



Lagan Homes

Land West of Ratby

GREAT CRESTED NEWT REPORT AND MITIGATION

STRATEGY

September 2024

FPCR Environment and Design Ltd

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1.0 INTRODUCTION

1.1 This report has been produced by FPCR Environment and Design Ltd. on behalf of Lagan Homes and details the results of eDNA survey and further recommendations for great crested newt *Triturus cristatus* (GCN) for a site on land to the west of Ratby, Leicestershire (Central grid ref: SK 50744 06004). This report should be read in conjunction with the Ecological Appraisal (FPCR, 2024) for this site.

Site Location and Context

1.2 The site is approximately 33 ha in size, dominated by farmland including arable fields and pastureland, bound, and divided by hedgerows. Field compartments to the north of Burroughs Road comprised temporary grass and clover ley, with woodland and willow plantation present to the northwest. Habitats to the south of Burroughs Road were dominated by grassland, with two field ponds and cattle present to the south. Several mature trees were noted within hedgerows and field compartments. The surrounding landscape is dominated by woodland, arable and pastureland with the village of Ratby located to the north and east. A small stream is located between the two redline compartments, which flows under Burroughs Road and through mature woodland bordering the site to the southwest.

2.0 METHODOLOGY

Desk Study

2.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations including:

- Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.defra.gov.uk);
- The Leicestershire & Rutland Environmental Records Centre (LRERC)

2.2 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk), was also undertaken in order to provide additional context and identify any water bodies within 500m of the site boundary.

Habitat Suitability Index (HSI)

2.3 An assessment was made to determine the suitability of each pond within the search area for GCN using the HSI methodology, as developed by Oldham et al¹. The HSI provides a measure of the likely suitability of a waterbody for supporting GCN. This methodology assesses ponds against ten pre-determined criteria, producing a score that indicates suitability for GCN occupation. Generally, waterbodies with a higher score are more likely to support this species than those with a lower score and there is a positive correlation between HSI scores and waterbodies with GCN recorded. Ten separate attributes are assessed for each pond:

- Location (Area A, B or C within the UK);
- Pond Area (size in metres²);

¹ Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal* 10(4), 143-155pp

- Permanence (how many times it may dry out in a decade);
- Water quality (invertebrate diversity);
- Shade (percentage of a waterbodies perimeter shaded);
- Fowl (impact of waterfowl if present);
- Fish (impact of fish if present);
- Pond Count (density of ponds within 1km)
- Terrestrial Habitat (quality of surrounding habitat); and
- Macrophytes (percentage of surface area occupied).

2.4 A score is assigned according to the most appropriate criteria level set within each attribute and total score calculated of between 0 and 1. Pond suitability is then determined according to the following scale.

Table 1: HSI Score Scale

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

eDNA Survey

2.5 Water sampling/analysis of P2 and two pools of standing water associated with tributaries of Rothley Brook (P3 and P4) was undertaken in accordance with the guidance as set out in the Analytical and Methodological Development for Improved Surveillance of Great Crested Newt; WC1067; Appendix 5; Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA². This methodology has been approved by Natural England for the determination of GCN presence/absence. Access was requested to survey the additional off-site ponds to the south of site (ponds P5-7) however, was not permitted.

2.6 Sampling was undertaken on 23rd May 2024 during the recommended survey season (15th April – 30th June, inclusive) by appropriately licenced ecologists who collected samples of water from the ponds/pools of standing water. Sampling was undertaken using kits obtained from ADAS. This comprised taking samples of agitated water from 20 locations around the pond and mixing thoroughly. Fifteen millilitres of this water was then placed into each of the 6 sterile sample tubes containing preservative, precipitates and a DNA sequence that was used for degradation control. All samples were stored in accordance with the protocols provided by the laboratory. The samples were then transported under suitable conditions to ADAS's laboratory for analysis. Following

² http://randd.defra.gov.uk/Document.aspx?Document=11976_WC1067_Appendix_5_TechnicalAdviceNote.pdf

analysis, results provided by the laboratory could have one of three outcomes which are described in Table 2 below.

Table 2: Description of Possible Results of eDNA Analysis

Result	Description
Positive	A positive result means that eDNA from GCN was detected and they have been present within the water in the 20 days preceding sampling. An eDNA score would be provided indicating the number of positive replicates from a series of twelve.
Negative	DNA from GCN was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive	Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided. Degradation can occur through poor storage of the samples or kits and inhibition can occur through unexpected chemicals in the sample.

Survey Limitations

2.7 Pond 1 was dry at the time of survey, and it was therefore not possible to survey this waterbody for the presence of GCN eDNA.

