

ESL (Ecological Services) Ltd, 1 Otago House, Allenby Business Village, Crofton Road, Lincoln LN3 4NL

Tel: 01522 539325 Fax: 01522 539782 Email: enquiries@esl-lincoln.co.uk Web: www.ecologicalservicesltd.com

**ECOLOGICAL APPRAISAL AND BIODIVERSITY
NET GAIN STATEMENT:**

LAND OFF JAMES ROAD, CROWLAND

**FINAL
NOVEMBER 2024**

DOCUMENT CONTROL

TITLE: Ecological Appraisal and Biodiversity Net Gain Statement: Land off James Road, Crowland
PROJECT REF: ES175
VERSION: Final
DATE: November 2024
AUTHOR(S): Rebecca Orange & Luke Hartley ACIEEM
PROOF READER: John Pover
APPROVED BY: Dave Hughes MCIEEM

ISSUED TO: Graham Prior
Principal Landscape Architect
Robert Doughty Consultancy
32 High Street
Helpringham
Sleaford
Lincolnshire
NG34 0RA

This report has been prepared by ESL with all reasonable skill, care and diligence, within the terms of the contract with the Client. The report is confidential to the Client. ESL accepts no responsibility of whatever nature to third parties to whom this report may be made known. No part of this document may be reproduced without the prior written approval of ESL.

Contents	Page
1 INTRODUCTION	2
2 LOCAL PLANNING POLICY	2
2.1 LOCAL PLANNING POLICY	2
3 DESK STUDY	3
3.1 METHODS	3
3.2 RESULTS	3
3.3 ASSESSMENT	4
4 HABITATS AND PLANT SPECIES	5
4.1 METHODS	5
4.2 RESULTS	5
4.3 ASSESSMENT	7
5 FAUNA	7
5.1 SURVEY SCOPE	7
5.2 AMPHIBIANS	8
5.3 BIRDS	9
6 BIODIVERSITY NET GAIN STATEMENT	10
6.1 METHODS	10
6.2 BASELINE CONDITIONS	11
6.3 IMPACTS OF THE PROPOSED SCHEME	11
6.4 BIODIVERSITY NET GAIN OUTCOME OF THE PROPOSED SCHEME	12
7 SUMMARY OF RECOMMENDATIONS	12
8 REFERENCES	13
APPENDIX 1	14

EXECUTIVE SUMMARY

ESL (Ecological Services) Limited has been commissioned by Robert Doughty Consultancy Limited to undertake an Ecological Appraisal and Biodiversity Net Gain Statement in order to identify any constraints and opportunities associated with a planning application for a cemetery on land off James Road, Crowland.

Summary of findings:

- No sites with statutory or non-statutory designation for nature conservation will be affected by the proposed development.
- One pond identified within 250m of the Site returned negative results for great crested newt eDNA.
- Standard protective measures will be put in place to ensure there are no adverse effects on birds.
- All other species were scoped out of the appraisal due to the absence, low value and/or unsuitability of the habitats present on or adjacent to the Site.
- The Site has a Biodiversity Net Gain baseline of 2.30 Biodiversity Units for habitats and 0.57 Biodiversity Units for hedgerows.

Summary of recommendations:

- No vegetation suitable for use by nesting birds must be cleared between March and August inclusive unless it has been hand-searched by an experienced ecologist for active nests in advance. All active nests must be protected from damage until the young have fledged.
- The scheme as presented, delivers 2.53 Biodiversity Units for habitats and 1.51 Biodiversity Units for hedgerows, which results in a 10.00% and 163.19% net gain respectively.
- The surveys must be updated if planning has not been consented by 1 November 2025.

ECOLOGICAL APPRAISAL AND BIODIVERSITY NET GAIN STATEMENT: LAND OFF JAMES ROAD, CROWLAND

1 INTRODUCTION

- 1.1 ESL (Ecological Services) Limited (ESL) has been commissioned by Robert Doughty Consultancy Limited to undertake an Ecological Appraisal and Biodiversity Net Gain (BNG) Statement in order to identify any constraints and opportunities associated with a planning application for a cemetery on land off James Road, Crowland (hereafter referred to as the 'Site').
- 1.2 The aim of the Ecological Appraisal is to:
- Determine any likely effects on any site designated for nature conservation.
 - Characterise the habitats and species present and determine their conservation status.
 - Assess the likelihood of any adverse ecological effects, identify the need for further information and recommend pragmatic mitigation/enhancement measures.
- 1.3 The aim of the BNG Statement is to:
- Calculate the current biodiversity baseline value of the Site.
 - Calculate the pre-intervention scenario (the effect of the proposed scheme prior to habitat creation and enhancement measures).
 - Identify options for habitat creation and enhancement to achieve a 10% net gain.
- 1.4 A Site location map is given as Figure 1, a habitat map as Figure 2 and a BNG post-intervention scenario as Figure 3. Photographs are included within the text. Species are referred to by their English names throughout, followed by scientific names where first mentioned. A schedule of all BNG baseline habitats and hedgerows is provided as Appendix 1 and the Statutory Metric Calculation Tool spreadsheet is provided as a standalone document.

