaken by Peak Ecology Ltd identified an absence of GCN within 500m of the site, one pond – P5 was not assessed. A precautionary approach should therefore be taken during any vegetation removal, and during construction with the following Reasonable Avoidance Measures (RAMs) incorporated:

- Onsite grassland should be maintained to a short sward (less than 100mm) prior to the commencement of works. This is to discourage amphibians/reptiles from using the site.
- Before any works commence, all site contractors/stakeholders will be briefed during a 'Tool-box' talk of the potential for protected species to occur on site, what to look out for and what to do in the event that animals are found.
- A pre-commencement check, prior to the removal of any vegetation, will be carried out by an ecologist. This will involve a fingertip search of any areas of concern. Only once the site has been confirmed to be free from amphibians/reptiles, can vegetation clearance commence under ecological supervision.
- During construction works, materials that require piling will be stored within areas of bare ground above ground level, using pallets to prevent amphibians/reptiles from seeking shelter below.
- Excavations/trenches should not be left open overnight to prevent amphibians/reptiles falling into them and becoming trapped. If trenches cannot be filled in after the working day for whatever reason, an escape mechanism such as wooden planks of 50mm wide as a minimum should be placed in them at a 45-degree diagonal angle.
- Open excavations should be checked in the morning on a daily basis for the presence of any animals that may have fallen in during the night.

- If an amphibian/reptile is found in the absence of supervision, work must stop immediately, and contact should be made with the assigned licensed, qualified ecologist. At no point should any person handle a great crested newt, or suspected great crested newt, without express consent from the qualified ecologist. Any common newts, frogs or toads found should be carefully caught (where capture is possible and humane) in a ventilated box using dampened gloved hands and released into suitable nearby vegetation that will remain unaffected by the proposed works. Any reptiles found should be left to leave the site of their own accord. Where this is not possible, they should be placed into a ventilated box using gloved hands and released into suitable nearby vegetation, away from the working area.
- If in the event a GCN, or suspected GCN is found, work must cease; the ecologist will be made aware of the finding and will appraise the situation providing further advice. Site staff must be made aware that if GCN are found there is a correct procedure in place to follow, and failure to halt works may result in committing an offence. At no point should any person handle a GCN or suspected GCN. Unlicensed handling is illegal and untrained handling may cause the newt unnecessary stress and injury.

5.3.2 ***Foraging and Commuting Bats***

As works will largely be confined to existing hard standing areas, with no proposed removal of woodland areas, trees or scrub, no further surveys are required as the impact of the development on foraging and commuting bats is anticipated to be low, further reduced through the implementation of a sensitive lighting scheme.

The new site lighting scheme should be designed to avoid illuminating habitats used by bats, such as hedgerows and woodland, in accordance with guidance set out in Bats and Artificial Lighting at Night (ILP, 2023). Consideration should also be given to the times automatic lighting will be on, to maximise the amount of time the area is in darkness.

During the construction phase it is recommended that works are not carried out after dusk and they do not commence until after dawn. Generators and machinery that emit significant noise levels must not be left to run through the night.

5.3.3 ***Badgers***

A pre-commencement check should be carried out on site to ensure no new badger setts have been excavated prior to works. Should a new active sett be found, a buffer would be established around the sett, in which no works can be undertaken.

The following precautionary measures should also be implemented during site works:

- Open trenches or pits must be covered over at night or left with a sloping end, to prevent mammals such as badger from falling in and becoming trapped;
- Pipes over 120mm will need to be capped off at night to prevent mammals from using them for shelter; and

- Night works should be avoided where possible with illumination of works kept to a minimum.

In the unlikely event a badger sett is found during works, then all works should cease and a suitably qualified ecologist contacted for advice on how to proceed.

5.3.4 ***Willow Tit***

The removal of any habitats which may support willow tits, such as dense/scattered scrub and immature scattered trees, should take place under ecological supervision and outside the main bird nesting season for willow tits. The general nesting season runs from March to September (inclusive), although as willow tits tend to nest early, and start to establish territories February onwards, ensuring vegetation clearance is carried out before the end of January would minimise impacts.

During the ecological supervision, the overseeing Ecological Clerk of Works (ECoW) will highlight any features for retention, and will ensure habitat loss is kept to a minimum. The ECoW will select pieces of deadwood/freshly cut wood for use in creating nesting features onsite. The wood will be attached to retained trees across the site to create nesting opportunities and will comprise of birch or willow 10-20cm diameter. Logs can be attached using wire and staples for sturdiness and should measure 1-1.5 metres in height, placed just off the ground. A minimum of ten nesting features should be incorporated.

