
Great Crested Newt Survey Report

Sesswick Way, Wrexham

for

Low Carbon Farming 2 Ltd.

22 March 2021

Client

Low Carbon Farming 2 Ltd.

Planning authority

Wrexham County Borough Council

Time limit of reliance

Please note that the reported surveys were conducted on the date(s) stated in the report and that it represents site conditions at the time of the visit. The findings and recommended mitigation are based on these conditions. If site conditions change materially after the site survey, the original report cannot be relied upon and will need to be updated. Ecological reports and surveys can typically be relied on for 18 to 24 months from the date of survey.

Surveys supporting European Protected Species Mitigation Licence applications must be within the current or most recent survey season for bats (May to September), or within two survey seasons for great crested newts (March to June).

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<i>Signed disclosure</i> <i>The information, data, advice and opinions provided in this report which I have provided is true and has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. I confirm that the opinions expressed are my true and professional bona fide opinions.</i> <i>Etienne Swarts, ACIEEM</i>	
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SUMMARY

- Greenlight Environmental Consultancy Ltd. has been commissioned to carry out protected species surveys for great crested newts *Triturus cristatus* ("GCN"), relating to a proposed development of land adjacent to Sesswick Way, Wrexham, Wales, LL13 0PA (grid reference: SJ 36923 47983).
- This report provides the results of the GCN survey and any potential effects of the proposed development on such species.
- The ecology report is required in support of a planning application for the construction of a glasshouse, packing and welfare building, energy centre and heating system, CO₂ storage tanks, customer and DNO substation, access and parking, and a closed irrigation system.
- The survey and assessment were completed by independent qualified and experienced ecologists with Natural Resources Wales survey licences for the relevant protected species, and in accordance with the latest survey guidelines.
- The findings of the assessment are that there are no significant ecological constraints that would prevent the proposed works.
- If the following mitigation and enhancements are incorporated into the proposed layout, there will be a net gain for biodiversity, as is encouraged by the National Planning Policy Framework.

Protected habitats/species	Status	Potential effect	Recommended mitigation and enhancements
Great crested newts	No aquatic habitats and some suitable terrestrial habitats on site. 27 ponds within 250m – 17 assessed as below average to excellent suitability for GCN, three dry and seven could not be accessed for detailed assessment. eDNA survey returned a positive result for 12 ponds. Historic records indicate a large GCN population, of National Importance and of European Importance within northeast Wales, near the site.	Loss of some terrestrial habitat including corridors of dispersal (arable land and hedgerow). Temporary disturbance of terrestrial habitat for pipeline works. Risk of injuring or killing individual GCN potentially present within the site. No impacts on aquatic habitats.	<u>Mitigation</u> EPS mitigation licence required prior to any works being conducted. The licence will include the following: Creation of receptor areas to the northwest, east and south of the development, to include terrestrial planting, hibernacula and aquatic habitats. Exclusion fencing with pitfall traps installed around the site perimeter and checked for 60 nights in suitable weather during the GCN active period. Any animals caught to be moved to the receptor site. Phased vegetation clearance and hand search of all suitable refugia. Soft landscaping, using native species, to maintain habitat links across the site. Long-term management of the receptor area and monitoring of GCN population.

1. METHODOLOGY

- 1.1. A draft Interim Ecological Impact Assessment ("EclA") was carried out and issued by Greenlight Environmental Consultancy Ltd. (2020). The report recommended further GCN surveys prior to the commencement of the development.
- 1.2. The water features on and near the site were assessed for their suitability for GCN, according to a Habitat Suitability Index (Oldham *et al.*, 2000) and reported in Appendix C.

eDNA analysis

- 1.3. In order to determine the presence/likely absence of GCN on site, an eDNA survey was conducted on 16 ponds (ponds 2-9, 17-20, 22-23, 25-26) across three separate dates in May 2020, following the field sampling protocol provided by the Department for Environment, Food and Rural Affairs ("DEFRA") and Biggs *et al.* (2014).
- 1.4. The eDNA method detects pond occupancy from GCN using traces of DNA shed into the pond environment. The water samples collected were sent to SureScreen Scientifics for laboratory analysis.
- 1.5. The results of the analysis are defined as follows by SureScreen Scientifics:
 - **Sample Integrity Check ("SIC"):** Refers to quality of packaging, absence of tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to results errors. Inspection upon receipt of sample at the laboratory. To check if the Sample is of adequate integrity when received. Pass or Fail.
 - **Degradation Check ("DC"):** Analysis of the spiked DNA marker to see if there has been degradation of the kit since made in the laboratory to sampling to analysis. Pass or Fail.
 - **Inhibition Check ("IC"):** PCR inhibitors can cause false results. Inhibitors are analysed to check the quality of the result. Every effort is made to clean the sample pre-analysis however some inhibitors cannot be extracted. An unacceptable inhibition check will cause an indeterminate sample and must be sampled again.
 - **Result:**
 - **Negative:** Means that GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as no evidence of GCN presence.
 - **Positive:** Means that GCN eDNA was found at or above the threshold level and the presence of GCN at this location at the time of sampling or in the recent past is confirmed.

- **Positive Replicates:** To generate the results all of the tubes from each pond are combined to produce one eDNA extract. Then twelve separate analyses are undertaken. If one or more of these analyses are positive the pond is declared positive for the presence of GCN. It may be assumed that small fractions of positive analyses suggest low level presence but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive.
- 1.6. The surveys were undertaken by Sarah Carver (Natural England GCN survey licence level 1 2015-16713-CLS-CLS, Natural Resources Wales GCN survey licence level 1 S085140/1).

Historic records

- 1.7. Historic records, obtained from Cofnod North Wales Environmental Information Service, were interrogated to review whether the ponds had previously supported GCN. Records are presented in Table 1.

Constraints

- 1.8. Limitations and constraints affecting survey techniques will be detailed in Appendix E where the percentage of the shorelines/pond margins that could be accessed is specified. Access to the steep sides of some ponds, silted ponds and those in dense impenetrable woodland was challenging.

2. SITE CONTEXT

- 2.1. The site is accessed off Sesswick Way, a busy road to the south of Wrexham Industrial Estate. The site centre is at grid reference: SJ 36888 47980.
- 2.2. The site comprises a large arable field divided into two separate compartments separated by a track bordered by a hedgerow and public right of way. Surrounding the site are a number of woodlands including mature woodland, ponds, river, mature trees and hedgerows.

3. FIELD STUDY

Ponds

- 3.1. There are no ponds or waterbodies within the red line boundary. Although there are 27 ponds within 250m of the red line boundary that were studied, access was not granted to visit and survey all of them. Access was permitted to ponds 2, 3, 4, 5, 6, 7, 8, 9, 17, 18, 19, 20, 22, 23, 24 (dry), 25 & 26.
- 3.2. Refer to Appendix F for descriptions of ponds and their immediate surrounding habitats.
- 3.3. Some of the ponds are mitigation ponds (2, 3, 4, 8, 9 & 14) constructed approximately 10 years ago as compensation for the construction of Sesswick Road. Ponds 3, 7, 20, 17, 18 & 19, are old. Ponds 22 and 23 were 'functional' lagoons within the Welsh Water Site with ponds 25 and 26 understood to be mitigation ponds within the Welsh Water site.

GCN status at and around the development site

- 3.4. Wrexham is considered to be of national importance for GCN. There are numerous records for great crested newt within 1km of the site and several for the individual ponds within 250m of the site. In addition, there is a terrestrial record from 2016 for a sub-adult on the southern edge of the track. It is considered that due to the proximity of the waterbodies to each other that there is a reasonable certainty of animal interchange between them and therefore a meta-population of GCN exists to the south of the site, possibly spread across two main population centres. There are also numerous records for common amphibians.
- 3.5. There were two additional ponds identified on the boundary of the 250 buffer zone, but separated from the site by habitat barriers. One was present to the south west of Pond 21 on the 250m buffer line border, which was south of the A525 road and the other to the east of Pond 7 east of Bedfield Road at grid reference SJ 37442 47716, which held records of GCN adults, eggs and larvae from 1999-2005.

- 3.6. The HSI survey results and whether or not great crested newts were recorded during any historic surveys are provided in Table 1.
- 3.7. The proposed development areas comprise the main agricultural field and two temporary disturbance areas; one each to the north and west. The main arable field compartment to the east of the track will involve permanent habitat loss by construction of commercial scale glasshouses and reservoirs. The arable compartment to the west of the track will be retained.
- 3.8. The mosaic of terrestrial habitats across and around the site including mature woodland, grassland and tall ruderal vegetation and to a lesser extent the arable land, were considered suitable for great crested newts.

Habitat Suitability Index

- 3.9. The results of the HSI are summarised in Table 1 and detailed Appendix C.
- 3.10. The majority of the ponds provided a range of scores from 0.72 to 0.94 categorising the ponds as between 'good' to 'excellent' in terms of their suitability to support great crested newts, with only two ponds scoring 0.59 'below average'.

eDNA Analysis

- 3.11. Pond water samples were taken on three separate dates in May 2020 in fine and dry weather conditions. The individual sample kit reference numbers and date of sampling are specified in Appendix E.
- 3.12. The results of the eDNA survey indicated that ponds 12 ponds (ponds 2-4, 6-9, 17-18, 23 and 25-26) are used by GCN, with a **positive** result and 1-12 positive replicates. The eDNA sample analysis provided by SureScreen Scientifics are summarised in Table 1 and detailed in Appendix D.
- 3.13. The results are caveated with reference to the limitations and constraints described in section 1.8, where in some instances for some ponds, less than 80% of the shoreline was accessible.

Pond No.	HSI suitability	eDNA results	Cofnod GCN records
1	No authorised access		-
2	Excellent	Positive	Adults and larvae 2005-2015
3	Excellent	Positive	3 males 2017
4	Excellent	Positive	Adults 2017-2019
5	Excellent	Negative	Adults and larvae 2014-2019
6	Excellent	Positive	Adults 2015
7	Excellent	Positive	Adults 2015
8	Good	Positive	Adults and larvae 2014-2017
9	Excellent	Positive	Adults and larvae 2014-2017
10	No authorised access		Adults, larvae and eggs 2000 Adults 2001-2009
11	No authorised access		Adults, larvae and eggs 2000 Adults 2001-2009
12	Dry	N/A	Adults and eggs 1999-2000
13	No authorised access		Adults and larvae 2013-2015
14	No authorised access		Adults and juveniles 2014-2017
15	No authorised access		Adults 2014-2015
16	Dry	N/A	-
17	Excellent	Positive	Male and female 2000 and 2017
18	Excellent	Positive	Present 1992-2000
19	Excellent	Negative	Adults 2014-2015 and before 2003
20	Excellent	Negative	-
21	Below average	No authorised access at the time of survey	-
22	Excellent	Negative	Adult 2002
23	Good	Positive	-
24	Dry	N/A	-
25	Below average	Positive	-
26	Good	Positive	-
27	Excellent	No authorised access at the time of survey	-
Pond on 250m buffer. Grid ref: SJ 37442 47716	Not assessed		Adults, eggs, larvae – 30 records from 1999-2015

Table 1, HSI suitability, eDNA results and history data summary.

4. EVALUATION AND POTENTIAL IMPACTS

GCN status of habitats

- 4.1. No ponds will be directly affected by the development proposals.
- 4.2. The proposed works will require the clearance of vegetated habitats on site, including ≈19.38ha (excluding reservoirs) of an arable field, ≈95m of species-poor hedgerow (Priority Habitat) and a small number of scattered mature trees.
- 4.3. The majority of the proposed development area is likely to constitute suboptimal terrestrial habitat for GCN with, however, some good quality corridors of dispersal. The arable compartments are less favourable than grassland, hedgerows and woodland. The peripheral margins and the grassy track dividing the arable compartments could provide habitat linkages and foraging opportunities.
- 4.4. In terms of its suitability as terrestrial habitat for GCN, although it is accepted that intensively managed arable land is not a barrier to dispersal, it can regulate migration and dispersal, (Great crested newt conservation handbook, Langton *et al.* 2001). The arable field itself offers little opportunities for refuge (daytime, summer or winter), few foraging opportunities and some dispersal though limited. The field margins and hedgerows do however provide habitat linkages and corridors.
- 4.5. Two areas of temporary disturbance for the purposes of pipeline installation will be affected. These are 0.56ha to the west in primary core habitat <50m from known GCN ponds and 0.67ha distant to the north approximately 450m from GCN ponds; most of which is in primary habitat and a proportion of which is in more distant suboptimal habitat. These primary good quality GCN habitat are classified as such because they comprise grassland, scrub and tall ruderal vegetation. Those classified as suboptimal comprise arable intensively managed farmland.
- 4.6. Both the eDNA results and the historic Cofnod records show that a GCN population or populations exist to south, southeast and southwest of the proposed development site. The habitats within the landscape are likely to facilitate good interchange between the ponds and general dispersal where continuity exists and where no major barriers are present. Ponds that do not currently support GCN could feasibly do so in the future based on the results of the HSI Assessment.
- 4.7. Some of the ponds to the southeast of the development were constructed in 2010 as part of the mitigation and compensation measures for the development of Sesswick Road and are under monitoring and management for the purposes for great crested newt conservation.

GCN Status

- 4.8. The current full population status of GCN in the ponds around the site is not known. The GCN status in Wrexham is accepted to be of National Importance and of European Importance within northeast Wales.

Predicting Impacts of the development on the GCN population status

- 4.9. Impacts have been assessed below in accordance with guidance set out in section 6 of the Great Crested Newt Mitigation Guidelines (English Nature, 2001): -

Pre- and mid-development short term impacts

- 4.10. There is perceived to be a general increased disturbance to habitats and species during the construction period. Site clearance, regrading, drainage work and degradation of habitats are likely to be the main effects. There is the potential for killing, injuring or disturbing GCN.

