MOTT MACDONALD

NDR Year Five Post Construction Monitoring

Great Crested Newts

January 2023

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Great Crested Newts

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
P1	07/10/2022	James Rowland	Paul Renshaw		First Draft
A	16/12/2022	James Rowland	Paul Renshaw	Simon Allen	First Issue
B	01/02/2023	Carmen Hatton	Paul Renshaw	Simon Allen	Second Issue

Document reference: 100107584 | 1 | B |

Information class: Standard

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Introduction

1.1 Project Description

Mott MacDonald Ltd has been appointed by Norfolk County Council to undertake the monitoring of great crested newt *Triturus cristatus* (GCN) populations as part of the Norwich Northern Distributor Road (NDR), now known as Broadland Northway. This monitoring consists of post-construction surveys as detailed in the Development Consent Order (DCO) mitigation table, and in the EPS Licence documentation.

The NDR runs from the Fakenham Road (A1067) to the west of the city (near Attlebridge) and passes eastwards around the north of the city to join with the A47 at Postwick. The route is approximately 22km in length.

1.2 Baseline Data

As part of the environmental impact assessment, extensive GCN surveys were undertaken between 2008 and 2013. These surveys were to support the assessment of the potential impacts of the NDR scheme on local GCN populations and to determine required mitigation and licencing requirements. Detailed information can be found in the Norwich Northern Distributor Road – Technical Appendix for Great Crested Newts from the Environmental Statement (available on the Planning Inspectorate website).

1.3 Study Area

The study area includes three separate area with GCN populations:

- Dog Lane, Horsford (three ponds), Quaker Lane,
- Spixworth (one pond) and
- Gazebo Farm, Rackheath (eight ponds, including four that were installed at the beginning of the NDR construction period, to mitigate for the loss of one breeding pond).

The individual survey locations can be found on maps in Appendix A.

1.4 Scope of the report

The scope of this report is to:

- Present the results of the 2022 (year five post-construction) surveys of all GCN ponds
- Provide a comparison to survey results from previous years
- Inform the levels of usage of the ponds over time
- Provide recommendations for further management, mitigation, and enhancement
- Provide recommendations for additional future surveys, alongside those already required under the terms of the DCO post-construction monitoring regime and the EPS licence.

1.5 Legislation

GCN are listed under Annex II and IV of the EC Council Directive 92/43/EEC 1992 “Conservation of Natural Habitats and Wild Fauna and Flora” (Council Directive 92/43/EEC) as a European Protected Species (EPS). This directive requires members to protect species at all stages of their life cycle e.g., adults, sub adults, eft and eggs and their habitats. This directive has been transposed into UK legislation through the Conservation of Habitats and Species Regulations 2017 (as amended).

Regulation 41 of The Conservation of Habitats and Species Regulations 2017 (as amended) makes it an offence to:

- Deliberately capture, injure or kill GCN or destroy their eggs
- Deliberately disturb GCN in a way that would affect their ability to survive, breed or rear young, hibernate or migrate or significantly affect the local distribution or abundance of the species
- Damage or destroy a breeding site or resting place of a GCN − this applies whether they are present or not
- Possess or control any live or dead specimen, or anything derived from a GCN

In addition to the above protection, GCN in the UK are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). In addition to the above, it lists the following as additional offences:

- Sale
- Damage or destroy any structure or place used for shelter or protection
- Disturbance of an animal whilst it is occupying a place, which it uses for shelter or protection
- Obstruct access to any structure or place which an animal uses for shelter or protection

Methodology

2.1 Surveys

Three survey methods were employed at each of the ponds in 2022, on every visit. The exact method was decided on a case-by-case basis, depending on what was suitable for the conditions found on site and suitability of the technique. The surveys were undertaken in accordance with the GCN mitigation guidelines (English Nature, 2001).

Survey methods included:

- Egg search: Searching suitable live and dead submerged vegetation for great crested newt eggs. Once GCN eggs are identified no further searching is undertaken.
- Torch survey: Use of a high powered Clulite torch at night to illuminate the pond and visually see any newts in the pond.
- Bottle trapping: Bottle traps (two litre soft drink bottles with the end cut off and inverted into the main body) are installed around the pond margin and left overnight with an air bubble above the surface of the water.

Terrestrial habitat search: Searching suitable refugia, such as log piles, for adult and juvenile great crested newts.

Each pond was visited a total of six times within the relevant survey period (15 March to 30 June) as required by the guidelines. A total of two surveyors were used on each survey with at least one of the surveyors holding a Class 1 GCN survey licence.