2 LOCAL PLANNING POLICY

2.1 LOCAL PLANNING POLICY

The South East Lincolnshire Local Plan, adopted March 2019.

- 2.1.1 Policy 28: The Natural Environment outlines that:
- All development proposals should provide an overall net gain in biodiversity by:
 - Protecting the biodiversity value of land, buildings and trees, minimising fragmentation of habitats.
 - Maximising the opportunities for restoration, enhancement and connection of natural habitats and species of principal importance.

- Incorporating beneficial biodiversity conservation features on buildings where appropriate and maximising opportunities to enhance green infrastructure and ecological corridors, including water space.
- Conserving or enhancing biodiversity or geodiversity conservation features that will provide new habitat, help wildlife to adapt to climate change and if the development is within a Nature Improvement Area (NIA), contributing to the aims and objectives of the NIA.

3 DESK STUDY

3.1 METHODS

- 3.1.1 The Natural England 'MAGIC' and 'Nature on the Map' websites were consulted to obtain information on any internationally- and nationally-protected sites and for citations of any Sites of Special Scientific Interest (SSSI) or National Nature Reserves (NNR) within 5km of the Site. Information was also sought on any Local Nature Reserves (LNR) within 2km of the Site.
- 3.1.2 The Lincolnshire Environmental Records Centre (LERC) was asked to provide a data report on local sites of conservation interest including Local Wildlife Sites (LWS) and notable species within 2km of the Site.

3.2 RESULTS

- 3.2.1 The LERC data search was provided on 11 July 2024. The results are summarised in Tables 1 and 2 below; pre-2004 records have been screened out. For the purposes of this report, 'Important Species' are those:
- Having statutory protection.
 - Listed as Species of Principal Importance as set out in Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC) (formerly UK BAP species).
 - Listed in the Vascular Plant Red List for England (Stroh *et al.*, 2014).
 - Listed in the Lincolnshire Biodiversity Action Plan (Greater Lincolnshire Nature Partnership, Revised 2015).

TABLE 1. Sites with statutory or non-statutory protection for nature conservation within the search area.

Name, Designation and Description	Proximity to the Site
New River LWS. Spanning 16km the site is noted for its diverse aquatic flora.	1.1km northwest.
Crowland Wash Lake LWS. A former IDB drainage site, now a linear wetland site supporting a variety of aquatic flora.	1.2km northwest.

Name, Designation and Description	Proximity to the Site
River Welland Corridor LWS. A wetland corridor spanning 16km of the River Welland, comprising the river itself alongside a mosaic of grassland, ponds, scattered scrub and occasional trees. The sites flora is diverse and interesting with a combination of native and non-native species.	1.8km northwest.
There are no statutory sites within 2km.	

TABLE 2. Important species within the search area.

Species/Group	Proximity to the Site
Two records for amphibians comprising common toad <i>Bufo bufo</i> and smooth newt <i>Lissotriton vulgaris</i> , 2006.	Closest approximately 700m southwest.
Eight records for badger <i>Meles meles</i> , 2008-2013.	Closest approximately 500m west.
Four records of otter <i>Lutra lutra</i> , 2008-2020.	Closest approximately 500m northwest.
10 records for water vole <i>Avicola amphibius</i> , 2004-2010.	Including in the vicinity of the Site.
Nine records for brown hare <i>Lepus europaeus</i> , 2004-2019.	Closest approximately 600m northwest.
23 records for hedgehog <i>Erinaceus europaeus</i> , 2005-2021.	Including in the vicinity of the Site.
82 records for at least four species of bats including eight roost records, 2004-2022.	Closest approximately 100m northwest. Roost records from Crowland.
1,221 records for 60 species of protected and priority birds, 2004-2022.	Frequent records from Crowland within proximity of the Site.
Eight records for six species of priority invertebrates including small heath <i>Coenonympha pamphilus</i> and large nutmeg <i>Apamea anceps</i> , 2018-2022.	Closest approximately 750m northwest.
Two records for two species of Schedule-9 plant; Canadian waterweed <i>Elodea canadensis</i> and Himalayan balsam <i>Impatiens glandulifera</i> , 2011-2012.	Closest approximately 1.6km northwest.