Long-term impacts

- 4.11. Permanent loss and modification of terrestrial habitat, comprising foraging, refuge/hibernation and dispersal routes are considered to be the primary impacts. Even when ponds are unaffected directly, GCN populations can become less viable through terrestrial habitat loss and fragmentation and isolation.
- 4.12. Other impacts could be deemed as alteration in runoff volumes and water chemistry, changes to water quality, alteration in other amphibian and invertebrate assemblage and effects relating to biosecurity.

Post-development interference impacts

- 4.13. Alteration in lighting, traffic and noise could be considered as potential impacts.

Cumulative influences

- 4.14. Cumulative influences on existing ponds must be considered and assessed in the context. These include past, present and future potential developments, for example both the construction of Sesswick Road and the proposed new glasshouse development.

Positive impacts

- 4.15. Positive impacts that have been identified include increased dispersal opportunities for newts from the south to the new mitigation site in the north. This could lead to a higher more viable metapopulation less prone to future threats. Furthermore, the long-term management of a site designed for the benefits of GCN is considered to have more conservation and biodiversity value than that of a large intensively farmed arable compartment.

Current conservation status and determining impacts

- 4.16. In order to achieve long term FCS, Current Conservation Status ("CCS") must be assessed. Some work assessing population changes in ponds to the south and southeast of the proposed development by Middlemarch Environmental as part of the Sesswick Road development has already been undertaken.
- 4.17. The Spatial Action Plan for Great Crested Newts in Wrexham Report Number 77 Natural Resources Wales Modelling NRW March 2017 is a Manual for Achieving FSC. It provides a strategy for setting out how to achieve the greatest conservation benefit for great crested newts.
- 4.18. The Spatial Action Plan report sets out scoring methodology that can be used to determine the CCS of GCN at a single pond or a series of ponds and predictive modelling techniques to determine FCS for the county of Wrexham.
- 4.19. It uses a number of attributes and considers for assessment both positive and negative factors in relation to site protection and surrounding land use, pollution risk, human disturbance, natural succession, environmental change. The scores are derived from assessing population size, pond density, habitat quality and prospects to the pond persisting.
- 4.20. The distribution of pond quality across the whole population would also need to be considered.
- 4.21. In accordance with the Spatial Plan, *'the impact of a project upon a great crested newt population can be assessed as the predicted change in CCS as a result of the activity'*.
- 4.22. In accordance with the Spatial Plan the following methodology must be adopted to assess an impact of a development:-

'1. The total CCS for the population should be calculated in absence of the proposed activity. This is calculated as detailed in Chapter 5 where each pond comprising the population is scored in terms of its population size, HSI score and number of ponds within the vicinity. The total CCS can be used to establish a baseline metric for assessing the population prior to the activity. Individual pond scores should be assessed to see if the population is in a favourable conservation status.'

2. *The CCS should be calculated for the population after the proposed activity, in the absence of any mitigation.*
3. *The difference between the total CCS before and after should be calculated in order to quantify the loss of conservation status.*
4. *Individual pond scores should be used to assess whether the population is favourable after the activity. An accurate impact assessment relies on being able to accurately predict CCS after the activity. Some aspects of this are relatively straightforward, whereas others are more difficult'.*

4.23. The Spatial Plan states that ...

'The CCS of a species is considered to be the sum of all elements of its biological condition and all influences acting upon it, and can be described by the status of its:

- *range/area of occupancy within the range*
- *viability and abundance of populations*
- *amount of habitat*
- *future prospects*

The conservation status of a species can be considered favourable when the species is prospering (in both quality and extent/population) and with good prospects to do so in the future (Evans & Arvela 2011)'.

4.24. Table 7.2 in The Spatial Action Plan provides advice for predicting the impacts of development on pond HSI scores.

4.25. The Spatial Action Plan maintains that the primary objective of GCN mitigation is to maintain the conservation status of GCN in the long-term, and as such it must ensure that in the very least there is no long-term loss. Because successful mitigation cannot be guaranteed, it upholds the provision of additional resources as an 'insurance' mechanism to increase the chance of success. It specifies that

'the mitigation targets should be proportional to the value of the population (i.e. the contribution of the population to overall FCS) and the severity of the predicted impact'.

4.26. The Spatial Plan goes on to say that

'The likely effectiveness of a mitigation scheme can be assessed using the same method as the impact assessment. Once the mitigation has been designed, the predicted total and relative CCS for the affected population post mitigation can be calculated and compared to that prior to the development. The aims of any mitigation scheme should be:

1. *To ensure that there is no net loss in CCS as a result of the development*
2. *To maintain affected populations at FCS*
3. *Dependent on the level of impact, to enhance the CCS of affected populations. For high impact schemes (any project involving the loss of ponds or core terrestrial habitat) the mitigation should aim to increase the total CCS by at least 1.3x the pre- development level, and ensure all affected populations are at FCS, regardless of their CCS before the development. For a moderate impact project, the mitigation should aim to increase the CCS of the affected populations. For low impact schemes, the CCS is not predicted to decline as a result of the development and therefore the mitigation will be would be focussed on the protection of individual animals in order to ensure legal compliance.'*

Impacts of the development on the GCN population status in relation to CCS

- 4.27. On balance, based on **predicting Impacts of the development on the GCN population status** above, the impact is assessed to be **Moderate-High** with no loss of aquatic habitat and the majority of the habitat lost considered suboptimal. Some loss of **primary core habitat** is acknowledged in the southeast region of the site adjacent to the 'Sesswick Road' existing mitigation ponds. Intermediate and distant losses of poorer quality newt habitat are also envisaged. Temporary disturbance of good quality habitat followed by reinstatement are likely to exert impacts.
- 4.28. The CCS of the affected GCN population to the southeast of the proposed development should be calculated and used to determine the requirements of the habitat creation, which should aim to significantly increase the CSS or converted into a financial contribution for habitat creation, management and monitoring by a third party or specialist body.

Achieving FCS

- 4.29. Assessing whether the status of the species is favourable, 'Favourable Reference Values' (FRV) for each of the four components of status must be calculated (population size, number/density of ponds, habitat quality and prospects).
- 4.30. A variety of options for achieving FCS at a county level in Wrexham were considered in the Spatial Plan. Restoring the number of ponds with an **HSI >0.7 to 1843** levels was concluded to be the preferred option.
- 4.31. 1843 pond data was selected as a baseline because it reflected the status of GCN prior to the significant decline recorded in the 20th Century. The Spatial Plan states that '*Gleed-Owen (2007) estimated a 37% decline in the number of ponds in northeast Wales between 1843 and 2007*'.

4.32. The Spatial Plan goes on to state that...

'Based on this rationale, FCS in Wrexham will be met when there is either the equivalent number of ponds in total or the (estimated) equivalent number of ponds occupied by crested great newts or the (estimated) same number of high quality ponds (i.e. with HSI's >0.7) as there would have been in 1843'.

Proposed Targets

4.33. In order to achieve, maintain and measure FCS, targets would need to be set out in the mitigation strategy both for existing ponds in the landscape in proximity to the development and then new ponds created as part of the mitigation scheme. This concept is discussed in Section 5.

5. DISCUSSION, SPECIES PROTECTION & MITIGATION

General Principles

- 5.1. The main impacts requiring mitigation are considered to be the loss of terrestrial habitat along with interference in habitat connectivity. Other influences include temporary disturbance and reinstatement of terrestrial habitat, general disturbance effects, road layout and installation of drainage and engineering features, noise, lighting, changes in runoff and water quality affecting existing ponds.

Key Principles of mitigation

- 5.2. Principles of mitigation have been assessed below in accordance with guidance set out in section 7 of the Great Crested Newt Mitigation Guidelines (English Nature, 2001): -
- 5.3. It is recognised by the Great Crested Newt Mitigation Guidelines (English Nature, 2001) that there are two main elements –
- i. **Mitigation** which is defined as practises to reduce or remove damage by for example altering the layout of the proposed development, or capturing newts to avoid killing.
 - ii. **Compensation** which is offsetting the damage caused by the development by creation and management of new habitat and newt population.
- 5.4. The primary aim being to ensure that there is no detriment to conservation status of GCN. In addition, the conservation of common amphibians ought to be promoted.
- 5.5. **The level of mitigation required is said by** the Great Crested Newt Mitigation Guidelines (English Nature, 2001) to *‘depend on the size and type of impact, and the importance of the population affected’*.
- 5.6. A full population class assessment has not been undertaken within ponds surrounding the proposed development, but the ponds to the south are accepted in the very least as supporting or capable of supporting a breeding population and should be evaluated in the very least, collectively as a large size class. Based on using section 5.8.5 of Natural England GCN Mitigation Guidelines, ‘Site Status Assessment’ it would qualify as of **High Importance** in terms of **quantitative assessment** in accordance with Natural England guidance. **Qualitatively**, it is categorised as of **moderate importance** because although breeding is occurring, habitats are common in the county of Wrexham and the locality of northeast Wales. **Functionally**, because there is dispersal to and from other nearby populations and the site plays an important role for nearby populations, this would qualify it as of **major importance**. From a **contextual** view point,

the population is not fully assessed, but is thought to be typical of that in the local area and so of **moderate importance**.

Outline Mitigation Approach

- 5.7. Any development would need to meet the three tests in the European Protected Species licensing process which includes demonstrating that there are reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment, providing evidence of no other satisfactory alternative to the development and 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. Furthermore, a suitable compensation area of habitat to replace that lost to development would need to be provided. Natural Resources Wales ("NRW") have advised that there is a policy of needing to provide an equivalent compensation area to that of the size of area lost to development. This could be provided on site, off site but close to the site or based on a combination of both approaches. Another option that could be considered is to make a financial contribution towards a designated strategic GCN site.
- 5.8. Compensation site safeguarding would need to be secured in addition to long-term sustainable management and monitoring implemented for a period of circa 25 years to the satisfaction of Wrexham County Borough Council ("WCBC") and NRW.
- 5.9. Mechanisms must be adopted to ensure long-term secure management such as transfer of land and/or resources to an appropriate independent entity.
- 5.10. Monitoring of the nearby existing GCN population would need to be undertaken to measure FCS.
- 5.11. Although any proposals will require a European Protected Species Mitigation Licence from NRW to legally permit the development, the impact to GCN would however be greatly reduced if the development size was decreased and as much habitat retained as possible. Attempts have been made to achieve this with the retention of a 4m grassland swathe around the infrastructure.
- 5.12. In order to be able to proceed with the proposed works and to ensure that no detrimental impacts will result on the species, a European Protected Species mitigation licence from Natural Resources Wales will be required for the proposed works. The following mitigation and compensatory measures are recommended:
 - i. The creation of an amphibian receptor area ('mitigation area') and 'green buffer' zones to the northwest, east and south of the proposed glasshouse (totalling ~19.82ha). The scheme will include terrestrial and aquatic habitats. These areas are currently intensively managed

arable farmland, bordered by mature woodland, a river corridor, grassland, scrub and further arable fields. Please refer to Appendix I for the proposed mitigation scheme.

- a. Terrestrial habitats should consist of a species-rich rough grassland ($\approx 17.53\text{ha}$), with scrub ($\approx 0.33\text{ha}$) and woodland ($\approx 1.16\text{ha}$) planting, and the creation of 12 south facing bunds/hibernacula (Appendix H) that are covered in low-nutrient soils. These bunds will create variation in site topography and provide varying microclimates for amphibians.
 - b. The planting of a new species-rich (≥ 5 native species) hedgerow and tree belt, measuring $\approx 565\text{m}$ and $\approx 325\text{m}$ along the western and northern boundaries of the proposed glasshouse respectively. A list of suitable native species for planting and sowing is provided in Appendix H.
 - c. Habitat corridors to be maintained and encourage dispersal from the south. A track of 565m in length and about 4m wide (0.23ha) consisting of a modified tall ruderal grassland mosaic and a hedgerow to be retained and protected between the two arable fields.
 - d. Aquatic habitats should consist of the creation of 21 new ponds throughout the mitigation areas. The ponds should have a surface area of $100\text{--}300\text{m}^2$ (totalling $\approx 0.57\text{ha}$), with a maximum depth of 2.5m , gradually sloping sides and a 1m deep shelf on the southern section to provide breeding areas for newts. No fish are to be released into the ponds.
- ii. A temporary exclusion fencing with pitfall traps (100 traps/ha) to be installed around the site perimeter and checked for a minimum of 60 nights, in suitable weather conditions and during the active season for amphibians (March to October). Any animals caught are to be translocated to the designated receptor area. The fence will remain in situ during the construction period to prevent amphibians moving back into the area of works.
 - iii. During the trapping period, night searches will be conducted by a licenced ecologist. The search will involve a thorough inspection of the site using high powered torches for active amphibians approximately an hour after sunset.
 - iv. Phased vegetation clearance conducted during the defined trapping period. The initial cut should be to a height of 10cm , with subsequent cuts once a week to maintain sward height.
 - v. A hand destructive search of all suitable amphibian habitat to take place at the end of the trapping period, under watching brief by a licensed GCN ecologist. Any animals caught are to be translocated to the designated receptor area.

- vi. Storage of building materials to be raised from the ground on pallets to avoid providing potential resting places for amphibians.
- vii. Any excavations should have a rough sawn plank placed inside to act as a ramp to allow any animals that have fallen in to escape. The excavations should be checked each morning works are scheduled for, to remove any animals trapped.
- viii. Long-term monitoring of the GCN population in accordance with the Great Crested Newt Mitigation Guidelines (English Nature, 2001).