2.8 Access was not permitted to survey off-site waterbodies P5-P7.

3.0 LEGISLATIVE AND PLANNING POLICY CONTEXT

3.1 GCN are afforded full legal protection under the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife & Countryside Act 1981 (as amended). The purpose of the legislation is to maintain and restore protected species to a situation where their populations are favourable.

3.2 Under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 it is illegal to:

- Deliberately capture, injure or kill any wild animal of a EPS;
- Deliberately disturb wild animals of an EPS (affecting ability to survive, breed or rear young) – disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young;
- Deliberately disturb wild animals of an EPS (impairing ability to migrate or hibernate) – disturbance of animals includes in particular any disturbance which is likely to impair their ability in the case of hibernating or migratory species to hibernate or migrate;
- Deliberately disturb wild animals of an EPS (affecting local distribution and abundance) – disturbance of animals includes in particular any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong;
- Deliberately disturb wild animals of an EPS (whilst occupying a structure of place used for shelter or protection) – intentionally or recklessly disturb any wild animal while it is occupying a structure or place which it uses for shelter or protection; and
- Damage or destroy a breeding site or resting place an EPS.

3.3 Under the Wildlife and Countryside Act 1981 (as amended) it is illegal to:

- Recklessly or intentionally kill, injure or take any wild animals included in Schedule 5;

- Recklessly or intentionally damage or destroy, or obstruct access to any structure or place which any wild animal included in Schedule 5 uses for shelter or protection; and
- Recklessly or intentionally disturb any such animal while it is occupying a structure or place which it uses for shelter or protection.

3.4 Where GCN are present, and impacts upon them arising from activities such as development cannot be avoided, a EPS Licence from Natural England is required in order to allow proposals to derogate from the legislation (licences cannot be obtained to provide protection against offences under the Wildlife & Countryside Act 1981 (as amended)). As part of the application process a number of 'Tests' have to be met by the application. Natural England have provided guidance³ regarding these 'Tests', which state:

"In determining whether or not to grant a licence Natural England must apply the requirements of Regulation 53 of the Regulations and, in particular, the three tests set out in sub-paragraphs (2)(e), (9)(a) and (9)(b)⁶.

(1) **Regulation 53(2)(e)** states: *a licence can be granted for the purposes of "preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment".*

(2) **Regulation 53(9)(a)** states: *the appropriate authority shall not grant a licence unless they are satisfied "that there is no satisfactory alternative".*

(3) **Regulation 53(9)(b)** states: *the appropriate authority shall not grant a licence unless they are satisfied "that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range."*

3.5 Additional guidance by Natural England⁴ defines conservation status as follows:

"Conservation status is defined as "the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its population within its territory". It is assessed as favourable when:

- *population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and;*
- *The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and;*
- *There is, or will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis."*

3.6 It must be noted that Regulation 53 has now been replaced by Regulation 55 within the Conservation of Habitats and Species Regulations 2017 (as amended) (which has replaced the 2010 (as amended) Regulations), however, the terminology present remains unaltered, and this advice is still considered appropriate. These tests must not only reach agreement with Natural

³ Natural England. (2010). *Natural England Guidance Note: European Protected Species and the Planning Process – Natural England's Application of the 'Three Tests' to Licence Applications.* [online]. Available at: <http://publications.naturalengland.org.uk/publication/113030>

⁴ Natural England. (2013). *European Protected Species: Mitigation Licensing – How to get a licence.* [online]. Available at: <http://publications.naturalengland.org.uk/publication/4727870517673984>

England when assessing a Licence application, they must also be assessed by the planning authority when determining a planning application.

3.7 The impact that this legislation has on the Planning system is also outlined in Government Circular 06/2005⁵. This states:

'The presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. Local authorities should consult English Nature [now Natural England] before granting planning permission. They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species. They should also advise developers that they must comply with any statutory species' protection provisions affecting the site concerned'.

3.8 GCN are also included on the list of species which are of principal importance for the conservation of biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act. The S41 list is used to guide decision-makers, including local planning authorities, in implementing their duty under section 40 of the Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

3.9 European Protected Species are a material consideration within the planning process to ensure impacts on these species are minimised and mitigated for as necessary. The National Planning Policy Framework (NPPF)⁶ sets out principles which ensure that development will not result in significant harm to biodiversity and geological conservation interests and wherever possible, alternatives are sought. Where proposals cannot reasonably be located elsewhere, the NPPF considers that adequate mitigation measures should be put in place, and where mitigation is not sufficiently adequate to prevent significant harm, compensation measures should be sought. Networks of habitats are viewed by the NPPF as a valuable resource, linking sites of importance and providing routes or stepping stones for migration, dispersal and genetic exchange of species in the wider context. Such networks should be protected from development and where possible, strengthened or integrated within it.

