Cottam Solar Project

Environmental Statement

Appendix 9.7: Great Crested Newt Survey Report

Prepared by: Clarkson & Woods Ltd.
January 2023

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Cottam
SOLAR PROJECT

GREAT CRESTED NEWT SURVEY REPORT

COTTAM SOLAR PROJECT

carried out by

CLARKSON & WOODS
ECOLOGICAL CONSULTANTS

commissioned by

COTTAM SOLAR PROJECT LTD.

SEPTEMBER 2022

GREAT CRESTED NEWT SURVEY REPORT

COTTAM SOLAR PROJECT

CONTENTS

Project title:	Cottam Solar Project		
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	Harry Fox	Tom Clarkson	

1 INTRODUCTION

1.1.1 Clarkson and Woods Ltd. was commissioned by Cottam Solar Project Ltd to carry out great crested newt (GCN) presence/likely absence surveys for the Cottam Solar Project. The Scheme broadly comprised four Sites: Cottam 1, Cottam 2, Cottam 3a and Cottam 3b situated in the West Lindsey District of Lincolnshire. These are referred to hereafter as 'the Sites', or individually as given above. In addition, the route of the below-ground electrical cable which will connect the Sites to one another and to the National Grid point of connection was included within the survey scope. Proposals comprise the development of an NSIP-scale solar park, containing solar energy production and storage components.

1.1.2 Environmental DNA surveys and Habitat Suitability Index assessments were carried out on waterbodies within and surrounding (up to 250m from the Sites' red line boundaries) between 28th April 2021 and 30th June 2022.

1.1.3 Surveys followed a scope agreed through consultation with Natural England via a Discretionary Advice Service dialogue, as well as Lincolnshire Wildlife Trust, and followed survey methodology aligned with the Great Crested Newt Mitigation Guidelines[1].

1.1.4 Unless the client indicates to the contrary, information on the presence of species collected during the surveys will be passed to the county biological records centre in order to augment their records for the area. This is in line with the CIEEM code of professional conduct[2].

1.2 Aims and Limitations

1.2.1 Surveys for GCN were undertaken to establish species presence or likely absence to ensure that the works are carried out in line with relevant legislation, and to inform an appropriate approach to mitigation during the construction and operational phases of the Scheme. The Survey Area encompasses all land within the solar and battery elements of the Scheme, as well as a corridor of land within which the electrical cabling will be installed.

1.2.2 This report details the methods and results of the surveys and provides an overview of the potential impacts on GCN that could result from the proposals, to inform the layout of the Scheme.

1.2.3 This information will be used within the eventual Cottam Solar Project Environmental Statement to inform the ecological evaluation of the habitats used by GCN and to characterise the impacts on them considered likely to result from the Scheme.

1.3 Description of the Survey Area

The Sites

1.3.1 The Sites are spread over an approximately 17Km area stretching from south to north between the settlements of Coates and Thorpe in the Fallows (Cottam 1), Corringham (Cottam 2) and Blyton (Cottam 3a and 3b) as shown in Figure 1. For the purposes of this document, Cottam 1 was further split into three distinct areas, namely Cottam 1 North, Cottam 1 South and Cottam 1 West.

1.3.2 The Sites all predominantly comprise large, open and generally flat arable fields characterised by winter-sown cereal crops, bounded by a network of managed hedgerows and ditches with narrow field margins, where present.

1.3.3 These Sites' habitats are very much typical of the surrounding landscape, which is dominated by arable farmland interspersed with small settlements and farmsteads linked by minor and single-track roads. The surrounding landscape is mostly flat but becomes more undulating north past Cottam 3a and rises to the east of the Sites at the 'Lincoln Cliff', some 4-5Km away, which is a significant north-south escarpment. The River Trent is located approximately 5km west of the Sites as it flows north towards the Humber Estuary, itself some 27km north of Cottam 3a.

1.3.4 Whilst no woodland is present within the Sites, several small stands of managed and unmanaged woodland are present adjacent and in the surrounding landscape, often the result of historical game management.

[1] Great Crested Newt Mitigation Guidelines. English Nature. 2001.
[2] Code of Professional Conduct. CIEEM, January 2019.

1.3.5 Standing water is generally absent from the Sites and their surroundings following the in-filling of traditional livestock drinking ponds, save for a very small number of agricultural pools/pits, decoy ponds or managed recreational fisheries.

1.3.6 Flowing water occurs sparsely, centred on the minor River Till (in the case of Cottam 1, and Cottam 2 via the Corringham and Yarthorpe Becks) and River Eau (around Cottam 3a via the Northorpe Beck) and their various feeder streams, and managed agricultural drainage ditches which regularly dry out.

Cable Route Survey Area

1.3.7 As shown on Figure 1, the proposed cable route will run a length of approximately 22km from Cottam 3a in the north to Cottam Power Station in the south west, approximately 1km west of the River Trent. It will connect up each of the Sites to one another and carry power to Cottam Power Station as the National Grid point of connection.

1.3.8 For the GCN surveys, a study area for the cable route was determined, to comprise a c.100m swathe of land along the approximate preferred route of the cable. The c.6km section leading from Cottam Power Station is significantly wider than this owing to the predicted need to accommodate multiple cables, including those resulting from other proposed solar projects in the area. Consequently, for the purposes of this survey, this shorter section is referred to as the Shared Cable Route (SCR), while the remainder is referred to as the Cottam Cable Route (CCR).

1.3.9 At the time of creation of the cable route survey area for the purposes of this survey, the exact final cable route was not decided, but was agreed to be sited within this swathe of land following completion of all environmental assessments.

1.3.10 In order to collect baseline information on the presence or otherwise of GCN within and in proximity of the CCR/SCR, a 250m search buffer was determined to be appropriate for the location of candidate ponds for further survey.

Quality Assurance

1.3.11 All ecologists employed directly by Clarkson and Woods are members or pending members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct[3] when undertaking ecological work.

1.3.12 The competence of all field surveyors has been assessed by Clarkson and Woods with respect to the CIEEM Competencies for Species Survey (CSS)[4].

1.3.13 This report has been prepared in accordance with the relevant British Standard: *BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*[5]. It has been prepared by an experienced ecologist who is a member of CIEEM. The report has also been subject to a two-stage quality assurance review by appropriately experienced ecologists who are full members of CIEEM.

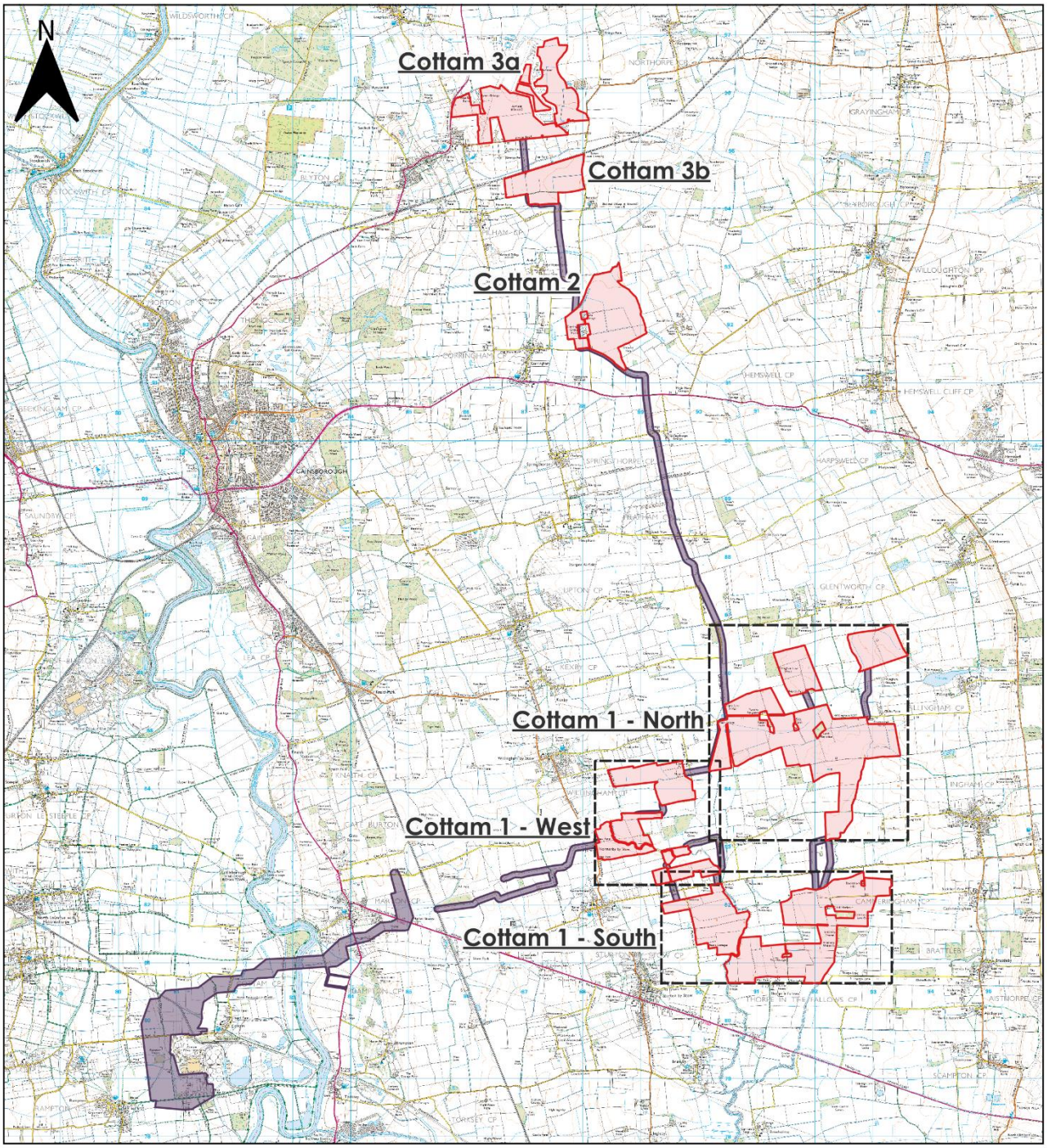
1.4 Assessment Scope / Consultation

1.4.1 The following statutory bodies were consulted to agree the appropriate scope of GCN surveys for the project, including the search buffer distances used:

- **Natural England** – Advisor assigned at onset of consultation. Paid-for Discretionary Advice Service available outside of statutory consultation process.
- **Lincolnshire Wildlife Trust** – A principal adviser to West Lindsey District Council on ecological matters.

1.4.2 No concerns were raised by these statutory bodies regarding the scope of surveys discussed.

[3] CIEEM (February 2022). *Code of Professional Conduct*. [redacted]
[4] CIEEM (2013). *Competencies for Species Survey (CSS)*. [redacted]
[5] The British Standards Institution (2013). *BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*. BSI Standards Ltd.



Key

- Scheme boundary
- Cable route corridor
- Site bounding box

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Project
Cottam Solar Project

Title
Proposed development sites and cable route

Figure number
1

Date
05/10/2022

Scale
0 1 2 3 km

2 METHODOLOGY

2.1 Desk Study

2.1.1 The Lincolnshire Environmental Records Centre (LERC) was consulted for records of amphibians, specifically GCN within 1km of the Site.

2.1.2 Clarkson and Woods' own database of ecological records derived from past survey work was also consulted for further locally-relevant data.

2.1.3 The Natural England/DEFRA web-based MAGIC map database was also consulted for records of European Protected Species (EPS) licences issued for mitigation projects concerning bats within 1km of the Site.

2.1.4 The data presented within this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.

2.2 Field Surveys

Survey Area Rationale

2.2.1 In determining an appropriate Survey Area radius beyond the red line boundary of the Sites and cable routes, a rationale was applied in consultation with Natural England. In general, development proposals which have the potential to significantly harm GCN or their habitats (and so may lead to a licence application) should be underpinned by survey evidence derived from either 250m or 500m beyond the site boundaries. The following factors were considered in order to determine the appropriate survey buffer for the Survey Area:

- **Habitat Suitability, Connectivity and Land Management:** Habitats within the Sites and local landscape are almost uniformly of low suitability, being dominated by arable farmland with limited pasture and woodland blocks. Very few or no areas of wetland or waterbodies exist beyond mostly dry ditches and the River Till corridor. Habitat connectivity is limited to narrow uncultivated field margins, managed hedgerows and woodland edges and represents a network of poor interconnectivity given the ubiquitously large field sizes and presence of minor and A-roads. The dominant arable land management is not generally conducive to thriving amphibian populations owing to the annual cultivation regime, application of sprays and the in-filling/draining of waterbodies or clearance of stands of vegetation, together degrading the ability for GCN to disperse within this landscape.
- **Density of Ponds and GCN Records in Lincolnshire:** From a review of OS mapping and Desk Study data it is evident that, while GCN are present across Lincolnshire, they tend to be recorded at a relatively low density. While this may be hampered by under-recording considering the arable-dominated landscape, it is considered to likely be a relatively fair representation of the fragmented condition of the pond network and GCN population in this part of the County. A large GCN population local to the Survey Area was therefore not considered likely to occur. Furthermore, due to the land management types given above, the pond network is considered to be sporadic.
- **Characteristics of Likely Development Impacts**: The installation of a ground mounted solar array will result in temporary impacts to the fields within the Sites, including the tracking of machinery, laying of cabling and the insertion of piled frameworks onto which the panels will be mounted. Grassland and other natural habitats will be created and managed beneath the arrays themselves. Other structures installed will include electrical inverter cabinets, minor electrical substations, perimeter fencing and access trackways. A development free buffer from all field boundaries will be observed within the Scheme design. This will mean that hedgerows, woodland, waterbodies, watercourses and uncultivated margins will be preserved throughout the development and enhanced wherever possible.