Habitat Management and Monitoring

- 5.13. Mitigation measures following the works will include the long-term management of the receptor area to maintain the ponds, a species-rich tussocky grassland and limit scrub encroachment.

Management Objectives:

- i. Maintenance of grassland areas to minimise invasive weed growth while introducing a sympathetic management regime to encourage other priority species;
- ii. Replacement of all failed trees and shrubs in woodland, scrub and hedgerows during the establishment phase;
- iii. Removal of tall and herbaceous vegetation around planted areas to minimise soil moisture competition;
- iv. Promotion of rapid tree and shrub growth and reducing the risk of pest damage;
- v. Promotion of species rich wet meadow grasslands;
- vi. Management of ponds for the maintenance of the great crested newt population at a favourable conservation status;
- vii. Control of invasive plants in the ponds;
- viii. Maintenance of aquatic vegetation cover suitable for GCNs;
- ix. Maintenance of habitat connectivity to promote newt dispersal;
- x. Manage and maintain existing habitats to promote target species;
- xi. Maintenance of fencing, drainage infrastructure, footpaths and access points.

Species Rich Wetland Meadow Grassland Management:

- i. Once an established sward is achieved grasslands will be trimmed to a height no lower than 75mm once annually in either April, May or September (following an ecological assessment

for nesting birds). Grasslands will be cut with a mower with the cutting bar specially adjusted to be raised.

- ii. A zoned management approach will be taken to grassland management leaving some areas un-mown at different times of the year to encourage structural diversity to provide habitat for nesting birds, encourage late flowering species to seed and to provide refuges for insects.
- iii. Meadows will be cut once per year with arisings being raked off and either removed from site and/or some placed on top of or near the hibernacula.
- iv. Mowing will not be undertaken within the immediate vicinity of the ponds but periodic vegetation management to facilitate access for monitoring will be undertaken.
- v. Consideration could be given to a grazing regime at an appropriately devised low stocking density.

Pond Monitoring, Management and Maintenance:

- i. Ponds will be monitored annually in spring by inspection during the monitoring surveys or separately if not being surveyed for great crested newts that year and should any one species become dominant the spread will be controlled through hand pulling of encroaching vegetation in November -January to maintain no less than 60% open water;
- ii. The ponds will remain free of any over-shading and leaf litter;
- iii. The ponds will be fenced and secure from public interference therefore dumping of rubbish / litter will be unlikely; however, any rubbish found during annual monitoring will be removed;
- iv. In the event of the ponds not retaining water, they will be repaired.
- v. The ponds and reservoirs will be monitored for the presence of fish and invasive plant species and should they become present methods will be implemented to ensure they are safely eradicated.
- vi. In the event of fire, acute pollution or other major damage, methods will be implemented to reinstate the pond.
- vii. Fencing will be maintained around the ponds to discourage public access.

Woodland Management to Proposed Woodland, Scrub and Hedgerows:

- i. Ring weed all establishing trees and shrubs with approved glyphosate herbicide applied at manufacturers recommended rates annually if required, to maintain a weed free zone

within a 0.5m radius of the base of each plant. This shall include weed growth within the spirals; where weeds must be carefully removed by lifting the guard and folding the weeds out onto the ground where they can be sprayed;

- ii. Where appropriate a Controlled Droplet applicator (CDA) or Knapsack sprayer with a shield shall be used to minimise spray drift (No herbicide will be used in the vicinity of ponds);
- iii. Application will be limited to once a year in the months of either April or May to ensure no terrestrial newts are adversely affected.
- iv. Should any trees die or become diseased during the aftercare phase they will be replaced with a tree of the same species and size
- v. Selective thinning and pruning of scrub and woodland and woodland planting blocks reaching approximately 10 years will be undertaken to promote species and structural diversity.
- vi. Annual trimming of existing and established hedgerows outside of the bird nesting season.
- vii. Stock proof fencing will be erected around the woodlands and scrub and will be maintained.

GCN Monitoring

- i. Monitoring of the GCN population in the 12 new mitigation ponds will be carried out annually for the management and monitoring duration of 25 years.
- ii. Monitoring will consist of egg searches and two GCN torch count visits annually.
- iii. Common species of amphibian and reptile will also be recorded.
- iv. Invasive species will be recorded and control/eradication measures implemented accordingly.
- v. An annual assessment of pond aquatic/marginal vegetation cover, fish, wildfowl and invasive species will be carried out.
- vi. An annual inspection of terrestrial habitats will be undertaken and records kept to determine management prescriptions.
- vii. The results will be entered onto the Cofnod online Wales recording system.

Annual Report

- i. A report summarising the management and results of the monitoring undertaken in the preceding year will be submitted annually to WCBC and NRW in December.
- ii. An annual meeting will be held with the management organisation, WCBC and NRW.

- iii. Management and monitoring will be reviewed every five years and appropriate corrective action and adjustments will be made in liaison with WCBC and NRW.
- 5.14. After the effects of the above mitigation, we predict a significant enhancement of the favourable conservation status of GCN on and near the site, and we therefore consider that an EPS mitigation licence should be granted by NRW.

Proposed Targets

- 5.15. The proposed targets for the ponds within the GCN mitigation areas and Ponds to the south of the development are as follows:
- i. For all new Glasshouse Mitigation Ponds the HSI score should be between Good and Excellent (0.7+).
 - ii. All ponds that supported GCN populations prior to the development should continue to support them at least equal to the population prior to works commencing.
 - iii. All ponds that were created as aquatic mitigation habitat should support GCN populations with a target of 'medium' class size.
 - iv. The overall population level for the new Glasshouse mitigation area and ponds to the south collectively should be greater than the overall population (ponds deemed to be with 250m of each other) and greater than for the metapopulation (ponds deemed to be within 500m of each other) that existed in the south prior to works commencing.

Summary of Habitat Losses, Temporary Disturbance and Creation

Habitat type		Habitat (ha)					
		Permanent losses	Temporary disturbance & reinstatement	Created mitigation area 1	Created mitigation area 2	Created mitigation area 3	Created mitigation area 4
Aquatic habitats (excluding reservoirs) (ha/number)	New proposed ponds	0	0	0.08 (4 ponds)	0.23 (8 ponds)	0.23 (8 ponds)	0.03 (1 pond)
	Existing ponds					0.03 (1 pond)	0.015 (1 pond)
Terrestrial	Grassland/ ruderal mosaic (ha)	0	0.88	2.55*	3.69*	8.55*	2.74*
	New proposed woodland (ha)	0	0	0.21	0.41	0.54	0
	Arable (ha) (excluding area lost to new mitigation areas)	21.75	0.87	0	0	0	0
	Hedgerow (m)	95**	30	0	565*** 1657 trees and shrubs	0	0
	Scrub (ha)	0	0.2	0.33	0	0	0
	Woodland belt (m)	0	0	0	325 (36 trees)	0	0
	Mature trees	2 (possibly 3)	0	0	See woodland belt	0	0
	Existing woodland to be managed	0	0	0	0	0.18	0
	Existing neutral grassland to be managed	0	0	0	0	0	0
	Existing river corridor	0	0	0	0	0	0

Table 2, summary of habitat losses, disturbance, creation and enhancement.

* species-rich grassland. ** remnant isolated in centre of arable field. *** outside of mitigation area.

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Wrexham Borough Council, Local Planning Guidance Great Crested Newt Mitigation Requirements – Johnstown Newt Site SAC and the Wider Countryside Planning Document

Appendix A

Legislation

European Protected Species

National Planning Policy - National Planning Policy Framework (NPPF)

Section 15 of the National Planning Policy Framework 2019 (NPPF): Conserving and enhancing the natural environment states that ‘planning policies and decisions should contribute to and enhance the natural and local environment by ... minimising impacts on and providing net gains for biodiversity.’

Office of The Deputy Prime Minister (“ODPM”) Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the planning system.

Paragraph 98 of Circular 06/2005 states that ‘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’.

Implications of legislation and policies

Without this ecological assessment, the potential developer would be unable to demonstrate due diligence in his responsibilities. Furthermore, the local planning authority would not have been provided with sufficient information for a planning decision to be made. This could result in non-determination or refusal of the application.

With legal responsibilities and planning implications, it is essential that any ecological assessment of a potential development site, including the area of this report, must determine the possible presence or absence of any protected species as part of any planning development consideration.

Where mitigation or compensation measures are required to ensure that no significant impacts will result on biodiversity from the development, the proposed measures may be secured through planning conditions or by EPS Mitigation Licences from Natural England or Natural Resources Wales.

Great Crested Newts

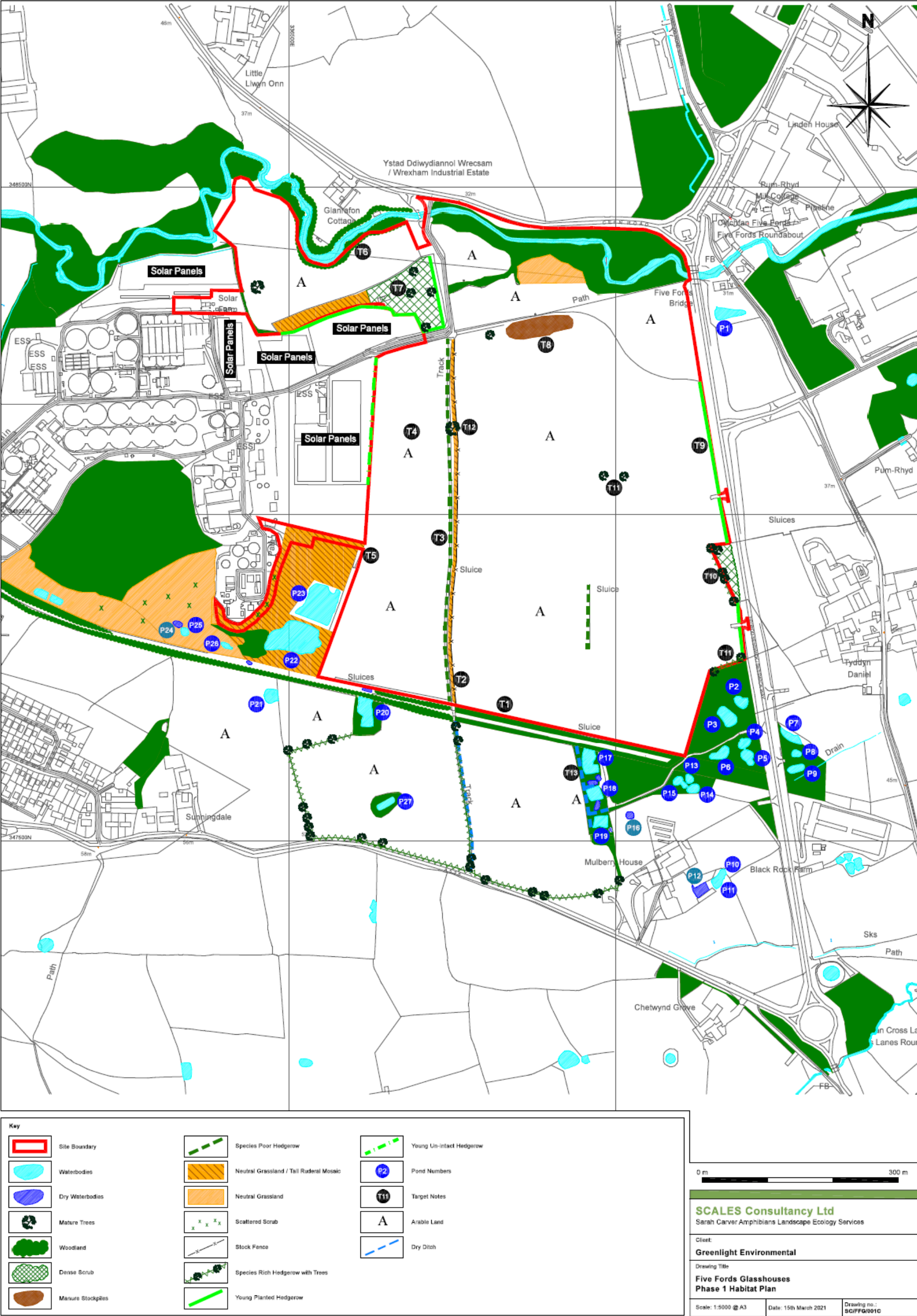
Great crested newts are protected under both English and European law. It is an offence to kill, injure, disturb or take great crested newts or to damage or destroy their places of shelter, whether the animals are present or not.

Natural England or Natural Resources Wales Licensing - EPS Mitigation Licensing

Licences can be obtained from the Wildlife Management and Licensing Service at Natural England or Natural Resources Wales to allow certain activities that would otherwise constitute an offence, for the purposes of development (e.g. destruction of a bat roost, loss of great crested newt aquatic and terrestrial habitat, etc).