2.2 Limitations

The results are likely to underestimate the GCN population for the following reasons:

- GCN surveys are only predicted to record between 2% and 30% of the population (English Nature, 2001).
- The overnight temperatures were very low in early April 2022 and as a result, bottle trapping was not undertaken on visit one for the Dog Lane and Quaker Farm ponds (Ponds 5,6,7 and 16). Bottle trapping was still undertaken at the Rackheath ponds the previous evening. Torching was undertaken for all ponds, newts were detected using just this method in ponds 5, 6, 16.
- As in previous years, the use of netting was avoided to ensure that the gills of larvae, which are likely to be present in ponds from May, were not damaged, Sufficient techniques were used so that netting was not required, and the results were not impacted by the omission of this technique.
- No land access (due to land ownership constraints) was available to Ponds 37 and 47 for all surveys during 2022. Therefore, survey results for Pond 37 and Pond 47 are not included in this report.
- Turbid water and/or the presence of pond weed, dense vegetation and scrub limited torching efforts in Ponds 6,44, 46, NE, NW, SE and SW. However, newts were still identified in these ponds despite the limitation.
- A stallion was present in the field surrounding Pond 7 throughout the survey period, because of this bottle trapping was not undertaken due to accidental trampling risk of bottles. A terrestrial habitat search was undertaken as a third survey method instead of bottle trapping, with newts, still identified in the pond via torching.

- A moorhen *Gallinula chloropus*, was found nesting on the bank of Pond 7 from visit 3 onwards, due to the risk of disturbance, no further survey visits to Pond 7 were undertaken.
- Ponds 45 and 46 had areas of filamentous algae which also restricted the torching survey effort, though newts were still identified in these ponds throughout the surveys.
- The water level in Pond 46 became too low to bottle trap after visit 2. A terrestrial habitat search was undertaken as a third survey method instead of bottle trapping, with newts, still identified in the pond via torching until the pond dried out completely following visit 4; and

Low water levels were present in all ponds surveyed due to the dry winter of 2021//22. Dry conditions persisted throughout the spring survey period, causing a gradual reduction in bottle traps throughout all surveyed ponds except Pond 7 where no bottle traps were used throughout 2022.

Results

3.1 Survey results 2022

Detailed results from the 2022 GCN surveys can be found in Appendix B. Peak counts from the 2022 surveys are shown in Table 3.1 below. results from the 2022 GCN surveys can be found in Appendix B. Peak counts from the 2022 surveys are shown in Table 3.1 below. Detailed results from the 2022 GCN surveys can be found in Appendix B. Peak counts from the 2022 surveys are shown in Table 3.1 below.

Table 3.1: Survey results from 2022

Site name	Pond no.	Peak count of GCN
Dog Lane	5	22
Dog Lane	6	1
Dog Lane	7	21
Quaker Farm	16	16
Rackheath	42	1
Rackheath	44	24
Rackheath	45	22
Rackheath	46	3
Rackheath	NW	5
Rackheath	NE	10
Rackheath	SW	12
Rackheath	SE	17

Source: Mott MacDonald, 2022

3.2 Survey results from 2007-2022

Table 3.2: Peak counts from surveys 2007-2022

Site Name	Pond no.	Date	Peak count of GCN
Dog Lane	5	**2022**	**22**
Dog Lane	5	2021	17
Dog Lane	5	2020	5
Dog Lane	5	2019	42
Dog Lane	5	2018	68
Dog Lane	5	2017	13
Dog Lane	5	2016	27
Dog Lane	5	2013	14
Dog Lane	5	2012	8
Dog Lane	5	2007	28
Dog Lane	6	**2022**	**1**
Dog Lane	6	2021	1
Dog Lane	6	2020	0
Dog Lane	6	2019	1
Dog Lane	6	2018	22
Dog Lane	6	2017	1
Dog Lane	6	2016	1
Dog Lane	6	2013	0
Dog Lane	6	2007	1

Site Name	Pond no.	Date	Peak count of GCN
Dog Lane	7	**2022**	**21**
Dog Lane	7	2021	0
Dog Lane	7	2020	1
Dog Lane	7	2019	4
Dog Lane	7	2018	3
Dog Lane	7	2017	0
Dog Lane	7	2016	10
Dog Lane	7	2013	12
Dog Lane	7	2007	6
Quaker Farm	16	**2022**	**16**
Quaker Farm	16	2021	31
Quaker Farm	16	2020	3
Quaker Farm	16	2019	25
Quaker Farm	16	2018	27
Quaker Farm	16	2017	30
Quaker Farm	16	2016	28
Quaker Farm	16	2012	27
Quaker Farm	16	2009	5
Quaker Farm	16	2007	7
Rackheath	42	**2022**	**1**
Rackheath	42	2021	3
Rackheath	42	2020	0
Rackheath	42	2019	5
Rackheath	42	2018	8
Rackheath	42	2017	0
Rackheath	42	2016	11
Rackheath	42	2013	19
Rackheath	42	2012	15
Rackheath	42	2009	2
Rackheath	42	2007	5
Rackheath	44	**2022**	**24**
Rackheath	44	2021	9
Rackheath	44	2020	9
Rackheath	44	2019	2
Rackheath	44	2018	19
Rackheath	44	2017	0
Rackheath	44	2016	9
Rackheath	44	2013	9
Rackheath	44	2012	9
Rackheath	44	2009	6
Rackheath	44	2007	4
Rackheath	45	**2022**	**22**
Rackheath	45	2021	23
Rackheath	45	2020	9
Rackheath	45	2019	1
Rackheath	45	2018	18