To mitigate for the loss of scrub, replacement planting should be incorporated into the scheme (Appendix J). Suitable species include alder, birch and willow. The groups of existing scattered young immature trees on the sites northern side could be extended along the sites boundary to provide a suitable habitat corridor onsite for this species. It would also be of benefit to create a shallow water scrape within the planted area (50cm depth in the centre of the feature with gently sloping edges) which will be of benefit for invertebrates and therefore foraging birds.

5.3.5 ***Breeding Birds***

The removal/cutting/pruning of any habitats which may support breeding birds, such as the areas of dense scrub, woodland, trees should take place outside the main bird nesting season, which typically runs from March to September (inclusive).

Where this is not possible, and vegetation removal/cutting/pruning is to take place within the nesting season, a pre-commencement check must be carried out by an appropriately experienced ecologist immediately prior to vegetation removal. Should an active nest be discovered, an exclusion zone around the nest will be demarcated in which no works can take place until the young have fledged the nest.

5.3.6 ***Reptiles***

The proposed works will result in the loss of minor areas of suitable habitat for reptiles. While the 2021 surveys undertaken by Peak Ecology Ltd, identified an absence of reptiles onsite, a precautionary approach should still be taken during vegetation removal and fence installation with the following RAMs incorporated:

- All site workers to be given a toolbox talk, including identification of reptiles and how to proceed should one be found.
- Any removal of vegetation to facilitate fence installation should be carried out by hand where possible.
- Storage of materials to be within the hardstanding area and ideally on a raised platform. Waste materials to be stored within skips (or suitable containers/raised platforms).
- Any trenches/open excavations to be filled in overnight. If this is not possible, then a ramp should be left to allow a means of escape – i.e. wooden plank.
- Should a reptile be found onsite, it should be allowed to leave the area of its own accord and works should cease until ecological advice sought.

5.3.7 *Invasive species*

Snowberry was recorded onsite within the SE woodland area. While snowberry is not a Schedule 9 species under the Wildlife and Countryside Act, its invasive nature warrants control to prevent further spread and to improve the condition of the woodland.

A pre-commencement Invasive Species Survey should be undertaken prior to any vegetation clearance site works, followed by an Invasive Species Management Plan to include already identified snowberry.

5.3.8 *Hedgehog*

The following RAMs should be implemented during works to minimise impact on hedgehogs;

- During construction, it is recommended that deep, steep sided excavations are not left overnight without an escape route, either a ramp or sloping bank. Similarly, it is advised that any pipes stored on site are capped.
- Open excavations should be checked in the morning on a daily basis for the presence of any animals that may have fallen in during the night.
- If a hedgehog is found onsite, it should be picked up with gloved hands, placed in a ventilated box and released into suitable nearby vegetation that will be unaffected by the proposed works.
- It is important that any new fencing or walls installed as part of the development do not create a barrier to dispersal for wildlife. It is recommended that suitable holes are incorporated at the base of boundary structures to allow wildlife to commute through the site, such as specific “hedgehog holes” which are 13 x 13cm in size.

6 REFERENCES

- Ashton Bennet (2023) Risk Assessment SSSI, Stairfoot. Report Ref: PB 3505/SSSI rev 3.
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APPENDICES

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APPENDIX A : Protected and Priority Species

Legal protection is afforded to particular habitats and species (as well as designated sites), see Appendix B. The legislation, and the habitats and species listed, vary between the different jurisdictions. Certain habitats and species are also considered to have some level of nature conservation importance, due to factors such as their rarity, vulnerability or declining population/status. This document uses the term 'priority habitats' and 'priority species', as they are those which should be considered as priorities for conservation (it should not be confused with priority habitats and species as listed in the EU Habitats Directive). Priority habitats and species are defined as those which are:

- 1) listed as a national priority for conservation (such as those listed as habitats and species of principal importance for the conservation of biodiversity);
- 2) listed as a local priority for conservation, for example in the relevant local Biodiversity Action Plan (BAP);
- 3) Red Listed using International Union for the Conservation of Nature (IUCN) criteria (e.g. in an all-Ireland Red List, in one of the UK Species Status Project reviews, in the Species of Conservation Concern Red List, Birds of Conservation Concern in Wales, or BWI/ RSPB Red List for Ireland and Northern Ireland (Birds of Conservation Concern in Ireland 2014 to 2019) or, where a more recent assessment of the taxonomic group has not yet been undertaken, listed in a Red Data Book);
- 4) listed as Near Threatened or Amber Listed e.g. in an all-Ireland Red List, in one of the UK Species Status Project reviews, in Birds of Conservation Concern in Wales, in the Species of Conservation Concern Amber List or BirdWatch Ireland (BWI)/RSPB Amber List for Ireland and Northern Ireland (Birds of Conservation Concern in Ireland 2014 to 2019);
- 5) listed as a Nationally Rare or Nationally Scarce species (e.g. in one of the Species Status Project reviews) or listed as a Nationally Notable species where a more recent assessment of the taxonomic group has not yet been undertaken; and/or
- 6) endemic to a country or geographic location (it is appropriate to recognise endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place).

Most protected species are also considered to be priority species, although there are some exceptions. There are numerous priority habitats and species which do not receive any legal protection.

Note that the terms 'priority habitat' and 'priority species' used in this document differ from the following uses of the same terms:

- a) These terms were previously used to denote those habitats and species afforded the highest level of priority for conservation under the UK BAP; this has been superseded by the lists of habitats and species of principal importance for the conservation of biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, Section 7 of the Environment (Wales) Act 2016, or their equivalents in Scotland

(Nature Conservation (Scotland) Act 2004, Scotland's Biodiversity Strategy and the Scottish Biodiversity List¹⁵) and Ireland (Actions for Biodiversity – Ireland's National Biodiversity Plan 2017 -2021¹⁶; and Valuing Nature – A Biodiversity Strategy for Northern Ireland to 2020).

- b) The terms 'Priority Natural Habitat Type' and 'Priority Species' are used to denote specific lists of habitats and species under The Conservation of Habitats and Species Regulations 2017; these are defined in Articles 1(d) and 1(h) respectively of the Habitats Directive.

APPENDIX B : Relevant Legislation

The following text provides information on the key legislation, which is applicable to this survey.

The main wildlife legislation in the UK is as follows:

European Legislation

The relevant sections of the EC Directives and international conventions are summarised below:

- EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitat Directive 1992) as amended (92/43/EEC)

The Directive requires Member States to introduce a range of measures including the protection of species listed in the Annexes. The 189 habitats listed in Annex I of the Directive and the 788 species listed in Annex II, are to be protected by means of a network of sites. Once adopted, these are designated by Member States as Special Areas of Conservation (SACs), and along with Special Protection Areas (SPAs) classified under the EC Birds Directive. The Habitats Directive introduces the precautionary principle; that disturbance to the designated sites can only be permitted having ascertained no adverse effect on the integrity of the site.

- EC Directive on the Conservation of Wild Birds (Birds Directive 1979) as amended (79/409/EEC)

The main provisions of the Directive includes; the maintenance of the favourable conservation status of all wild bird species across their distributional range.

- Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)

The Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

UK Legislation

The sections of UK legislation considered to be of relevance include:

- The Conservation (Natural Habitats, and c.) Regulations 2017 (as amended)

This transposes the Habitats Directive into national law. The Regulations provide for the designation and protection of 'European sites', and the protection of 'European protected species.

- The Wildlife and Countryside Act 1981 (as amended) (WCA)

This consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain.

- The Countryside and Rights of Way Act 2000 (CRoW)

This act strengthens wildlife enforcement legislation.

- The Protection of Badgers Act 1992

Species-Specific Legislation

Species specific legislation is provided in the Table below:

Species-Specific Wildlife Legislation

Feature/Species	Legislation	It is an offence to:
Plants	Sch. 8 Wildlife and Countryside Act 1981 (as amended)	• Pick; • Uproot; • Trade; • Possess (for trade) Any wild plant listed.
Invasive weeds – Japanese knotweed, Himalayan balsam,	Sch. 9 Wildlife and Countryside Act 1981 (as amended)	• Allow to spread.
Hedgerows	Hedgerow Regulations 1997.	Outlines a number of criteria for designation of ‘important’ hedgerows. ‘Important’ hedgerows cannot be removed without notifying the relevant body.
Breeding birds	Wildlife and Countryside Act 1981 (as amended). Countryside and Rights of Way Act 2000.	• Kill; • Injure; • Take; any wild bird, their eggs or nest (with the exception of those on Sch. 2).
Specially protected birds	Sch. 1 Wildlife and Countryside Act 1981 (as amended).	As above but includes: • Disturbing birds at their nest, or their dependent young.
Badgers	The Protection of Badgers Act 1992	• Wilfully kill, injure, take, or cruelly ill-treat a badger, or attempt to do so; • Possess any dead badger or any part of, or anything derived from, a dead badger; • Intentionally or recklessly interfere with a sett by disturbing badgers whilst they are occupying a sett, damaging or destroying a sett, causing a dog to enter a sett, or obstructing access to it. A badger sett is defined in the legislation as “<i>any structure or place, which displays signs indicating current use by a badger</i>”.