Appendix B

Pond locations



Appendix C

HSI scoring table

Pond	1	2	3	4	5	6	7	8	9	10	11
Geographic location	No authorised access	Zone A	Zone A	Zone A	Zone A	Zone A	Zone A	Zone A	Zone A	Authorised access refused	Authorised access refused
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Pond surface area (m ²)		300m ²	550m ²	200m ²	300m ²	350m ²	300m ²	100m ²	200m ²		
		0.60	1.00	0.40	0.60	0.70	0.60	0.20	0.40		
Desiccation rate		Never	Never	Never	Never	Never	Never	>3 years in 10	>3 years in 10		
		0.90	0.90	0.90	0.90	0.90	0.90	0.50	0.50		
Water quality/invert density		Good	Good	Good	Good	Good	Good	Good	Good		
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Shoreline shade (%)		50%	50%	30%	30%	80%	50%	70%	70%		
		1.00	1.00	1.00	1.00	0.60	1.00	0.80	0.80		
Waterfowl impacts		Absent	Minor	Absent	Absent	Absent	Absent	Absent	Absent		
		1.00	0.67	1.00	1.00	1.00	1.00	1.00	1.00		
Fish impacts		Absent	Minor	Absent	Absent	Absent	Absent	Absent	Absent		
		1.00	0.67	1.00	1.00	1.00	1.00	1.00	1.00		
Ponds within 1km		13+	13+	13+	13+	13+	13+	13+	13+		
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Terrestrial habitat quality		Good	Good	Good	Good	Good	Good	Good	Good		
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Macrophyte cover (%)		60%	10%	80%	80%	50%	50%	70%	70%		
		0.90	0.40	1.00	1.00	0.80	0.80	1.00	1.00		
HSI Score		Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Excellent		
		0.93	0.83	0.90	0.94	0.88	0.91	0.77	0.83		

Pond	12	13	14	15	16	17	18	19	20	21*	22
Geographic location	Dry	No authorised access	No authorised access	No authorised access	Dry	Zone A	Zone A	Zone A	Zone A	Zone A	Zone A
						1.00	1.00	1.00	1.00	1.00	1.00
Pond surface area (m ²)						700m ²	600m ²	350m ²	800m ²	150m ²	3,000m ²
						1.00	1.00	0.70	0.99	0.25	0.80
Desiccation rate						Never	Never	Never	Never	Annually	Never
						0.90	0.90	0.90	0.90	0.10	0.90
Water quality/ invert density						Good	Good	Good	Good	Poor	Moderate
						1.00	1.00	1.00	1.00	0.33	0.67
Shoreline shade (%)						50%	80%	40%	50%	60%	30%
						1.00	0.60	1.00	1.00	1.00	1.00
Waterfowl impacts						Absent	Absent	Absent	Absent	Absent	Minor
						1.00	1.00	1.00	1.00	1.00	0.67
Fish impacts						Absent	Absent	Absent	Absent	Absent	Absent
						1.00	1.00	1.00	1.00	1.00	1.00
Ponds within 1km						13+	13+	13+	13+	13+	13+
						1.00	1.00	1.00	1.00	1.00	1.00
Terrestrial habitat quality						Good	Good	Good	Good	Moderate	Good
						1.00	1.00	1.00	1.00	0.67	1.00
Macrophyte cover (%)						20%	10%	10%	10%	70%	30%
						0.50	0.40	0.40	0.40	1.00	0.60
HSI Score						Excellent	Excellent	Excellent	Excellent	Below average	Excellent
						0.92	0.86	0.84	0.90	0.59	0.85

Pond	23	24	25	26	27*	Pond on 250m buffer. Grid ref: SJ 37442 47716
Geographic location	Zone A	Dry	Zone A	Zone A	Zone A	Not assessed
	1.00		1.00	1.00	1.00	
Pond surface area (m ²)	2,500m ²		50m ²	100m ²	300m ²	
	0.80		0.10	0.20	0.50	
Desiccation rate	Never		Annually	>3 years in 10	Rarely dries	
	0.90		0.10	0.50	1.00	
Water quality/ invert density	Poor		Moderate	Moderate	Moderate	
	0.33		0.67	0.67	0.67	
Shoreline shade (%)	5%		0%	40%	50%	
	1.00		1.00	1.00	1.00	
Waterfowl impacts	Minor		Absent	Absent	Absent	
	0.67		1.00	1.00	1.00	
Fish impacts	Minor		Absent	Absent	Absent	
	0.33		1.00	1.00	1.00	
Ponds within 1km	13+		13+	13+	12	
	1.00		1.00	1.00	0.95	
Terrestrial habitat quality	Good		Good	Good	Good	
	1.00		1.00	1.00	1.00	
Macrophyte cover (%)	10%		50%	40%	30%	
	0.40		0.80	0.70	0.60	
HSI Score	Good		Below average	Good	Excellent	
	0.72		0.59	0.74	0.85	

Table 3, HSI score for ponds within 250m of the proposed site. *data assumed from opposite side of fence. ** pond discovered and assessed on 28th February 2021.

Appendix D

eDNA results



Folio No: E7547
 Report No: 1
 Purchase Order: Etienne Swarts
 Client: GREENLIGHT
 Contact: Etienne, Sarah Carver

TECHNICAL REPORT

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

SUMMARY

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

RESULTS

Date sample received at Laboratory: 28/05/2020
Date Reported: 04/06/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
2761	Pond 20, Five Fords		Pass	Pass	Pass	Negative	0
2762	Pond 17, Five Fords		Pass	Pass	Pass	Positive	2
2763	Pond 3, Five Fords		Pass	Pass	Pass	Positive	8
2765	Pond 9, Five Fords		Pass	Pass	Pass	Positive	4
2767	Pond 18, Five Fords		Pass	Pass	Pass	Positive	2
2769	Pond 4, Five Fords		Pass	Pass	Pass	Positive	5
2771	Pond 2 (2), Five Fords		Pass	Pass	Pass	Positive	1



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 Company Registration No. 08950940



2772	Pond 19, Five Fords		Pass	Pass	Pass	Negative	0
2773	Pond 5, Five Fords		Pass	Pass	Pass	Negative	0
2774	Pond 6, Five Fords		Pass	Pass	Pass	Positive	2
2775	Pond 26, Five Fords		Pass	Pass	Pass	Positive	1
2777	Pond 22, Five Fords		Pass	Pass	Pass	Negative	0
2778	Pond 23, Five Fords		Pass	Pass	Pass	Positive	1
2779	Pond 8, Five Fords		Pass	Pass	Pass	Positive	5
2780	Pond 7, Five Fords		Pass	Pass	Pass	Positive	12

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

Reported by: Sarah Evans

Approved by: Chris Troth

METHODOLOGY

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

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

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

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

INTERPRETATION OF RESULTS



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



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Folio No: E7624
Report No: 1
Purchase Order: Etienne
Client: GREENLIGHT
Contact: Sarah Carver

TECHNICAL REPORT

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

SUMMARY

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

RESULTS

Date sample received at Laboratory: 04/06/2020
Date Reported: 11/06/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
2768	Pond 25, Five Fords		Pass	Pass	Pass	Positive	5

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

Reported by: Chris Troth

Approved by: Sarah Evans



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Page 1 of 2



METHODOLOGY

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

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

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

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

INTERPRETATION OF RESULTS

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



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Appendix E

eDNA sample information

Pond No.	Kit lab reference	Sample date	Percentage of shoreline sampled %	Posted for next day delivery	Notes
1	-	-	-	-	No authorised access
2	2771	24/05/20	85	26/05/20	-
3	2763	24/05/20	65	26/05/20	-
4	2769	24/05/20	100	26/05/20	-
5	2773	24/05/20	100	26/05/20	-
6	2774	24/05/20	100	26/05/20	-
7	2780	24/05/20	75	26/05/20	-
8	2779	24/05/20	100	26/05/20	-
9	2765	24/05/20	100	26/05/20	-
10	-	-	-	-	No authorised access. Fish introduced according to owner
11	-	-	-	-	No authorised access. Fish introduced according to owner
12	-	-	-	-	Dry
13	-	-	-	-	No authorised access
14	-	-	-	-	No authorised access
15	-	-	-	-	No authorised access
16	-	-	-	-	Dry
17	2762	24/05/20	80	26/05/20	-
18	2767	24/05/20	70	26/05/20	-
19	2772	24/05/20	70	26/05/20	-
20	2761	24/05/20	80	26/05/20	-
21	-	-	-	-	No authorised access
22	2777	26/05/20	60	26/05/20	-
23	2778	26/05/20	60	26/05/20	-
24	-	-	-	-	Dry
25	2768	29/05/20	100	03/06/20	-
26	2775	26/05/20	100	26/05/20	-
27	-	-	-	-	No authorised access

Appendix F

Pond descriptions

Numbers/letters in brackets after the Pond number are the name/code assigned to the pond according to Middlemarch pond numbering system.

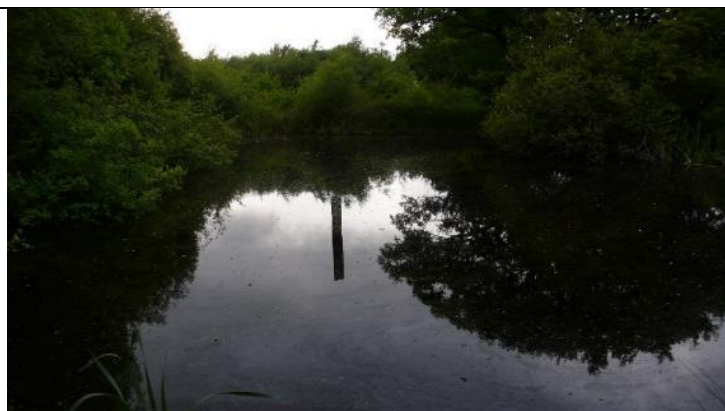
Pond 1 – Understood to be a water attenuation lagoon constructed as part of the development for the new Sesswick Road.

No photo

Pond 2 (N1) – A medium pond 280m² surrounded by dense willow including coppiced goat willow *Salix cinerea*. Reedmace *Typha latifolia*, and Rush *Juncus sp.* Water forget-me-not *Myosotis scorpioides* present. Depth not known.



Pond 3 (X2) – A large old pond of approximately 550m² in size, heavily shaded by mature woodland with little marginal or aquatic vegetation. Some reedmace, broad-leaved willow herb, bittersweet *Solanum dulcamara*, horsetail *Equisetum sp.* and broad-leaved pondweed *Potamogeton natans* were present.



Pond 4 (N4 on marker post) - A medium pond approximately 230m² with well-established marginal and aquatic vegetation comprising mainly of common reedmace. Broad-leaved pondweed was present in the open water areas. Fool's watercress *Apium nodiflorum*, Rush species and sedges were present. Pond was surrounded by dense goat willow scrub. Pond connected by a shallow ditch to pond 5.



Pond 5 (N2 on marker post) – A pond very similar to pond 4 about 320m². Pond connected by a shallow ditch to pond 4



Pond 6 (N3 on marker post) – 360m² approximately. Pond surrounded by dense goat willow with reedmace, broad-leaved pondweed and rush. Pond did not appear to be particularly deep.



Pond 7 (X1) – a small pond with 150m² open water but 320m² in total surrounded by dense bramble with some mature oak trees. Reedmace was present and much of the surface was covered in duckweed *Lemna minor*. Some bittersweet was present on the edges. The southern edge was more open water with reedmace dominating the northern end.



Pond 8 (N5) – approximately 125m². possibly a mitigation pond for the road Marginal and aquatic vegetation includes reedmace and broad-leaved pondweed and covered approximately 70% of the water surface. Some rush and large bittercress *Cardamine amara* was present on the margins.



Pond 9 (N6) – A pond about 200m², possibly a mitigation pond for the road, estimated to be approximately 1m deep with 70% vegetation cover. Plants included Broad leaved pond weed, reedmace, large bittercress, fool's watercress.



Pond 16 - A dry farm pond.



Pond 17 (X5 on marker post). 700m² approximately.
An old deep shaded pond surrounded by mature woodland. A large proportion of the surface had a covering of duckweed. Rush sp., horsetail, reedmace and bittersweet were recorded.



Pond 18 (X7) - 500m² approximately.
An old deep shaded pond surrounded by mature woodland. A large proportion of the surface had a covering of duckweed. Very little aquatic or marginal vegetation. Some reedmace was present. Smaller dry pools were present to the north and south. The southern may contain water at higher water levels.



Pond 19 (X9 on marker post) – 350m² approximately. A partially shaded old pond within mature woodland. Vegetation included Willowherb *Epilobium sp.*, Horsetail, rush, broad-leaved pondweed and water starwort *Callitriche paulustris*.



Pond 20 (X11) - A large pond with silty shallow edges 800m² approximately. Situated in dense mature woodland. Some limited vegetation included reedmace and bittersweet.



Pond 21 – A small shallow pond in a horse grazed field with Reedmace. Assessed from a distance on the opposite side of the fence to the north. 150m² approximately.



Pond 22 – A large lagoon 3000m² approximately within the Welsh Water property with shallow silty edges and willow on the banks. A fringe of dense Reedmace was present on the shoreline with frequent Gipsywort *Lycopus europaeus* and occasional bittersweet.



Pond 23 – A large engineered raised lagoon 2500m² approximately within the Welsh Water property. Possibly deep with reedmace. Nettle and dense bramble dominate the banks and Gipsywort and *Epilobium sp.* are frequent. Coot *fulica atra* was present. Anecdotal evidence of presence of fish. Swallows were skimming over the surface.



Pond 24 – A very small dry 'mitigation' pond. Bare exposed banks.



Pond 25 – A very small 'mitigation' pond with reedmace as the dominant plant and occasional rush species. Approximately 50m² with bare exposed banks.



Pond 26 – A fairly small 'mitigation' pond. Rush species, reedmace and Ragged robin *Lychnis flos-cuculi* were present. Approximately 100m².



Pond 27 – A linear pond 10m x 30m narrower at the north eastern end and wider at the south western end. Contains inundated woodland. The pond is situated within the middle of an arable field setting of open pasture with intact hedgerows on the boundaries.



Appendix G

Native species suitable for planting and sowing

Plants should be obtained from specialist nurseries and preferably be of local genetic stock.