⁵ ODPM. (2005). *Government Circular: Biodiversity and Geological Conservation*. [online]. London: ODPM & DEFRA Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf

⁶ Ministry of Housing communities & Local Government (July, 2021) *National Planning Policy Framework* [online] Available from: <https://www.gov.uk/government/publications/national-planning-policy-framework-2>

4.0 RESULTS

Desk Study

4.1 A single GCN record was returned from LRERC within 1km of the site; located approximately 965m to the northwest. The record comprised a positive eDNA result from 2019 with an eDNA score of 9. Further information provided as part of the record indicated the pond scored 'good' on the Habitat Suitability Index assessment.

Pond Descriptions

4.2 Two ponds (P1 and P2) were recorded within the site boundary and two areas of standing water (P3 and P4) were identified associated with the off-site watercourse, Tributaries of Rothley Brook; situated approximately 15m from the redline boundary at the closest point. Descriptions are provided in Table 3 below. The watercourse itself was considered largely unsuitable to support GCN due to flow and lack of aquatic and marginal vegetation. Three off-site waterbodies (P5, P6 and P7) were identified within 250m of the site using OS maps and aerial imagery, all located to the south of site, approximately 60-85m from the boundary. Access was not permitted to survey these ponds; however, a description is provided in Table 4 based on aerial imagery and information available within the public domain. Pond locations are shown on Figure 1.

Table 3: Pond Descriptions

Pond	Description	Photo
P1 Onsite	Small field pond at the base of an ash tree, approximately 7m by 4m in size, heavily shaded with no evidence of aquatic or marginal vegetation. Banks heavily poached by cattle. Held water during winter months, however dry during eDNA survey.	 

Pond	Description	Photo
P2 Onsite	Field pond approximately 10m by 7m, heavily poached by cattle.	
P3 Offsite	Standing water associated with Tributaries of Rothley brook, located to the north of the channel and measuring approximately 15m by 5m. Aquatic and marginal vegetation included fool's watercress <i>Helosciadium nodiflorum</i> and brooklime <i>Veronica beccabunga</i> .	 
P4 Offsite	Pool of standing water associated with Tributaries of Rothley brook, approximately 5m by 5m.	

Table 4: Off-site Pond Descriptions Based on Aerial Imagery

Pond	Description	Distance/ Direction from site
P5	Small field pond likely associated with Holywell Farm Cottage.	c. 60m south
P6	Newly created SuDS basin associated with Ratby Medical Centre.	c.65m southeast
P7	Woodland pond, assessed to be 'below average' for GCN as part of the planning application for Ratby Medical Centre in 2020 (Planning ref:20/00786/FUL).	c. 85m southeast

Habitat Suitability Index (HSI) Assessment

4.3 Table 5 provides a summary of the HSI assessment for each of the accessible ponds. Detailed HSI results are provided in Appendix A.

Table 5: HSI Scores for Ponds

Pond	HSI Score	Predicted Presence	HSI Category
1	0.44	3%	Poor
2	0.49	3%	Poor
3	0.68	55%	Average
4	0.62	55%	Average

eDNA Surveys

4.4 Pond 1 was dry at the time of the eDNA survey. The eDNA analysis returned negative results for P2 and the pool of standing water at the north-west of site (P4). A positive result was returned for P3, located approximately 45m to the south of the redline boundary, with one positive replicate from a series of twelve. Full results of the analysis are provided in the attached laboratory report (Appendix B).

5.0 DISCUSSION & RECOMMENDATIONS

Assessment

5.1 Environmental DNA survey confirmed the presence of GCN off-site, located within a pool of standing water (P3) associated with Tributaries of Rothley Brook; approximately 45m to the south of the site boundary. Survey of the on-site pond, P2, returned a negative eDNA result, while pond P1 was dry at the time of survey and therefore considered unlikely to provide suitable breeding habitat to GCN in most years.

5.2 Access was not permitted to survey off-site waterbodies P5-P7, however, P7 was assessed to be 'below average' for GCN as part of the planning application for Ratby Medical Centre in 2020 and was not subject to further assessment (Planning ref:20/00786/FUL). Pond P6 was created as part of this application between 2022 and 2023, based on imagery from Google Earth. Ponds P6 and P7, are located approximately 65m and 85m from the application site, at their closest point (an access road off Desford Lane, the main site being over 100m away). P6 is an establishing SuDs basin and if subject to a HSI assessment it is very likely that it would score 'below average for GCN' or lower. P7 forms an established pond. Both are separated from the application site by Desford Lane and the medical centre and car park to the north/north-west which form partial barriers to dispersal. Both ponds are located adjacent to established areas of woodland and scrub which is optimal habitat for this species. It is therefore considered that if GCN were present in these ponds, it is extremely unlikely they would disperse into the application site. P5 is located south of the Rothley Brook Tributary which is considered to form a partial barrier to the dispersal of GCN, in the event that they are present in this pond. Given the above, the presence of P5, P6 and P7 do not pose a constraint to the proposals.

