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# Appendix 10B: Great Crested Newt Survey

## Keuper Gas Storage Project

ISSUE RECORD

| | |
|---|---|
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| Date | 26/09/2025 |
| Written by | Charlotte Haylock<br>Senior Ecologist |
| Approved by | Jenny Hills<br>Principal Ecologist |

The information and advice contained in this report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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# 1 INTRODUCTION

## 1.1 Scope of Report

This report has been prepared by Peak Ecology Ltd on behalf of Keuper Gas Storage Limited. It provides the results of great crested newt (GCN) *Triturus cristatus* surveys carried out in 2025, associated with the Proposed Development.

The purpose of this report is to:

- Detail the methodology used to undertake surveys relating to GCN; including Habitat Suitability Index Assessment (HSI), environmental DNA surveys (eDNA) and population size class surveys;
- Provide survey details, including surveyors, survey conditions and timings and any constraints to the 2025 survey effort; and
- Summarise the findings of the surveys.

This report does not include an evaluation of impacts or detailed mitigation; this will be provided within the EIA.

The approach to this survey and report follows best practice published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2013) and the Biodiversity – Code of Practice for Planning and Development (BSI, 2013). Details of individual survey methods and associated supporting information are provided in Section 2.

## 1.2 Study Area

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. The Zone of Influence relating to GCN is considered to be 250m from the red-line boundary.

The Study Area for GCN comprised the Site and a buffer extending 250m from the red-line boundary. A study of previous survey data and online Ordnance Survey and aerial imagery mapping tools was carried out to identify all potential waterbodies within this area to be subject to further assessment.

The Study Area is displayed alongside the results of pond surveys in Figure 1, Section 3.2.

## 1.3 Planning Context and Legislation

GCN are a European Protected Species (EPS), listed under the EU Habitats Directive and Appendix II of the Bern Convention (1979). They are also listed under Schedule 2 of the Habitats and Species Regulations 2019 and Schedule 5 of the Wildlife and Countryside Act 1981. As such, it is an offence to:

- Intentionally or deliberately capture, kill or injure a GCN;
- Intentionally or recklessly damage, destroy or disturb a breeding site or resting place;

- Possess a GCN, or any part of it; and
- Sell, barter, exchange or transport GCN.

GCN are also listed as a Species of Principal Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act, 2006.

# 2 METHODOLOGY

## 2.1 Desk Study

A desk-based review of GCN records obtained from RECORD, Cheshire Environmental Record Centre) was completed in February 2025. In addition, the Multi-Agency Geographic Information for the Countryside (MAGIC) website was accessed to identify any records of GCN licence returns within the Study Area. The desk study has been reported in a standalone document (Appendix 10A) but information relevant to GCN has been included in this report.

Survey data collected by Peak Ecology during 2014, to inform an EIA produced for the Consented Development, was also reviewed. This comprised results of HSI, eDNA and population size class surveys.

The desk study also highlighted any landscape features within the Study Area that were considered to be dispersal barriers for GCN, such as fast-flowing watercourses or roads with high traffic volume. Any ponds beyond such features were scoped out of the assessment.

## 2.2 Habitat Suitability Index Assessment

All ponds considered within the Desk Study for further assessment were subject to a field survey. This identified any ponds that had been lost due to changes in land use, permanently dried, or were inaccessible for further survey.

A HSI survey (Oldham *et al,* 2000) was carried out of all accessible ponds during March 2025; comprising an assessment of each pond against ten habitat Suitability Indices:

- 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 1 below.

**Table 1: 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% |

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 judgement on survey requirements and is a useful tool for informing mitigation or ecological enhancement proposals.

### 2.3 eDNA Survey

An eDNA survey was carried out of all ponds where it was possible for surveyors to retrieve water samples for laboratory analysis. This was completed within April and May 2025, which is within the accepted survey window (mid-April to end-June).

The survey involved collecting six water samples of each pond, from a minimum of 20 sample points around the perimeter. The samples were sent for analysis by Surescreen Scientifics to confirm presence or likely absence of GCN eDNA. Where the analysis confirmed a negative result, the pond was removed from any further survey effort.

All water samples were collected by GCN licenced ecologists, or by an assistant to a licenced ecologist.