Feature/Species	Legislation	It is an offence to:
Bats	Sch. 5 Wildlife and Countryside Act 1981 (as amended). Conservation of Habitats and Species Regulations 2017 (as amended).	- Intentionally or deliberately kill, injure or capture (or take) bats; - Deliberately disturb bats (whether in a roost or not); - Recklessly disturb roosting bats or obstruct access to their roosts; - Damage or destroy bat roosts.
Common reptiles	Sch. 5 Wildlife and Countryside Act 1981 (as amended). Countryside and Rights of Way Act 2000.	Deliberate or reckless: - Killing; - Injuring - Sale.
Common amphibians	Sch. 5 and Sch. 9 Wildlife and Countryside Act 1981 (as amended). Countryside and Rights of Way Act 2000.	- Sell; - Transport; and - Advertise for sale.
Great crested newt	Sch. 5 Wildlife and Countryside Act 1981 (as amended). Conservation of Habitats and Species Regulations 2017 (as amended).	- Kill; - Injure; - Disturb - Destroy any place used for rest or shelter.

In addition, species and habitats listed on the UK Post-2010 Biodiversity Framework (formally the UK BAP) are also considered. Details on these species and habitats can be found at: <http://jncc.defra.gov.uk/page-5705>.

Protected Sites

A network of protected sites, at varying levels, have been put in place across the UK. Further details are provided below;

International importance

- Natura 2000

Natura 2000 is the name of the European Union-wide network of nature conservation sites established under the EC Habitats and Birds Directives. This network will comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

- Special Areas of Conservation (SAC)

SACs are designated under the EC Habitats Directive. The Directive applies to the UK and the overseas territory of Gibraltar. SACs are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs in terrestrial areas and territorial marine waters out to 12 nautical miles are designated under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). New and/or amended Habitats Regulations

are shortly to be introduced to provide a mechanism for the designation of SACs and SPAs in UK offshore waters (from 12-200 nm).

National importance

- Sites of Special Scientific Interest (SSSI)

The SSSI series has developed since 1949 as the national suite of sites providing statutory protection for the best examples of the UK's flora, fauna, or geological or physiographical features. Most SSSIs are privately-owned or managed; others are owned or managed by public bodies or non-government organisations. The SSSIs designation may extend into intertidal areas out to the jurisdictional limit of local authorities, generally Mean Low Water in England and Northern Ireland; Mean Low Water of Spring tides in Scotland. In Wales, the limit is Mean Low Water for SSSIs notified before 2002, and, for more recent notifications, the limit is Lowest Astronomical Tides, where the features of interest extend down to LAT. There is no provision for marine SSSIs beyond low water mark. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs have been renotified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and the Nature Conservation (Scotland) Act 2004.

Regional/local importance

- Wildlife Sites

Local authorities for any given area may designate certain areas as being of local conservation interest. The criteria for inclusion, and the level of protection provided, if any, may vary between areas. Most individual counties have a similar scheme, although they do vary. These sites, which may be given various titles such as 'Listed Wildlife Sites' (LWS), 'County Wildlife Sites' (CWS), 'Local Nature Conservation Sites' (LNCS), 'Sites of Importance for Nature Conservation' (SINCs), or Sites of Nature Conservation Importance' (SNCIs), together with statutory designations, are defined in local and structure plans under the Town and Country Planning system and are a material consideration when planning applications are being determined.

APPENDIX C : Methodologies

Assessment Method for Great Crested Newts

Ponds were evaluated using the Habitat Suitability Index (HSI) assessment method (Oldham et al, 2000). During a daytime site visit, each pond was assessed against 10 key habitat criteria, or Suitability Indices (SI) as follows:

- SI1 Geographic area
- SI2 Pond area
- SI3 Pond drying
- SI4 Water quality
- SI5 % shoreline shade
- SI6 Presence of waterfowl
- SI7 Presence of fish
- SI8 Pond count within 1km
- SI9 Terrestrial habitat quality
- SI10 % macrophyte cover

Based on a standardised scoring system, each SI achieves a score of between 0 and 1, and these are used to calculate an overall score for that pond. The scores equate to a habitat suitability rating as per Table 5 below.