Site Name	Pond no.	Date	Peak count of GCN
Rackheath	45	2017	8
Rackheath	45	2016	4
Rackheath	45	2013	2
Rackheath	45	2012	0
Rackheath	45	2009	1
Rackheath	45	2007	5
Rackheath	46	**2022**	**3**
Rackheath	46	2021	4
Rackheath	46	2020	5
Rackheath	46	2019	0
Rackheath	46	2018	3
Rackheath	46	2017	0
Rackheath	46	2016	2
Rackheath	46	2013	1
Rackheath	46	2012	0
Rackheath	NW	**2022**	**5**
Rackheath	NW	2021	12
Rackheath	NW	2020	3
Rackheath	NW	2019	5
Rackheath	NW	2018	9
Rackheath	NW	2017	2
Rackheath	NE	**2022**	**10**
Rackheath	NE	2021	6
Rackheath	NE	2020	10
Rackheath	NE	2019	5
Rackheath	NE	2018	11
Rackheath	NE	2017	5
Rackheath	SW	**2022**	**12**
Rackheath	SW	2021	35
Rackheath	SW	2020	3
Rackheath	SW	2019	8
Rackheath	SW	2018	5
Rackheath	SW	2017	2
Rackheath	SW	2016	12
Rackheath	SE	**2022**	**17**
Rackheath	SE	2021	26
Rackheath	SE	2020	8
Rackheath	SE	2019	0
Rackheath	SE	2018	9
Rackheath	SE	2017	3
Rackheath	SE	2016	13

Source: Mott Macdonald, 2022

The peak count per metapopulation is shown in Table 3.3 below for surveys between 2007 and 2022.

Table 3.3: Metapopulation peak counts from surveys 2007 to 2022 combined based on the peak counts in Table 3.2

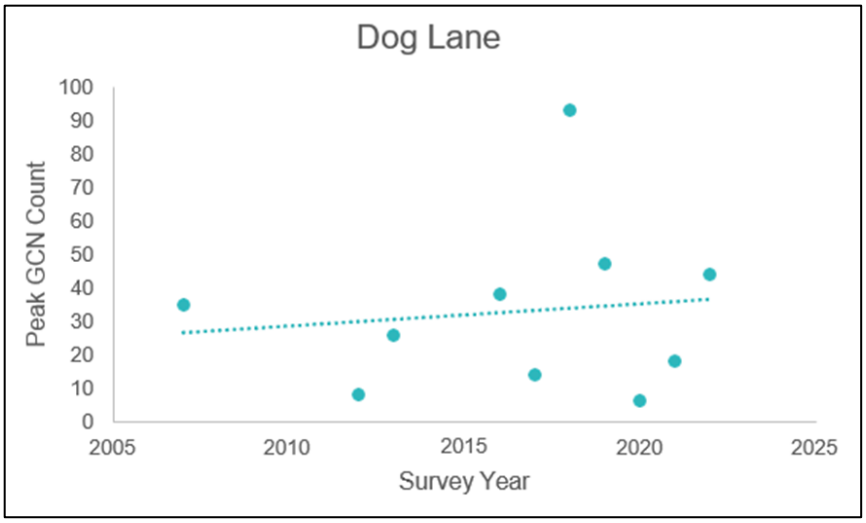
Site Name	Date	Peak count per meta-population
Dog Lane	**2022**	**44**
Dog Lane	2021	18
Dog Lane	2020	6
Dog Lane	2019	47
Dog Lane	2018	93
Dog Lane	2017	14
Dog Lane	2016	38
Dog Lane	2013	26
Dog Lane	2012	8 (only 1 of 3 ponds surveyed)
Dog Lane	2007	35
Quaker Farm	**2022**	**16**
Quaker Farm	2021	31
Quaker Farm	2020	3
Quaker Farm	2019	25
Quaker Farm	2018	27
Quaker Farm	2017	30
Quaker Farm	2016	28
Quaker Farm	2012	27
Quaker Farm	2009	5
Quaker Farm	2007	7
Rackheath	**2022**	**94**
Rackheath	2021	118
Rackheath	2020	46
Rackheath	2019	58
Rackheath	2018	102
Rackheath	2017	20
Rackheath	2016	68
Rackheath	2013	43
Rackheath	2012	51

Source: Mott Macdonald, 2022

3.3 Metapopulation peak count trends from 2007-2022

Survey result data from 2007-2022 for metapopulation peak counts at Dog Lane is shown below in a scatter graph with a trend line in Chart 3.1.