2.2.2 Following consideration of the above factors, a 250m radius was considered an appropriate and proportionate distance within which to identify and survey waterbodies for GCN impacts associated with the Scheme. Consequently, the Survey Area incorporated all land at the Sites and the cable routes as well as an additional 250m radius from these.

2.2.3 GCN are associated with, and most frequently use, suitable habitats within close proximity to their breeding ponds (or networks thereof). GCN may be found up to 250m from ponds (and up to 500m from ponds in exceptional circumstances[6]); however, studies by Jehle[7] and Cresswell & Whitworth[8] have demonstrated that the habitat within 50m of the pond is the most important to GCN and supports the majority of a population within its terrestrial phase. Based on Natural England's GCN mitigation guidelines, habitat within 50m is noted to be 'immediate' or 'core' habitat, 50 – 250m is known as intermediate habitat and >250m is termed 'distant' habitat.

2.2.4 Presence of GCN in ponds >250m are not considered to be relevant to the temporary and low impacts associated with the proposals. Any records or presence of GCN beyond 250m of the Sites would not impact the proposals or mitigation due to the negligible impact on any newts present, lack of habitat provided by the Site and lack of connective habitat the Site may otherwise provide. This approach is also supported by and forms the basis of GCN district licensing schemes elsewhere in the country administered by Natural England.

Identification of Waterbodies and Access

2.2.5 Candidate waterbodies were identified through consultation of Ordnance Survey 1:25,000 mapping, and the OS MasterMap 'Inland water' dataset, as well as cross-checking with Google Earth aerial imagery, where appropriate.

2.2.6 Land agents, Savils, were commissioned to undertake identification of landowners and correspondence with them in writing in advance of the survey periods to ensure sufficient notice was given to landowners and to ensure an adequate level of effort was expended in attempting to gain access permissions. Follow-up telephone or email contact, and/or site visits were also undertaken where necessary.

2.2.7 All waterbodies within the Sites and a 250m radius of the Site boundaries were accessed and surveyed across the 2021 and 2022 survey seasons, where access permission was granted and access was practicable. Of the 96 waterbodies identified, 81 were granted access for field survey, as shown in Figures 2 to 6 and in Table 1.

Table 1: Waterbodies Identified within 250m of the Site

Site	Waterbody Ref	Distance / Direction from Site	Access Granted?	Waterbody Present?
Cottam 1 North	C1N-1	Adjacent East & West	Y	Y
	C1N-2	50m West	Y	Y
	C1N-3	35m West	Y	Y
	C1N-4	40m Northwest	Y	Y
	C1N-5	75m South	Y	Y
	C1N-6	20m East	Y	Y
	C1N-7	30m West	Y	Y
	C1N-8	195m North	N	--
	C1N-9	15m West	Y	Y
	C1N-10	35m North	Y	Y

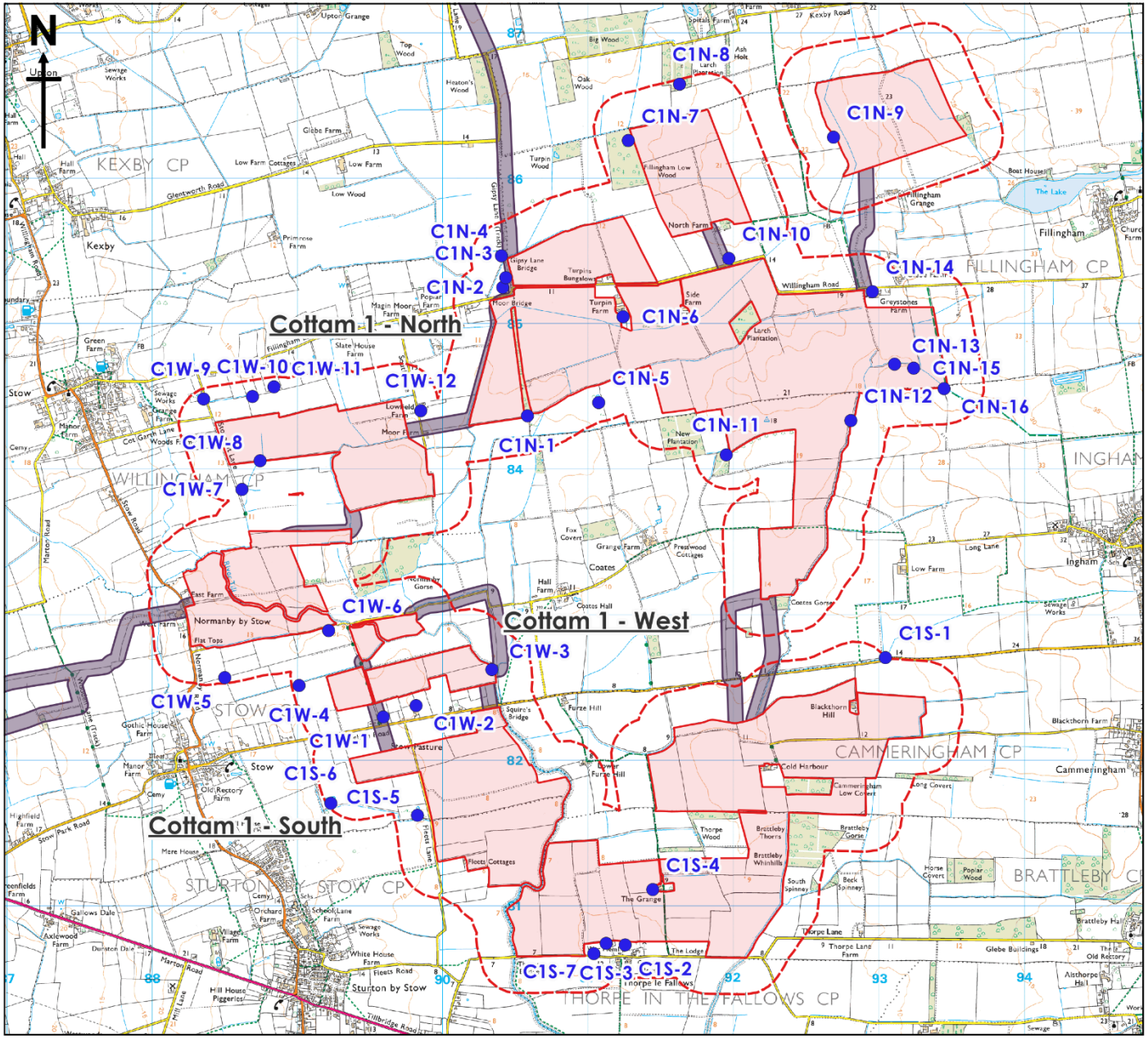
[6] Great Crested Newt Mitigation Guidelines. 2001. Natural England
[7] Jehle R (2000) The terrestrial summer habitat of radio- tracked great crested newts (Triturus cristatus) and marbled newts (T. marmoratus). Herpetological Journal 10: 137-142
[8] Cresswell W and Whitworth R (2004) An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt *Triturus cristatus*. English Nature Research Report 576. English Nature, Peterborough

Site	Waterbody Ref	Distance / Direction from Site	Access Granted?	Waterbody Present?
	C1N-11	25m Southwest	Y	Y
	C1N-12	Adjacent East	Y	Y
	C1N-13	On site	Y	Y
	C1N-14	45m East	Y	Y
	C1N-15	On site	Y	Y
	C1N-16	Adjacent South	Y	Y
Cottam 1 West	C1W-1	100m South	Y	Y
	C1W-2	85m South	Y	N
	C1W-3	On site	Y	Y
	C1W-4	195m Southwest	Y	Y
	C1W-5	205m South	Y	Y
	C1W-6	20m South	Y	Y
	C1W-7	180m South	N	--
	C1W-8	On site	Y	Y
	C1W-9	185m North	N	--
	C1W-10	135m North	Y	Y
	C1W-11	180m North	Y	Y
	C1W-12	115m East	Y	Y
Cottam 1 South	C1S-1	250m Northeast	Y	N
	C1S-2	15m South	N	--
	C1S-3	15m South	Y	Y
	C1S-4	5m East	Y	Y
	C1S-5	65m West	N	--
	C1S-6	175m West	Y	Y
	C1S-7	50m Southeast	Y	Y
Cottam 2	C2-1	150m East	Y	Y
	C2-2	On site	Y	Y
	C2-3	On site	Y	N
	C2-4	On site	Y	Y

Site	Waterbody Ref	Distance / Direction from Site	Access Granted?	Waterbody Present?
	C2-5	On site	Y	Y
	C2-6	Adjacent North	Y	Y
	C2-7	Adjacent East	Y	N
	C2-8	30m South	Y	N
	C2-9	10m West	Y	Y
	C2-10	Adjacent North, West	Y	N
	C2-11	On site	Y	Y
	C2-12	Adjacent East	N	--
	C2-13	135m North	N	--
Cottam 3a	C3a-1	25m East	Y	N
	C3a-2	10m South	Y	Y
	C3a-3	15m Northeast	Y	Y
	C3a-4	10m West	N	--
	C3a-5	70m East	N	--
	C3a-6	65m West	N	--
	C3a-7	60m South	Y	Y
	C3a-8	20m West	Y	Y
	C3a-9	15m East	Y	Y
	C3a-10	50m East	Y	Y
	C3a-11	On site	Y	Y
Cottam 3b	C3b-1	On site	Y	Y
	C3b-2	20m North	N	--
	C3b-3	30m Northwest	Y	Y
	C3b-4	75m West	Y	Y
	C3b-5	175m South	Y	Y
	C3b-6	185m South	Y	N
	C3b-7	On site	Y	Y
	C3b-8	45m North	N	--
	C3b-9	80m North	N	--

Site	Waterbody Ref	Distance / Direction from Site	Access Granted?	Waterbody Present?
Cottam Cable Route*	CCR-1	200m East	Y	Y
	CCR-2	195m East	N	--
	CCR-3	180m East	Y	Y
	CCR-4	100m East	Y	Y
	CCR-5	270m East	Y	Y
	CCR-6	100m East	N	--
	CCR-7	220m East	N	--
	CCR-8	100m East	Y	Y
	CCR-9	On Site	Y	Y
	CCR-10	On Site	Y	Y
	CCR-11	230m Northwest	Y	N
Shared Cable Route*	SCR-1	On Site	Y	N
	SCR-2	120m East	Y	Y
	SCR-3	105m North	Y	Y
	SCR-4	On Site	Y	Y
	SCR-5	240m North	Y	Y
	SCR-6	On Site	Y	Y
	SCR-7	70m North	Y	Y
	SCR-8	30m North	Y	Y
	SCR-9	On Site	Y	Y
	SCR-10	On Site	Y	Y
	SCR-11	140m South	Y	N
	SCR-12	250m South	Y	N
	SCR-13	85m East	Y	Y
	SCR-14	245m South	Y	N
	SCR-15	275m Southeast	Y	Y
	SCR-16	On Site	Y	Y
	SCR-17	75m South	Y	Y

*Distances of waterbodies are approximate from cable route corridor



Key:

- Ponds
- Scheme boundary
- 250m boundary buffer
- Cable route corridor

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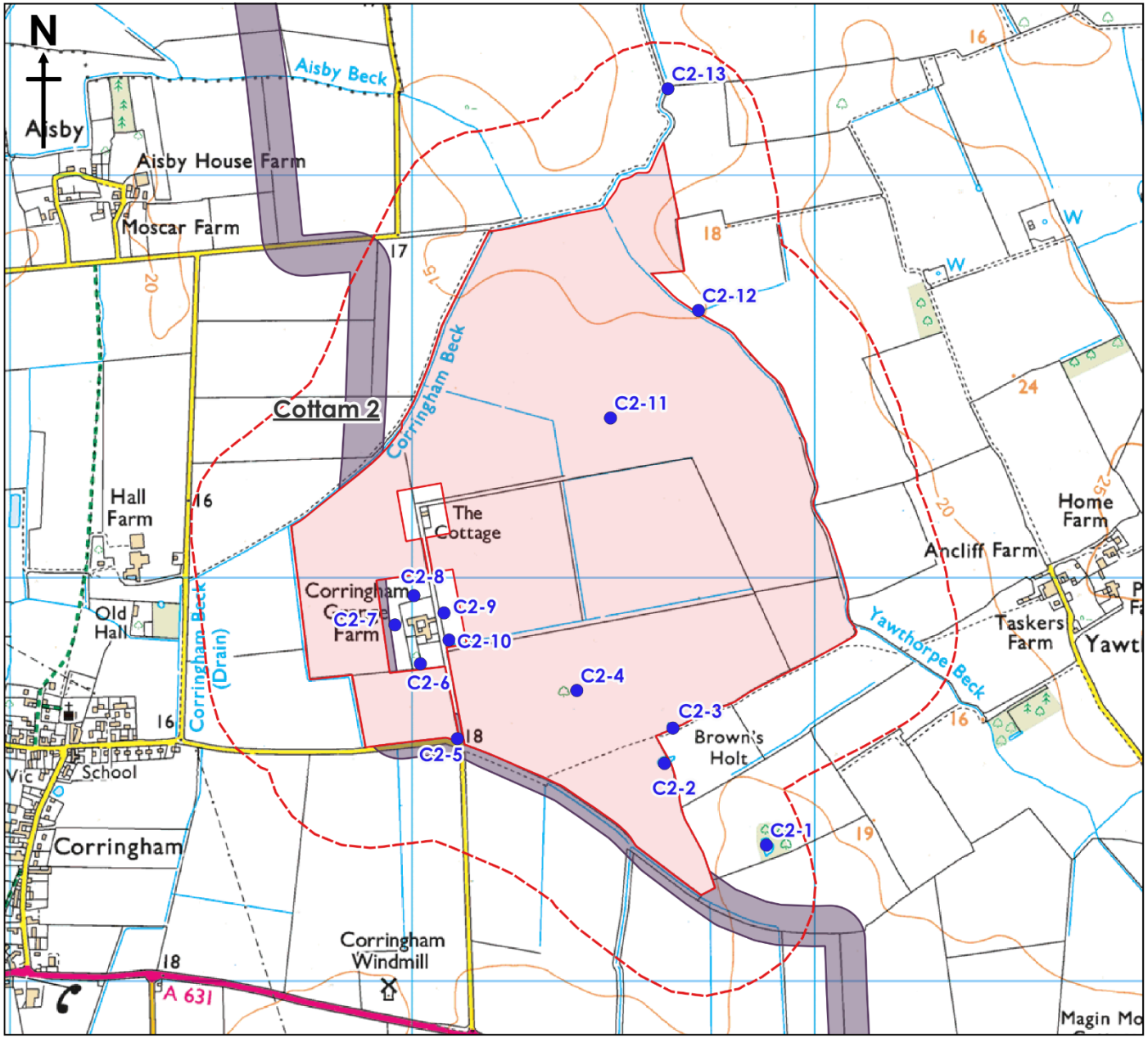
Project	**Cottam Solar Project**
Title	**Locations of waterbodies found during search**
Figure number	**2**
Date	**05/10/2022**
Scale	0 0.5 1 1.5 km



Key:

- Ponds
- Scheme boundary
- 250m boundary buffer
- Cable route corridor

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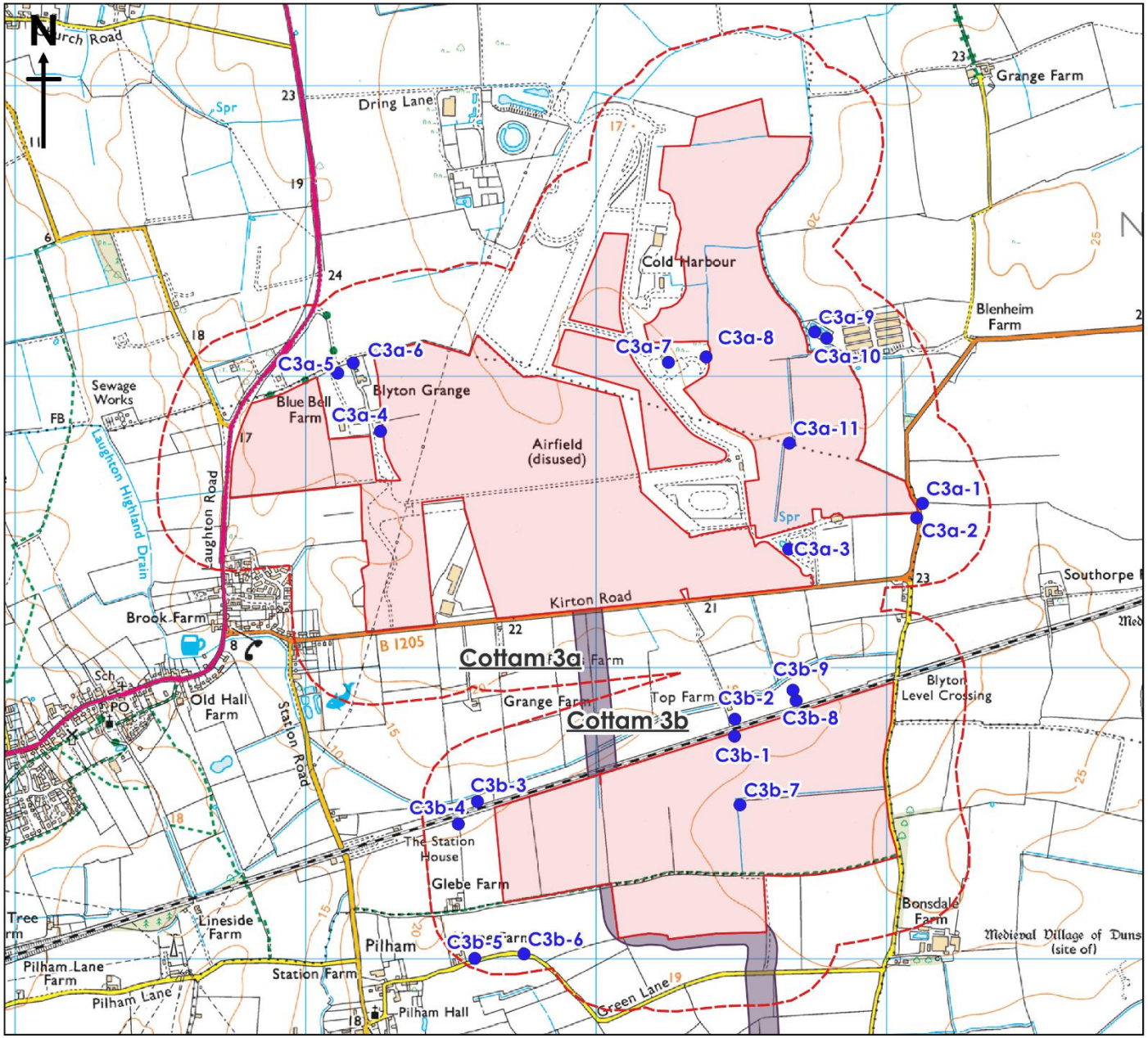
Project	**Cottam Solar Project**
Title	**Locations of waterbodies found during search**
Figure number	**3**
Date	**05/10/2022**
Scale	0 0.25 0.5 km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Key:
Ponds
Scheme boundary
250m boundary buffer
Cable route corridor
C3a-1
C3a-2
C3a-3
C3a-4
C3a-5
C3a-6
C3a-7
C3a-8
C3a-9
C3a-10
C3a-11
C3b-1
C3b-2
C3b-3
C3b-4
C3b-5
C3b-6
C3b-7
C3b-8
C3b-9
Cottam 3a
Cottam 3b
Grange Farm
Cold Harbour
Blenheim Farm
Airfield (disused)
Blyton Grange
Blue Bell Farm
Sewage Works
Laughton Highland Drain
Laughton Road
Kirton Road
B 1205
Brook Farm
Old Hall Farm
Station Road
Top Farm
Blyton Level Crossing
The Station House
Glebe Farm
Lineside Farm
Pilham
Pilham Lane Farm
Pilham Lane
Station Farm
Pilham Hall
Green Lane
Bonsdale Farm
Medieval Village of Duns (site of)
Dring Lane
Spr
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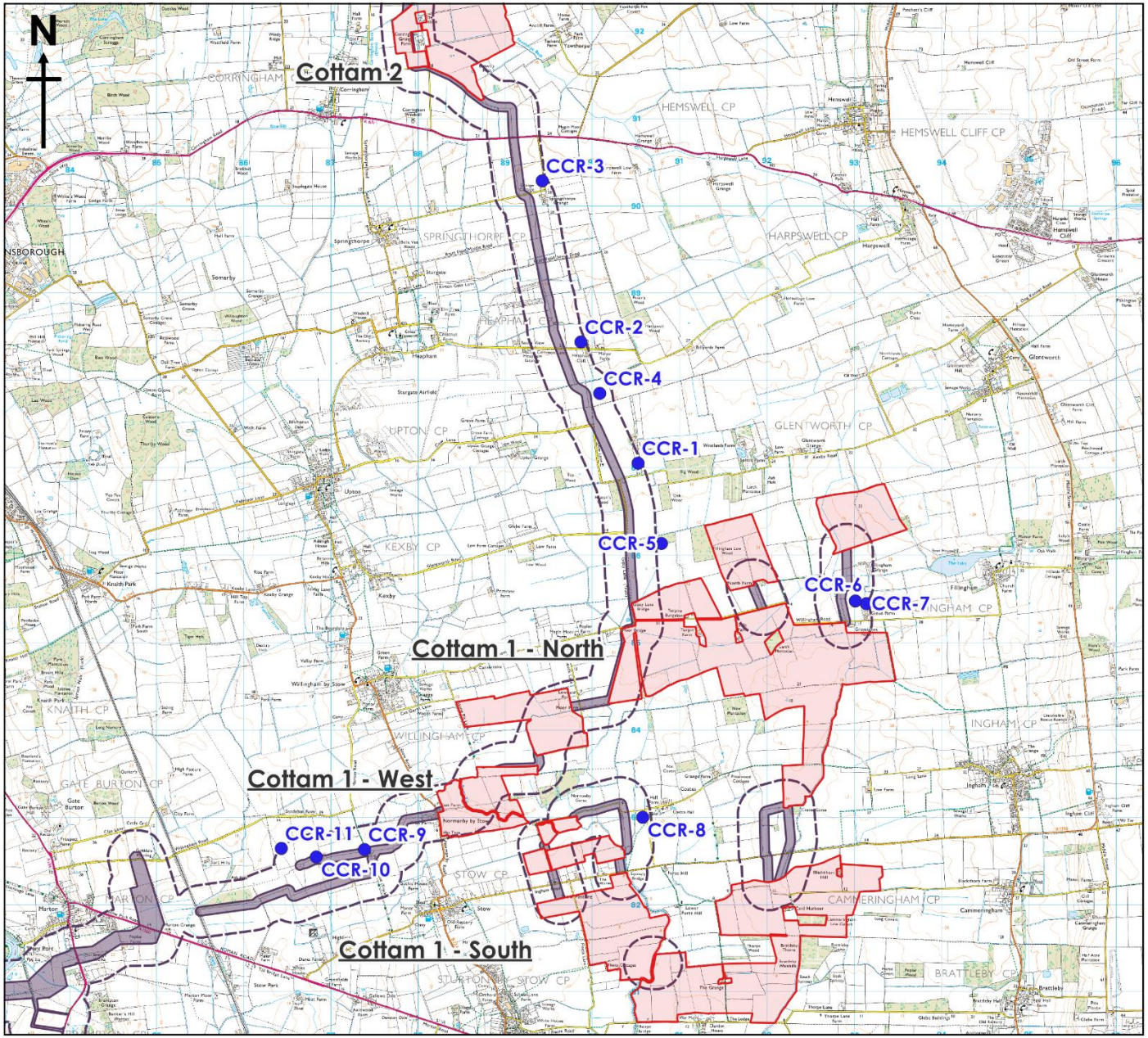
Project
Cottam Solar Project
Title
Locations of waterbodies found during search
Figure number
4
Date
05/10/2022
Scale
0
0.35
0.7 km



Key:

- Ponds
- Scheme boundary
- Cable route corridor
- Cable route pond search buffer