3.3 ASSESSMENT

Sites with statutory or non-statutory protection.

- 3.3.1 The closest non-statutory site is New River, 1.1km northwest of the Site; there are no statutory sites within 2km. Due to the Site's proximity to protected sites as well as the localised and short-term impacts associated with this type of scheme, the potential risk of an adverse effect on any site designated for nature conservation is considered highly unlikely.

Important species

- 3.3.2 The significance of important species records germane to the scheme is discussed later in the report.

4 HABITATS AND PLANT SPECIES

4.1 METHODS

- 4.1.1 A Preliminary Ecological Appraisal (PEA) was undertaken on 15th July 2024 by Rebecca Orange in accordance with best practice guidelines (JNCC, 2010, CIEEM, 2017). All habitats were characterised by identifying the dominant and typical species, which were given a UK habitat classification (UK Hab, 2023); notes were made on adjacent land use. A search was made for any invasive, non-native plant species listed on Schedule-9 of the Wildlife and Countryside Act 1981 (as amended).

4.2 RESULTS

Overview.

- 4.2.1 The Site comprises an arable field situated on the south-eastern outskirts of the village of Crowland, off James Road to the north with the A16 adjacent to the south (Figure 1). Land use beyond the north-eastern Site boundary is allotments while to the southwest, the land is a continuation of the arable cropland on Site.

Non-cereal crops (c1d).

- 4.2.2 Much of the northern half of the Site had been recently ploughed (Photograph 1).

Other cereal crops (c1c7).

- 4.2.3 The remaining southern half of the Site comprised a cereal crop (Photograph 2).



Photograph 1. View from northern corner of Site looking south; freshly-ploughed non-cereal crops with modified grassland margin to the left.



Photograph 2. View from southern Site boundary, looking northwest showing cereal crops.

Modified grassland (g4).

- 4.2.4 Along the north-western and north-eastern boundaries of the Site, there is a margin of 'good condition' modified grassland (Photograph 3). The grassland comprised abundant perennial rye-grass *Lolium perenne*, Yorkshire fog *Holcus lanatus* and American willowherb *Epilobium ciliatum* alongside frequent common ragwort *Senecio jacobaea* and bristly oxtongue *Helminthotheca echioides*.
- 4.2.5 The margin along the north-western boundary and the northern end of the north-eastern boundary are uncut tall-sward, where creeping thistle *Cirsium arvense*, great willowherb *Epilobium hirsutum* and common nettle *Urtica dioica* are frequent. The remaining southern part of the north-eastern boundary is mown with frequent creeping buttercup *Ranunculus repens*.

Artificial unvegetated, unsealed surface (u1c).

- 4.2.6 To the north of the Site, there is a gravel access track off James Road, which cuts through a small area of woodland (Photograph 4). The track is routinely used as access to the allotments and appears to be well-managed with no vegetation growing through.



Photograph 3. View from northern corner of Site looking southeast, showing tall-sward modified grassland (mown further southeast).



Photograph 4. View from south of access track looking northwest, showing gravel track with woodland on either side.

Other native hedgerow (h2a6).

- 4.2.7 The north-eastern boundary of the Site is marked by a native hedgerow, separating the Site from the allotments beyond (Photograph 6). The hedgerow is species-poor with only three woody species. The northern half of the hedgerow is characterised by abundant dog rose *Rosa canina* with frequent hawthorn *Crataegus monogyna*, while the southern half has abundant hawthorn and occasional dog rose. Domestic plum is frequent throughout.

Adjacent land.

- 4.2.8 There is a young pedunculate oak plantation woodland either side of the existing Site entrance (Photograph 5). The ground flora is limited, with large areas of bare ground. Frequent species

include bramble *Rubus fruticosus*, herb Robert *Geranium robertianum*, wood avens *Geum urbanum* common nettle and common hogweed *Heracleum sphondylium*.



Photograph 5. View of adjacent woodland, showing young oak plantation.



Photograph 6. View from eastern corner of Site looking northwest, showing native hedgerow along Site boundary.