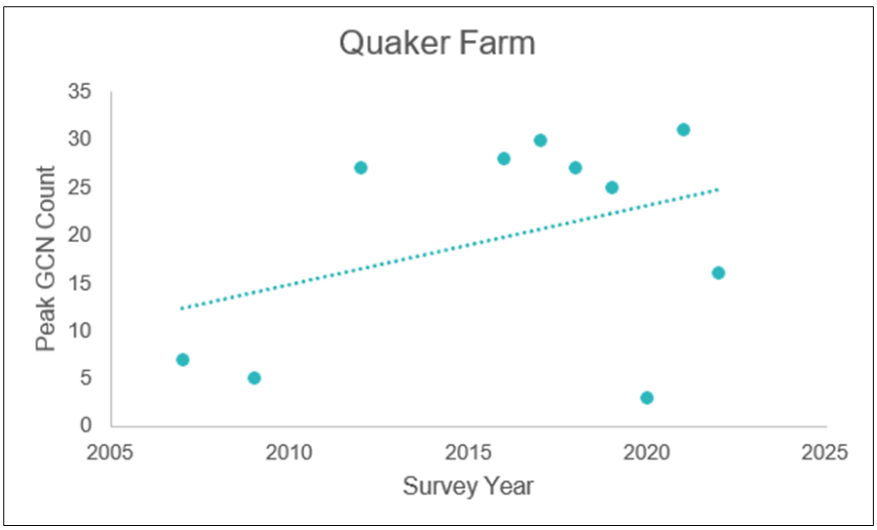
Chart 3.1: Scatter graph of metapopulation peak counts for Dog Lane



Source: Mott Macdonald, 2022

Survey result data from 2007-2022 for metapopulation peak counts at Quaker Farm is shown below in a scatter graph with a trend line in Chart 3.2.

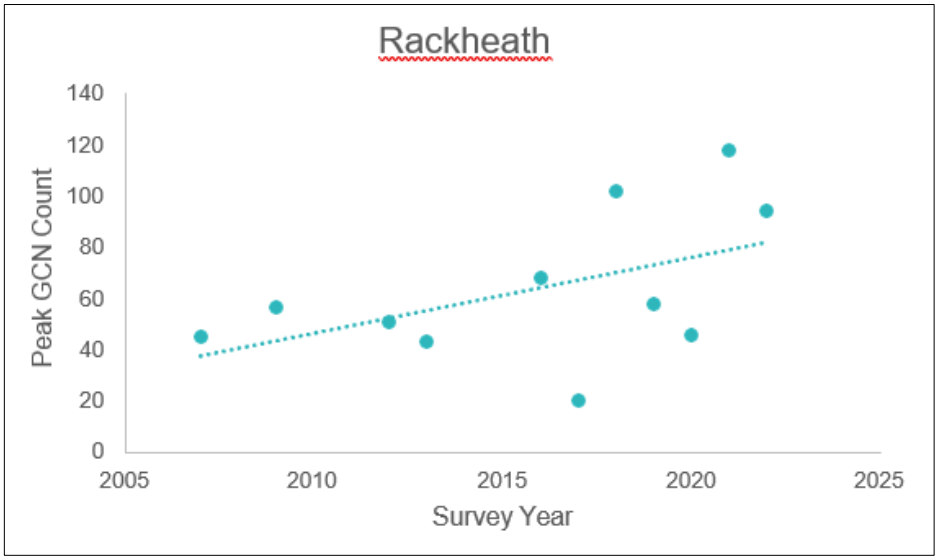
Chart 3.2 - Scatter graph of metapopulation peak counts for Quaker Farm



Source: Mott Macdonald, 2022

Survey result data from 2007-2022 for metapopulation peak counts at Rackheath is shown below in a scatter graph with a trend line in Chart 3.3.

Chart 3.3 - Scatter graph of metapopulation peak counts for Rackheath



Source: Mott Macdonald, 2022

Discussion and Recommendations

4.1 Comments on the 2022 survey season

The water levels were low across all ponds across the survey season, this caused a reduction in bottle traps throughout the survey season for all ponds, with Pond 46 being unsuitable to trap after visit 2 and drying out completely after visit 4.

Although surveys of Pond 7 were hindered by the presence of a nesting moorhen great crested adults and newt eggs were identified (which are not included in peak counts), indicating that GCN are utilising the ponds for breeding. With Pond 7 having the highest peak count (21) in 2022 when compared to all previous survey years.

4.2 Discussion on populations

The Dog Lane metapopulation saw a peak count of 44 in 2022. The scatter graph indicates a stable trend from 2007-2022. The metapopulation of Quaker Farm had a peak count of 16 in 2022. Although this number is slightly lower than most of the previous years, the overall trend line is positive and indicates an increase in GCN numbers from 2007-2022. At Rackheath, the metapopulation peak count was 94 in 2022, one of the highest counts recorded over the 2007-2022 period. This also has a positive trendline, which demonstrates an increase in GCN numbers for the metapopulation at this site.

Lower peak meta-population counts in 2022 could at least be partly explained by the low water levels present in all ponds surveyed, due to the dry winter of 2021//22. Dry conditions persisted throughout the spring survey period, causing a gradual reduction in bottle traps in ponds. A reduction in the number of bottle traps used when compared to the 2021 survey period, could have led to fewer newts being observed.