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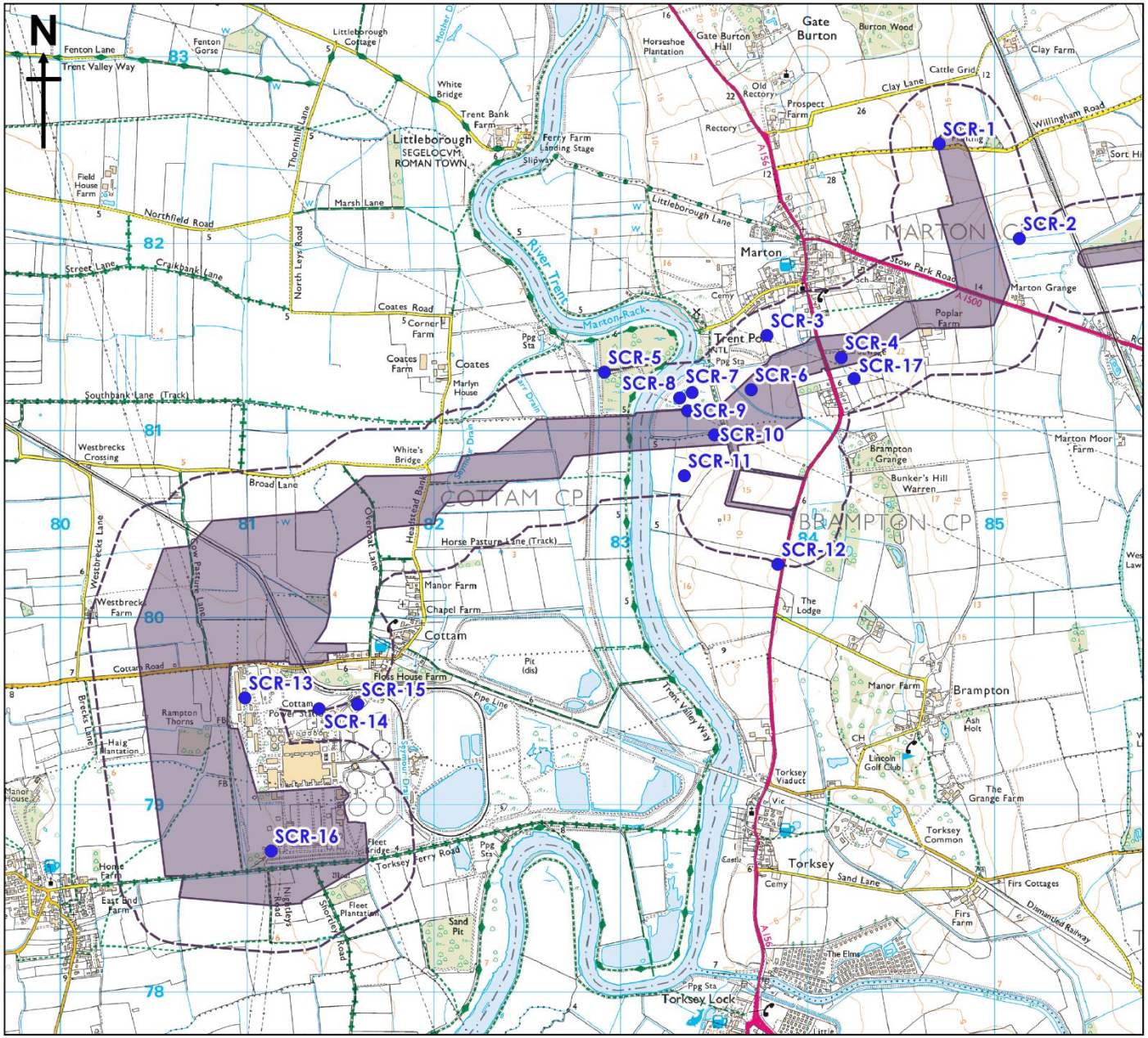
Project
Cottam Solar Project

Title
Locations of waterbodies found during search

Figure number
5

Date
05/10/2022

Scale
0 0.8 1.6 2.4 km



Key:

- Ponds
- Cable route corridor
- Cable route pond search buffer

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Project
Cottam Solar Project

Title
Locations of waterbodies found during search

Figure number
6

Date
05/10/2022

Scale
0 0.55 1.1 km

Personnel

2.2.8 Table 2 presents the surveyor details for the individuals associated with undertaking the GCN eDNA surveys and habitat assessments.

Table 2: Surveyor Details

Name and Relevant Qualifications	Surveyor Details including Natural England Licence Number
Charlie Durigan BSc MSc	ACIEEM, 9 years' survey experience Personal survey licence (2017-28064-CLS-CLS)
Harry Fox BSc	MCIEEM, 14 years' survey experience Personal survey licence (2016-19781-CLS-CLS)
Mike Hockey BSc	MCIEEM, 8 years' survey experience Personal survey licence (2019-38987-CLS-CLS)
Mark Jermy BSc	14 years' survey experience Personal survey licence (2015-17366-CLS-CLS)
Joel Wright BSc MSc	MCIEEM, 9 years' survey experience
Adèle Remazeilles	ACIEEM, 5 years' survey experience
Rebecca Sandey MSc	ACIEEM, 3 years' survey experience
James Latham	MCIEEM, 18 years' survey experience
Sarah Richards BSc MSc	QCIEEM, 2 years' survey experience
Molly Brown BSc MSc	StuCIEEM, 1 year's survey experience
Indie England BSc	QCIEEM, 1 year's survey experience
Matt Jones MSc BSc	2 years' survey experience
Fabian Bowes-Richley MSc BSc	1 year's survey experience
Bryony Blades MSc	1 year's survey experience

HSI and eDNA Survey Methods

2.2.9 Where suitable waterbodies were identified on accessible land a Habitat Suitability Index (HSI) score was calculated for each following the methodology described by Oldham et al[9]. HSI scores give a relative indication of the likelihood that a waterbody would support breeding GCN. Factors which increase these scores include the presence of other potentially suitable waterbodies nearby, water quality, waterbody size, absence of fish/waterfowl, vegetation cover and shading. Full HSI results for each waterbody are provided in Appendix A.

2.2.10 All survey visits undertaken during 2021 were limited to those on the Sites (*i.e.* within the red line boundary) and those outside of the development boundary, but within the same ownership boundaries. Survey visits undertaken in 2022 focussed on those waterbodies on third party land within 250m of the Scheme, and within

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

the CCR/SCR search areas. Attempts were also made to resurvey waterbodies in 2022 that had been recorded during the 2021 survey visit as *dry, but likely to hold water*.

2.2.11 eDNA surveys can only be undertaken where the water level is of a sufficient depth (>10cm) and the surveys must be undertaken between 15th April and 30th June, inclusive for the result to be considered reliable. This spans the GCN breeding season and immediately after, when eDNA from the species will likely remain in the water column once the animals have left. Within this period, it is possible for waterbodies to have dried up and therefore be unsuitable for eDNA survey. Professional judgement was used, based on habitats and vegetation present, to determine the suitability for breeding GCN in any given year, and surveys were repeated wherever possible if a pond was found to be dry at the time of survey only due to weather conditions. Water samples were taken from 20 locations around each of the surveyed waterbodies following best practice as outlined in the Defra Project Report WC1067[10]. Care was taken to ensure that the water was not contaminated from other sources and that the sediment was not stirred up to contaminate the samples with denatured DNA from prior GCN habitation.

2.2.12 GCN eDNA kits were provided and water samples analysed by ADAS, an approved laboratory under the Natural England proficiency testing scheme.

2.2.13 Figures 3 and 4 present the Sites along with the 250m buffer within which waterbodies were assessed. Where water was present and access was consented, these waterbodies were then subject to the above detailed HSI and eDNA surveys.

eDNA Survey Limitations

2.2.14 False positive scores can occur due to a number of factors; including;

- Cross contamination between sites (due to equipment, clothing etc.).
- Aquatic animals (e.g. heron, water vole) transferring newt DNA between sites (e.g. in faeces, in water trapped in fur).
- In-flows, bringing eDNA from sites with newts into unoccupied waterbodies.
- A laboratory false positive.
- Historic eDNA in sediment released into the water column.

2.2.15 False negative scores can occur due to a number of factors; including;

- Resident very low population present.
- Very wide, shallow drawdown zones where samples are collected, where no newt activity has occurred.
- Presence of very densely packed aquatic vegetation in waterbody reducing sample collection/newt activity in these areas.
- Limited access to the entire waterbody perimeter.
- Laboratory false negatives.

2.2.16 Despite the above listed limitations, use of GCN eDNA survey as a survey technique method is a tried and tested method, and is approved for use by Natural England, with studies showing it can provide a more reliable result than the traditional survey techniques[9]. Furthermore, ADAS are a Natural England approved laboratory and undertake proficiency testing, consistently returning a reliable 100% score, including the 2021 and 2022 seasons. The results are therefore considered to be reliable and accurate. Furthermore, care was taken to strictly follow the GCN eDNA sampling best practice measures to prevent cross-contamination, as well as biosecurity issues.

2.2.17 All samples were taken from sufficient water depths (i.e. >10cm), however, where water levels were observed to be close to this depth, this was noted during the survey. Where features such as in-flows into the waterbodies sampled were observed, which are not included within the HSI assessment, these were recorded during the survey and have been reported as such, so that they may be taken into account.

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

2.2.18 In some instances, an indeterminate result is returned from the eDNA analysis; this occurs where factors such as the presence of contaminants or high sediment content in the water column make DNA extraction difficult, as in the case of slurry pits, waterbodies with high waterfowl populations, or waterbodies subject to accumulated leachate or agricultural runoff. Where survey results were returned as indeterminate following survey in 2021 and HSI scores suggested that the waterbody may have some potential suitability for GCN, these were resurveyed using filter kits during the 2022 season. Filter kits allow the water sample to be taken, while removing the potential for inhibition during analysis. In this case, all waterbodies with an HSI score of "Below Average" or above were revisited, excluding those with "Poor" suitability".

2.2.19 While best efforts were made to access all waterbodies identified, in some cases access was refused by the landowner or the landowner could not be identified/contacted for permission. In these cases, an attempt is made to infer GCN presence or absence from the results associated with nearby waterbodies, if any, and from HSI scores. 15 ponds out of 96 (16%) could not be accessed, as shown in Table 1. These were distributed across all four Sites and associated cable routes.

2.2.20 Where waterbodies were observed to be dry in the 2021 survey season, these were revisited during 2022 to account for potential temporal fluctuations in water level. In few cases, the waterbody was assessed as unlikely to hold water at any time of year following the 2021 survey, often due to a complete lack of vegetation associated with damp/wet habitats or due to the presence of dense vegetation associated with dry habitats, such as bramble scrub. These waterbodies were therefore not subject to a second survey and were scoped out as unsuitable for GCN.

2.2.21 Where dense vegetation surrounded a waterbody and made access difficult, attempts were made to clear areas as best as possible in order to take water samples. In some cases where this happened, access to the shoreline was greatly reduced and samples were either taken from a more limited area, or fewer samples were collected in total. This has been highlighted within the relevant tables below. Where these samples were returned as negative for GCN, the suitability of the surrounding habitat, presence of other nearby waterbodies and the HSI score of the waterbody will also be taken into account when recommendations for appropriate mitigation are made.

2.2.22 Access agreements and logistics for six ponds within the shared cable route precluded the completion of eDNA surveys within the industry-standard survey window in 2022. Nevertheless, Habitat Suitability Index scores were calculated from field surveys of these ponds to give an indication of likelihood of GCN breeding usage. As anecdotal records of GCN within these ponds exist, it is considered that an assumed presence within these ponds would be an appropriate basis for assessment until further survey can be carried out.

3 RESULTS

3.1 Desk Study Information

3.1.1 For Cottam 1, 76 GCN records are present beyond 250m of the Site, the closest being 475m southwest of the Site.

3.1.2 No GCN records were present within 2km of Cottam 2 or within 2km of Cottam 3a or 3b.

3.1.3 In relation to the SCR, a cluster of at least 22 GCN records was present located between 600m and 1.8km to the south and east of the SCR. This cluster is associated with lagoons and pools created during the construction of the Cottam Power Station, situated between the eastern boundary of the power station and the River Trent at Torksey Viaduct.

3.1.4 In relation to the CCR, only one GCN record was present within 250m of its outline, located approximately 500m southeast of pond CCR-3 and dating from an eDNA survey conducted in 2017. The actual grid reference (and lat-long coordinates) provided with the record places it within the centre of an arable field where there are no pond or other potential waterbodies close by. Consequently, from an examination of OS mapping data and fieldwork conducted in the area, it is assumed that it relates to CCR-3, although it is also acknowledged that the location could equally likely be derived from a poor-accuracy GPS reading or mis-entry of data.

3.1.5 GCN records are very sparsely distributed within the West Lindsey district, reflecting the fact that the intensive agricultural land-use, which characterises the landscape, provides generally poor habitat for this species. The Cottam sites are considered to be consistently sub-optimal for GCN in terms of intrinsic habitat value and local population densities.

3.1.6 GCN are Species of Principal Importance (SoPI) under the NERC Act (2006) and are listed on the Lincolnshire Biodiversity Action Plan (BAP).

3.1.7 GCN district level licensing (DLL) is not currently available in South Lincolnshire.

3.1.8 A search for previously issued European Protected Species Licences for great crested newts from within 1km of the Sites and cable route were obtained using the DEFRA MAGIC website[11]. No records were found.

3.2 Field Survey Results

Descriptions and HSI of Accessible Waterbodies

3.2.1 A large proportion of the waterbodies surveyed were noted to be in an agricultural setting and/or managed to support waterfowl and other game birds for shooting. These waterbodies were observed to be generally high in sediment, heavily shaded and devoid of aquatic or bankside vegetation as a result, which significantly reduced the suitability of the waterbodies, and often adjacent habitat, for breeding or sheltering GCN. This outcome is reflected within the HSI results, of which 13 were assessed as being of "Below Average" and 17 as being of "Poor" suitability.

Cottam 1

3.2.2 Of the 35 waterbodies that were identified within 250m of Cottam 1, 28 (80%) were found to exist, were granted access and were subsequently visited during the 2021 and/or 2022 survey seasons. 20 of these waterbodies held water and were subject to eDNA survey. Table 3 refers.