### 2.4 Population Size Class / Further Survey

All accessible ponds where GCN eDNA was present were subject to population size class surveys, hereafter referred to as a further survey.

This comprised up to six additional survey visits to facilitate a population size class assessment for each pond; this information is required to inform appropriate and proportionate mitigation measures in the event that a European Protected Species licence is required.

The accepted survey window for further survey visits commences in March, prior to that of eDNA surveys which can only be carried out from mid-April. Typically, eDNA surveys are carried out first to confirm the requirement for further surveys; however, due to the large number of ponds to be assessed, it was considered appropriate to begin further survey visits before the eDNA survey could be completed. This ensured that whilst those ponds that returned a negative eDNA result could be scoped out, sufficient survey effort had already been completed on ponds with GCN presence to ensure all remaining visits could be carried out within the appropriate survey window.

The six survey visits for each pond were carried out between April and mid-June, with at least three visits taking place during the optimum survey period of mid-April to mid-May; this is to obtain the peak count of newts within the pond. Each survey visit implemented a combination of survey techniques including bottle trapping, torching and egg searches, as detailed below in Table 2.

**Table 2: GCN Survey Techniques**

| Survey Technique | Methodology |
|---|---|
| Egg searching | Examining suitable submerged and emergent vegetation from the bank to identify GCN eggs, which are laid singularly and concealed within folds of leaves. Once GCN eggs are found, the species is considered present and egg searches cease for that pond, to avoid unnecessary disturbance of eggs. |
| Torching | Surveying ponds by torchlight shortly after dusk, walking the perimeter of the pond and scanning the water for presence of newts, including adults and larvae. Torching is a suitable technique for taking a count of newts, to determine population size class. Torches with up to 1,000,000 candle power were used. |
| Bottle trapping | Deploying bottle traps within the water at regular intervals (typically one trap per two metres) around the pond edge. Traps are set in the evening and left in place overnight, then retrieved the following morning to be checked for any trapped newts. A population size count can be taken from numbers of GCN trapped. |

### 2.4.1 *Population Size Class Assessment*

The maximum count of adult GCN in each pond, using either torch surveying or bottle trapping, was used to calculate a population size class estimate. The broad categorisations used are as follows:

- ‘Small’ for maximum counts up to 10;
- ‘Medium’ for maximum counts between 11 and 100; and
- ‘Large’ for maximum counts over 100

It can sometimes be appropriate to base the population size class on a cumulative count from multiple ponds where they are clustered in close proximity to each other (typically within 250m). Where this is the case, it will be clearly identified in the evaluation.

## 2.5 Surveyors

All surveys were led by a licenced GCN ecologist, with an assistant to provide health and safety support. All lead surveyors are experienced in survey and site assessment for GCN, are registered to use a Level 1 or Level 2 Class Licence for GCN survey, issued by Natural England, and are appropriately qualified to undertake the surveys based on the CIEEM competency framework (CIEEM, 2021).

Details of surveyors are provided below in Table 3.

**Table 3: Surveyor Details**

| Surveyor | GCN Licence Registration Number |
|---|---|
| **Lead Surveyors** | |
| Charlotte Haylock | 2021-52149-CLS-CLS |
| Jonathan Brickland | 2016-22564-CLS-CLS |
| Melissa Emblin-Simpson | 2024-12393-CL08-GCN |
| Neil Watkin | 2015-18151-CLS-CLS |
| Niamh Sherborne | 2023-11339-CL08-GCN |
| Jamie Davis | 2024-12165-CL08-GCN |
| Katie Hadwin | 2015-7495-CLS-CLS |
| **Assistant Surveyors** | |
| Hannah Weald | N/A |
| Charlie Flowers | N/A |
| Eve Scott | N/A |
| Libby Norton | N/A |
| Sabina Schneider | N/A |
| Emily Stephenson | N/A |
| Becky Clarke | N/A |
| Tabitha Bishop | N/A |
| Helena Coles | N/A |

## 2.6 Limitations

### 2.6.1 *Survey Methods*

It should be noted that if there were no observations of GCN during surveys, 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.

The water within the majority of ponds surveyed was notably turbid throughout the survey period, which reduced visibility for surveyors whilst torching.