The data shows that population numbers in all metapopulations appear to be generally stable throughout the survey/monitoring period. Given the quality of the habitat for GCNs and wider species, the Gazebo Farm area was designated a County Wildlife Site in 2022. This demonstrates the good work in maintaining the ponds and terrestrial habitats in the area, and hence the favourable condition status of the metapopulation here. The recommendations below include measures to maintain this momentum.

4.3 Recommendations

To maintain the favourable conservation status of the great crested newt populations, and as part of the obligations set out within in the Natural England mitigation licence (2015-12445-EPS-MIT-5), ponds should be subject to some ongoing management.

General maintenance is ongoing for ponds 42, 44, 45, 46, NW, NE, SW and SE at Rackheath, as these are all under the ownership of Norfolk County Council. Recommended management of ponds NE and NW was undertaken during the winter of 2020/21 as per the NDR Ecological Post-Construction Monitoring – Great Crested Newt Report (Mott MacDonald, 2020).

The remaining management recommendations for ponds 42, 44, 45 and 46 are scheduled to be undertaken by Norfolk County Council during 2021 and 2022. Details of the recommended management can be found in Appendix C – Gazebo Farm Ecological Mitigation Area (Broadland Northway) (Norfolk County Council, 2021). Note that the good condition of ponds SW and SE are such that there are no specific maintenance recommendations.

Given the exceptionally hot dry summer, and the scope for this to become increasingly common in the future, it is recommended that the scope to excavate some of the leaf litter and sediment from ponds 42 to 46 should once again be explored. This would need to be informed by conversations around health and safety, and the varying physical accessibility, but even if just parts of some of the ponds were dug out, this would go a long way to maximising the habitat management to date and would help to ensure the favourable conservation status of the GCN metapopulation here, in the face of the effects of climate changes.

Accessing the ponds with a tracked excavator would need to be done under supervisor of the named ecologist on the GCN licence, or an accredited agent, and would likely involve a watching brief/fingertip search of the habitat traversed when accessing the ponds. If agreed, the work should be carried out at a suitable time of year, when damage/risk would be at a sensibly low level.

GCN monitoring surveys will continue in 2023.

References

English Nature (2001). Great Crested Newt Mitigation Guidelines.

Mott MacDonald (2013). Great Crested Newt Survey – Technical Appendix (233906/BSE/NOR/08/B 5 November 2013).

Mott MacDonald (2016). Norwich Northern Distributor Road Great Crested Newt Monitoring 2016.

Mott MacDonald (2017). Norwich Northern Distributor Road Great Crested Newt Monitoring 2017.

Mott MacDonald (2018). Norwich Northern Distributor Road Great Crested Newt Monitoring 2018.

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Mott MacDonald (2021). Norwich Northern Distributor Road Great Crested Newt Monitoring 2021.

Appendices

A. Pond Locations and Numbers

Figure A.1: Aerial image showing pond locations at Dog Lane 2021

Source: Google Earth, 2021

Figure A2: Aerial image showing pond locations at Quaker Farm

Source: Google Earth, 2021

Figure A3: Aerial image showing pond locations at Rackheath

Source: Google Earth, 2021

B. 2022 GCN Survey Results

Table B.1: 2022 Full GCN survey results

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Dog Lane	5	07/04/2022	3	7	N/A - too cold for bottle trapping	None identified	Yes - none identified	No	Yes - none identified
Dog Lane	5	21/04/2022	7	8	1 male GCN, 6 female GCN	7 male GCN, 5 female GCN	Yes - none identified	No	Yes - none identified
Dog Lane	5	04/05/2022	9	12	3 female GCN	1 female GCN, 1 male GCN and 1 smooth	Yes - none identified	No	Yes - none identified
Dog Lane	5	10/05/2022	12	16	None identified	2 male GCN, 1 female GCN	Yes - none identified	No	Yes - none identified
Dog Lane	5	17/05/2022	15	18	2 male GCN, 1 female GCN, 1 male smooth	10 GCN male, 9 GCN female	Yes - none identified	No	Yes - none identified
Dog Lane	5	31/05/2022	8	13	No access due to nesting ducks.	No access due to nesting ducks.	No access due to nesting ducks	No access due to nesting ducks	No access due to nesting ducks

Pond peak count = 22

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Dog Lane	6	07/04/2022	3	7	N/A - too cold for bottle trapping.	None identified	Yes - none identified	No	Yes - none identified
Dog Lane	6	21/04/2022	7	8	None identified	None identified	Yes - none identified	No	Yes - none identified
Dog Lane	6	04/05/2022	9	12	Water level too low to bottle trap	1 female GCN	Yes - none identified	No	Yes - none identified
Dog Lane	6	10/05/2022	12	16	Water level too low to bottle trap	None identified	Yes - none identified	No	Yes - none identified
Dog Lane	6	17/05/2022	15	18	Water level too low to bottle trap	None identified	Yes - none identified	No	Yes - none identified
Dog Lane	6	31/05/2022	13	8	Water level too low to bottle trap	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 1