5.3 Given the above information and the lack of suitable waterbodies in proximity to P3, it is considered unlikely that the local area supports more than a small population of GCN. It is also possible that the positive eDNA result of P3 arose from DNA travelling downstream from Crow and Burroughs wood to the northwest of site, where GCN are known to be present based on the 2019 desk study record. The distance that DNA can travel downstream in running water varies according to various factors including flow rate, depth substrate, water chemistry and environmental conditions⁷, however, transport distances have been recorded ranging from a few hundred metres to several kilometres⁸.

5.4 Suitable on-site habitat for GCN is largely confined to boundary and linear features, with the cattle grazed modified grassland providing limited foraging opportunities. Off-site habitats including the marshy grassland immediately adjacent to the stream and Wirlybones Wood (approximately 20m to the west of P3), provide more suitable terrestrial habitat for GCN, with Wirlybones wood connected to a substantial parcel of woodland further to the west, offering optimal foraging and hibernation habitat.

5.5 Natural England guidelines state that suitable terrestrial habitats within 250 metres of a breeding pond are likely to be used most frequently by GCN. More recent research commissioned by Natural England has shown that GCN densities are very low over 100m from the breeding pond, and that

⁷ Shogren, A.J., Tank, J.L., Andruszkiewicz, E., Olds, B., Mahon, A.R., Jerde, C.L. and Bolster, D. (2017). Controls on eDNA movement in streams: transport, retention and resuspension. *Scientific Reports*, 7: 5065

⁸ Jane, S. F. et al. Distance, flow and PCR inhibition: eDNA dynamics in two headwater streams. *Mol. Ecol. Resour.* 15, 216–227 (2015)

a majority occur within 50m of the pond⁹. This is also supported by previous research, which suggests that where suitable habitat is present the majority of any GCN population will use terrestrial habitats within 50 metres of the breeding pond (see for example, Jehle (2003))¹⁰. It is therefore likely that GCN present within P3 would utilise suitable habitats in closer proximity to P3 rather than venture onto lower quality site habitats, including Wirlybones wood and habitats adjacent to the stream. Figure 2 shows that only a very small area of site is located within 50m of P3, while the area within 100m is all proposed to be green infrastructure. Construction of the spine road is approximately 150m from the pond, with residential development c.170m away.

5.6 Given the absence of GCN within P2, the limited suitable habitat on site and the presence of more optimal habitats in closer proximity to P3, it is considered unlikely that GCN are present on site and potential impacts resulting from proposals are likely to be minimal. Given the proximity of P3 to site, however, this species poses a potential constraint. The following working methods detail appropriate precautionary methodologies for construction works to ensure that no great crested newts are harmed as a result of the proposed development.

6.0 WORKING METHODS FOR GENERAL CONSTRUCTION

6.1 Agricultural management of the site should continue prior to works commencing to maintain the site as a short sward with limited suitability for great crested newts. If for any reason, the fields fall out of management and the condition of on-site habitats change, this method statement will be reviewed.

6.2 The following applies to clearance works within 250m of Pond P3, as shown on Figure 2, particularly suitable linear features such as hedgerows:

- Prior to the commencement of works a tool-box talk will be given by the supervising ecologist to all personnel involved in clearance works identifying the ecology of, habitat associated with and the process that will be implemented in the unlikely event that any GCN are found on-site. The site shall then be walked by the ecologist and contractor to determine the exact areas requiring supervision by an ecologist and sensitive clearance.
- Any welfare/office units (required before site clearance has taken place) should be situated within areas of GCN-unsuitable habitat or carefully hand-searched by the supervising ecologist prior to placement.
- It is recommended the timings of the works are undertaken to coincide with the GCN breeding season (March-June, inclusive), when GCN are likely to be in their breeding ponds. Clearance works of the grassland is also permitted during hibernation season (October-February, inclusive), however any works to hedgerows or potential hibernation habitat must be undertaken in the active season (March- October when overnight temperatures are consistently above 5°C).
- If works take place during the nesting bird season (March- August inclusive), any vegetation to be removed will be checked by a suitably experienced ecologist prior to clearance to ensure no nests are present.