A negative eDNA result may be considered as evidence of GCN absence; however, this does not exclude the potential for GCN presence below the limit of detection.

### 2.6.2 *Access*

Due to access constraints in the early stages of the assessment, several ponds were not initially subject to a HSI survey. These ponds were; however, scoped in to further assessment when access was granted.

Additional constraints including perimeter stock fencing, impenetrable bankside vegetation, steep banks, or presence of bulls in surrounding fields, were encountered throughout the survey. These are detailed for the relevant pond in the survey results table.

For many ponds, it was only possible for surveyors to access small areas of open water; this became increasingly difficult throughout the unseasonably dry survey period, as ponds dried out and water retreated, leaving the remaining water difficult to survey.

### 2.6.3 *Survey Timing and Conditions*

Further survey visits were carried out under suitable weather conditions, where ambient overnight temperatures exceeded 5°C and with little to no wind or rain.

Bottle trapping was not carried out within particularly warm conditions to avoid trapping newts in oxygen depleted water. The lack of rainfall throughout the survey period also resulted in many ponds becoming unsuitable for trapping, with many ponds drying out completely.

# 3 RESULTS

## 3.1 Desk Study

The desk study identified a total of 147 ponds potentially present within the Study Area. Five of these ponds were considered to be situated beyond barriers to dispersal and were therefore ruled out from further assessment.

### 3.1.1 *Records Search*

Table 4 below details the historical records of GCN presence within the Study Area, provided by RECORD. Abundance has been given where this information is available; where presence was confirmed by eDNA, abundance has been given as N/A. Where a record corresponds to an on-site pond surveyed during 2025, the relevant pond reference number has been given.

**Table 4: Historical records of GCN presence within Study Area**

| Grid Reference | Date | Abundance | Pond Reference (2025) |
|---|---|---|---|
| SJ6956070326 | May 2014 | 1 | P339b |
| SJ7001870757 | June 2014 | N/A | P325 |
| SJ7011570834 | June 2014 | N/A | P321 |
| SJ6972070118 | May 2014 | 7 | P351 |
| SJ6954769993 | May 2014 | 4 | P358 |
| SJ7018969633 | June 2014 | N/A | X186 |
| SJ7016769532 | June 2014 | N/A | X271 |
| SJ7009369494 | June 2014 | N/A | P421 |
| SJ7012269418 | June 2014 | N/A | P422 |
| SJ7048269958 | May 2014 | 3 | P366 |
| SJ7064870069 | May 2014 | 11 | P359 |
| SJ7078970158 | May 2014 | 2 | P354 |
| SJ7062270426 | May 2014 | 6 | P336 |
| SJ7083070445 | May 2014 | 5 | P337 |
| SJ7083070445 | May 2014 | 5 | P326 |
| SJ7083070445 | May 2014 | 5 | P327 |
| SJ7075470949 | June 2014 | N/A | P320 |
| SJ7074870676 | May 2014 | N/A | X45 |

| Grid Reference | Date | Abundance | Pond Reference (2025) |
|---|---|---|---|
| SJ7087770580 | May 2014 | 7 | P334 |
| SJ7093370084 | May 2014 | 8 | P360 |
| SJ7088169965 | May 2014 | 5 | P367 |
| SJ7087069835 | May 2014 | 8 | P371 |
| SJ7073169749 | May 2014 | 3 | P375 |
| SJ7047869809 | May 2014 | 2 | P372 |
| SJ7057769796 | May 2014 | 5 | P373 |
| SJ7082569689 | May 2014 | 5 | P376 |
| SJ7107669792 | May 2014 | 1 | P377 |
| SJ7123269905 | May 2014 | 4 | P370 |
| SJ7097269632 | May 2014 | 4 | P380 |
| SJ7129769675 | May 2014 | 2 | P382 |
| SJ7126269433 | May 2014 | 3 | P385 |
| SJ7140069458 | May 2014 | 5 | P386 |
| SJ7132369146 | May 2014 | 1 | P407 |
| SJ6999969196 | June 2014 | N/A | X163 |
| SJ7090068191 | June 2014 | N/A | X246 |
| SJ7210969753 | June 2014 | N/A | P365 |
| SJ7212769844 | May 2014 | 1 | P364 |
| SJ7184770263 | June 2014 | N/A | P348 |
| SJ7171070306 | June 2014 | N/A | P344 |
| SJ7219170291 | June 2014 | N/A | P350 |

## 3.2 Survey Results

### 3.2.1 *Summary of Findings*

A total of 105 ponds were subject to some level of further survey effort, with GCN presence confirmed in 35 ponds; as a result of either GCN egg identification, trapped GCN during the further survey visits, or a positive eDNA result. The highest count of GCN was in Pond 353a, with a peak count of seven during Visit 2.