4.3 ASSESSMENT

- 4.3.1 None of the recorded plant species is listed above the 'Least Concern' threat level in the British Red Data Book (Stroh *et al.*, 2014). The habitats, plant communities and individual species are generally common and widespread in a local and national context.
- 4.3.2 No Schedule-9 non-native plant species were recorded.

5 FAUNA

5.1 SURVEY SCOPE

- 5.1.1 Having reviewed the desk study, consulted an Ordnance Survey map and aerial imagery to set the Site in a local context and having undertaken a Site walkover, the habitats on Site were assessed for their potential for use by a range of protected and notable species including amphibians, reptiles, birds, bats, badgers and hedgehogs, as per published guidelines.
- 5.1.2 Of those, only birds are considered a material consideration. All other protected and notable species can be scoped out of the assessment due to:
- An absence of suitable habitat to support a viable population.
 - No evidence of use being found during the PEA.
 - The Site being beyond their known distribution range.
 - The species, even if present, most likely being resilient to any effects of the scheme or any effect being negligible and not warranting mitigation.

5.2 AMPHIBIANS

Habitat Suitability Index.

- 5.2.1 An Ordnance Survey map and aerial imagery were used to identify all waterbodies within 250m of the Site. These were visited on 27 June 2024 by Luke Hartley ACIEEM and a Habitat Suitability Index (HSI) was calculated following the Amphibian and Reptile Groups of UK guidelines (ARG UK, 2010). A limited hand-search of suitable refuges was conducted, as was a search for signs of breeding amphibians within the ponds such as spawning and folded leaves indicating the presence of eggs.

Results.

- 5.2.2 One waterbody was identified; an attenuation basin constructed alongside a new residential development on the western side of James Road, immediately opposite the Site entrance. Although fairly new, the waterbody supported dense marginal vegetation including frequent bulrush *Typha latifolia*, abundant water cress *Nasturtium officinale*, occasional great willowherb *Epilobium hirsutum* and frequent aquatic macrophytes including broad-leaved pondweed *Potamogeton natans* and stonewort *Chara* sp.
- 5.2.3 The HSI for the waterbody was 0.82, indicating 'excellent' suitability for great crested newts *Triturus cristatus* (GCN).



Photograph 5. View of the attenuation basin from the edge of the new residential development.



Photograph 6. View of marginal vegetation.

eDNA analysis.

- 5.2.4 Water samples were collected from the waterbody by the same surveyor (Natural England GCN survey licence number 2020-44842-CLS-CLS), in accordance with the methods given in the Freshwater Habitats Trust's technical advice (Biggs *et al.*, 2014). The samples were sent to SureScreen Scientifics laboratory for eDNA analysis the same day.

Results.

- 5.2.5 The sample tested negative for GCN eDNA. The report is provided as Appendix 1.

Avoidance/mitigation/enhancement measures.

- 5.2.6 There are currently no requirements for further surveys or specific mitigation measures.

5.3 BIRDS

Methods.

- 5.3.1 All bird species observed during the survey on-Site were recorded. The Site was assessed for its potential to support Schedule-1 bird species and its potential to support a significant population of priority bird species. It was also searched for signs of historic nesting use by a range of protected and priority birds.

Results and assessment.

- 5.3.2 A typical assemblage of birds was recorded both on the Site and along the boundary features, although no priority bird species were recorded during the survey.
- 5.3.3 The Site is unlikely to support nesting Schedule-1 species.
- 5.3.4 The hedgerow along the north-eastern boundary of the Site provides opportunities for a range of common and widespread birds and future use can be expected in the nesting season.

Avoidance/mitigation/enhancement measures.

- 5.3.5 The Wildlife and Countryside Act 1981 (as amended) protects all wild birds, their nests and eggs. Under this Act, it is an offence to:
- Kill, injure or take any wild bird.
 - Take, damage or destroy the nest of any wild bird while it is in use or being built.
 - Take or destroy the egg of any wild bird.
- 5.3.6 Bird nesting sites are not themselves protected when not in use and the common species are not protected from disturbance whilst occupying their nest-sites. However, certain rare breeding birds, listed on Schedule-1 of the Act (e.g., barn owls *Tyto alba*), are also protected against disturbance whilst building a nest or when on or near a nest containing eggs or young.
- 5.3.7 The removal of any habitat suitable for use by nesting birds must be undertaken outside the nesting bird season, which typically runs from March to August inclusive. If this is not possible, an ecologist must carry out a search for active nests before work begins. Any active nest must be cordoned off and left until the young have fledged.
- 5.3.8 Tree and hedgerow planting associated with the proposed BNG strategy, detailed in Section 6 below, will provide biodiversity enhancement for birds locally, comprising additional nesting habitat and foraging provision.