In general, ponds with high HSI scores are more likely to support GCN than those with low scores. This alone does not determine whether or not a pond should be subject to further survey, but rather provides an indication of habitat quality to aid professional judgment on survey requirements and is a useful tool for informing mitigation or ecological enhancement proposals.

Table 3: Summary of HSI Assessment Scale

HSI score	Pond Suitability	Occupancy Rate
<0.5	Poor	3%
0.5 – 0.59	Below average	20%
0.6 – 0.69	Average	55%
0.7 – 0.79	Good	79%
>0.8	Excellent	93%

Assessment Method for Bats

Following current good practice guidelines (Collins (ed) 2016), the assessment comprised a visual inspection of each of the trees and/or built structure, for the latter including any internal areas such as roof voids or cellars.

The location and description of any features such as holes, crevices or internal voids that could potentially be used by roosting bats was recorded and a search was made for any evidence of bat presence such as droppings or feeding remains. Binoculars, ladders, high powered torches and endoscopes were used where necessary to facilitate more detailed inspection of individual features.

Based on the number, location and type of any potential roost features, structures and trees were categorised as having negligible, low, moderate or high potential for roosting bats, or confirmed roost where direct evidence of bat presence was encountered. Evaluation of roost potential is necessarily subjective and relies on the professional judgment of the surveyor; however, the table below provides a useful guide to how this is informed.

Examples of characteristics that inform assessment of roost potential

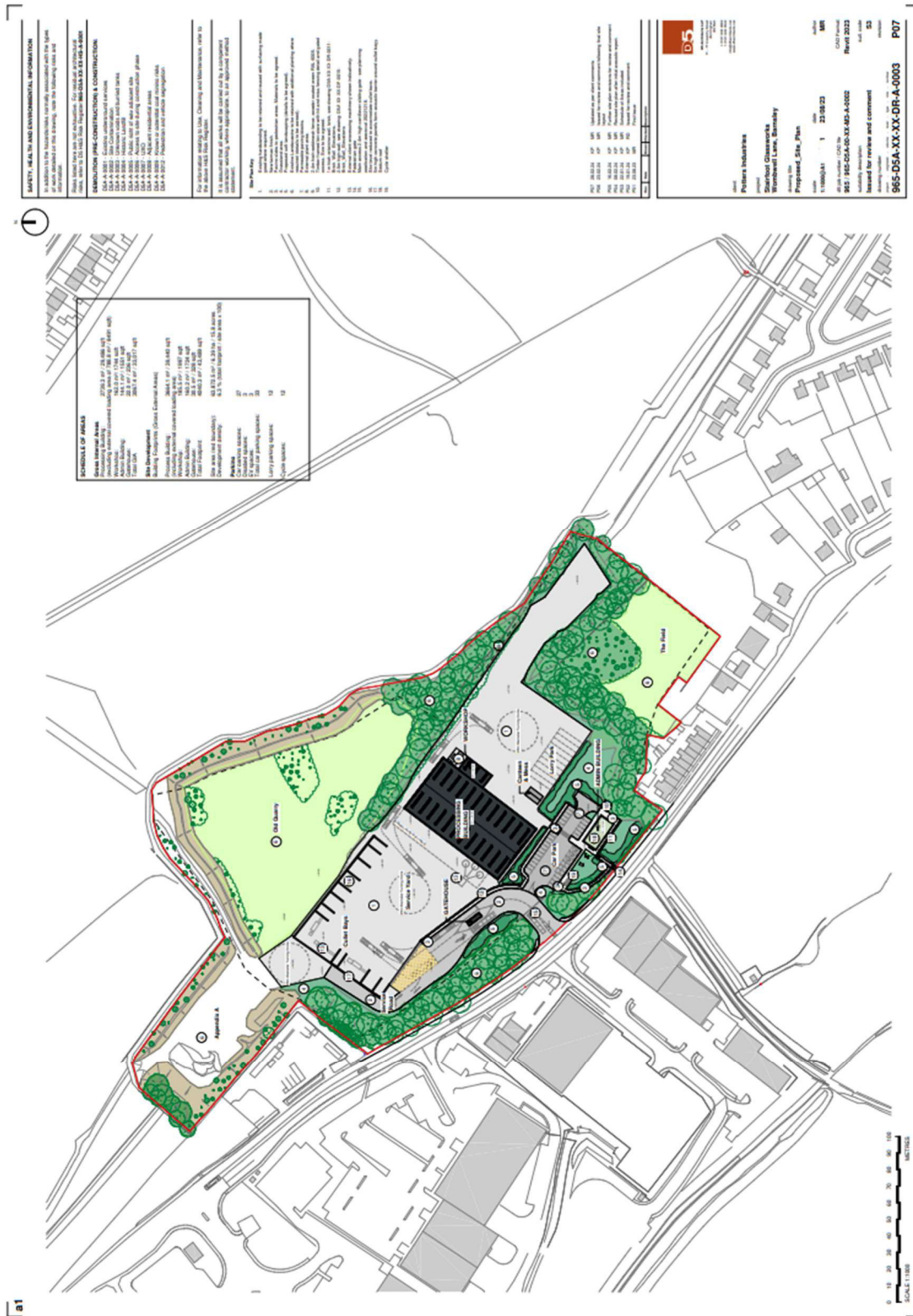
Status	Typical characteristics
Negligible potential	• Modern construction / immature trees • Lack of access points for bats • Situated within very poor quality foraging habitat • High levels of external lighting
Low potential	• Small number of minor hole / crevice features suitable for opportunistic roosting • Lack of roof voids or small cluttered roof spaces • Features obscured by dense cobwebs • Unlikely to support breeding or hibernating bats • Situated within poor quality foraging habitat
Moderate potential	• One or more hole / crevice features suitable for roosting, e.g. damaged soffits, uneven roof tiles • Access into large, dark internal spaces such as roof voids • Trees with small fissures and crevices in dead wood suitable for day roosting • Situated within or near to moderate/good quality foraging habitat