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Dog Lane	7	07/04/2022	3	7	N/A - too cold for bottle trapping	None identified	Yes - GCN eggs identified	No	Yes - none identified
Dog Lane	7	21/04/2022	7	8	N/A - trapping not undertaken due to the presence of a stallion, for surveyor, newt and horse safety	7 male GCN, 14 female GCN	Yes - GCN eggs identified	No	Yes - none identified
Dog Lane	7	04/05/2022	9	12		4 female smooth	Yes - GCN eggs identified	No	Yes - none identified
Dog Lane	7	10/05/2022	12	16		N/A nesting moorhen on pond edge	N/A nesting moorhen on pond edge	N/A nesting moorhen on pond edge	N/A nesting moorhen on pond edge
Dog Lane	7	17/05/2022	15	18			N/A nesting moorhen on pond edge	N/A nesting moorhen on pond edge	N/A nesting moorhen on pond edge
Dog Lane	7	31/05/2022	8	13			N/A nesting moorhen on pond edge	N/A nesting moorhen on pond edge	N/A nesting moorhen on pond edge

Pond peak count = 21

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Quaker Farm	16	07/04/2022	3	7	N/A - too cold for bottle trapping	None identified	Yes - none identified	No	Yes - 2 juvenile GCN
Quaker Farm	16	21/04/2022	7	8	4 male GCN, 2 female GCN	6 male GCN, 4 female GCN, 1 smooth	identified	No	Yes - 1 juvenile GCN
Quaker Farm	16	04/05/2022	9	12	4 male GCN, 2 female GCN	2 male GCN, 3 female GCN	Yes - GCN eggs identified	No	Yes - 1 juvenile GCN
Quaker Farm	16	10/05/2022	12	16	1 male GCN, 2 female GCN	3 male GCN, 1 female GCN, 1 male smooth, 1 female smooth	Yes - GCN eggs identified	No	Yes - 2 juvenile GCN
Quaker Farm	16	17/05/2022	15	18	3 male GCN, 2 female GCN, 1 male smooth, 1 female smooth	5 male GCN, 2 female GCN, 1 male smooth, 2 female smooth, 1 adult common frog	Yes - none identified	No	Yes - 1 juvenile GCN
Quaker Farm	16	31/05/2022	8	13	1 female GCN,1 female smooth	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 16

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Rackheath	NW	06/04/2022	8	11	None identified	5 male GCN, 1 male and 1 female smooth newt	Yes - none identified	No	Yes - none identified
Rackheath	NW	20/04/2022	7	9	2 male GCN	1 male GCN and 2 female smooth	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	NW	03/05/2022	7	8		None identified	Yes - GCN eggs identified	No	Yes – none identified
Rackheath	NW	09/05/2022	14	17	3 male GCN, 2 male smooth, 1 female smooth	None identified	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	NW	16/05/2022	13	18	3 male GCN, 1 female GCN, 3 male smooth	1 female GCN	Yes - none identified	No	Yes - none identified
Rackheath	NW	30/05/2022	6	11	1 male smooth, 1 female smooth	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 5

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Rackheath	NE	06/04/2022	8	11	1 male GCN	1 male GCN and 1 male smooth newt	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	NE	20/04/2022	7	9	2 male GCN	2 male GCN, 1 female GCN	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	NE	03/05/2022	7	8	1 male GCN, 2 female GCN, 2 female smooth	4 male GCN, 2 female GCN	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	NE	09/05/2022	14	17	1 female GCN, 3 male smooth	None identified	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	NE	16/05/2022	13	18	7 male GCN, 2 female GCN, 1 immature GCN, 1 male smooth, 2 female smooth	None identified	Yes - none identified	No	Yes - none identified
Rackheath	NE	30/05/2022	6	11	1 immature GCN	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 10

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Rackheath	SW	06/04/2022	8	11	3 female GCN, 1 imature, 1 female and 1 larval smooth newt	2 male GCN, 4 female GCN	Yes - none identified	No	Yes - none identified
Rackheath	SW	20/04/2022	7	9	2 male GCN, 4 female GCN, 1 female and 1 immature smooth newt	2 male and 3 female GCN	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	SW	03/05/2022	7	8	2 male GCN, 5 female GCN	5 female GCN, 1 female smooth, 1 common frog	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	SW	09/05/2022	14	17	3 male GCN, 1 female GCN	None identified	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	SW	16/05/2022	13	18	3 male GCN, 1 female GCN, 5 male smooth, 2 female smooth	5 female GCN, 2 female smooth	Yes - none identified	No	Yes - none identified
Rackheath	SW	30/05/2022	6	11	1 male GCN, 1 male smooth	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 12