6 BIODIVERSITY NET GAIN STATEMENT

6.1 METHODS

- 6.1.1 The habitats were condition-assessed during the PEA by the same surveyor, utilising the Statutory Metric methodology (Defra, 2023), hereafter referred to as 'the Metric'. The Metric calculation tool was used to determine the value of the Site's biodiversity in terms of Biodiversity Units (BU).

Strategic significance.

- 6.1.2 The desk study was utilised to identify and review Local Planning Policy and other relevant documentation detailing local biodiversity priorities and to determine the strategic significance of habitats both within the baseline and the post-intervention scenario.
- 6.1.3 Of the baseline habitats on Site, the woodland on either side of the access track is in a green infrastructure zone (Policy 32: Community, Health and Wellbeing) and has therefore been assigned high strategic significance. All other habitats on Site have been assigned low strategic significance as they are considered widespread and replaceable.
- 6.1.4 All baseline and post-intervention hedgerows have been assigned high strategic significance in line with Policy 3: Design and New Development, which states that all developments should secure the incorporation of existing hedgerows and trees and the provision of appropriate new landscaping to enhance biodiversity, green infrastructure, flood risk mitigation and urban cooling.
- 6.1.5 Of the post-intervention habitats on Site, Policy 3 applies to the individual trees, which will also be assigned high strategic significance. All other habitats on Site have been assigned low strategic significance.

Post-development calculations.

- 6.1.6 The Scheme Block Plan (drawing number 1144-8_SK_SP01) has been used to model the post-intervention value of the Site and to identify all on-Site opportunities to maximise biodiversity gain.

Temporal multipliers.

- 6.1.7 Due to the small nature of the scheme and its likely completion within a year, a delay in starting habitat creation of zero years has been assigned to all habitat creation and enhancement measures.

6.2 BASELINE CONDITIONS

6.2.1 The Site comprises four habitat types (0.92ha) generating 2.30BU and one hedgerow type (0.12km) generating 0.57BU. The contribution of each habitat and hedgerow type are given in Tables 3 and 4 and are illustrated on Figure 2.

TABLE 3. Summary baseline of habitats present on-Site and their contributing values.

Broad habitat Category	Habitat Type	Condition	Area (ha)	Habitat BU
Cropland	Non-cereal crops	N/A	0.3993	0.80
	Cereal crops	N/A	0.3273	0.65
Grassland	Modified grassland	Good	0.133	0.80
		Poor	0.0073	0.01
Individual trees	Rural tree	Moderate	0.0041	0.04
Urban	Artificial unvegetated, unsealed surface	N/A	0.0538	0.00
Total			0.92*	2.30

* Excluding area of Individual trees.

TABLE 4. Summary baseline of hedgerows present of on-Site and their contributing values.

Broad habitat Category	Hedgerow Type	Condition	Length (km)	Hedgerow BU
Hedgerow	Native hedgerow	Moderate	0.1243	0.57
Total			0.12	0.57

6.3 IMPACTS OF THE PROPOSED SCHEME

Habitats.

6.3.1 All habitats on Site are expected to be lost in order to facilitate the scheme.

Hedgerows.

6.3.2 The native hedgerow along the north-eastern boundary will be largely retained in situ, with a small loss of approximately 0.01km at the northern end to facilitate improved access onto the Site.

Application of the mitigation hierarchy.

6.3.3 The Site comprises 'Very Low' and 'Low' distinctiveness habitats; avoidance or minimising impact is considered unnecessary. Instead, offsetting biodiversity impact can be achieved through meeting the BNG target.

- 6.3.4 Considering all these impacts and mitigation measures, Table 5 below highlights the habitat and hedgerow BU required through habitat creation and enhancement measures to reach no net loss and then 10% net gain.

TABLE 5. Impact of the proposed scheme and requirement to achieve 10% net gain.

BU Type	Proposed scheme impact (i.e., habitat creation/enhancement to achieve no net loss) (BU)	Habitat creation/enhancement to achieve 10% net gain (BU)
Habitat	2.30	2.53
Hedgerow	0.05	0.11

6.4 BIODIVERSITY NET GAIN OUTCOME OF THE PROPOSED SCHEME

- 6.4.1 The target condition for each habitat and hedgerow type is detailed in Tables 6 and 7 below and is illustrated on Figure 3.

TABLE 6. Summary post-intervention scenario of on-Site habitats and their contributing values.