Status	Typical characteristics
High potential	• Old buildings / mature or veteran trees • Trees with woodpecker holes or deep fissures and crevices in dead wood • Structures with large, uncluttered roof voids • Traditional brick, stone or timber framed barns • Features suitable for large numbers of bats and/or several different species • Types of structure suitable for hibernation, e.g. caves, tunnels, ice houses etc • Low level of disturbance by humans • Little / no external lighting • Situated within good quality foraging habitat
Confirmed Roost	Bats seen or heard within the roost feature during the survey Bat droppings, particularly if piled rather than scattered Feeding remains such as moth wings Existing record of roost at that location

Guidance for assessing the overall value of potential development sites for bats (Collins (ed), 2016)

Site Status	Description
 Increasing site value for bats	• No features likely to be used by bats • Small number of potential roost sites but unlikely to be suitable for maternity roosts or hibernacula • Isolated habitat that could be used by foraging bats • Isolated site not connected by prominent linear features to suitable other/adjacent foraging habitats • Several potential roost sites in buildings, trees or other structures • Habitat suitable for foraging bats (e.g. trees, water, scrub, grassland present) • Site is connected with the wider landscape by features that could be used by foraging/commuting bats (e.g. gardens backed by scrub or line of trees) • Buildings, trees or other structures (e.g. caves or underground structures) of particular significance for roosting bats • Site includes high quality foraging habitat (e.g. broadleaved woodland, tree-lined watercourses, parkland with mature trees and rough grass) • Site is connected with the wider landscape by strong linear features that could be used by commuting bats (e.g. hedgerows, river valleys) • Site is close to known roosts • Bats recorded or observed using an area for foraging or commuting close to a potential roost

APPENDIX D : Proposed Development Plans



APPENDIX E : Photographic Plates

No.	Description	Photograph
1	View of the site looking south east across existing hard standing area	
2	Hawthorn hedgerow located on sites south west boundary	
3	Other neutral grassland located towards the southern boundary	

No.	Description	Photograph
4	View of eastern side of the site showing the area of dense mixed scrub, with other neutral grassland and tall ruderal in the foreground.	
5	View within the woodland	
6	View of the onsite woodland towards the eastern side of the site, with woodland edges	

No.	Description	Photograph
7	View of the north eastern side of the site showing other neutral grassland and scrub.	
8	View of the site looking south west showing other neutral grassland and ruderal	
9	View along track towards the northern boundary showing other neutral grassland, scattered trees and ruderal	

No.	Description	Photograph
10	View of the north western section of the site showing vegetated bunds	 A photograph showing a sloping area of land with sparse green vegetation and patches of bare, light-colored soil. In the background, there is a line of trees and a cloudy sky.
11	View of the woodland along the sites south western boundary	 A photograph showing a dense line of green trees and bushes, forming a woodland boundary. The foreground is a flat, light-colored area with some sparse vegetation.
12	View of the site looking south east	 A wide-angle photograph showing a large, flat area of land with sparse green vegetation and patches of bare, light-colored soil. In the background, there is a line of trees and a cloudy sky.