⁹ Creswell and Whitworth, (2004). An assessment of efficiency of capture techniques and the value of different habitats for the GCN. Herpetological Journal vol. 10, p 143-5

¹⁰ Jehle, R. (2000). The terrestrial summer habitat radio tracked GCNs (*Triturus cristatus* and marbled newts (*Triturus marmoratus*)). The Herpetological Journal 10:137-143

- Following confirmation of no nesting birds, immediately prior to the commencement of clearance, the habitats to be removed will be hand searched by the supervising ecologist and cut/ strimmed as necessary. Any suitable resting or sheltering features (i.e. rubble/log piles) will be dismantled by hand under supervision of the ecologist.
- Sections of hedgerow to be removed will be grubbed up with care using appropriate machinery and under supervision of the ecologist. All brash and arisings will be used to create dead wood piles/mulch within unaffected areas of hedgerow or removed from site.
- For grassland clearance, following hand searching and strimming as necessary, the upper 50mm of soils will be stripped under ecologist supervision. Once the above areas are confirmed free of GCN, works can then take place on site.
- During the works any trenches/holes/other earthworks created during site works should be open for the minimum period possible. These will be carefully backfilled, with surfaces compacted down. Unless closed on the same day as excavated, these should incorporate at least one sloping end to a maximum angle of 60° to enable animals to easily exit should they accidentally enter these overnight. Where soil conditions/trench design do not allow this a plank or board will be placed within to provide a means of escape. Trenches will be checked each morning they are open for the presence of great crested newts.

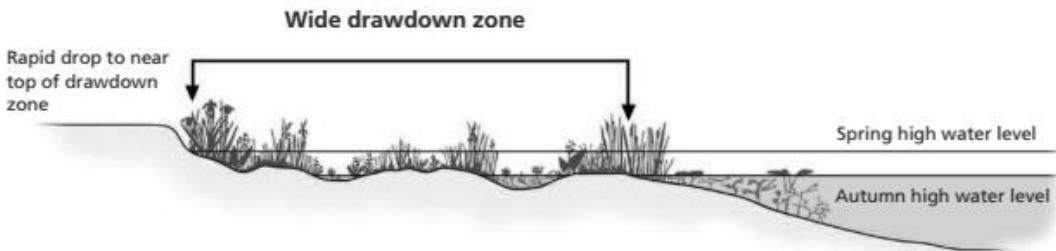
6.3 If any GCN or unidentified amphibian is observed/found during any of the works **all works must immediately cease** and FPCR must be immediately contacted.

7.0 ENHANCEMENTS

7.1 The green infrastructure proposals include the provision of species rich wildflower grassland, woodland, scrub, SuDS and the creation of a pond, all of which will provide suitable habitat for great crested newts. The below recommendations detail features of design to enhance suitability of these habitats for great crested newts, in addition to additional enhancements which could be provided.

Pond Design

7.2 The pond should incorporate gently sloping sides, with very shallow edges (i.e. 1:50), maximising the drawdown zone and focusing on edge habitats. If necessary, the outer edge can be dug steeply to reach the desired depth, with a broad, flat drawdown zone then created at the water's edge. This will create differing conditions of light and temperature and will thus maximise and encourage a diversification in the flora and associated fauna. The shallowest areas should grade into an expanse of seasonally wet mud that may attract a further variety of invertebrates and plants, which will, in turn, attract other fauna including birds and other mammals. The drawdown zone should be contoured and gently undulated, providing hummocks and hollows to increase diversity within the wetland zones. Margins should be shallow to maximise productivity and the potential for wildlife, and have shelves of low gradients, gently shelving to the pond base.



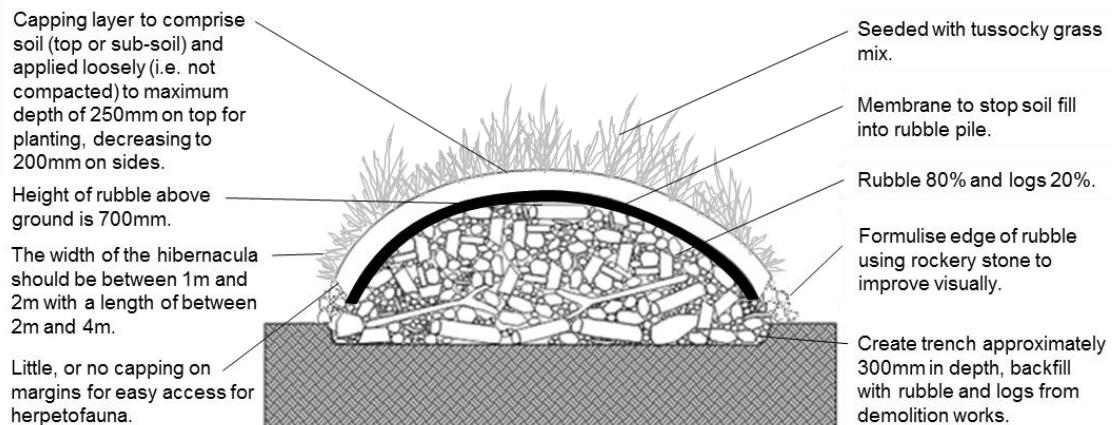
7.3 The pond should be planted with aquatic, marginal and emergent vegetation to facilitate establishment and to provide food and shelter to wildlife. Species selected should be native and of local provenance. Non-native species must be avoided since many are invasive. Marginal vegetation should not exceed 20% of the open water. Species could also include favoured egg-laying grasses and plants for GCN such as sweet or flote grasses *Glyceria* spp., water mint *Mentha aquatica*, water forget-me-not *Myosotis scorpioides* and rigid hornwort *ceratophyllum demersum*.