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Rackheath	SE	06/04/2022	8	11	1 female smooth newt	2 male GCN, 1 female GCN and 1 juvenile common frog	Yes - none identified	No	Yes - none identified
Rackheath	SE	20/04/2022	7	9	3 male GCN, 5 female GCN, 3 male smooth and 4 female smooth	2 male GCN, 1 female GCN and 1 female smooth.	Yes - none identified	No	Yes - none identified
Rackheath	SE	03/05/2022	7	8	4 male GCN, 7 female GCN, 1 male smooth and 1 female smooth	4 male GCN, 2 female GCN, 1 male smooth	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	SE	09/05/2022	14	17	1 male GCN, 1 female GCN, 1 female smooth, 3 smooth larvae	2 male GCN, 2 adult common frogs	Yes - GCN eggs identified	No	Yes - none identified
Rackheath	SE	16/05/2022	13	18	3 female GCN, 1 female smooth	None identified	Yes - none identified	No	Yes - none identified
Rackheath	SE	30/05/2022	6	10	1 female smooth newt	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 17

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Rackheath	42	06/04/2022	8	11	None identified	1 juvenile common frog	Yes - none identified	No	Yes - none identified
Rackheath	42	20/04/2022	7	9	1 male GCN	1 male smooth	Yes - none identified	No	Yes - none identified
Rackheath	42	03/05/2022	7	8	None identified	1 adult common frog	Yes - none identified	No	Yes - none identified
Rackheath	42	09/05/2022	14	17	None identified	None identified	Yes - none identified	No	Yes - none identified
Rackheath	42	16/05/2022	13	18	None identified	4 female smooth	Yes – none identified	No	Yes - none identified
Rackheath	42	30/05/2022	6	11	None identified	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 1

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Rackheath	44	06/04/2022	8	11	None identified	None identified	Yes - none identified	No	Yes - 1 juvenile smooth newt
Rackheath	44	20/04/2022	7	9	9 male GCN and 13 female GCN	1 male GCN, 1 female GCN, 3 male smooth and 1 female smooth.	Yes - none identified	No	Yes - 1 juvenile GCN
Rackheath	44	03/05/2022	7	8	4 male GCN, 2 female GCN	1 male GCN, 1 female GCN	Yes - none identified	No	Yes - none identified
Rackheath	44	09/05/2022	14	17	8 male GCN, 11 female GCN, 1 female smooth	2 male GCN, 1 female GCN, 1 smooth male, 4 female smooth	Yes - none identified	No	Yes - none identified
Rackheath	44	16/05/2022	13	18	3 male GCN, 1 male smooth	1 male GCN, 2 male smooth, 7 female smooth and 2 adult common frog	Yes - none identified	No	Yes - none identified
Rackheath	44	30/05/2022	6	11	1 male GCN, 1 female GCN	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 24

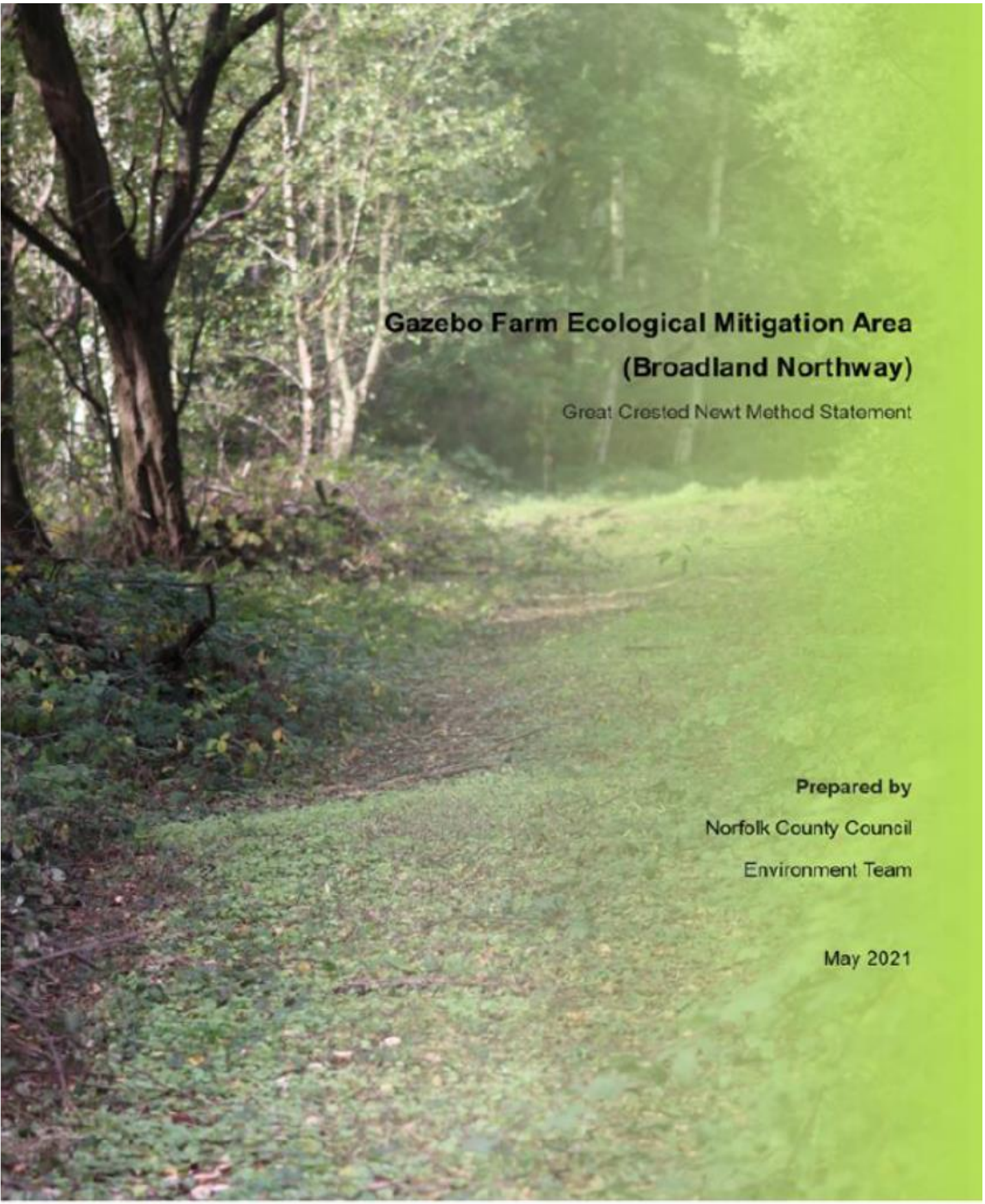
Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Rackheath	45	06/04/2022	8	11	2 female smooth newts	12 male GCN and 1 female GCN, 2 male and 6 female smooth newts	Yes - none identified	No	Yes - none identified
Rackheath	45	20/04/2022	7	9	6 male smooth and 5 female smooth	10 male GCN, 1 female GCN and 5 female smooth	Yes - none identified	No	Yes - none identified
Rackheath	45	03/05/2022	7	8	1 male GCN, 4 female GCN, 1 female smooth	3 male smooth, 1 female smooth	Yes - none identified	No	Yes - none identified
Rackheath	45	09/05/2022	14	17	5 male GCN, 6 female GCN, 1 immature GCN, 2 male smooth, 1 female smooth	6 male GCN, 4 female GCN, 4 male smooth, 2 female smooth	Yes - none identified	No	Yes - none identified
Rackheath	45	16/05/2022	13	18	6 male GCN, 5 female GCN 4 smooth male, 3 smooth female	5 male GCN, 1 female GCN, 5 male smooth, 3 female smooth and 5 adult common frog	Yes - none identified	No	Yes - none identified
Rackheath	45	30/05/2022	6	11	2 male smooth, 2 female smooth	4 male GCN, 1 female GCN, 4 male smooth, 6 female smooth	Yes - none identified	No	Yes - none identified