APPENDIX F : Botanical Species List

Ephemeral/ short perennial vegetation	
Forb species	
black medic	<i>Medicago lupulina</i>
bristly oxtongue	<i>Helminthotheca echioides</i>
buddleia	<i>Buddleja davidii</i>
colt's-foot	<i>Tussilago farfara</i>
common bird's-foot-trefoil	<i>Lotus corniculatus</i>
common daisy	<i>Bellis perennis</i>
common toadflax	<i>Linaria vulgaris</i>
creeping thistle	<i>Cirsium arvense</i>
cut-leaved crane's-bill	<i>Geranium dissectum</i>
dandelion	<i>Taraxacum officinale agg.</i>
foxford	<i>Digitalis purpurea</i>
groundsel	<i>Senecio vulgaris</i>
hawkweed sp.	<i>Hieracium sp.</i>
oxeye daisy	<i>Leucanthemum vulgare</i>
ribwort plantain	<i>Plantago lanceolata</i>
rosebay willowherb	<i>Chamerion angustifolium</i>
Shepherd's purse	<i>Capsella bursa-pastoris</i>
silver birch sapling	<i>Betula pendula</i>
sycamore sapling	<i>Acer pseudoplatanus</i>
weld	<i>Reseda luteola</i>
wood avens	<i>Geum urbanum</i>
woody nightshade	<i>Solanum dulcamara</i>
yarrow	<i>Achillea millefolium</i>
Grass species	
false oat grass	<i>Arrhenatherum elatius</i>
perennial rye grass	<i>Lolium perenne</i>
Yorkshire fog	<i>Holcus lanatus</i>
Species poor semi-improved grassland	
Grass species	
cock's-foot grass	<i>Dactylis glomerata</i>
false oat grass	<i>Arrhenatherum elatius</i>
red fescue	<i>Festuca rubra</i>
timothy grass	<i>Phleum pratense</i>
Forb species	
bush vetch	<i>Vicia sepium</i>
common bird's-foot-trefoil	<i>Lotus corniculatus</i>
common mouse ear	<i>Cerastium fontanum</i>
creeping buttercup	<i>Ranunculus repens</i>

creeping cinquefoil	<i>Potentilla reptans</i>
creeping thistle	<i>Cirsium arvense</i>
curled dock	<i>Rumex crispus</i>
dove's-foot cranesbill	<i>Geranium molle</i>
fox-and-cubs	<i>Pilosella aurantiaca</i>
greater plantain	<i>Plantago major</i>
herb Robert	<i>Geranium robertianum</i>
ragwort	<i>Jacobaea vulgaris</i>
red campion	<i>Silene dioica</i>
ribwort plantain	<i>Plantago lanceolata</i>
sweet melilot	<i>Melilotus officinalis</i>
white clover	<i>Trifolium repens</i>
wild strawberry	<i>Fragaria vesca</i>
Tall ruderal vegetation	
Forb species	
colt's-foot	<i>Tussilago farfara</i>
common nettle	<i>Urtica dioica</i>
cow parsley	<i>Anthriscus sylvestris</i>
creeping buttercup	<i>Ranunculus repens</i>
goat willow	<i>Salix caprea</i>
groundsel	<i>Senecio vulgaris</i>
hard rush	<i>Juncus inflexus</i>
hawthorn	<i>Crataegus monogyna</i>
hedge bindweed	<i>Calystegia sepium</i>
hogweed	<i>Heracleum sphondylium</i>
mugwort	<i>Artemisia vulgaris</i>
rosebay willowherb	<i>Chamerion angustifolium</i>
spear thistle	<i>Cirsium vulgare</i>
Grass species	
false oat grass	<i>Arrhenatherum elatius</i>
Scattered & dense scrub	
apple	<i>Malus sp.</i>
blackthorn	<i>Prunus spinosa</i>
common mallow	<i>Malva sylvestris</i>
crack willow	<i>Salix fragilis</i>
dog rose	<i>Rosa canina</i>
dogwood	<i>Cornus sanguinea</i>
elder	<i>Sambucus nigra</i>
hawthorn	<i>Crataegus monogyna</i>
hazel	<i>Corylus avellana</i>
hedge bindweed	<i>Calystegia sepium</i>
oak	<i>Quercus robur</i>