Hibernacula/ Refugia

7.4 Artificial hibernacula could be created in the development. These can occur along hedgerow boundaries, along stream corridors, or within tussock grassland, ideally away from public footpaths.

7.5 Hibernacula can provide a mix of refuge and wintering habitat for amphibians and reptiles. The hibernacula should be constructed out of loosely piled rubble and logs, so that small crevices will be created between material that will allow refuge for amphibians, invertebrates and small mammals. Ideally, on sites with free-draining soils, the hibernacula should be constructed and built up within a pit, whereas sites with impermeable soils or high flood risk, hibernacula should be constructed as a pile on a gentle slope for drainage.

7.6 For amphibians the hibernacula should be positioned within 200m of a pond in marginal habitat surrounded by tussocky grassland or scrub (particularly to the north) that receives both sun and shade. Mulch, consisting of composted bark, should be incorporated into the construction of the hibernacula to provide a deep litter layer of at least 100mm that holds moisture. Additional habitat features could be added around the hibernacula, such as log piles which supply a source of food and shelter.

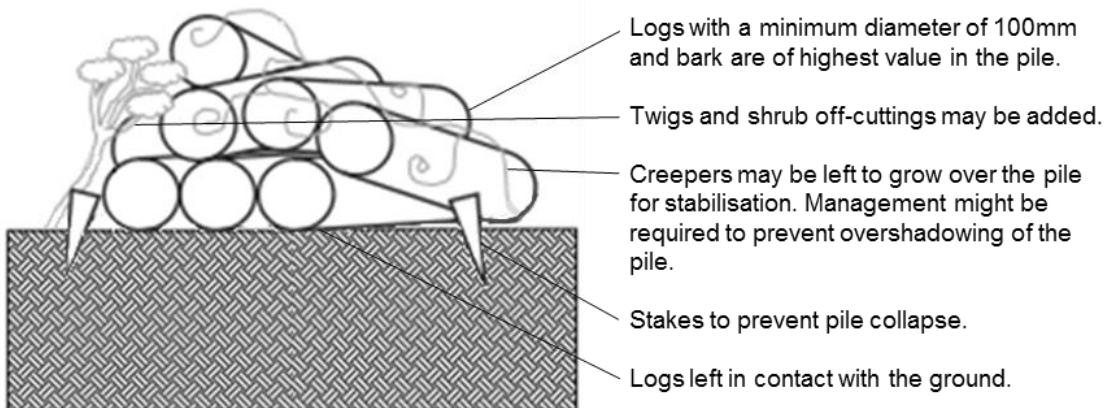


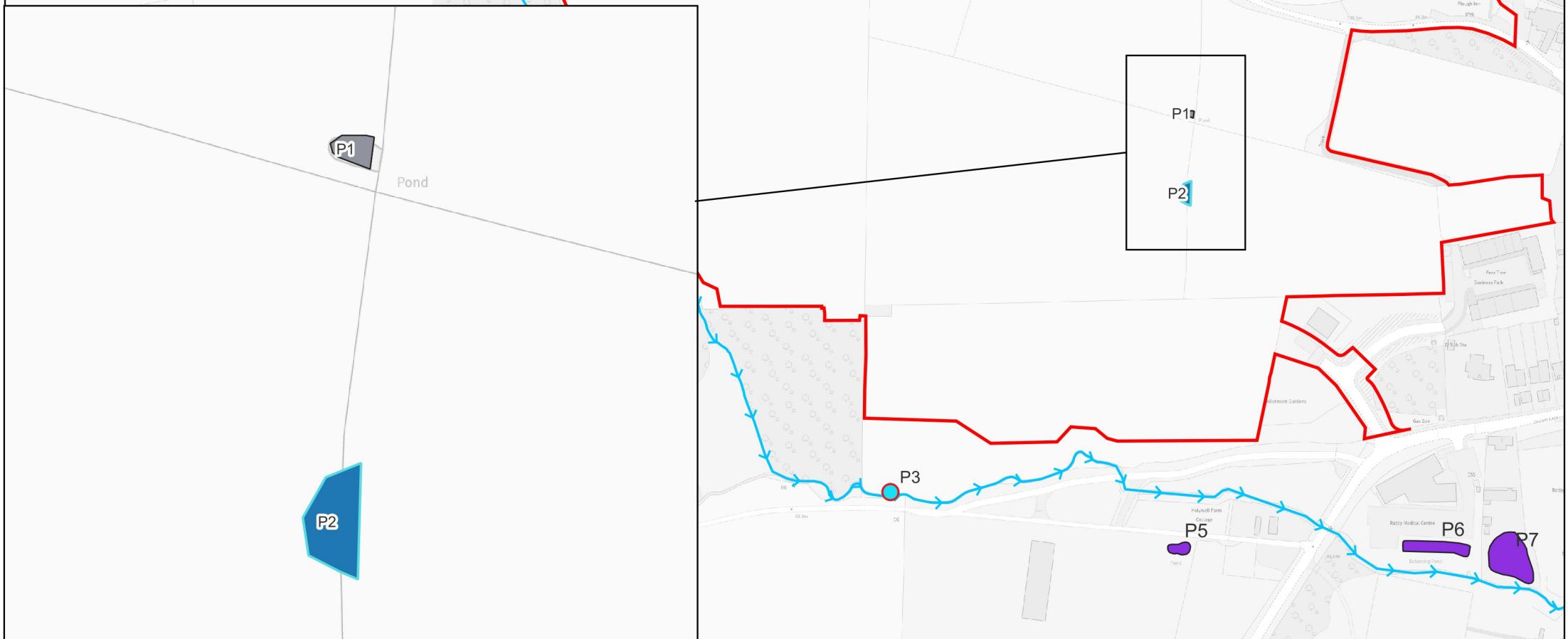
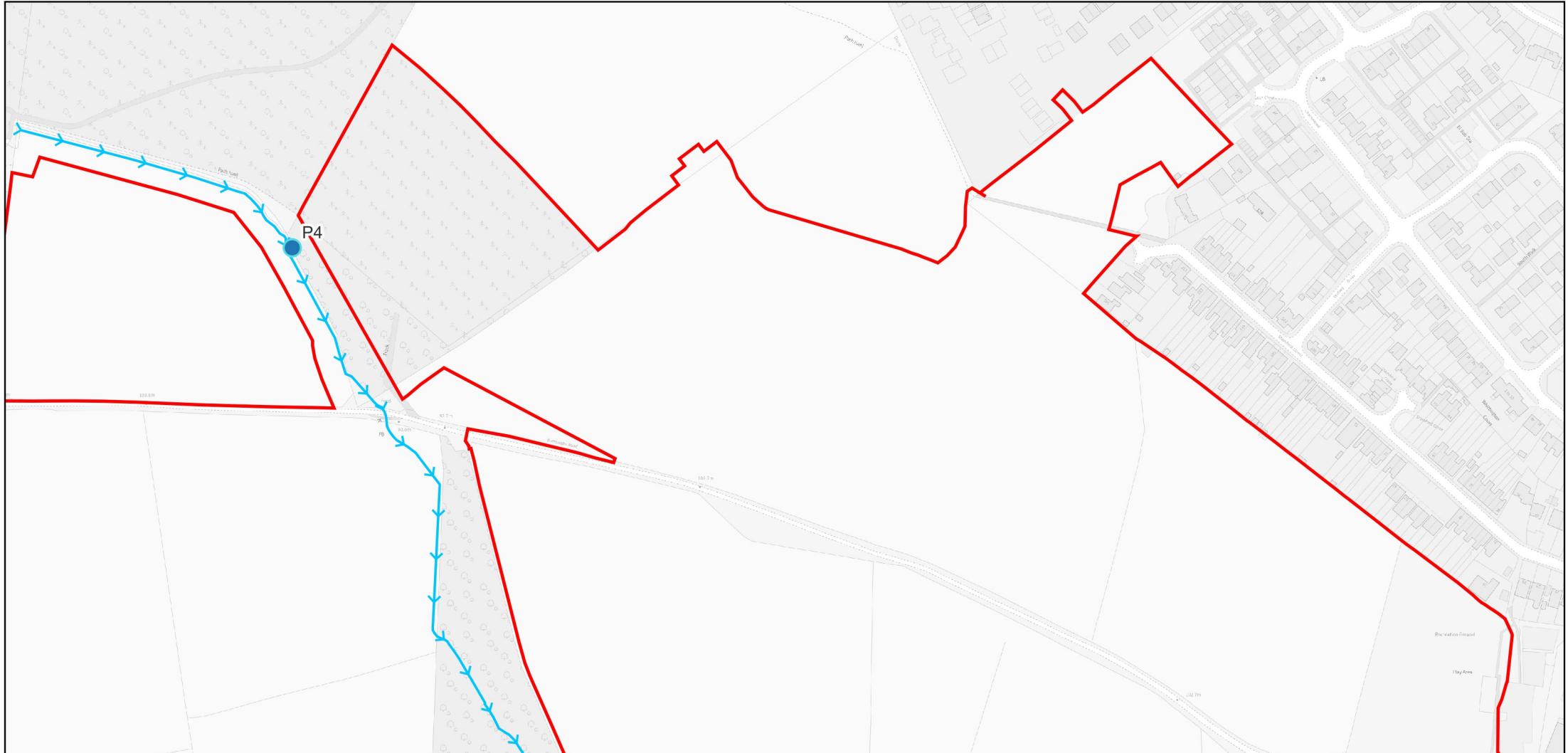
Log Piles