Table 3: Cottam 1 Waterbody Descriptions and HSI Scores

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
Cottam 1 South (C1S)-3	0.56 | BELOW AVG.	16/06/2021	In-field and livestock poached	eDNA survey undertaken

[11] https://magic.defra.gov.uk/ accessed 13/07/2021

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
C1S-4	0.67 | AVERAGE	16/06/2021	Shaded to south, waterfowl present	eDNA survey undertaken
C1S-6	0.70 | GOOD	09/05/2022	Large pond with fish & waterfowl present	eDNA survey undertaken
C1S-7	N/A (dry)	09/05/2022	Dry at time of survey (2022 only). In livestock field (grazing cattle)	Appeared unlikely to hold water. Unsuitable for GCN
Cottam 1 West (C1W)-1	0.57 | BELOW AVG.	29/06/2022	Lined garden pond	eDNA survey undertaken
C1W-3	N/A (dry)	09/05/2022	Dry at time of survey (2021 and 2022)	Likely to hold water at some times of year due to presence of vegetation associated with wet habitats
C1W-4	0.73 | GOOD	16/06/2021	Small; within hedgerow adjacent to arable field	eDNA survey undertaken
C1W-5	N/A (dry)	16/06/2021	Dry at time of survey	Appeared unlikely to hold water
C1W-6	0.61 | AVERAGE	16/06/2021	Fully shaded by surrounding copse; fenced off	eDNA survey undertaken
C1W-8	0.76 | GOOD	16/06/2021	Steep banks dominated by grass, ruderals & frequent blackthorn	eDNA survey undertaken
C1W-10	N/A (dry)	21/06/2022	Dry at time of survey (2022 only)	Appeared unlikely to hold water
C1W-11	N/A (dry)	21/06/2022	Dry at time of survey (2022 only)	Appeared unlikely to hold water
C1W-12	0.45 | POOR	09/05/2022	Small waterbody with wildfowl present	eDNA survey undertaken
Cottam 1 North (C1N)-1	N/A (dry)	15/06/2021	Dry at time of survey (2021 only)	Appeared unlikely to hold water during GCN breeding
C1N-2	0.33 | POOR	10/05/2022	Duck pond (geese & ducks breeding)	eDNA survey undertaken
C1N-3	0.45 | POOR	10/05/2022	Duck pond	eDNA survey undertaken
C1N- 4	0.70 | GOOD	10/05/2022	Shallow, in-field pond. Geese present	eDNA survey undertaken

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
C1N-5	0.41 | POOR	10/05/2022	Shaded woodland waterbody	eDNA survey undertaken
C1N-6	0.46 | POOR	15/06/2021	Slurry pit / farm run-off	eDNA survey undertaken
C1N-7	0.46 | POOR	10/05/2022	Duck (shooting) pond	eDNA survey undertaken
C1N-9	0.57 | BELOW AVG.	15/06/2021	Small, shaded woodland waterbody	eDNA survey undertaken
C1N-10	0.38 | POOR	10/05/2022	Pair of immediately adjacent duck ponds. Geese present and stocked with carp. Tadpoles noted in one	eDNA survey undertaken (1 kit for both ponds)
C1N-11	0.60 | AVERAGE	15/06/2021	Within woodland; shaded	eDNA survey undertaken
C1N-12	N/A (dry)	15/06/2021	Dry at phase 1 and at time of survey (2021 and 2022)	Appeared unlikely to hold water
C1N-13	0.45 | POOR	15/06/2021	Adjacent to drain, with in- and outflow	eDNA survey undertaken
C1N-14	0.46 | POOR	15/06/2021	Stocked pond	eDNA survey undertaken
C1N-15	0.54 | BELOW AVG.	15/06/2021	Stocked pond within willow copse	eDNA survey undertaken
C1N-16	N/A (dry)	10/05/2022	Dry at time of survey (2022 only)	Likely unsuitable for GCN

Cottam 2

3.2.3 Of the 13 waterbodies that were identified within 250m Cottam 2, 7 (53.85%) were found to exist, were given access and were subsequently visited during the 2021 and/or 2022 survey seasons. Five of these waterbodies held water and were subject to eDNA survey. Table 4 refers.

Table 4: Cottam 2 Waterbody Descriptions and HSI Scores

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
Cottam 2 (C2)-1	0.44 | POOR	11/05/2022	Duck (shooting) pond	eDNA survey undertaken
C2-2	0.73 | GOOD	28/05/2021	Within copse of willow spp., hawthorn & blackthorn scrub	eDNA survey undertaken
C2-4	0.75 | GOOD	28/05/2021	In-field pond with steep banks. Moorhen present.	eDNA survey undertaken

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
			Significant rabbit damage to terrestrial habitat	
C2-5	0.43 | POOR	28/05/2021 + 11/05/2022	Within corner of livestock field; cattle poached	Very shallow water (2021) and dry (2022) at time of survey (no eDNA undertaken.)
C2-6	0.56 | BELOW AVG.	11/05/2022	Surrounded by very dense scrub	eDNA survey undertaken
C2-9	0.35 | POOR	16/06/2021	Slurry pit, steep banks (unsafe to survey)	Unsuitable for GCN, no water. eDNA not undertaken.
C2-11	0.53 | BELOW AVG.	16/06/2021	Infield waterbody with low water level	eDNA survey undertaken

Cottam 3a

3.2.4 Of the 11 waterbodies that were identified within 250m of Cottam 3a, 7 (63.64%) were found to exist, were given access and were subsequently visited during the 2021 and/or 2022 survey seasons. All 7 of these waterbodies held water and were subject to eDNA survey. Table 5 refers.

Table 5: Cottam 3a Waterbody Descriptions and HSI Scores

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
Cottam 3a(C3a)-2	0.26 | POOR	10/05/2022	Adjacent to road within copse of willow sp. & ash	eDNA survey undertaken
C3a-3	0.79 | GOOD	16/06/2021	Large manmade waterbody, stocked with fish	eDNA survey undertaken
C3a-7	0.67 | AVERAGE	16/06/2021	Large manmade waterbody, stocked with fish	eDNA survey undertaken
C3a-8	0.74 | GOOD	16/06/2021	Sited within area of dense woodland / scrub	eDNA survey undertaken
C3a-9	0.70 | GOOD	22/06/2022	Adjacent poultry farm	Outflow to Pond 10 eDNA survey undertaken
C3a-10	0.66 | BELOW AVG.	22/06/2022	Adjacent poultry farm	Inflow from Pond 9 eDNA survey undertaken
C3a-11	0.70 | GOOD	16/06/2021	Field pond fed by drainage ditch to east & west	eDNA survey undertaken

Cottam 3b

3.2.5 Of the 9 waterbodies that were identified within 250m Cottam 3a, 5 (55.56%) were found to exist, were given access and were subsequently visited during the 2021 and/or 2022 survey seasons. 4 of these waterbodies held water and were subject to eDNA survey. Table 6 refers.

Table 6: Cottam 3b Waterbody Descriptions and HSI Scores

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
Cottam 3b-1	N/A (dry)	16/06/2021	Overgrown with ruderal vegetation; dry at time of survey (2021 & 2022)	Unlikely to hold water, unsuitable for GCN
C3b-3	0.80 | EXCELLENT	11/05/2022	Large duck pond with multiple islands	eDNA survey undertaken
C3b-4	0.51 | BELOW AVG.	16/06/2021 22/06/2022	In corner of field within area of dense scrub. Dry in 2022	eDNA survey undertaken (2021)
C3b-5	0.54 | BELOW AVG.	22/06/2022	Shaded within copse of trees adjacent farmyard	eDNA survey undertaken
C3b-7	0.64 | AVERAGE	16/06/2021	Sited within area of dense woodland / scrub	eDNA survey undertaken

Cottam Cable Route and Shared Cable Route

3.2.6 Of the 28 waterbodies that were identified within 250m of the CCR/SCR, 20 (71%) were found to exist, were given access and were visited during the 2021 and/or 2022 survey seasons. As given in paragraph 2.2.22, six ponds within or in proximity to the SCR could not have eDNA surveys undertaken on them during the 2022 season. Seven of the accessed waterbodies held water and were subject to eDNA survey. Table 7 refers.

Table 7: Cottam Cable Route and Shared Cable Route Waterbody Descriptions and HSI Scores

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
Cottam Cable Route (CCR)-1	0.61 | AVERAGE	21/06/2022	Large, isolated duck pond	eDNA survey undertaken
CCR-3	0.51 | BELOW AVG.	21/06/2022	Large pond in area of good woodland/scrub habitat. Very scrubbed out to south. Muscovy ducks present. Farm close by to the south.	eDNA survey undertaken
CCR-4	0.38 | POOR	21/06/2022	Isolated in-field pond	eDNA survey undertaken
CCR-5	0.68 | AVERAGE	28/05/2021 + 11/05/2022	Large duck pond at the edge of woodland. Line of conifers to west	eDNA survey undertaken
CCR-8	0.73 | GOOD	21/06/2022	Large waterbody in area of good habitat; dense scrub	eDNA survey undertaken
CCR-9	N/A (dry)	12/05/2022	Dry agricultural pond with banks dominated by dense scrub	No eDNA survey, largely unsuitable for GCN

Waterbody Reference	HSI Score	Date Surveyed	Waterbody Description	Other Notes
CCR-10	N/A (dry)	11/05/2022	Agricultural pond. Water level too low at time of survey (<10cm), likely to dry completely, annually	No eDNA survey
SCR-2	N/A (dry)	11/05/2022	Dry at time of survey	Likely unsuitable for GCN
SCR-3	0.58 | BELOW AVG.	04/07/2022	Almost dry at time of survey. Likely only holds enough water early in season	eDNA not undertaken for access and seasonal reasons
SCR-4	0.48 | POOR	04/07/2022	Water level too low at time of survey (<10cm), likely to dry completely, annually	eDNA not undertaken for access and seasonal reasons
SCR-5	0.53 | BELOW AVG.	04/07/2022	Almost dry at time of survey. Likely only holds enough water early in season	eDNA not undertaken for access and seasonal reasons
SCR-6	N/A (dry)	04/07/2022	Unlikely to hold water for sufficient time during breeding season	Likely unsuitable for GCN
SCR-7	0.79 | GOOD	04/07/2022	Large pond, adjacent SCR-8. Low water, set within area of willow scrub	eDNA not undertaken for access and seasonal reasons
SCR-8	0.79 | GOOD	04/07/2022	Large pond, adjacent SCR-7. Low water, set within area of willow scrub	eDNA not undertaken for access and seasonal reasons
SCR-9	N/A (dry)	04/07/2022	Connected to dry ditch	Likely unsuitable for GCN
SCR-10	0.50 | BELOW AVG.	04/07/2022	Almost dry at time of survey. Likely only holds enough water early in season	eDNA not undertaken for access and seasonal reasons
SCR-13	N/A (unsuitable)	29/06/2022	Raw sewage tank, below ground with metal grid above	Unsuitable for GCN
SCR-15	0.34 | POOR	29/06/2022	Series of settling tanks within grounds of Cottam Power Station	eDNA survey undertaken
SCR-16	0.46 | POOR	29/06/2022	Separator tanks within grounds of Cottam Power Station	eDNA survey undertaken
SCR-17	N/A (dry)	04/07/2022	Dry. Likely only holds water early in season for short period.	No eDNA survey

GCN eDNA Survey Results

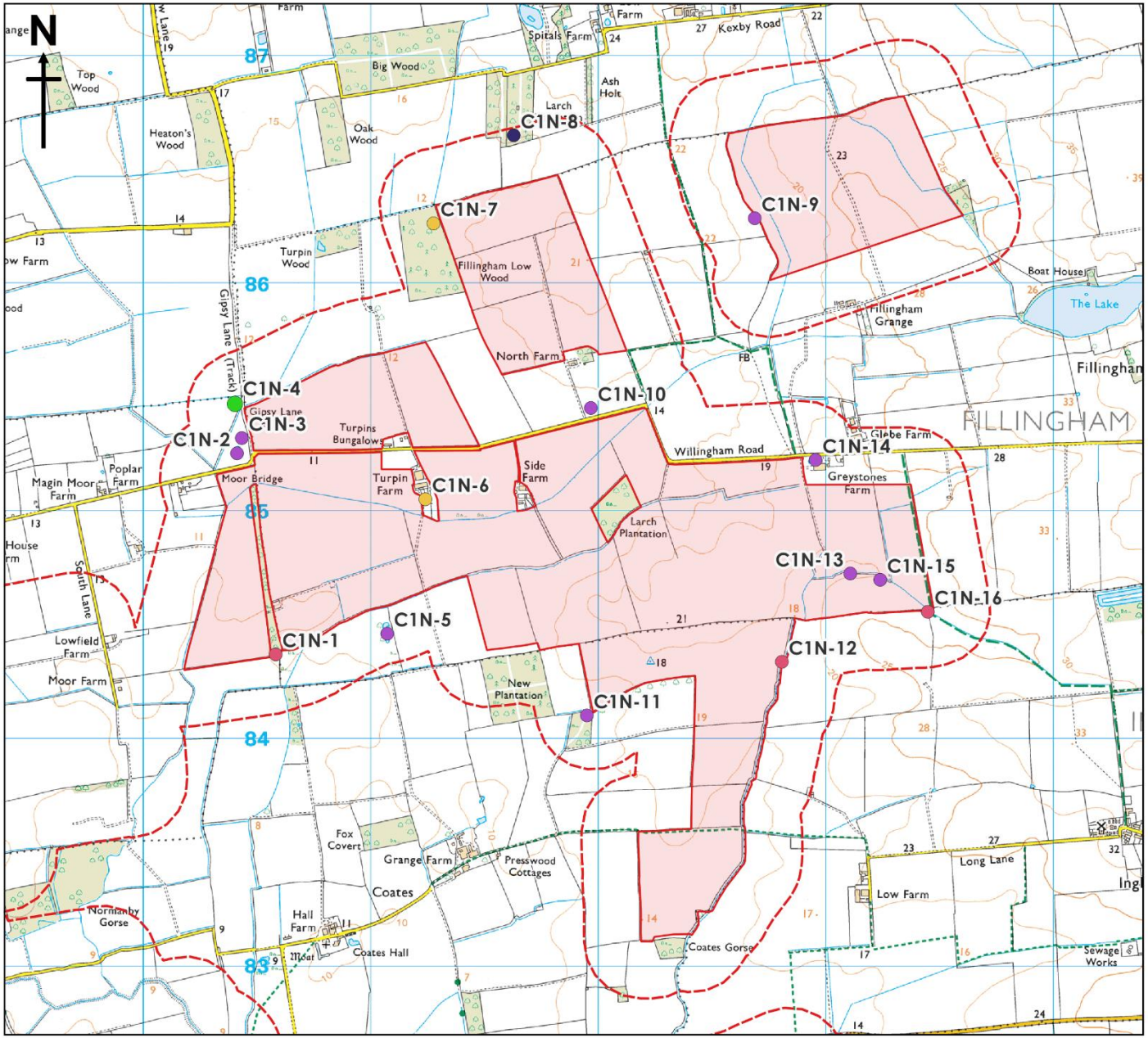
Cottam 1

3.2.7 A total of 20 waterbodies within 250m of Cottam 1 were subject to eDNA survey for GCN (Table 8 refers). Of these, two (C1S-3 and C1N-4) were found to be positive for the species. Neither waterbody fell inside of the redline boundary, although the nearest (C1S-3) was only 15m south of the Site.