An additional 14 ponds were not surveyed, for reasons listed in Table 5.

A summary of the survey results is presented in Figure 1, highlighting GCN presence across the Site.

The eDNA survey commenced following visit two of the further survey visits. Where GCN presence had already been confirmed during the first two visits, these ponds were not subject to an eDNA survey. Further survey visits continued for all ponds with confirmed GCN; however, it was not possible to complete the full suite of six survey visits on all ponds due to range of factors such as vegetation growth, livestock, ponds drying. Table 6 below provides all survey results and constraints for each pond where GCN were confirmed.

The eDNA survey returned a negative result for the following ponds, therefore no further survey was carried out:

> 320, 324, 326, 327, 328, 332, 334, 337, 339b, 340, 341, 334a, 334b, 343, 347, 348, 350, 358, 361, 362, 364, 365, 368, 370, 374a, 374b, 376, 377, 380, 382, 384, 391a, 391b, 391c, 391d, 391e, 391f, 391g, 392, 393a, 393b, 413, 414, 415, 416, 417, 421, 423, 425, 426, 427, 428, 429, 430, Z2, Z3, Z4, Z5, Z6, X28, X44, X45, X78, X229, X244, X246, X247, X262.

**Table 5: Ponds not surveyed**

| Pond | Grid Reference | Reason for No Survey |
|---|---|---|
| 318 | SJ 70047 70926 | Bulls posed health and safety concerns; outside the RLB |
| 319 | SJ 70208 70909 | Bulls posed health and safety concerns; outside the RLB |
| 321 | SJ 70114 70840 | Dense surrounding vegetation; outside the RLB |
| 325a | SJ7002570760 | Dense surrounding vegetation; outside the RLB |
| 379 | SJ 70605 69595 | Dry |
| 387 | SJ 70854 69430 | Dry |
| 401 | SJ 71965 69845 | Slurry pond / almost dry |
| 422 | SJ 70120 69417 | Almost dry; outside the RLB |
| X50 | SJ7061170763 | Dense surrounding vegetation; outside the RLB |