Key: (f) – fruit and berry species; (e) – evergreen species; (se) semi-evergreen species; (d) – deciduous species

Trees	
Alder (d)	<i>Alnus glutinosa</i>
Apples (f; d)	<i>Malus spp.</i> (local varieties)
Ash (d)	<i>Fraxinus excelsior</i>
Beech (d)	<i>Fagus sylvatica</i>
Bird cherry (f; d)	<i>Prunus padus</i>
Elder (f; d)	<i>Sambucus nigra</i>
Elm (d)	<i>Ulmus procera</i>
Field maple (d)	<i>Acer campestre</i>
Pedunculate oak (d)	<i>Quercus robur</i>
Rowan (f; d)	<i>Sorbus aucuparia</i>
Pears (f; d)	<i>Pyrus spp.</i>
Silver birch (d)	<i>Betula pendula</i>
Small-leaved lime (d)	<i>Tilia cordata</i>
White willow (d)	<i>Salix alba</i>
Wild cherry (f; d)	<i>Prunus avium</i>
Walnut (d)	<i>Juglans regia</i>

Shrubs	
Blackthorn (f; d)	<i>Prunus spinosa</i>
Buckthorn (f; d)	<i>Rhamnus catharticus</i>
Crab apple (f; d)	<i>Malus sylvestris</i>
Dog rose (f; d)	<i>Rosa canina</i>
Dogwood (f; d)	<i>Cornus sanguinea</i>
Field maple (d)	<i>Acer campestre</i>
Guelder-rose (f; d)	<i>Viburnum opulus</i>
Hawthorn (f; d)	<i>Crataegus monogyna</i>
Hazel (d)	<i>Corylus avellana</i>
Holly (e)	<i>Ilex aquifolium</i>
Honeysuckle (f; d)	<i>Lonicera periclymenum</i>
Spindle (f; d)	<i>Euonymus europaeus</i>
Wild privet (f; se)	<i>Ligustrum vulgare</i>
Yew (f; e)	<i>Taxus baccata</i>

Flowering plants	
Bird's-foot trefoil	<i>Lotus corniculatus</i>
Black knapweed	<i>Centaurea nigra</i>
Common cat's-ear	<i>Hypochaeris radicata</i>
Common sorrel	<i>Rumex acetosa</i>
Common vetch	<i>Vicia sativa</i>
Cowslip	<i>Primula veris</i>
Field scabious	<i>Knautia arvensis</i>
Foxglove	<i>Digitalis purpurea</i>
Lady's bedstraw	<i>Galium verum</i>
Meadow buttercup	<i>Ranunculus acris</i>
Meadow vetchling	<i>Lathyrus pratensis</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>
Primrose	<i>Primula vulgaris</i>
Red clover	<i>Trifolium pratense</i>
Selfheal	<i>Prunella vulgaris</i>
Sweet violet	<i>Viola odorata</i>
Wild daffodil	<i>Narcissus pseudonarcissus</i>
Yarrow	<i>Achillea millefolium</i>

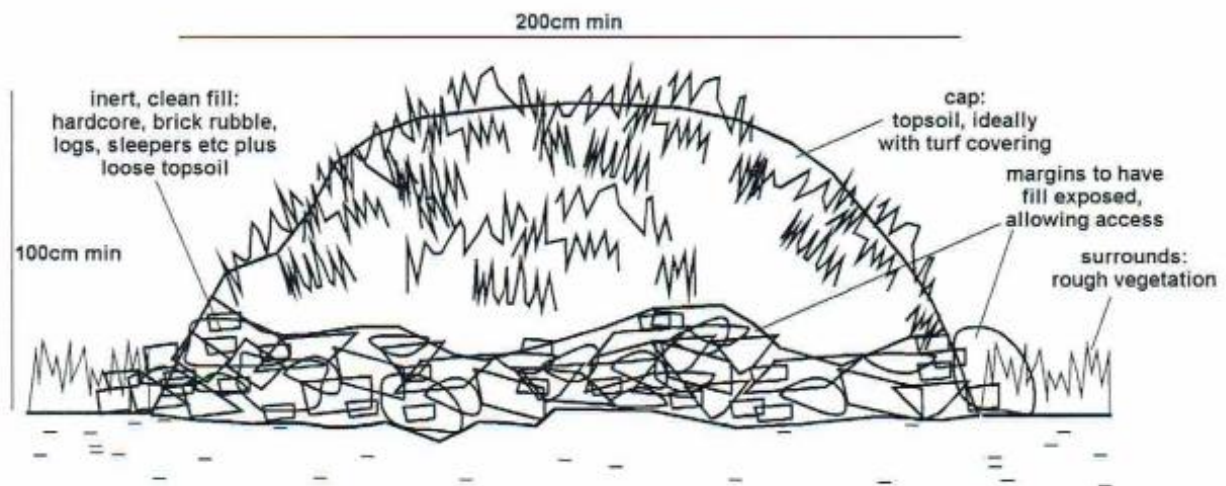
Grasses	
Common bent	<i>Agrostis capillaris</i>
Crested dog's-tail	<i>Cynosurus cristatus</i>
Meadow fescue	<i>Festuca pratensis</i>
Red fescue	<i>Festuca rubra</i>
Rough meadow-grass	<i>Poa trivialis</i>
Small timothy	<i>Phleum bertolonii</i>
Smooth meadow-grass	<i>Poa pratensis</i>
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>
Yellow oat-grass	<i>Trisetum flavescens</i>

Appendix H

Newt and reptile artificial hibernaculum design

Figure 3: Suggested hibernaculum design

This design mimics artificial and natural conditions in which great crested newts have frequently been found over-wintering. Dimensions should not be below 2m length x 1m width x 1m height. The illustrated design would be suitable for locating on an impermeable substrate. On free-draining substrates, the design is largely similar but the bulk of the fill is sited in an excavated depression in the ground. Hibernacula should ideally be positioned across a site, both close to and distant from breeding ponds, always in suitable terrestrial habitat and above the flood-line.



Source: English Nature (2001) *Great Crested Newt Mitigation Guidelines*, Peterborough.

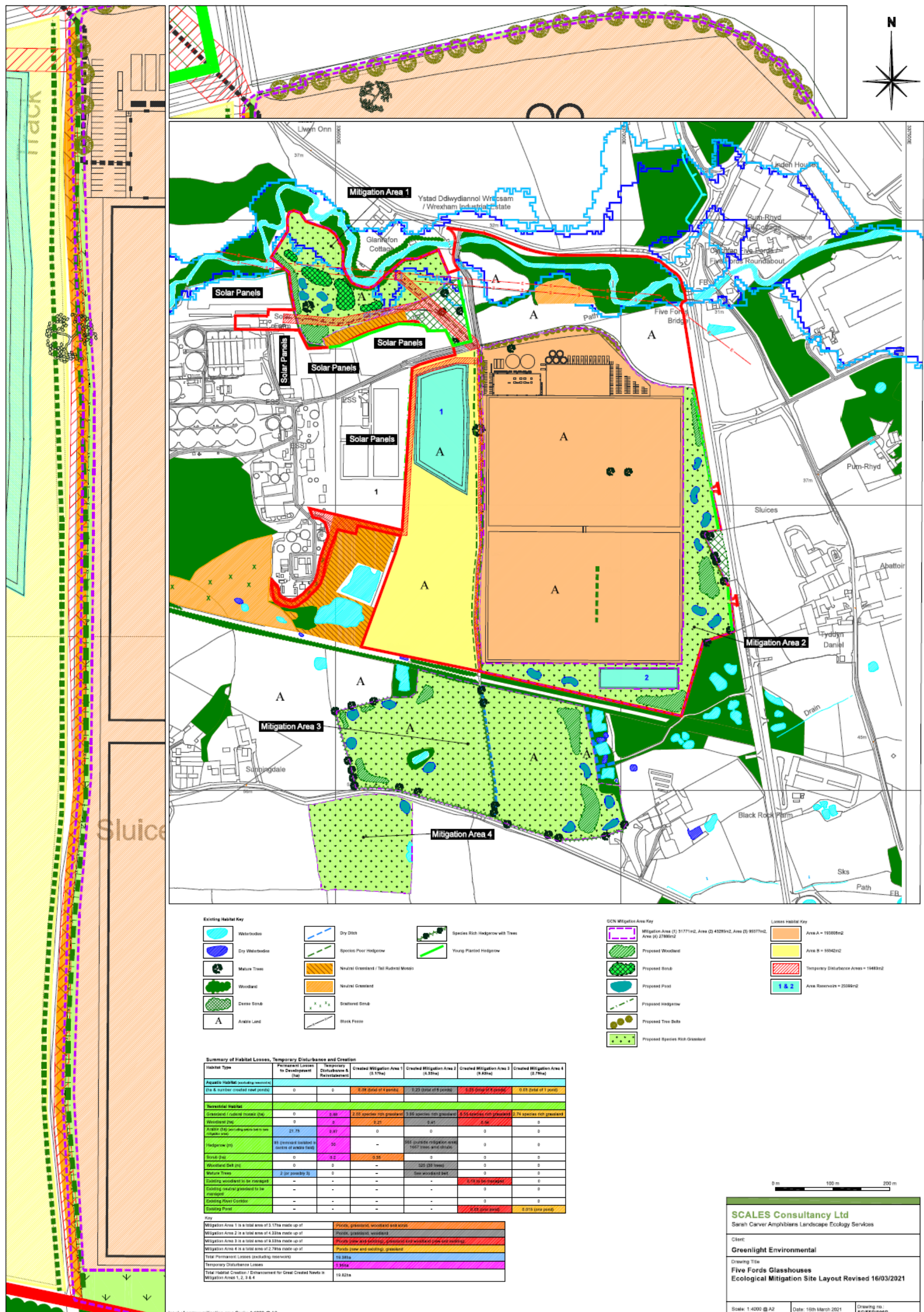
Appendix I

Proposed plans and GCN receptor area

Document titled 'Ecological Mitigation Site Layout - Wrexham 210322'

Drawing number: SC/FFG/006G

(SCALES Consultancy Ltd., 2021a)



Reptile Survey Report

FIVE FORDS GLASSHOUSES, WREXHAM

March 2021

SCALES Consultancy Ltd

Sarah Carver Amphibians Landscape Ecology Services

Balancing Ecology and Development

Client

Greenlight Environmental

Document	Five Fords Glasshouses Reptile Survey Report
Version	Draft – 26 th August 2020
	Draft – 27 th August 2020
	Final – 22 nd March 2021
Authors	Sarah Carver BSc (Hons) MSc, MCIEEM Natural England Licences Great Crested Newt licences - GCN Survey licence England 2015-16713-CLS-CLS GCN Survey licence Wales S085140/1
Reviewer	Sarah Carver

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Five Fords, Wrexham – Reptile Survey Report – March 2021 – SCALES Consultancy Limited for Greenlight Environmental

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 - 1.2 Surveys**

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- 4.0 DISCUSSION & RECOMMENDATIONS**

APPENDIX A

Great Crested Newt and Reptile Legislation

1.0 INTRODUCTION

SCALES Consultancy Ltd, undertook a Preliminary Ecological Appraisal survey of the Five Fords site on 20th May 2020 for Greenlight Environmental to assess potential base line ecological constraints to the proposed construction and operation of Glasshouses.

The interim Greenlight Environmental Ecological Impact Assessment (EcIA) 2020 recommended that a reptile survey should be undertaken.....

'A reptile presence/absence survey to be conducted in the appropriate season (optimally in April, May or September) to determine an appropriate mitigation strategy, which could include trapping and translocation of animals on site, and creation of reptile hibernacula'.

Further to this, the EcIA stated that.....

'The outcomes of the presence/likely absence surveys will inform the detailed mitigation for reptiles. We consider that the development will be able to accommodate this in the form of habitat creation, hibernacula construction and translocations, if required'.

This report details the findings of the survey and sets out recommendations for protection and conservation of reptiles.

1.1 Site Context

The site is accessed off Sesswick Way, a busy road to the south of Wrexham Industrial Estate. The site centre is at NGR SJ3688847980.

1.2 Site Description

The site comprises a large arable field divided into two separate compartments separated by a track bordered by a hedgerow and public right of way. Surrounding the site are a number of woodlands including mature woodland, ponds, river, mature trees and hedgerows.

This report specifically deals with reptiles. The legislation governing these species is provided in Appendix A. Drawing 1 illustrates the location reptile survey areas and refugia. This drawing is indicative.

1.3 Data Search

A 15th May 2020 Cofnod data search returned several reptile records within 2km of the site which are detailed below.

A 2013 grass snake record was provided at grid reference SJ3712147593 which is 38m from the southern boundary in the Sesswick Road ecological compensation site.

There are records for Slow worm and Adder at Grid Reference SJ380490 before 2009 which is 1221m from the proposed development site at Redwitter Brook. Also, at Redwitter Brook, there is a grass snake record 1686m from the site at Grid Reference SJ38114964.

There are also 1999 records for Slow worm and Adder, and two 1990 Grass snake records; all of which are over 1900m away from the site

Section 5.80 of the March 2021 EclA states that.....

'The grassland, mature woodland and scrub mosaic to the south, southwest and southeast of the site, predominately around the waterbodies, tracks tall grassland/ruderal vegetation and woodland edge is suitable for the reptile species including grass snake, adder and slow worm. The variance in vegetation structure and uneven ground provides a good mosaic of habitat for foraging, basking and hibernation potential. Although the site is set within a relatively arable setting, the main study area is linked to a variety of habitats via hedgerows'.

Sections 6.27 - 6.29 of the March 2021 EclA states that.....

'Certain habitats on site are considered suitable for reptiles, comprising of a mosaic of ephemeral, scrub, tall herb/ruderal and grassland.

As grass snakes have been recorded locally within the vicinity of ponds 13, 14 and 15, individual reptiles may commute onto or across site. The proposed works which involve the clearance of vegetated habitats on site (i.e. the permanent loss of ≈19.38ha of arable land, ≈95m of species-poor hedgerow (Priority Habitat) and a small number of scattered mature trees, and the temporary disturbance of ≈0.87ha of arable land, ≈0.88ha of grassland/ruderal mosaic, ≈0.2ha of scrub and ≈30m of species-poor hedgerow (Priority Habitat)), involve a risk of injuring or killing individual reptiles potentially present within the site.