3.2.8 Analysis of samples from two waterbodies were returned as indeterminate. In both cases, the samples were noted to contain very high levels of sediment.

Table 8: Cottam 1 eDNA Results

Waterbody Reference	eDNA Result	Other Notes
C1S-3	Positive	Offsite. Evidence of poaching by livestock
C1S-4	Negative	475m north of C1S-3
C1S-6	Negative	N/A
C1W-1	Negative	N/A
C1W-4	Negative	N/A
C1W-6	Negative	N/A
C1W-8	Negative	N/A
C1W-12	Negative	N/A
C1N-2	Negative	185m south of C1N-4; may support GCN in some years
C1N-3	Negative	130m south of C1N-4; may support GCN in some years
C1N-4	Positive	Offsite; within 25m of C1N-2 and C1N-3
C1N-5	Negative	Water level low; 10 samples taken
C1N-6	Indeterminate	Only 5 samples collected. High sediment, slurry; unsuitable for GCN
C1N-7	Indeterminate	High sediment – generally unsuitable for GCN ("poor" HSI)
C1N-9	Negative	N/A
C1N-10	Negative	N/A
C1N-11	Negative	Tadpoles observed
C1N-13	Negative	Lots tadpoles present, small fish observed
C1N-14	Negative	Fish present
C1N-15	Negative	Tadpoles observed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C1N-1
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C1N-3
C1N-4
C1N-5
C1N-6
C1N-7
C1N-8
C1N-9
C1N-10
C1N-11
C1N-12
C1N-13
C1N-14
C1N-15
C1N-16
Scheme boundary
250m boundary buffer
Key:
eDNA results
GCN POSITIVE
GCN NEGATIVE
eDNA INDETERMINATE
POND DRY
NO LANDOWNER CONSENT
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ECOLOGICAL CONSULTANTS
Project
Cottam Solar Project
Title
GCN eDNA survey results
Figure number
7a
Date
05/10/2022
Scale
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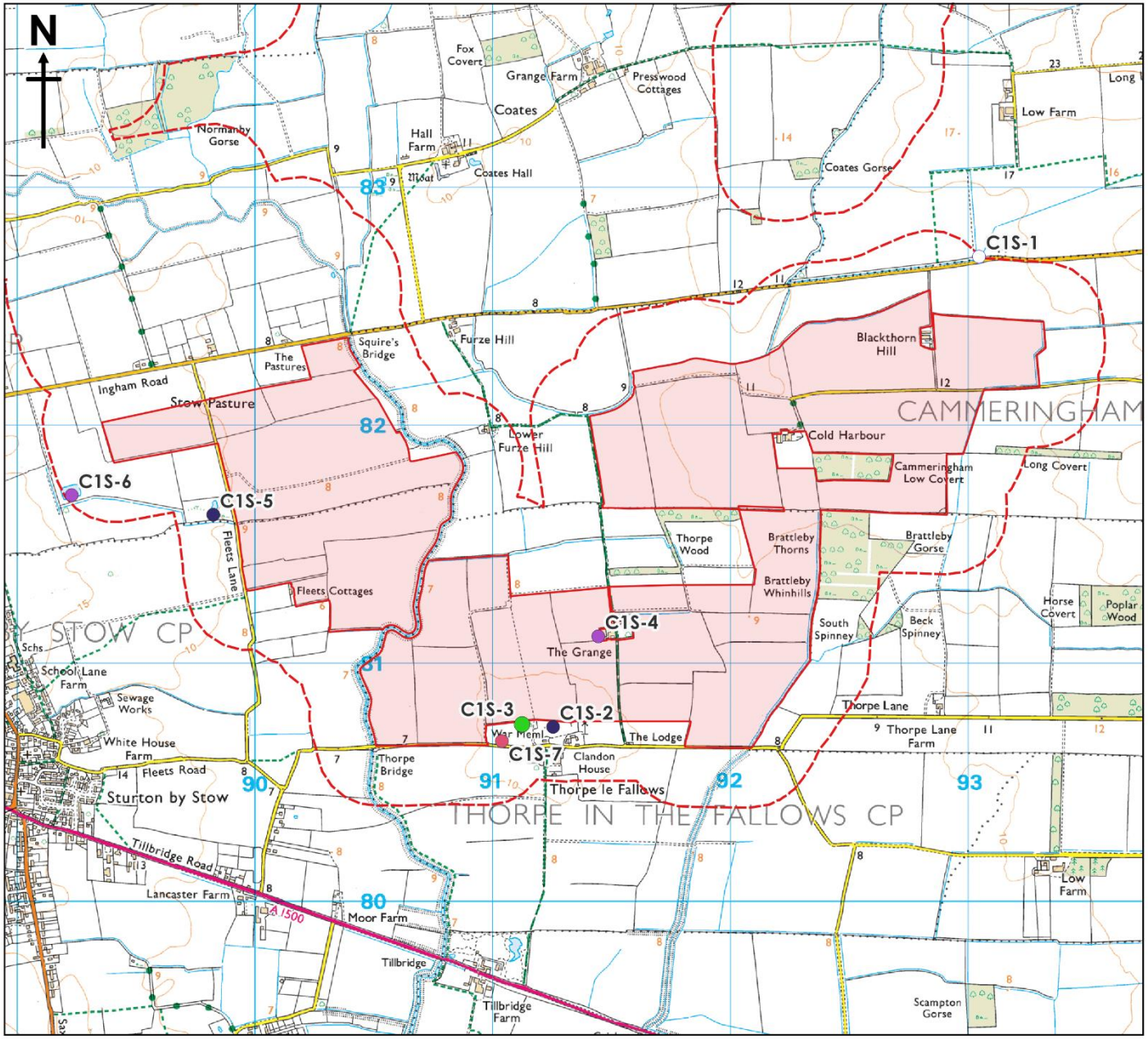
0.5
1 km



Key:

eDNA results

- GCN POSITIVE
- GCN NEGATIVE
- POND DRY
- NO LANDOWNER CONSENT
- NO POND
- Scheme boundary
- 250m boundary buffer

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ECOLOGICAL CONSULTANTS

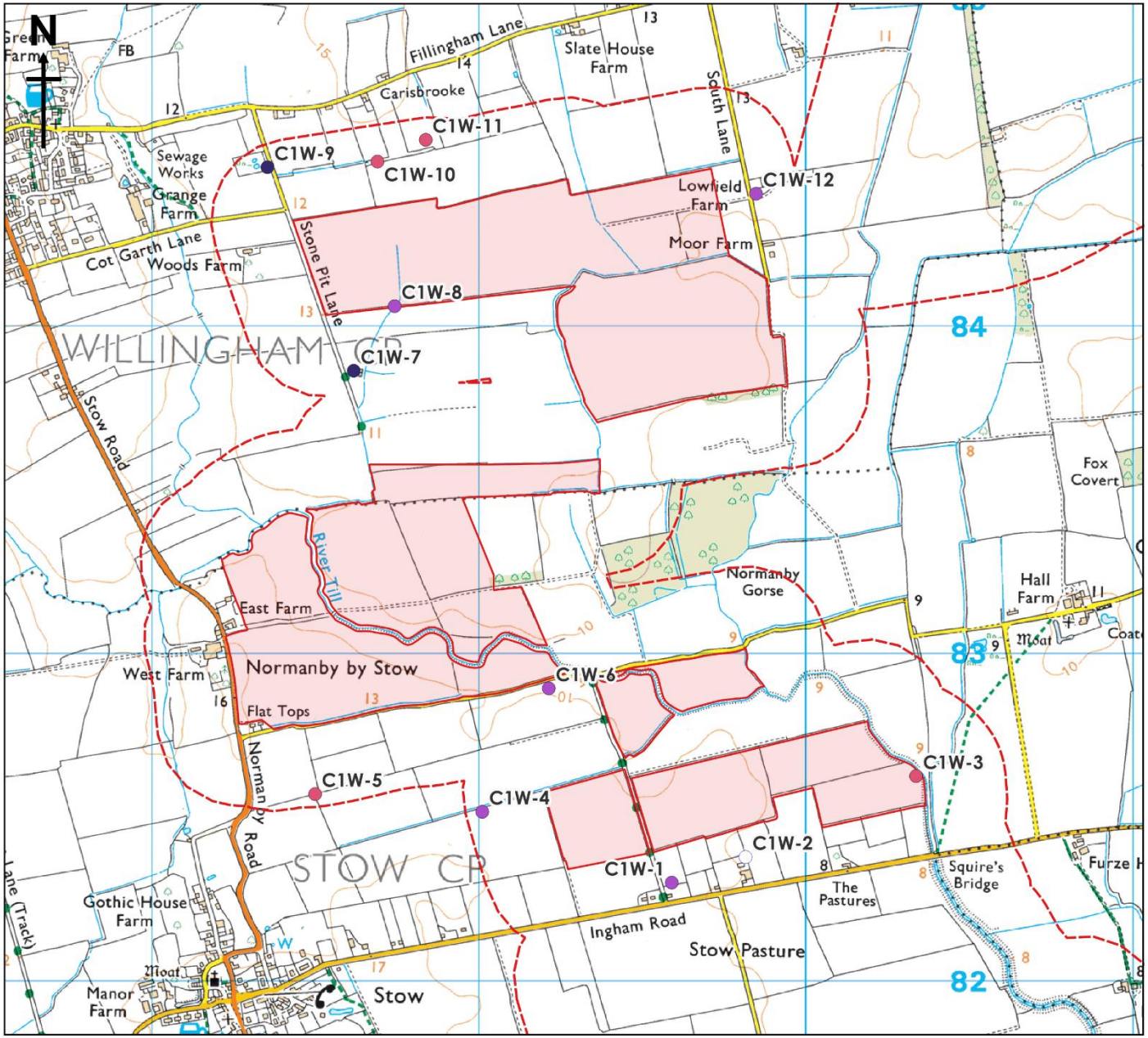
Project
Cottam Solar Project

Title
GCN eDNA survey results

Figure number
7b

Date
05/10/2022

Scale
0 0.45 0.9 km



Key:

eDNA results

- GCN NEGATIVE
- POND DRY
- NO LANDOWNER CONSENT
- NO POND
- Scheme boundary
- 250m boundary buffer

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Project	**Cottam Solar Project**
Title	**GCN eDNA survey results**
Figure number	**7c**
Date	**05/10/2022**
Scale	0 0.3 0.6 km

Cottam 2

3.2.9 A total of five waterbodies within 250m of Cottam 2 were subject to eDNA survey for GCN (Table 9 refers).

Table 9: Cottam 2 eDNA Results

Waterbody Reference	eDNA Result	Other Notes
C2-1	Indeterminate	High sediment – generally unsuitable for GCN (HSI "poor")
C2-2	Negative	75% shoreline accessible for sampling
C2-4	Negative	Algae present
C2- 6	Negative	30% shoreline accessible for sampling
C2-11	Negative	Low water level at time of survey (c.10cm depth); 15 samples taken

Cottam 3a

3.2.10 A total of seven waterbodies within 250m of Cottam 3a were subject to eDNA survey for GCN (Table 10 refers).

Table 10: Cottam 3 and 3b eDNA Results

Waterbody Reference	eDNA Result	Other Notes
C3a-2	Negative	High levels of algae present in water column
C3a-3	Negative	40% shoreline accessible for sampling; 15 samples taken
C3a-7	Negative	N/A
C3a-8	Negative	20% shoreline accessible for sampling; 9 samples collected
C3a-9	Negative	N/A
C3a-10	Negative	N/A
C3a-11	Indeterminate (white precipitate present)	Water level generally low (<20cm), 75% shoreline accessible for sampling (20 samples collected). Water sample was noted to turn cloudy when added to preserving solution during survey, likely due to agricultural leachates. The lack of local GCN records and lack of positive results from nearby ponds strongly indicates that this pond is unlikely to support GCN.