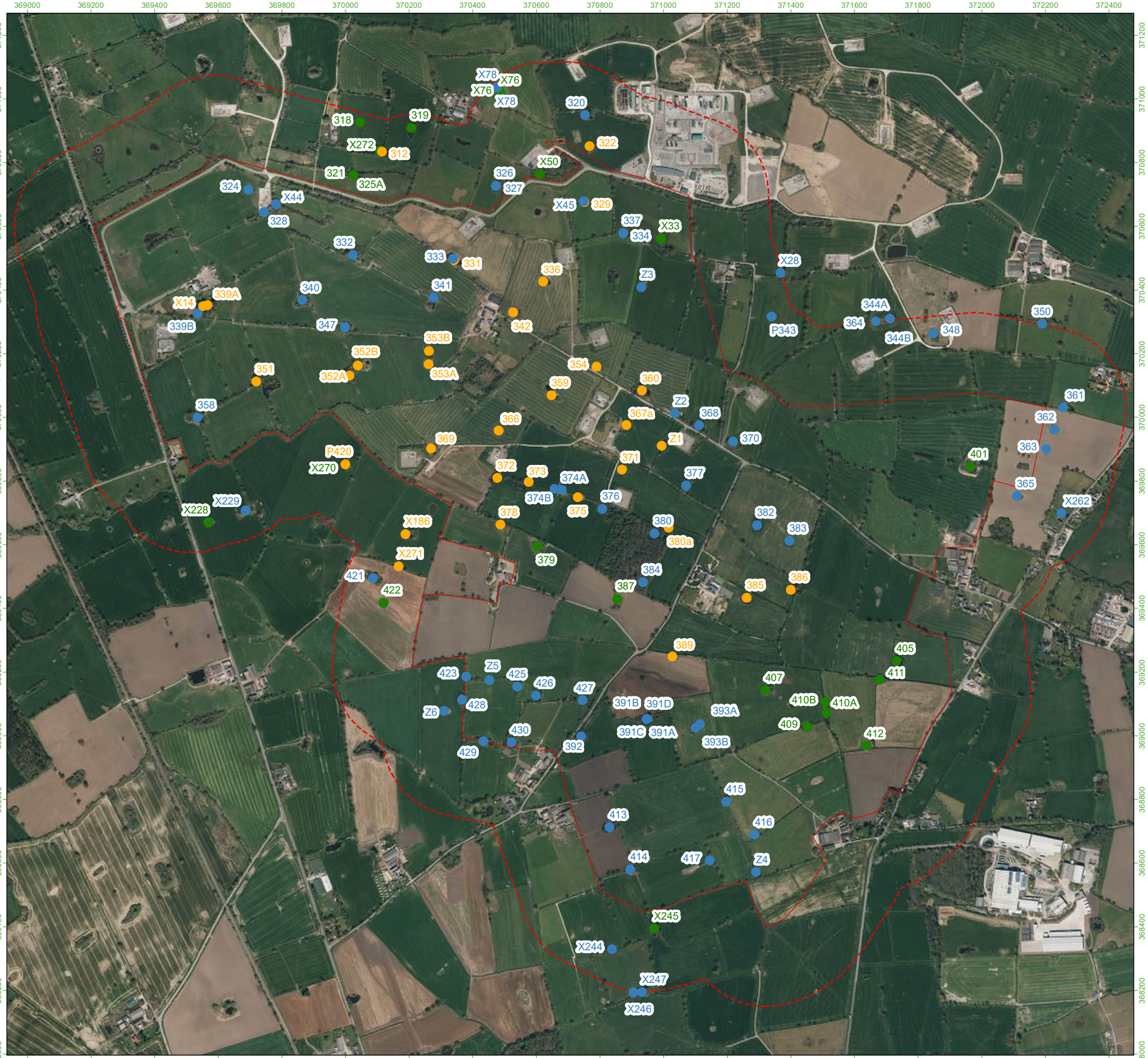
| Pond | Grid Reference | Reason for No Survey |
|---|---|---|
| X76 | SJ 70489 71019 | Dense surrounding vegetation; outside the RLB |
| X228 | SJ 69569 69669 | Dry; outside the RLB |
| X270 | SJ 70000 69852 | Dry; outside the RLB |
| X272 | SJ7010970837 | Bulls posed health and safety concerns; outside the RLB |
| X245 | SJ 70971 68394 | Dry; outside the RLB |

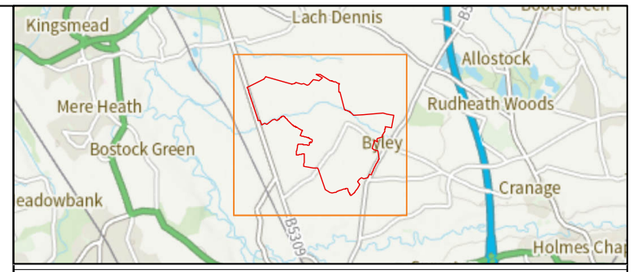
**Table 6: Ponds with GCN presence**

| Pond | Grid reference | HSI | Eggs found | eDNA | Highest GCN count (Visit No.) | Constraints to survey effort |
|---|---|---|---|---|---|---|
| 312 | SJ7011570834 | Good | No | Positive | - | Dense surrounding vegetation; no trapping possible. |
| 322 | SJ7076870851 | Poor | No | Positive | 1 (V1) | Barbed wire surrounding pond, very shallow; no trapping possible. |
| 329 | SJ7075170676 | Excellent | Yes | N/A | - | None. |
| 331 | SJ6938770560 | Poor | No | N/A | 1 (V1 & 2) | None. |
| 333 | SJ7034270493 | Good | Yes | Negative | - | None. |
| 336 | SJ7062270426 | Excellent | Yes | N/A | - | None. |
| 339a | SJ6956770352 | Good | No | Positive | - | None. |
| 342 | SJ7052870329 | Below average | Yes | N/A | - | None. |
| 351 | SJ6972070112 | Good | No | Positive | 5 (V2) | One survey visit not completed due to livestock in field. |
| 352a | SJ7001370131 | Poor | No | N/A | 1 (V3 & 6) | None. |
| 352b | SJ7004070162 | Average | Yes | N/A | 5 (V6) | None. |
| 353a | SJ7026270166 | Good | Yes | N/A | 7 (V2) | None. |
| 353b | SJ7026370208 | Average | Yes | N/A | 2 (V3) | None. |