Broad habitat Category	Habitat Type	Condition	Area (ha)	Habitat BU
Urban	Developed land; sealed surface	N/A	0.1836	0.00
	Cemeteries and churchyards	Good	0.0666	0.26
		Poor	0.5049	0.95
Grassland	Other neutral grassland	Moderate	0.1438	0.96
	Modified grassland	Moderate	0.0216	0.07
Individual trees	Urban tree	Moderate	0.0814	0.29
Total			0.94*	2.53

* Excluding area of Individual trees.

TABLE 7. Summary post-intervention scenario of on-Site hedgerows and their contributing values.

Broad habitat Category	Hedgerow Type	Condition	Length (km)	Hedgerow BU
Hedgerow	Native hedgerow	Moderate	0.3689	1.51
Total			0.37	1.51

7 SUMMARY OF RECOMMENDATIONS

- 7.1 No vegetation suitable for use by nesting birds will be cleared between March and August inclusive unless it has been searched by an ecologist in advance. Active nests will be protected until the young have fledged.

- 7.2 The Site Block Plan delivers 2.53BU for habitats and 1.51BU for hedgerows, which results in a 10.00% and 163.19% net gain respectively.
- 7.3 Following granting of planning permission, the Local Planning Authority will issue a pre-commencement planning condition for submission of a Biodiversity Gain Plan, which will provide full details of how the scheme will meet the 10% BNG target, including details of any off-site provisions.

8 REFERENCES

ARG UK, 2010. ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.

Biggs J., Ewald N., Valentini A., Gaboriaud C., Griffiths RA., Foster J., Wilkinson J., Arnett A., Williams P. and Dunn F., 2014. *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA.* Freshwater Habitats Trust, Oxford.

CIEEM, 2017. Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM, 2021. Biodiversity Net Gain Report & Audit Templates. Version 1. Chartered Institute of Ecology and Environmental Management, Winchester.

Defra, 2023. The Statutory Biodiversity Metric: draft user guide.

Defra, 2024a. Biodiversity gain sites register. Accessible at: <https://www.gov.uk/guidance/search-the-biodiversity-gain-sites-register>

Defra, 2024b. Statutory biodiversity credits. Accessible at: <https://www.gov.uk/guidance/buy-statutory-biodiversity-credits>

Oldham R S, Keeble J, Swan M J S, & Jeffcote M, 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10(4), 143-155.

Stroh P A, Leach S J, August T A, Walker K J, Pearman D A, Rumsey F J, Harrower C A, Fay M F, Martin J P, Pankhurst T, Preston C D & Taylor I, 2014. A Vascular Plant Red List for England. Botanical Society of Britain and Ireland, Bristol.

The South East Lincolnshire Local Plan, adopted March 2019.

UKHab Ltd, 2023. UK habitat Classification Version 2.0. www.ukhab.org.