Woodland	
Canopy species	
alder	<i>Alnus glutinosa</i>
apple	<i>Malus sp.</i>
ash	<i>Fraxinus excelsior</i>
aspen	<i>Populus tremula</i>
crack willow	<i>Salix fragilis</i>
elder	<i>Sambucus nigra</i>
field maple	<i>Acer campestre</i>
hawthorn	<i>Crataegus monogyna</i>
hazel	<i>Corylus avellana</i>
oak	<i>Quercus robur</i>
rowan	<i>Sorbus aucuparia</i>
silver birch	<i>Betula pendula</i>
sycamore	<i>Acer pseudoplatanus</i>
Understorey species	
bramble	<i>Rubus fruticosus</i>
buddleia	<i>Buddleja davidii</i>
common nettle	<i>Urtica dioica</i>
dog rose	<i>Rosa canina</i>
dogwood	<i>Cornus sanguinea</i>
guelder rose	<i>Viburnum opulus</i>
snowberry	<i>Symphoricarpos</i>

APPENDIX G : Habitat Suitability Index Score

Pond Number	2	
Sl ₁ - Location	A	1.0
Sl ₂ - Pond Area (m ²)	5000	0
Sl ₃ - Pond Drying	Sometimes dries	0.5
Sl ₄ - Water Quality	Moderate	0.67
Sl ₅ - Shoreline Shade (1m from the shore) (%)	25	1
Sl ₆ - Fowl	Minor	0.67
Sl ₇ - Fish	Possible	0.67
Sl ₈ - Pond Count	4	0.72
Sl ₉ - Terrestrial habitat	Good	1
Sl ₁₀ - Macrophytes (% of the pond surface area occupied by macrophyte cover)	10	0.4
Habitat Suitability Index (HSI Score)		0.71
Pond Suitability		Good

Pond Number	4	
Sl ₁ - Location	A	1.0
Sl ₂ - Pond Area (m ²)	300	0.6
Sl ₃ - Pond Drying	Annually dries	0.1
Sl ₄ - Water Quality	Moderate	0.67
Sl ₅ - Shoreline Shade (1m from the shore) (%)	50	1
Sl ₆ - Fowl	Absent	1
Sl ₇ - Fish	Absent	1
Sl ₈ - Pond Count	4	0.72
Sl ₉ - Terrestrial habitat	Good	1
Sl ₁₀ - Macrophytes (% of the pond surface area occupied by macrophyte cover)	0	0.3
Habitat Suitability Index (HSI Score)		0.62
Pond Suitability		Average

APPENDIX H : GCN eDNA results 2021



Folio No: E9773
Report No: 1
Purchase Order: ACEnv04.1
Client: PEAK ECOLOGY LTD
Contact: Michelle Cullimore-Pike

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (*TRITURUS CRISTATUS*)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 28/04/2021
Date Reported: 11/05/2021
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
2376	Pond 1	SE 37892 04995	Pass	Pass	Pass	Negative	0
2378	Pond 2	SE 37819 05426	Pass	Pass	Pass	Negative	0
2379	Pond 4	SE 38165 04888	Pass	Pass	Pass	Negative	0
2380	Pond 3	SE 37809 05075	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

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METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

- SIC:** **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.
- DC:** **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.
- IC:** **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.
- Result:** **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.



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APPENDIX I : Reptile results 2021

Results of Reptile Survey

No common reptiles were recorded throughout the survey in September 2021. A number of small mammals, namely vole species and common shrews, were recorded under mats on site. Common amphibians; smooth newt *Lissotriton vulgaris* and common toads *Bufo bufo*, were also recorded throughout the survey period in low numbers. The details of the reptile survey results are found in Table 2 below.

Table 2. Reptile Survey Results

Survey Visit	Date	Time	Results
Visit 1	06.09.21	09:35 - 10:25	No reptiles. Common shrew under mat 84 & 89
Visit 2	10.09.21	07:55 - 09:00	No reptiles.
Visit 3	15.09.21	09:00 - 09:55	No reptiles. One female smooth newt adult under mat 8, one common shrew under mat 57 and a small rodent under mat 83 & 84
Visit 4	17.09.21	09:00 - 10:05	No reptiles. One juvenile toad under mat 119.
Visit 5	20.09.21	08:50 - 09:50	No reptiles. Small mammal under mat 56, juvenile toad under mat 119.
Visit 6	22.09.21	08:50 - 09:35	No reptiles. Small mammal under mat 56.
Visit 7	24.09.21	09:05 - 09:45	One vole under mat 84, one adult toad under in-situ refugia.