| Pond | Grid reference | HSI | Eggs found | eDNA | Highest GCN count (Visit No.) | Constraints to survey effort |
|---|---|---|---|---|---|---|
| 354 | SJ7078970159 | Excellent | No | Positive | - | Only two standard surveys completed due to dense surrounding vegetation and pond drying. |
| 359 | SJ7064870069 | Excellent | Yes | N/A | 1 (V4) | None. |
| 360 | SJ7093370084 | Excellent | Yes | N/A | 4 (V3) | None. |
| 363 | SJ7220269900 | Poor | No | Negative | 1 (V2) | None. |
| 366 | SJ7048269958 | Excellent | Yes | N/A | 4 (V3) | None. |
| 367a | SJ7088469975 | N/A | No | N/A | 1 (V1) | Only four standard surveys completed due to dense surrounding vegetation. |
| 369 | SJ7026969902 | Average | No | Positive | - | Dense surrounding vegetation; no trapping possible. |
| 371 | SJ7087069835 | Below average | Yes | N/A | 5 (V2) | None. |
| 372 | SJ7047869809 | Excellent | Yes | Positive | - | None. |
| 373 | SJ7057769796 | Excellent | Yes | N/A | 1 (V1) | None. |
| 375 | SJ7073169749 | Good | No | Positive | - | None. |
| 378 | SJ7048869663 | Good | No | Positive | - | Only two standard surveys completed due to pond drying. |
| 383 | SJ7139169609 | Good | No | Negative | 1 (V2) | None. |

| Pond | Grid reference | HSI | Eggs found | eDNA | Highest GCN count (Visit No.) | Constraints to survey effort |
|---|---|---|---|---|---|---|
| 385 | SJ7126269433 | Below average | Yes | N/A | 6 (V3) | None. |
| 386 | SJ7140069458 | Poor | Yes | Positive | 1 (V1) | None. |
| 389 | SJ7102869248 | Good | No | Positive | - | Only three standard surveys completed due to dense surrounding vegetation. |
| 420 | SJ7000069852 | N/A | No | Positive | - | Access limited; no standard survey carried out. |
| Z1 | SJ7099469910 | N/A | Yes | N/A | 5 (V1) | None. |
| 380a | SJ7101669653 | N/A | Yes | Positive | - | Only two standard surveys completed due to dense surrounding vegetation. |
| X14 | SJ6955370349 | N/A | No | Positive | - | None. |
| X186 | SJ7018969633 | N/A | No | Positive | - | Access limited; no standard survey carried out. |
| X271 | SJ7016769532 | N/A | No | Positive | - | Access limited; no standard survey carried out. |




| Survey Information | |
|---|---|
| | Site boundary (358.9ha) |
| | Site boundary - 250m buffer |
| **Pond Survey Results** | |
| | GCN - present (32) |
| | GCN - not present (71) |
| | GCN - not surveyed (22) |



N

0 100 200 400
Metres

PROJECT TITLE

*HOLFORD BRINEFIELD - KGSP*

DRAWING TITLE

**Figure 1. Pond Survey Results Plan**

| VER | DATE | REMARKS | Drawn | Checked |
|---|---|---|---|---|
| 1.1 | 13/08/25 | Pond Results | MP | CH |

DRAWING NUMBER: PeakEcology/KGSP/PondResults

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| | |
|---|---|
| DATUM | OSGB |
| PROJECTION | BNG |
| PLOT SIZE | A3 |
| SCALE | 1:11,750 |

# 4 REFERENCES

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