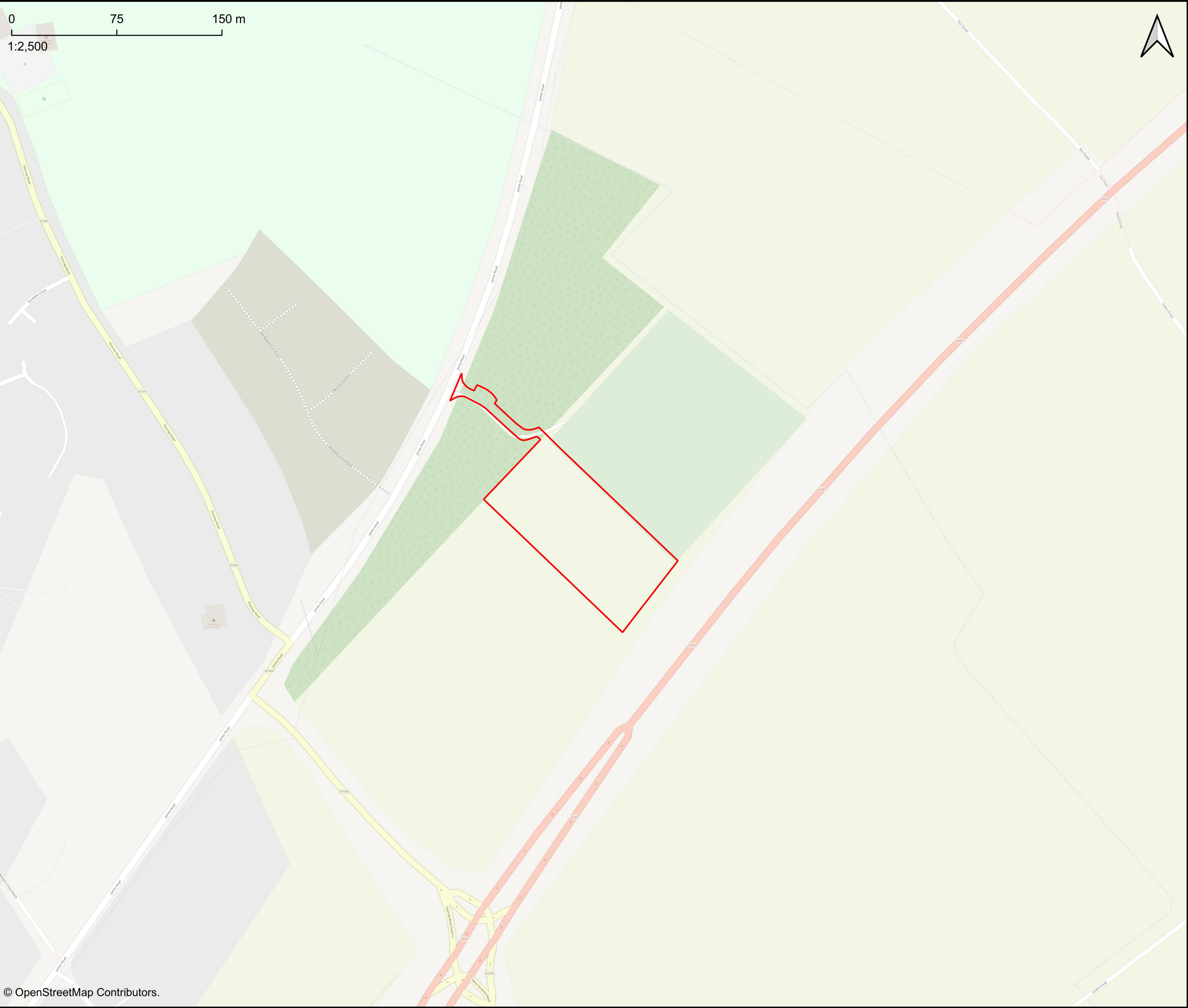
Wigginton M J, 1999. British Red Data Books. 1 Vascular Plants. 3rd edition. JNCC, Peterborough.

KEY
 Site boundary

SITE NAME:
Land off James Road, Crowland.

DRAWING TITLE:
Site location map.