*Prior to mitigation, **minor negative** impacts on reptiles are **certain**'.*

2.0 METHODOLOGY

2.1 Reptile Survey Methodology

An initial site walkover was completed to determine areas within the site which have potential for reptiles. A total of 75 artificial refugia consisting of flat bitumen felt, corrugated felt, carpets and corrugated tin (approximately 0.5m²) were placed within what was considered to be the most suitable reptile habitat, based on surveyor experience and knowledge, and left in situ for one- two weeks prior to monitoring commencing. In order to determine whether the site supported reptiles, habitats selected for survey consisted predominantly of south facing slopes of the grasslands and suitable field margins – refer to photographs of habitats surveyed. Froglife (1999) Reptile survey (Advice Sheet 10) guidelines recommend for general survey purposes placing 5-10 refuges per hectare. The use of 75 refugia to determine reptile presence constitutes a robust and appropriate survey approach and demonstrates substantial survey effort and greater than that recommended in order to establish the status of the site in terms of supporting reptiles.

In accordance with Froglife (1999) Reptile survey (Advice Sheet 10), in order to establish presence, seven checks to each of the 75 refugia were completed between 20th July and 26th August 2020. *Due to weather, timing, security/access constraints, each refugia was visited a total of 7 times over a grand total of 9 visits on 9 separate dates to the site.* At each visit, each felt, carpet or tin was checked above and underneath to determine presence of reptiles. This survey effort is in accordance with the 7 visits to each refugia specified in the guidelines required to determine presence. The Froglife guidelines recommend that the timing of surveys should be during periods of reptile activity between 8.30-11 a.m. and 4 – 6.30 p.m. during suitable weather conditions avoiding wind and rain and specify the months of April, May and September as being suitable with temperatures between 9°C and 18°C.

Surveys were led by Sarah Carver, an ecologist with a period of 28 years experience of field survey.

2.2 Limitations

Whilst every effort was made to undertake surveys during the most suitable of conditions available, surveys were required to be undertaken during July and August at the most favourable time of the day often dictated by weather conditions due to project timescale constraints and therefore inevitably conditions and timing during some of the visits were sub-optimal.

Details of the weather, conditions and timing of surveys are presented in table 1.

Reptile Survey Areas



Typical Habitat in the vicinity of tiles 41-45



Typical Habitat in the vicinity of tiles 46-55



Typical Habitat in the vicinity of tiles 56-63



Typical Habitat in the vicinity of tiles 1-8 on the field margins of the main arable field



Typical Habitat in the vicinity of tiles 11-20 on the edge of the grass track/footpath



Typical Habitat in the vicinity of tiles 66-75 in the barley field margins



Typical Habitat in the vicinity of tiles 34-40 in the wet grassland

4.0 RESULTS

4.1 Field Survey Results

Reptiles

No reptiles were recorded during the surveys.

Amphibians

A total of five great crested newts and four common toads were recorded during the surveys.

The great crested newts were recorded at tiles 2, 74 and 59. Two juveniles and an adult were present on separate occasions under tile 59 on the southern field margin of the northern arable maize field. A juvenile was present under tile 74 at the south west on the arable barley field margin. An adult was present under tile 2 on the mid-east of the arable maize field margin. Refer to drawing 'Reptile Tile Locations Map 15th March 2021.

Table 1 Results

Tiles Checked	Date	Time	Weather Conditions	Temperature °C	Records	Tile number	Tile type	Notes
1 to 40	20/07/2020	9-10.15	Sunny, minimal cloud, calm, dry, light breeze, rained on the 18th July	16-17	0	N/A	N/A	
41 to 63 & 66 to 75	21/07/2020	9-11.15	Bright hazy sunshine, overcast, still, calm	15	juv GCN	74	Tin	
					Toad	68	Carpet	
1 to 75	28/07/2020	8.40-11.15	Light to moderate intermittent breeze, dry, sun and cloud, 2 minute shower at 10.55 (heavy rain on 27th July)	15	juv GCN	59	Tin	
					Toad	61	Carpet	
1 to 75	03/08/2020	8.30-11.40	Sun, blue sky, 30% cloud, cloudier at 9.30 (90%) 5 mins of drizzle at 9.45	16	juv GCN	59	Tin	
1 to 75	12/08/2020	8.00-11.25	(On 10th thunderstorms/heavy rain, hot and dry on 11th) Hazy sunshine, clear sky, calm, light fog 8.00-9.00, humid	19-27 (forecasted to be 18-22)	0	N/A	N/A	
1 to 75	15/08/2020	8.20-11.10	Hazy sun, calm, light mist until 9.30. From 9.30 some clear blue sky and 70% cloud	16-18	Toad	61	Carpet	
					Adult Female GCN	2	Flat Felt	
1 to 75	20/08/2020	8.25-11.15	Bright, sunny (rained heavily yesterday). Light-moderate intermittent breeze. 50% white cloud at 10a.m.	17-19	0	N/A	N/A	Tiles 19 & 20 had been disturbed by vehicles
64,65, 41 - 56, 26-30, 66-68	24/08/2020	9.40-10.45	Sun, blue sky, white cloud 50%, slight breeze	16-18	0	N/A	N/A	Removed 41-55, 56, 26-30, 66-68
1-25, 30-40, 57-65, 69-75	26/08/2020	14.30-17.45	Sun, blue sky, white-grey cloud 80%, slight breeze - moderate intermittently at 17.00 (rained yesterday)	20-19	Adult Female GCN	59	Tin	Removed 1-25, 30-40, 57-65, 69-75
					Toad	61	Carpet	

Distribution of refugia

Tiles 1-40 were distributed on the 5/7/20

Tiles 41-46 were distributed on the 7/7/20

Tiles 41-63 & 66-75 were distributed on the 10/7/20

Tile 64 & 65 were distributed on the 21/7/20

Tiles - mixture of 10 carpets, 10 corrugated felt, 40 flat felt and 15 tins

PHOTOGRAPHS OF RECORDS



Tile 74 on 21/7/20 Juvenile GCN

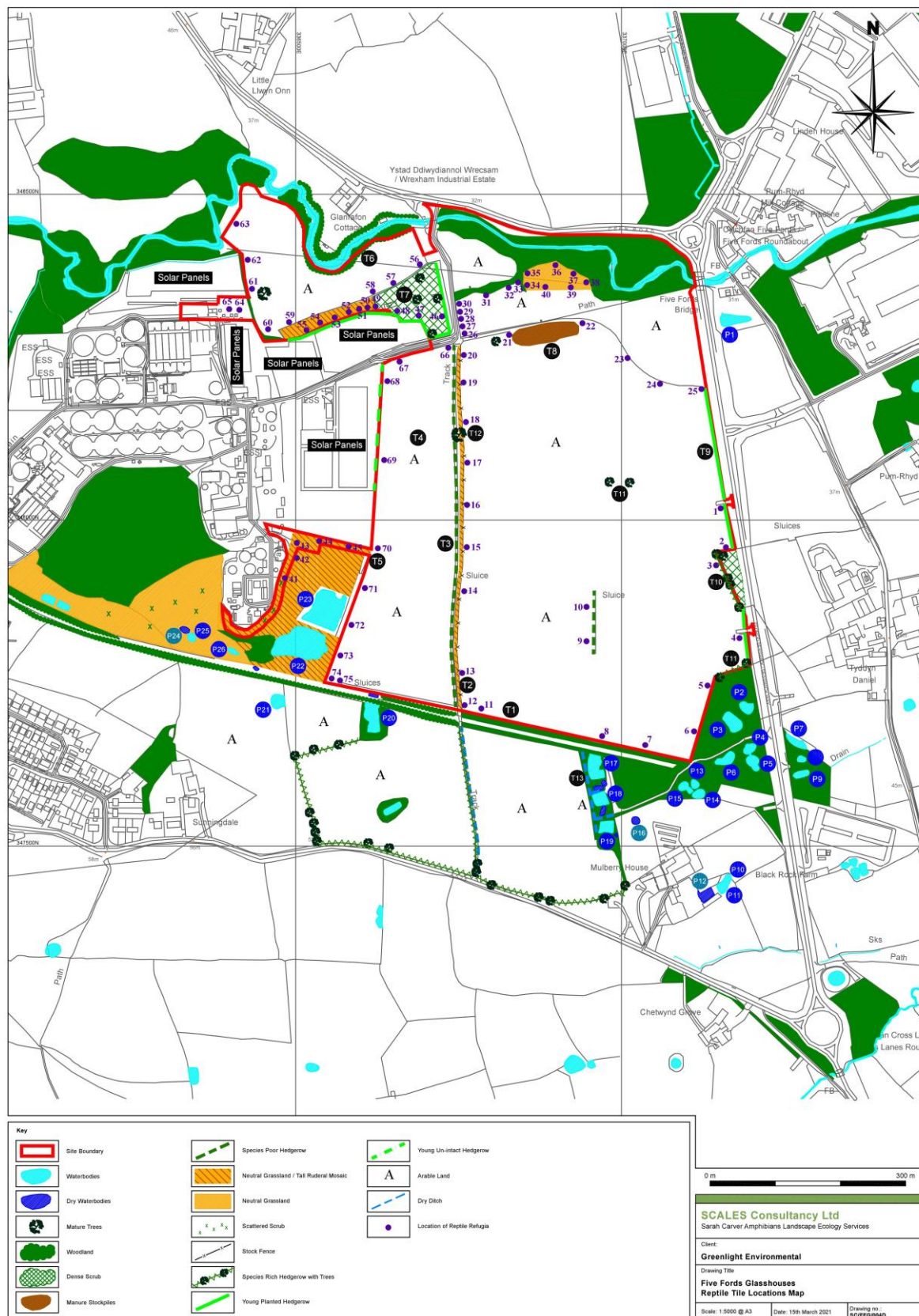


Tile 2 on 15/8/20 Female GCN



Tile 59 on 26/8/20 Female GCN

Drawing 01 provides the Location of Reptile Tiles and Habitat Map



4.0 DISCUSSION & RECOMMENDATIONS

Amphibians

Great crested newt and Common Toad were recorded during the survey.

The proposed development will not result in the damage or destruction of any aquatic habitat. It will however, involve temporary disturbance and permanent loss of terrestrial habitats.

It is recommended that a great crested newt strategy and mitigation scheme should be designed and submitted to the LPA and NRW for approval and wildlife licencing. The method statement should include details on trapping, exclusion, fencing, timescales, mitigation receptor site design and creation, long term management, long term security, biosecurity measures, responsibility, funding and safeguarding of the mitigation site.

Reptiles

Under the Wildlife and Countryside Act 1981 (as amended), the legislation prohibits the deliberate killing of any UK reptiles, so they need to be considered within the development proposals and appropriately protected.

Although no reptiles were recorded during the surveys, there are known records for the site and so measures to avoid harm, injury and/or killing reptiles will be necessary.

Mitigation for this project could ordinarily include a combination measures including methodology for reasonable avoidance of harm and measures to encourage any reptiles present to move of their own volition to areas unaffected by the development. This can include suitably timed sensitive habitat management, destructive searches of less favourable habitats but those still with potential to support reptiles under ecologist supervision, and capture - relocation by trapping in more favourable habitats.

However, the proposed trapping and exclusion of great crested newt will have the dual purpose of also ensuring that any reptiles present within habitats to be lost or temporarily disturbed will be safely relocated to the mitigation site that will be designed and created to serve to support both reptiles and amphibians. Therefore, exclusion of reptiles from the development areas would be undertaken during the great crested newt mitigation work. This exclusion and trapping programme would need to be carried out at an appropriate time of year during periods of reptile and amphibian activity to maximise capture efforts. It is considered appropriate to carry out a reasonable 'capture/release' programme to safeguard reptiles undertaken in advance of the commencement of the development involving the loss of suitable habitats deemed as capable of supporting reptiles during the great crested newt trapping.

The mitigation site will be designed for amphibians and reptiles and will comprise a variety of appropriate aquatic and terrestrial habitats including ponds, woodland, scrub and species rich grassland. It is proposed to be situated in the north west adjacent to the river corridor with good connectivity and links to surrounding habitats also deemed suitable for reptiles and amphibians.

The relocation scheme is likely to involve the use of amphibian exclusion and drift fence with pitfall trapping.

Areas of bare ground for basking and long grassland for suitable cover will be provided to ensure the habitats present optimum conditions for breeding, hibernation and foraging opportunities.

Long term sustainable management of the mitigation habitat with specific prescriptions for reptile will be made.

Conclusion

Under the Wildlife and Countryside Act 1981 (as amended), the legislation prohibits the deliberate killing of any UK reptiles. Any measures employed to protect great crested newts will have the incidental benefit of ensuring that any reptiles found to be present within the development area will be relocated safely to areas unaffected by the development. Habitats created and managed for great crested newt mitigation will be suitable to support any reptiles discovered in areas of development that have been relocated accordingly.

The designation and creation of appropriate habitats to be sustainably managed for great crested newts will ensure the long term protection of any relocated reptiles.

In conclusion it is recommended that a detailed reptile protection and mitigation scheme (in combination with a great crested newt mitigation scheme) be drafted for approval by the LPA and NRW.

The scheme should provide for the designation and creation of appropriate habitats to be sustainably managed for reptiles which will ensure their long term protection and should take into account the need for a licence issued by NRW under the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 in relation to great crested newt.