7.7 Log piles will ideally be created from tree work arisings from site and placed at the interface between woodland/hedgerow and informal grassland habitats, avoiding north facing areas. The

logs should be left in contact with the ground in dappled shade and built into a compact pile to maintain humidity. Stakes should be driven into the ground either side of the log pile to prevent the pile from collapsing.

7.8 Larger diameter logs (at least 100mm thick) with bark are of most value, particularly hard wood like ash, oak and beech, whereas freshly cut willow and poplar may re-sprout. Twigs, stems and shrub off-cuttings may also be added. Climbers may be allowed to grow thinly over the dead wood pile for stabilisation and moisture. Full sun will dry and heat the wood, supporting little life, whereas dense shade will promote the growth of fungi but may be too cool for insects.





Key

- Site Boundary
- Positive eDNA
- Negative eDNA
- Pond Dry
- Pond Not Surveyed
- Tributaries of Rothley Brook



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Key

- Site Boundary
- GCN Status
 - Dry
 - eDNA Negative
 - Positive eDNA
- Tributaries of Rothley Brook
- 50m Buffer
- 100m Buffer
- 250m Buffer
- Green Infrastructure
(Includes retained vegetation, new planting, habitat creation, accessible green space and drainage basins)
- Drainage Basins
- Residential Development
(Residential (13.5ha) c. 470 Units @ 35 dph)

client
Lagan Homes
project
**Land West of Ratby,
Leicestershire**
drawing title
Proposals and GCN Impact Plan

fpcr

scale @ A3
1:1,400

drawn
LTW/ JAW

issue date
2/9/2024

Figure 2

Appendix A:

Pond Number	Geographical Location	Pond Area	Pond Drying	Water Quality	Shade	Fowl	Fish	Ponds	Terrestrial Habitat	Macrophytes	HSI score	Pond Suitability	Predicted Presence
P1	1	0.05	0.1	0.67	0.9	1	1	0.93	0.33	0.3	0.44	Poor	3%
P2	1	0.05	0.1	0.67	1	1	1	0.93	0.67	0.35	0.49	Poor	3%
P3	1	0.05	0.9	1	1	1	0.67	0.93	1	0.8	0.68	Average	55%
P4	1	0.05	0.9	1	0.9	1	0.67	0.93	1	0.35	0.62	Average	55%

Appendix B



Client: Beth Sydenham,
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Email: Helen.Rees@adas.co.uk
www.adas.uk

Sample ID: ADAS-5443 Condition on Receipt: Good Volume: Passed
Client Identifier: P4, 10783 Description: pond water samples in preservative
Date of Receipt: 24/05/2024 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	30/05/2024
Degradation Control [§]	Within Limits	Real Time PCR	30/05/2024
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	30/05/2024
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/µL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:

Signed:

Position:

Director: Biotechnology

Position:

MD: Biotechnology

Date of preparation:

31/05/2024

Date of issue:

31/05/2024

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

† Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

§ No degradation is expected within time frame of kit preparation, sample collection and analysis.

#Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/µL) are also routinely run, results not shown here.



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Sample ID: ADAS-5450 Condition on Receipt: Low Sediment Volume: Passed
Client Identifier: p2, 10783 Description: pond water samples in preservative
Date of Receipt: 24/05/2024 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	31/05/2024
Degradation Control [§]	Within Limits	Real Time PCR	31/05/2024
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	31/05/2024
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/ μ L) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

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MD: Biotechnology

Date of preparation:

31/05/2024

Date of issue:

31/05/2024

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1} , 10^{-2} , 10^{-3} ng/ μ L) are also routinely run, results not shown here.



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Sample ID: ADAS-5452	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: P3, 10783	Description: pond water samples in preservative	
Date of Receipt: 24/05/2024	Material Tested: eDNA from pond water samples	

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	31/05/2024
Degradation Control [§]	Within Limits	Real Time PCR	31/05/2024
Great Crested Newt*	1 of 12 (GCN positive)	Real Time PCR	31/05/2024
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/µL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:

Signed:

Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 31/05/2024 Date of issue: 31/05/2024

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/µL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)