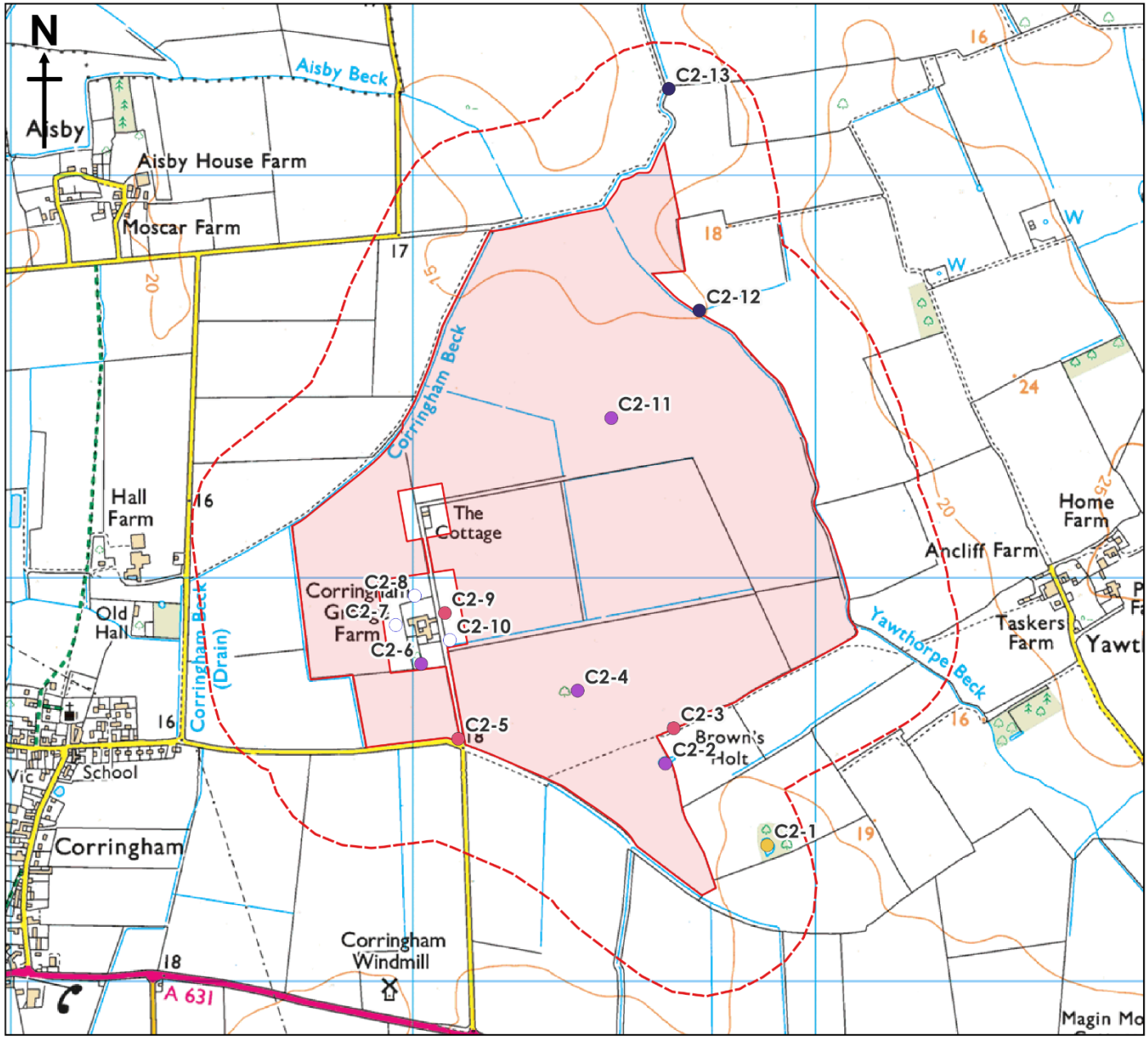
Cottam 3b

3.2.11 A total of four waterbodies within 250m of Cottam 3b were subject to eDNA survey for GCN (Table 11 refers).

Table 11: Cottam 3b eDNA Results

Waterbody Reference	eDNA Result	Other Notes
C3b-3	Negative	N/A
C3b-4	Negative	40% shoreline accessible for sampling; 13 samples collected. Approx. 20% algae cover
C3b-5	Indeterminate	Likely to be as a result of run-off from adjacent farm. The lack of local GCN records and lack of positive results from nearby ponds strongly indicates that this pond is unlikely to support GCN.

Waterbody Reference	eDNA Result	Other Notes
C3b-7	Negative	30% shoreline accessible for sampling; 14 samples collected



Key:

eDNA results

- GCN NEGATIVE
- eDNA INDETERMINATE
- POND DRY
- NO LANDOWNER CONSENT
- NO POND
- Scheme boundary
- 250m boundary buffer

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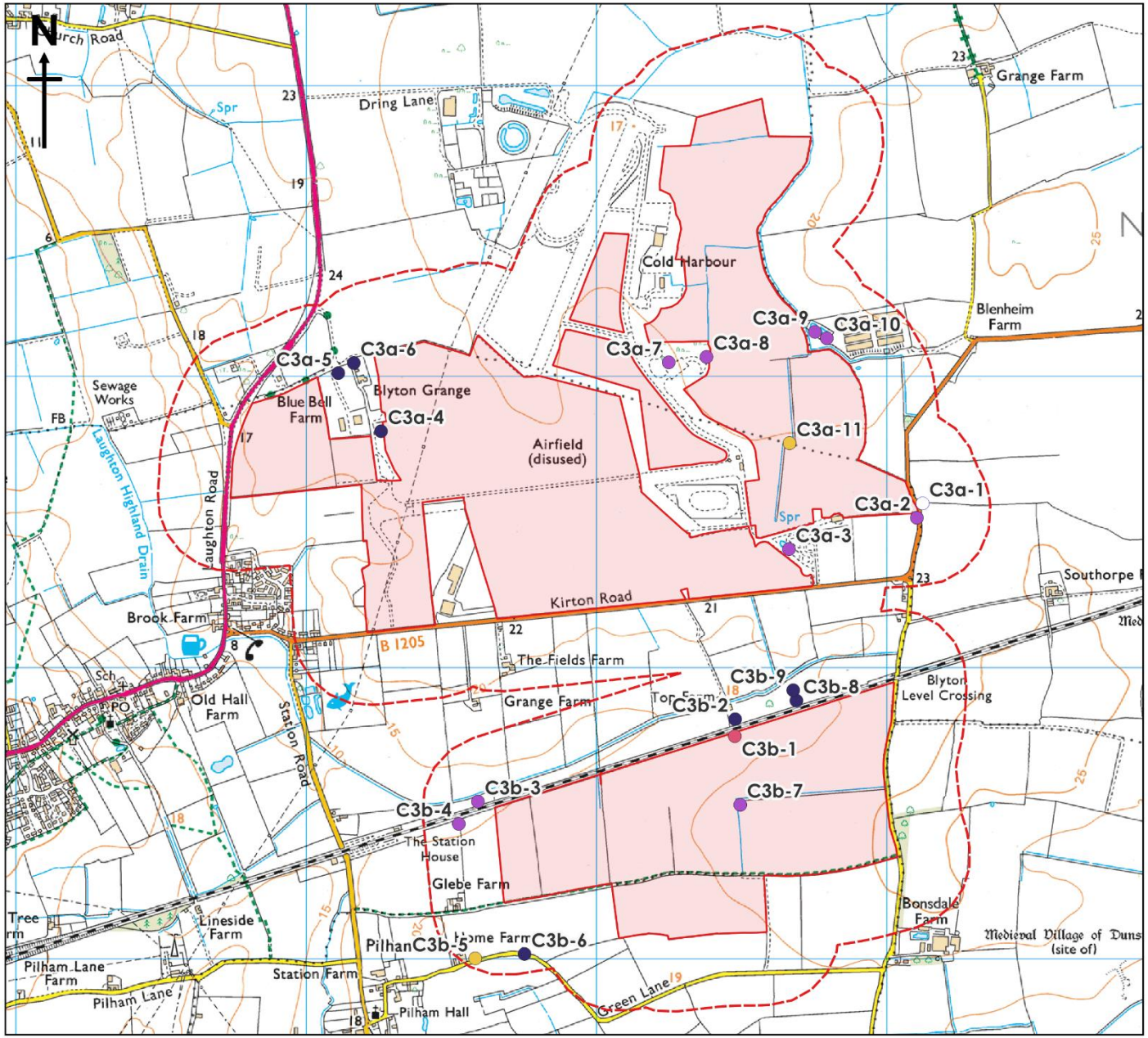
Project	**Cottam Solar Project**
Title	**GCN eDNA survey results**
Figure number	**8**
Date	**05/10/2022**
Scale	0 0.25 0.5 km



Key:

eDNA results

- GCN NEGATIVE
- eDNA INDETERMINATE
- POND DRY
- NO LANDOWNER CONSENT
- NO POND
- Scheme boundary
- 250m boundary buffer

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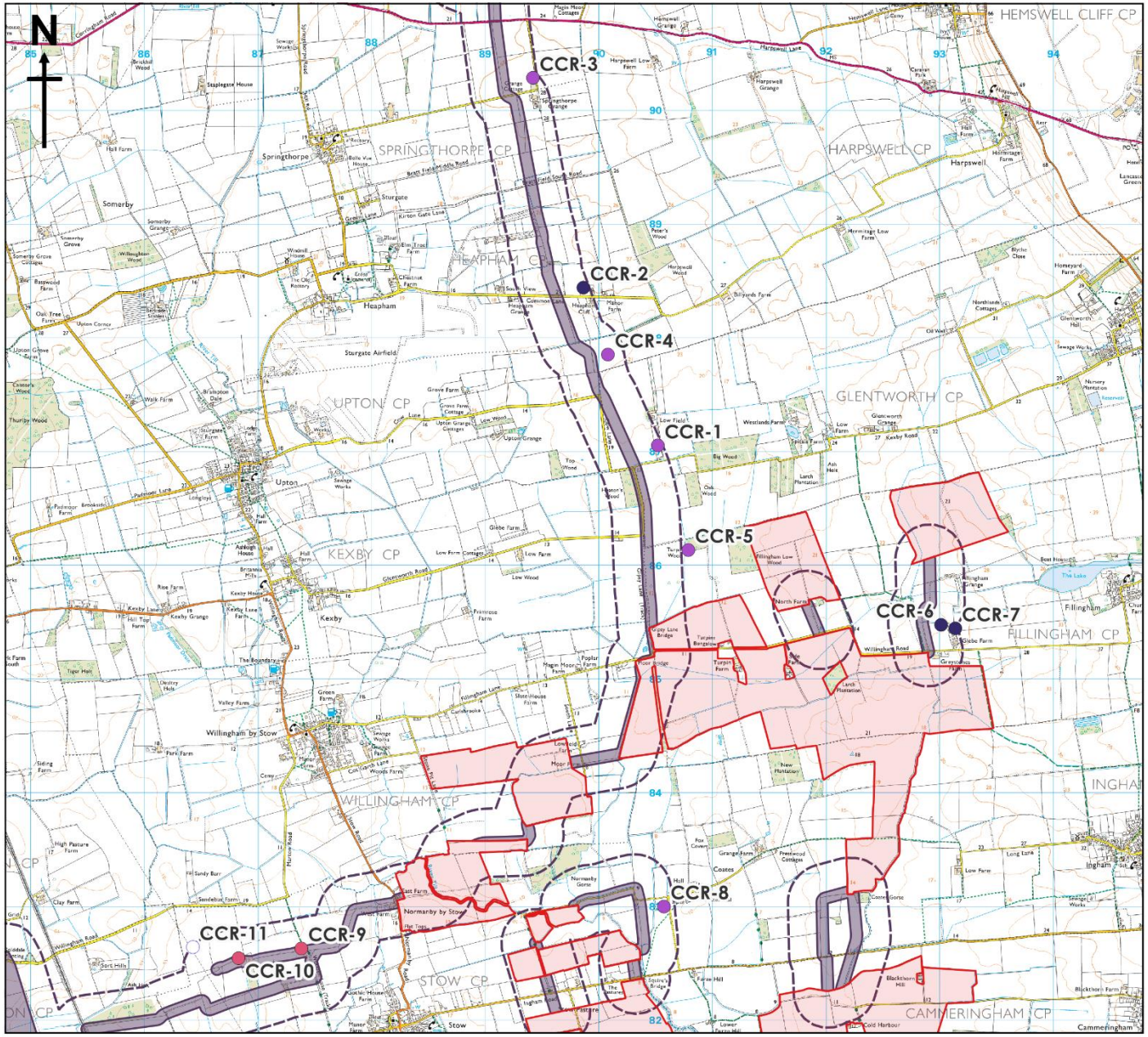
Project	**Cottam Solar Project**
Title	**GCN eDNA survey results**
Figure number	**9**
Date	**05/10/2022**
Scale	0 0.35 0.7 km

Cottam Cable Route

3.2.12 A total of seven waterbodies within 250m of the Cottam Cable Route were subject to eDNA survey for GCN; all were returned as negative for GCN (Table 12 refers).