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APPENDIX A - LEGISLATION & POLICY

Great Crested Newt Legislation

Great Crested Newts are protected under section 9 and listed on schedule 5 of the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000 (CRoW Act) which further extends their protection). They are also classed as European Protected Species listed on Annexes II and IV of the European Union Directive on Natural Habitats and Wild Fauna and Flora (Council Directive 92/43/EEC). This is implemented in the UK by The Conservation of Habitats and Species Regulations 2017 (as amended). They are on Schedule 2 of the Habitats Regulations which provide full protection under Regulation 40(1). The legislation is relevant to all life stages of the Great Crested Newt including eggs, larvae, juveniles and adults.

Under this aforementioned legislation it is an offence to intentionally or recklessly:-

- Kill, injure or take an individual of such a species;
- Possess any part of such species either alive or dead;
- Damage, destroy or obstruct access to any place or structure used by such species for shelter, rest, protection or breeding;
- Disturb such a species whilst using any place of shelter or protection;
- Sell or attempt to sell any such species.

In order to undertake surveys for Great Crested Newt, a surveyor must hold an appropriate licence issued by Natural England, Natural Resources Wales or Scottish Natural Heritage accordingly.

The Great Crested Newt is a UK Biodiversity Action Plan species for which objectives and targets to protect and restore newt habitats and create new sites through habitat management and re-creation are set. Environment (Wales) Act 2016 provide lists of habitats and species of principal importance for the conservation of biological diversity. The Great Crested Newt is included on these lists.

Reptile Legislation

Reptiles are protected under Schedule 5 of the Wildlife and Countryside Act 1981. Reptiles are listed in section 7 of the Environment (Wales) Act 2016 as a species of principal importance for which objectives and targets are set. provide lists of habitats and for the conservation of biological diversity. The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act (CRoW) 2000 and the Natural Environment and Rural Communities Act (NERC) 2006, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive), making it an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting;
- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act; intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act; intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection.

Reptile species that receive protection against intentional killing, injuring and sale:

- Slow-worm (*Anguis fragilis*)
- Common lizard (*Lacerta vivipara*)
- Adder (*Vipera berus*)

- Grass snake (*Natrix natrix*)

A licence is not required for mitigation work but best practice and lawful standards have to be followed to ensure compliance with the WCA 1981. The methods within this method statement follow standards set out by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998).

Against the background of the above legislation relating to reptiles, Natural England issued a guidance note (2004) entitled 'Reptiles: Guidelines For Developers'. The note sets out Natural England's expectation of reasonable avoidance and includes measures such as altering development layouts to avoid key areas, as well as capture and exclusion of reptiles.

Natural England goes on to specifically highlight 2 key aims where reptiles are present.

- To protect reptiles from any harm that might arise during the development work;
- To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.

HGBI Advice Sheet and Natural England Species Conservation Handbook

In 1998 the Herpetofauna Groups of Britain and Ireland (HGBI) produced the advisory note entitled 'Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards'. This advisory note presents a series of best practice guidelines and makes recommendations in regard to all aspects of herpetofauna translocations including those for fully protected (rare) species as well as partially protected (relatively common) reptile species.

Environment (Wales) Act 2016

Section 6 of Part 1 Sustainable management of natural resources places a duty on public bodies and local authorities to 'maintain and enhance biodiversity' in exercising their normal roles and functions. Section 7 requires those bodies to have due regard to the lists of habitats and species of 'principal importance' published in the Act.

Policy

National Planning Policy Framework

NPPF March 2019 section 15 'conserving and enhancing the natural environment' sets out current government policy on biodiversity and nature conservation and places a duty on planners to make material consideration to the effect of a development on biodiversity when considering planning applications. It maintains that the planning system should aim to minimise impacts to biodiversity and promote the preservation, restoration and re-creation of priority habitats and protection of priority species. The LPA should aim to conserve and enhance biodiversity.

Otter Avoidance, Mitigation & Compensation Strategy

FIVE FORDS GLASSHOUSES, WREXHAM

22nd March 2021

SCALES Consultancy Ltd

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Balancing Ecology and Development

Client

Greenlight Environmental

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APPENDIX A - AMPHIBIAN, REPTILE AND NESTING BIRD MITIGATION METHOD STATEMENT

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1.0 INTRODUCTION

SCALES Consultancy Ltd designed an Otter avoidance, mitigation and compensation strategy for Greenlight Environmental further to comments made by Natural Resources Wales addressed to Wrexham County Borough Council on the 27th August 2020 in a consultation process in relation to a planning application for a Glasshouse and associated development by Low Carbon farming 2 Limited.

1.1 Site Context

The site is accessed off Sesswick Way, a busy road to the south of Wrexham Industrial Estate. The site centre is at NGR SJ3688847980.

1.2 Site Description

The site currently comprises a large arable field divided into two separate compartments separated by a track bordered by a hedgerow and public right of way. Surrounding the site are a number of woodlands including mature woodland, ponds, river, mature trees and hedgerows.

1.3 Proposed Development

The proposed development will consist of two 8ha commercial glasshouses for growing salad and vegetable produce, comprised of structural steelwork and high specification glass designed for maximum light transmission. There will be a packing facility, energy centre, associated underground pipework and two reservoirs for the attenuation of rainwater from the glasshouse roofs.

1.4 Habitat Losses and Gains

The total permanent land losses to facilitate the development excluding the reservoirs are predicted to be **19.38ha** with **1.95ha** of land temporarily disturbed and reinstated. A total of **19.82ha** of high-quality mitigation habitat will be created. A long-term sustainable management plan will be implemented to promote species and habitat conservation.

1.5 Evaluation

An evaluation of the significance of Otter at the site and potential effects and impacts of the development on this species is made in this document.

1.6 Mitigation and Avoidance of Harm Strategy

A strategy has been designed to ensure the avoidance of harm to Otter and their habitat. Implementation of mitigation, avoidance and compensation measures set out in this document will aim to ensure their long-term protection along with that of their habitat.

2.0 REVIEW OF STATUS

2.1 Background and Desk Review

Protected sites

The EclA found the following information with regard to protected sites and records for otter:

Statutory

There are two statutory protected sites located within 2km – one Sites of Special Scientific Interest (“SSSI”) and one Special Conservation Area (“SAC”).

i. River Dee SSSI, approximately 2km southeast.

*“The River Dee is notified for its nationally important transition through a range of river types from mesotrophic to eutrophic. It is also notified for Atlantic salmon *Salmo salar*, otter *Lutra lutra*, club-tailed dragonfly *Gomphus vulgatissimus* and fluvial geomorphology.”*

ii. River Dee & Bala Lake SAC, approximately 2km southeast.

“The River Dee has its source in Snowdonia at the outflow of Llyn Tegid and it includes the Ceiriog Meloch, Tryweryn and Mynach tributaries. Its catchment contains a wide spectrum of landscape from high mountains around Bala, rugged peaks near Llangollen, steep sided wooded valleys, and the plains of Cheshire, Flintshire, north Shropshire and Wrexham.”

Records

Thirty-four otter *Lutra lutra* records were returned by Cofnod North Wales Environmental Information Service on the 15th May 2020 within 2km of the proposed development site.

The most recent was to the west of the proposed development site and from 2019. The closest record is located approximately 160m north-east.

2.2 Legislation

The Eurasian otter *Lutra lutra* is the only native UK otter species. It is fully protected under EC Habitats & Species Directive, Annex II and IV and schedule 2 of The Conservation of Habitats and Species Regulations 2017 and therefore classed as a European protected species (EPS). In addition, the otter is also protected under sections 9 and 11 of the Wildlife and Countryside Act 1981 (as amended) listed on Schedule 5.

It is an offence to deliberately or recklessly:

- capture, kill, disturb or injure otters;
- damage or destroy a breeding or resting place;
- obstruct access to their resting or sheltering places;
- possess, sell, control or transport live or dead otters, or parts of otters.

The Otter is also considered a Biodiversity Action Plan (BAP) ‘Priority Species’ and ‘Species of Principal Importance’ for the conservation of biological diversity in Wales under the Environment Wales Act 2016.

2.3 Impacts

The EclA identified ecological potential impacts in relation to protected species:

The potential impacts on ecological receptors during construction and operation of the proposals are identified and described in the EclA in terms of potential magnitude and probability.

Potential impacts during construction include:

- Direct harm from construction machinery.
- Pollution and waste during construction.
- Loss of habitat during construction works (this impact would continue into the operation phase of the development).
- Reduction in quality of neighbouring habitat (through disturbance) during construction works.

Potential impacts during operation include:

- Disturbance from operational activities.
- Pollution and waste from operation of the site.
- Disturbance from vehicular access activities.
- Loss of habitats occupied by the development (a continuation of the impact during the construction phase).

2.4 Proposed Work and Proximity of development

A trench with a total working area of approximately 20-30m width to include for vehicular access for the purposes of an underground pipeline installation is proposed to be undertaken approximately 5-15m from the banks of the River Clwydog. These works are temporary in nature and reinstatement of habitats will be implemented following completion of the work. The nearby habitats are described as woodland along the river corridor and arable farmland. Only the arable land will be directly affected by excavation and pipeline installation a distance of approximately 5-15m from the river corridor. Land within 200m of the river corridor that will be affected comprises arable, woodland, scrub and grassland. More distant habitats include ponds, arable land, woodland, hedgerows, scrub and grassland.

Although the River Clwydog is situated adjacent to the northern boundary and provides suitable habitat for water voles and otters, the EclA found that the river will not be directly impacted by the proposed development.

Section 6.25 of the EclA specifies that.....

‘A temporary trench with a working width of ≈20-30m is proposed to be undertaken ≈5-15m from the banks of the River Clywedog for the installation of the underground pipeline, with all habitats reinstated upon completion’.

Section 6.26 of the EclA specifies that.....

*.....‘Therefore, we predict **minor negative** impacts on water voles and otters are **likely**’.*

And section 7.18 states that.....

'As a precautionary measure, the following mitigation is recommended to avoid impacts on water voles and otters from the proposed works:

i. A 5m no-work buffer zone (includes vegetation clearance) to be applied from the top of the riverbank, to protect potential water vole burrows and prevent pollution/run-off from entering the watercourse. This area will be marked using a temporary barrier netting.

ii. If proposed works change to incorporate this area, further water vole surveys should be conducted prior to work commencing to inform a detailed mitigation strategy.

It goes on to state....

'After these precautionary mitigation measures, we predict no impact on water voles or otters from the development plans. We consider that a European Protected Species Mitigation Licence will not be required, and no further surveys are necessary'.

As well as the above measures set out in the EcIA, further consideration has been given to additional appropriate measures (also summarised in section 7.19 of the EcIA). A specific strategy aimed at an avoidance of harm approach along with mitigation and compensation measures are set out in **Section 4.0** of this report.

2.5 Establishing the Need for Further Survey Requirements

Natural England guidelines 6 October 2014 (updated 5 April 2019) advise that a survey for otters is required if:

- distribution and historical records suggest otters may be present;
- the development will affect a water body (e.g. river, stream, lake, sea or marshland);
- development will affect habitats near a water body directly or through environmental impacts, for example noise and light.

2.6 Standard Otter Survey Methodology

Surveys should be undertaken by a suitably experienced surveyor. Depending upon the nature of the surveys, it might be advisable if the surveyor holds an appropriate licence.

During the survey, a search for evidence of otters should be undertaken. Evidence with reference to NE guidelines updated 5 April 2019 includes:

- dung (spraints)
- tracks (footprints)
- feeding remains
- otter slides (into water)
- holts (underground dens)
- couches (above ground sites where otters rest during the day)

Surveys can be undertaken at any time of the year with spring being the optimum time. Survey requirements are usually tailored to the:

- Nature and types of impacts of the development on otters and their habitat;
- The likely predicted effects of the impacts upon otters and their habitat.

The information collected can then be used to devise mitigation measures.

2.7 Proposed Survey Protocol and Recommendations

Existing records of otter within 2km of the proposed development site have been studied.

Existing otter records and habitat survey information have been used to devise mitigation and avoidance measures and assess the need for further survey.

Pre-commencement of development and construction surveys will be undertaken to establish whether new signs or activity are present.

The results will form the basis of any adjustments deemed to then be required to the avoidance and mitigation proposals presented in this document.

2.8 Other Considerations

Local badger activity and known records within 2km of the site have been identified. All otter deterrent and protection fence will need to take account of the potential presence of badger. Badger and otter surveys are recommended prior to the commencement of any ground works including the erection of newt and/or badger fencing. Should any proposed otter (or GCN) fencing work be required within 30m of a badger sett or if otter holts and/or other signs of any protected species are recorded, licencing and reasonable avoidance of harm measures will need to be considered for badger and otter in addition to great crested newt. During any of the proposed mitigation work including otter/Great crested newt (GCN) fence installation, a reasonable avoidance method statement must be followed for species such as reptile, GCN and nesting birds. **See Appendix A.**

3.0 ASSESSMENT OF IMPACTS

3.1 Evaluation of Impacts Without Mitigation

According to NE updated Otter guidelines 5 April 2019, it is widely accepted that the otter is territorial and have large home ranges of up to 35km for males along rivers depending on the quality of the habitat and availability of food.

The predicted impacts of the development on otters are assessed below on the basis of providing no avoidance or mitigation measures.

1. Moderate - Major disturbance of habitats within 15m of the river corridor. Noise and lighting could have the potential to cause disturbance.
2. Minor interference with but not obstruction of routes within their range. The excavation of trenches for underground pipework installation could interfere and cause disturbance with usual regularly frequented routes.
3. Minor - Moderate disturbance to resting and feeding places. Habitat that may support resting otter could be temporarily lost to excavation and trenching of pipework. Vehicle movements and machinery could cause disturbance.
4. Minor – Moderate sediment deposits within the river could change water quality and affect food availability. Runoff from open excavations and bare soil could enter the river. A pollution incident in the river could occur.