Figure 1
Dwg no.: ES175-L162-001 Date: Nov 2024



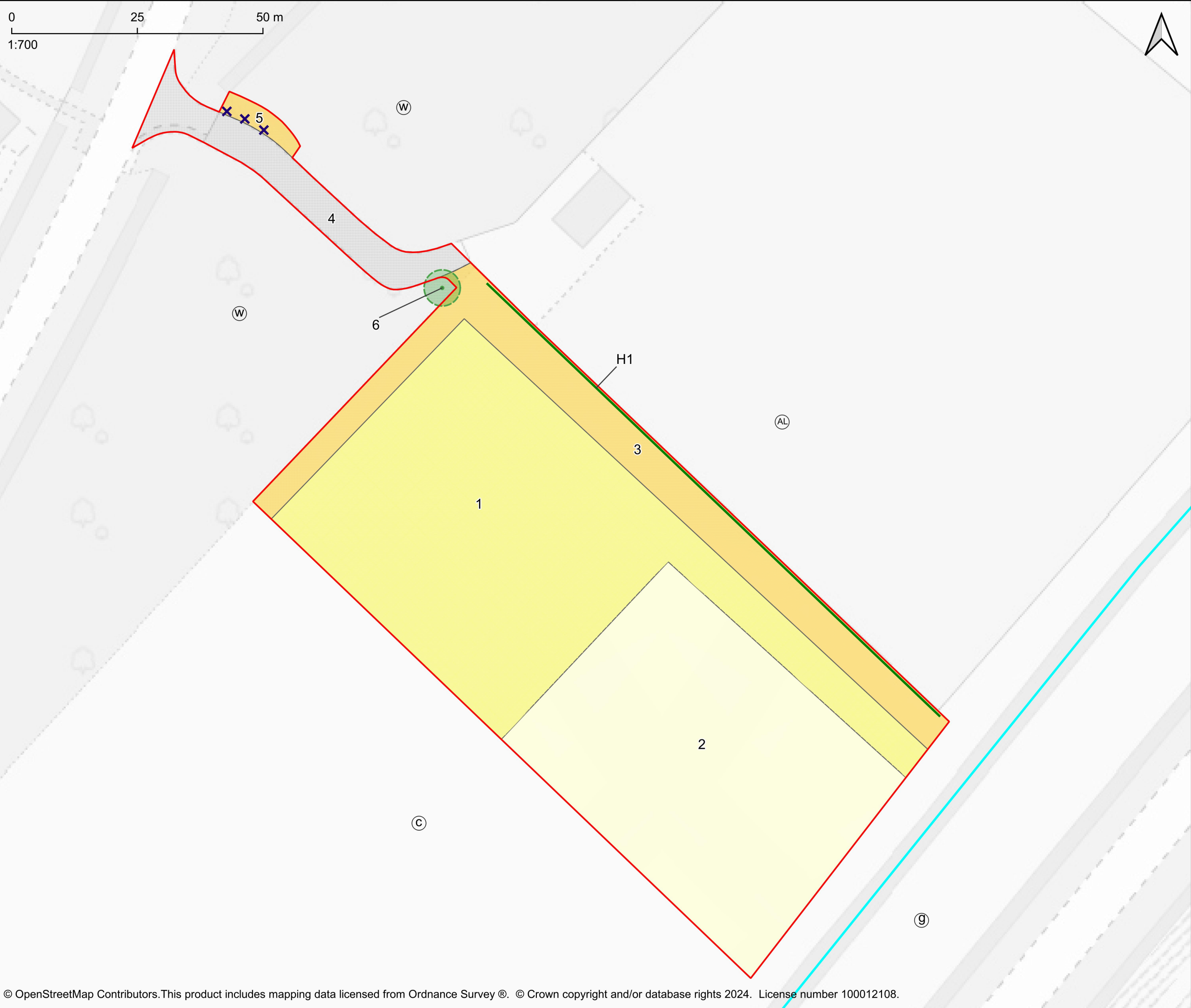
© OpenStreetMap Contributors.

- KEY**
- Site boundary
 - c1d - Non-cereal crops
 - c1c7 - Other cereal crops
 - g4 - Modified grassland
 - u1c - Artificial unvegetated, unsealed surface
 - 32 - Scattered trees
 - h2a6 - Other native hedgerow
 - r1g - Other standing water: 50 - Ditch
 - 847 - Introduced shrub
 - c - Cropland
 - w - Woodland
 - g - Grassland
 - 616 - Allotments

SITE NAME:
Land off James Road, Crowland.

DRAWING TITLE:
Habitat map.

Figure 2
Dwg no.: ES175-L162-002 Date: Nov 2024



KEY

- Site boundary
- Modified grassland (Moderate condition)
- Other neutral grassland (Moderate condition)
- Cemeteries and churchyards (Poor condition)
- Developed land; sealed surface (Buildings)
- Developed land; sealed surface
- Urban tree (Moderate condition)
- Cemeteries and churchyards (Green burial) (Good condition)
- Other neutral grassland (Ashes burial) (Moderate condition)
- h2a6 - Other native hedgerow (Moderate condition)

SITE NAME:
Land off James Road, Crowland.

DRAWING TITLE:
Biodiversity Net Gain post-intervention.

Figure 3
Dwg no.: ES175-L162-003 Date: Nov 2024



APPENDIX 1

EDNA REPORT

Folio No: 2887-2024
Purchase Order: E5175
Contact: ESL (Ecological
Services) Ltd
Issue Date: 16.07.2024
Received Date: 03.07.2024

GCN Report

Technical Report



SureScreen Scientifics

GCN eDNA Analysis

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 analyzing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

Results

Lab ID	Site Name	OS Reference	Degradation Check	Inhibition Check	Result	Positive Replicates
5439	Crowland - Pond 1	TF 2444409903	Pass	Pass	Negative	0/12

Matters affecting result: none

Reported by: Lauryn Jewkes

Approved by: Lauryn Jewkes



Methodology

The samples detailed above have been analyzed 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 tube which then undergoes DNA extraction. The extracted sample is then analyzed 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 attention to detail to prevent the 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 analytical security.

SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

Interpretation of Results

- Sample Integrity Check:** 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. Any samples which fail this test are rejected and eliminated before analysis.
- 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.
- Inhibition Check:** **Pass/Fail.** The presence of inhibitors within a sample is assessed using a DNA marker. If inhibition is detected, samples are purified and re-analyzed. 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 the WC1067 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.
Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for GCN presence or absence.