Table 12: Cottam Cable Route eDNA Results

Waterbody Reference	eDNA Result	Other Notes
CCR-1	Negative	N/A
CCR-3	Negative	This pond may have been the site of the desk study record relating to a positive eDNA result in 2017, although there are problems with the precise coordinates of the record in that it is apparently located in the middle of a nearby arable field. Should this be the case, this 2022 result is considered to supersede the 2017 result.
CCR-4	Negative	40% shoreline accessible for sampling
CCR-5	Negative	Indeterminate in May 2022 due to high sediment, resurveyed with filter kit in June 2022
CCR-8	Negative	N/A
SCR-15	Negative	N/A
SCR-16	Negative	N/A



Key:

eDNA results

- GCN NEGATIVE
- POND DRY
- NO LANDOWNER CONSENT
- NO POND
- Cable route corridor
- Cable route pond search buffer
- Scheme boundary

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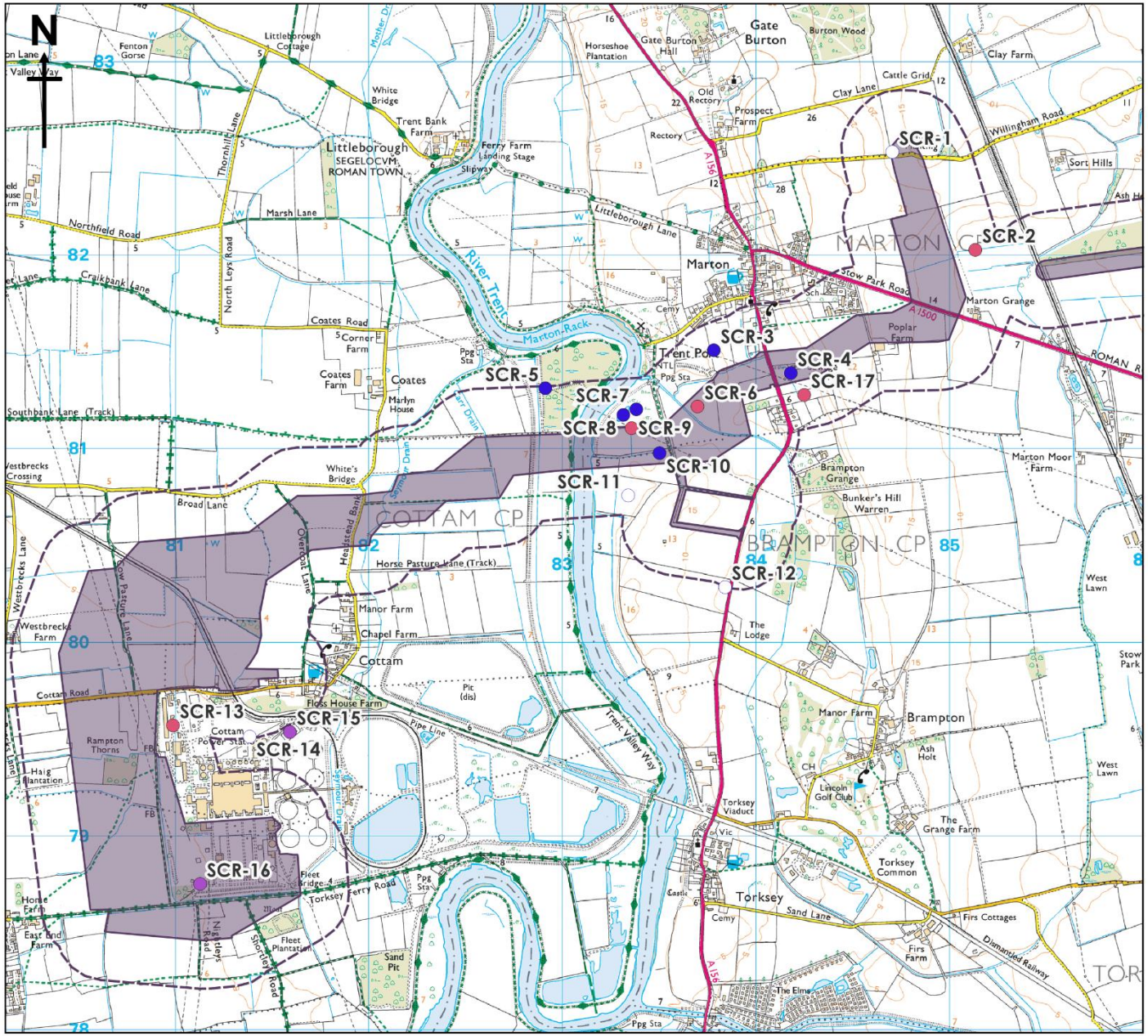
Project	**Cottam Solar Project**
Title	**GCN eDNA survey results**
Figure number	**10**
Date	**06/10/2022**
Scale	0 0.9 1.8 km



Key:

eDNA results

- GCN NEGATIVE
- POND DRY
- NO POND
- NO eDNA UNDERTAKEN
- Cable route corridor
- Cable route pond search buffer

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Project	**Cottam Solar Project**
Title	**GCN eDNA survey results**
Figure number	**11**
Date	**06/10/2022**
Scale	0 0.55 1.1 km

4 ECOLOGICAL EVALUATION

4.1.1 This section provides an analysis of the value of GCN as an ecological feature.

4.1.2 Of the 43 ponds associated with the Survey Area that were subject to eDNA survey, only two returned a positive result for GCN presence. This constitutes 4.65% of those surveyed within 250m of the Sites and cable route. No GCN were recorded in any ponds within close proximity (250m) of the CCR/SCR, Cottam 2, 3a or 3b. GCN were found present in Cottam 1 North 4 (40m west) and Cottam 1 South 3 (15m south). These two ponds are c.4km apart and are not considered to be biologically linked populations due to the extensive distance between them. Both ponds are outside the red line boundary of the Sites, and neither will be lost. Both ponds are located within 50m (the core habitat zone) from the red line boundary of the Sites.

4.1.3 No ponds will be lost to the development (regardless of GCN result).

4.1.4 The closest neighbouring pond to the positive record obtained at C1S-3 is C1S-2; however, no access consent was obtained to survey this pond. It is possible that these two ponds support a meta-population and, in the absence of further data, this should be been assumed on a precautionary basis. The only other pond within 500m of C1S-3 (i.e. C1S-7) recorded a negative result.

4.1.5 The other positive record was obtained from C1N-4; however, all ponds within 500m returned a negative record. It is therefore assumed that this is an isolated population.

4.1.6 Although GCN have been recorded within the vicinity of Cottam 1 (with none found to be present in Cottam 2 or 3), their distribution is sparse with only two seemingly isolated populations. Partial barriers to movement across the landscape include the River Till, the River Eau and Corringham Beck, as well as smaller roads. However, it is more likely that the large, intensively managed arable fields provide the most significant barrier to movement across the rural farmed landscape.

4.1.7 On the basis of the low suitability of the vast majority of habitat, lack of species records within the red line boundary and general lack of positive eDNA records, GCN are considered to be of Local Importance level only.

4.2 Potential Sources of Impact

4.2.1 The following activities associated with construction, operation and decommissioning of the solar array sites and cable routes may result in adverse impacts on GCN and their habitats. Illegal activities which may occur include:

- capturing, killing, disturbing or injuring GCN deliberately'
- damaging or destroying a breeding or resting place, and
- obstructing access to their resting or sheltering places (deliberately or by not taking enough care)

4.2.2 The above illegal activities could result from the following:

- Site clearance (associated with construction and decommissioning) including: removal of trees, scrub and vegetation, removal of spoil, rubble
- Site preparation including: construction of roads, compounds, substations security fencing and site compounds
- Pollution of retained habitats resulting from construction (both direct and indirect)
- Construction and operational lighting affecting habitat quality
- Insensitive management of habitats post construction

Potential Mitigation, Compensation and Enhancement Options

4.2.3 Despite confirmed presence of GCN in two waterbodies surrounding Cottam 1 (considered two separate populations) the Scheme has the potential to mitigate any impacts through a number of sensitive design and management options.

4.2.4 To avoid impacts on GCN the following should be considered:

- Following the mitigation hierarchy, impacts on the known GCN ponds, as well un-surveyed and indeterminate ponds can be avoided through retaining a 50m undeveloped buffer around ponds. This buffer should be enhanced to create optimal sheltering and foraging habitat for GCN through creation of rough grassland scrub mosaic.
- All newly created habitats will need to be sensitively managed under a site-specific landscape and ecological management plan.
- The majority of ponds were located within an intensively farmed landscape. Where land ownership permits, there is significant potential to enhance the existing ponds through sensitive management and pond restoration. This could include removal of tree and scrub shading, removal of silt and deepening (up to 1m) as well creation of shallow, profiled margins specifically on the southern aspect. New ponds can be created to connect pond networks and provide steppingstone waterbodies. This should be in line with emerging local nature recovery strategies.
- Construction within 250m of ponds within confirmed or unsurveyed ponds (on a precautionary basis) should be restricted to the hibernation period for GCN (November to early February inclusive). This is an approach that has been applied on other solar sites and has been approved by Natural England and corresponding Local Planning Authorities. When following this approach, all potentially suitable overwintering / sheltering and breeding habitat including any hedgerows, woodland and scrub margins will need to be demarked with appropriate exclusion fencing prior to any construction commencing.
- Pending the start date of construction, it may be possible to obtain a GCN district licence from the relevant authority to proceed with the works. At present South Lincolnshire is not covered under district licensing, however this is being rolled out across England and is likely to be in place before construction. District level licensing will allow construction to proceed without timing or mitigation constraints (pending the zoning of the Site); however, in all cases it is recommended that the best practice guidance is followed.
- Best practice would include a toolbox talk to contractors prior to construction to outline identification of GCN and steps to take in the unlikely event that they are encountered during construction.
- In the absence of a district licence and where winter working is unavoidable, it may be possible to proceed works under a non-licensable Risk Avoidance Method Statement (RAMS). This Method Statement would be detailed within a Construction Environmental Management Plan (CEMP) prepared for the construction phase of the development.

4.2.5 Apart from potential construction impacts on great crested newts, no adverse long-term effects upon GCN or other amphibians are anticipated.

4.2.6 On completion of the construction phase, the land within the array Sites should be managed to facilitate the establishment of a variety of habitats including targeting rough grassland and species-rich wildflower meadow. Provision of new grassland habitat within the array fields is likely to constitute a significant enhanced area in comparison with the regularly disturbed species-poor arable habitat which currently exists on the site. It is considered highly likely that such areas would suffer no net loss of habitat quality for amphibians in the medium term or beyond, especially considering the dominant arable habitat present within the survey area and the disruption/disturbance currently encountered.

APPENDIX A: WILDLIFE LEGISLATION & SPECIES INFORMATION FOR GREAT CRESTED NEWTS

Great crested newts are protected in England and Wales under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a great crested newt, or to deliberately disturb a great crested newt such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place for great crested newts. Intentional or reckless disturbance of great crested newts in places of shelter (ponds or terrestrial refuges), and damage to or obstruction of places of shelter are also offences under the Wildlife and Countryside Act 1981 (as amended). Penalties for offences against great crested newts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of ponds or terrestrial habitat, or which could result in killing of or injury to great crested newts, need to take place under licence. Works which could disturb great crested newts may also be licensable, though this is rarely the case unless loss of great crested newt habitat is also proposed, and should be assessed on a case by case basis. In practice this means that works involving any removal of or significant modification to ponds or terrestrial habitats (typically rough grassland, scrub, hedgerow bases and woodland) supporting great crested newts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of great crested newts in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

PLANNING POLICY IN RELATION TO BIODIVERSITY

The National Planning Policy Framework (NPPF), was published in March 2012 and revised in July 2021. Additional guidance can be found online at http://planningguidance.planningportal.gov.uk/blog/guidance/. The NPPF simplifies and collates a number of previous planning documents and outlines the government's objective towards biodiversity.

The NPPF identifies ways in which the planning system should contribute to and enhance the natural and local environment (Paragraph 174), including:

- (a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- (b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- (d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- (f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. protecting and enhancing valued landscapes, geological conservation interests and soils;

It also emphasises the importance of conserving biodiversity and areas covered by landscape designations (Paragraph 176):

Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.

When determining planning applications, the NPPF states that local planning authorities should aim to conserve and enhance biodiversity (Paragraph 175) by applying principles including:

- (a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- (b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- (c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons[6] and a suitable compensation strategy exists; and
- (d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate..

The following should be given the same protection as habitats sites:

- (a) potential Special Protection Areas and possible Special Areas of Conservation;
- (b) listed or proposed Ramsar sites7; and
- (c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

There is a general presumption in favour of sustainable development within the NPPF. It is noted in Paragraph 182 that this presumption does not apply where the plan or project is likely to have a significant effect on a habitat site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

ECOLOGICAL ENHANCEMENTS

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity can include restoring or enhancing a population or habitat"".

In England, the National Planning Policy Framework (NPPF), issued in July 2021, states that the planning system should contribute to "*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;* It also states that "*opportunities to incorporate biodiversity in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity*".

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