4.0 AVOIDANCE, MITIGATION & COMPENSATION MEASURES

4.1 Overall Strategy

In order to reduce or negate the potential impacts, a number of avoidance, mitigation and compensation methods have been devised.

4.2 Avoidance

A **mitigation method statement** to include all protected species outlined in **Appendix A** will be followed.

- No work on or near the river and known otter habitat (within 5m) will be carried out. A buffer zone of 5m along the river will be maintained where no work shall occur.
- No work will occur at night in order to reduce impacts to otter and other nocturnal species.
- No artificial lighting will be used within 30m of the river corridor.
- A tool-box talk to all contractors will be given by an ecologist in relation to the potential for otters to be present and the legislation governing their protection.
- A pollution control ecological protection method statement will be adhered to.
- A survey for signs of otter will be carried out prior to any construction work.

4.3 Mitigation

Mitigation measures are deemed necessary to reduce the impacts where potential negative effects cannot be avoided.

- As a precaution, an otter-proof fence will be erected around the section of pipeline trench within 30m of the river corridor to deter and prevent otters from entering the pipeline installation trenches development area. **Refer to Figure 1 for proposed location of otter fence Five Fords Glasshouses Indicative Proposed Otter Fence Layout (and Fence Specification) SC/FFG/009RevB 15th March 2021.** The otter fenced area will also be GCN exclusion fenced subject to EPS licencing. A separate strategy has been designed in relation to GCN protection.
- The erection of otter proof fence is not considered necessary in other development areas.
- Excavations that are a greater distance than 30m from the river corridor (and not otter fenced) will be furnished with an appropriately sized escape route for any animals that enter such as a ramp.
- An Ecological Clerk of Works will be appointed to oversee the mitigation will inspect the site regularly for signs of otter and use of any escape routes and integrity of the otter proof fence. A log of checks will be maintained.

- Should otter signs or features be identified within 30m of proposed development or within or on the periphery of existing working/development areas, operations will cease and advice will be sought from NRW.
- Water containing sediment and runoff will be prevented from attenuating or being discharged in an uncontrolled manner. However, if it accumulates it will be contained and prevented from discharging into the river. The use of bunded fuel areas to prevent pollution along with sand bags and straw bales to filter sediment from bare soils will reduce the potential for incidents. Areas of bare soil will be kept to a minimum. No water will be directly discharged to the river. Soil stockpiles and excavations will be kept to a minimum. **See Appendix B for pollution control measures.**

4.4 Compensation

Compensation measures include:

- Reinstatement of the habitats within temporary disturbance areas of trench excavation and pipeline installation.
- Creation of improved habitats with increased structural and species diversity such as wildflower grassland, woodland, scrub and ponds in place of arable crops within the vicinity of the river corridor and adjacent to the existing 'Sesswick Way Road Mitigation Area'.

5.0 DISCUSSION & SUMMARY

5.1 Licence Requirements

A licence is not deemed to be required. This decision has been reached because:

Harm and/or disturbance to otters can be avoided;

Damaging or blocking access to their habitats can be avoided.

5.2 Summary

The work will not result in a net loss of breeding or resting sites.

Sufficient stretches of unaffected river corridor are likely to sustain the otter population.

The work will provide an increased area of enhanced long term sustainably managed habitat than that which will be temporarily disturbed and restored.

The avoidance, mitigation and compensation measures proposed are designed to afford protection of the otter population and appropriate habitat at and adjacent to the site.

References

<https://www.gov.uk/guidance/otters-protection-surveys-and-licences> NE Published 6 October 2014
Last updated 5 April 2019

Wales Mammal Biodiversity Action Forum Mammal Action Plans Otter *Lutra lutra* October 2013

The Wildlife and Countryside Act 1981 (as amended)

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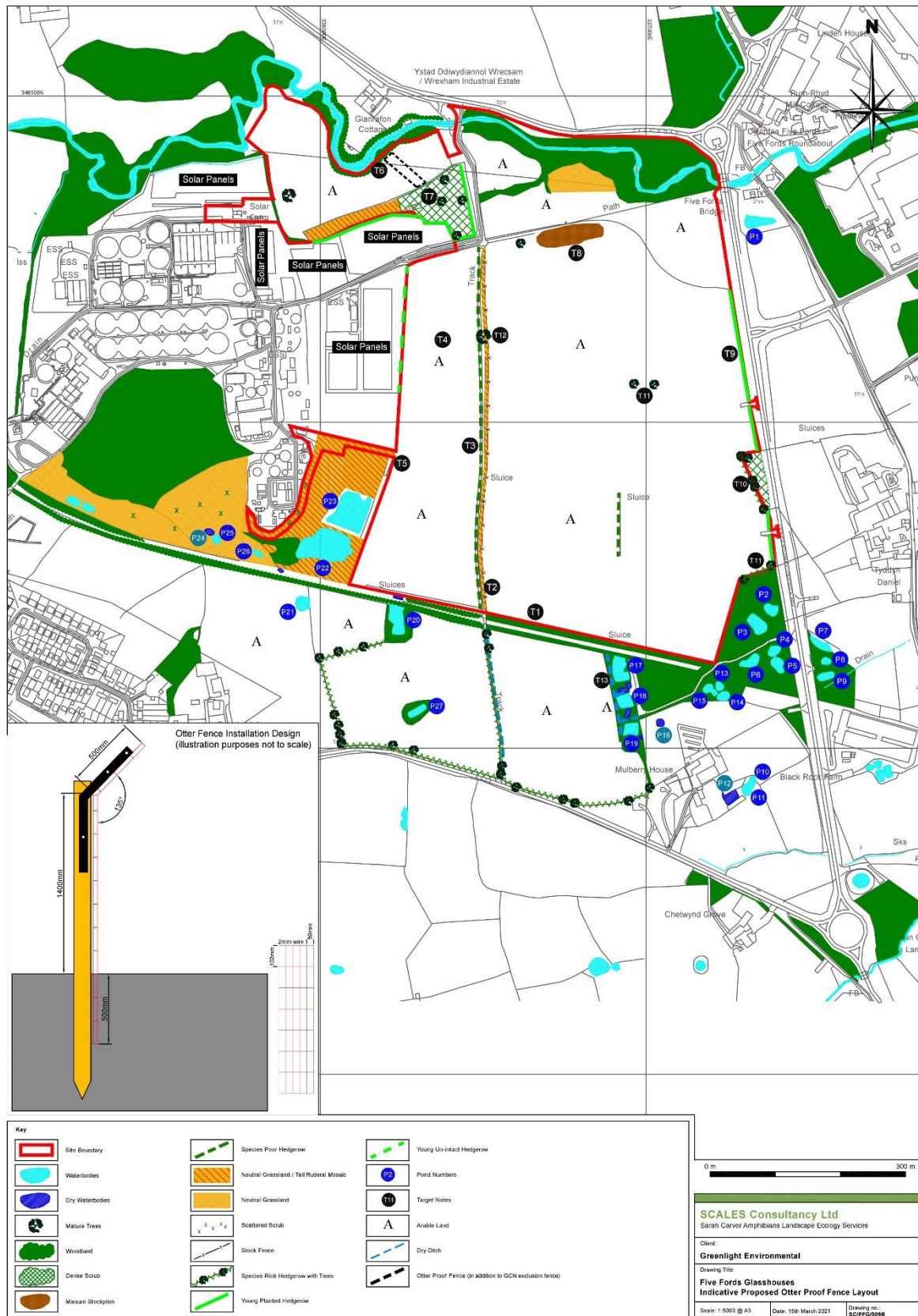
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Greenlight Environmental, EcIA 22nd March 2021, Five Fords Sesswick Way for Low Carbon farming 2 Limited

DRAWING – Five Fords Glasshouses Indicative Proposed Otter Fence Layout (and Fence Specification) SC/FFG/009RevB 15th March 2021



APPENDIX A – AMPHIBIAN, REPTILE AND NESTING BIRD MITIGATION METHOD STATEMENT

Purpose

As a precautionary approach it is considered that a reasonable avoidance measures scheme should be followed to ensure that there would be no impact on potential reptiles, great crested newt or nesting birds using the site during Otter/GCN fence installation. The procedures will be followed to significantly reduce the risk of causing an offence under current statutory legislation.

The statement as described below broadly follows the approach of checking and reducing available amphibian, reptile and nesting bird habitat thus minimising the likelihood of their presence during otter/GCN fence installation and in addition an ecologist searching habitats by hand and visually examining all areas prior to this work.

Reasonable Avoidance Measures Procedures for Otter/GCN fence installation

1. An ecologist will be retained during the project to provide advice and recommendations.
2. Prior to the commencement of any works, staff and contractors will be informed of the potential presence of reptiles and the associated legislation. Staff will be informed that they will need to cease work immediately and consult the appointed Ecologist in the event that the presence of an amphibian, reptile, nesting bird or any other significant wildlife in the operational area is suspected.
3. A tool box talk will be provided to convey relevant wildlife legislation and appropriate protective measures that need to be employed by operational and construction staff.
4. A preliminary search for the presence of amphibians, reptiles, badger setts and nesting bird activity will be undertaken by an ecologist prior to the access of any plant or machinery. The proposed route of access and fencing routes will be examined for features which have the potential to support reptiles – rubble, debris, log piles, wood brash piles, tussocky grassland, tree stumps and any refugia sites for example. All such features will be closely searched by hand prior to the access of machinery and plant. The ecologist will be present to undertake hand searches and supervision on each day that work is undertaken. Any refugia such as bricks or wood for example will be lifted, examined and removed from working areas.
5. All vegetation within working areas/fence routes will be cut so as to render it less desirable for great crested newts and reptiles to avoid harm during fence installation.
6. Prior to the commencement of vegetation cutting and GCN/otter fence installation, the location of the proposed GCN/otter fence installation work will be searched by hand for the presence of amphibians, reptiles and the site will be checked for nesting birds.
7. In the event that excavations are to be left exposed overnight or for a long period of time then a stick/ramp or plank (whichever is appropriate) will be placed in the excavation to aid the escape of any animal falling in and becoming trapped.
8. The above measures will be undertaken immediately prior to commencement of any works and any required mowing 1 weeks prior to the commencement of the works – this will

minimise the opportunity of fauna entering the area in the time of initial survey and inspection and the clearance/construction operations.

9. The Ecologist will be present at the commencement of the works and must be contacted in the event of any potential wildlife issues.
10. Common species of amphibian and reptile will be moved to safe havens on site unaffected by development activities.
11. Construction staff will remain in contact with the ecologist throughout the works.
12. In the event that a protected species is discovered at the site, works will cease and the ecologist will provide advice and recommendations in accordance with the appropriate statutory wildlife legislation.
13. Relevant authority approvals, permissions and protected species licences will be sought if necessary.

APPENDIX B ECOLOGICAL PROTECTION STATEMENT

The aim of the scheme outlined in this document is to set out measures to protect habitats within the surrounding environment during the construction phase of the development and reduce the risk of pollution.

Section 11 of the NPPF sets out the overall policy in relation to 'Conserving and Enhancing the Natural Environment' with paragraph number 109 stating that 'The planning system should contribute to and enhance the natural and local environment by:.... 'Minimising impacts on biodiversity'... and 'preventing both new and existing development by contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability'.

Paragraph number 122 also states that local planning authorities should assume that pollution control regimes will operate effectively. During the operational phase of the facility, Natural Resources Wales permitting and controls will apply.

Main Potential Sources of Pollution

The main potential pollutants during construction include dust, silt and drainage run-off.

- 1) Should any significant areas of ponding water develop, straw bales or alternatively sand bags will be placed around the boundary of the water so as to largely contain it and filter out any suspended solids. They will be placed in a continuous line in such a manner as to prevent water containing silts and sediments from discharging in an uncontrolled manner off site.
- 2) The straw bales or sand bags will be inspected and maintained in place as necessary throughout the construction period and will be replaced as necessary to ensure their effectiveness.
- 3) Care will be taken on site to minimise the steepness of any exposed bare ground or stockpiles which would be vulnerable to rainfall thereby reducing the risk of soil erosion and release of suspended sediments into standing surface water or the river. If significant stockpiles of material are created, they will be seeded to stabilise the soils.
- 4) Should the ground become dry and dusty, dust suppressant measures will be employed. Dust will be controlled by periodic bowsering of the site with clean water as necessary with the use of a tractor and bowser.
- 5) Chemicals including fuel and oil will be stored on site in a location with an impervious base within a bund and will be secured. The bund will be of adequate capacity to contain any spillages or leaks. Leaking drums or tanks will be prohibited from site and if any should be detected they will be removed immediately in accordance with a safe procedure. Please note there are no requirements for any fuels or oils on site at any time.
- 6) Valves to any tanks will be protected from vandalism and kept secure to prevent unauthorised access. They will be kept turned off and kept in a locked state when not in use and.
- 7) There is no requirement for onsite refuelling but if it is necessary, refuelling of plant will be undertaken in a designated area away from sensitive habitats and will be supervised and not

left unattended. Spill kits will be available on site. Hoses and valves will be maintained in a safe condition. Diesel pumps will be placed on drip trays to ensure that minor leaks and spillages are controlled. Any such accumulated liquids would be removed and appropriately disposed of.

- 8) In the event of a significant spillage or an emergency, the spill kit will be used and the area temporarily bunded immediately to avoid uncontrolled discharge. Any spilt substance would be contained by covering with absorbent materials such as soil or sand or a boom. Natural Resources Wales would be contacted in the case of such an Emergency and the appropriate advice sought and required procedures as instructed would be followed.