Pond peak count = 22

Site name	Pond no.	Date	Minimum overnight air temperature (°C)	Air temperature (°C)	Amphibians recorded through bottle trapping	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search
Rackheath	46	06/04/2022	8	11	1 male GCN and 2 female GCN, 2 female smooth newts	None identified	Yes - none identified	No	Yes - none identified
Rackheath	46	20/04/2022	7	9	Pond level too low to trap	3 male smooth2 female, smooth	Yes - none identified	No	Yes - none identified
Rackheath	46	03/05/2022	7	8	Pond level too low to trap	2 male smooth, 3 female smooth	Yes - none identified	No	Yes - none identified
Rackheath	46	09/05/2022	14	17	Pond level too low to trap	1 smooth 3 female smooth	Yes - none identified	No	Yes - none identified
Rackheath	46	16/05/2022	13	18	Pond level too low to trap	None identified	Yes - none identified	No	Yes - none identified
Rackheath	46	30/05/2022	6	11	Pond level too low to trap	None identified	Yes - none identified	No	Yes - none identified

Pond peak count = 3

C. Gazebo Farm Ecological Mitigation Area (Broadland Northway)



Gazebo Farm Ecological Mitigation Area (Broadland Northway)

Great Crested Newt Method Statement

Prepared by

Norfolk County Council

Environment Team

May 2021

IN TRAN communication for all

www.norfolk.gov.uk

Norfolk County Council

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The data has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that any opinions expressed are our best and professional bona fide opinions.

Date	Revision	Prepared by	Approved by	Comments
May 2021	Draft	CR	CD/ES	
July 2021	Final	CR	ES	

Contents

1 Introduction

Background

1.1 Gazebo Farm Ecological Mitigation Area (EMA) is at the site of the former Gazebo Farm, Rackheath, located at OS GR TG276128 (depicted in Appendix A, Figure 1). The EMA is approximately 4ha in size and is owned by Norfolk County Council. It is an important component of the ecological mitigation and landscape strategy delivered as part of the construction of the A1270 Broadland Northway, formerly known as the Norwich Northern Distributer Route (NDR).

1.2 Gazebo Farm EMA contains four pre-existing ponds, two adjacent to the access track, and two in the woodland in the south-west section of the site. The locations of these, and the reference numbers given to them in the ES, are shown on Figure 3. All the ponds appear man-made and have steep sides to a greater or lesser degree. Overhanging trees are shading the surfaces and there is some marginal vegetation including rushes and Typha.

1.3 This great crested newt method statement for the pre-existing ponds (42, 44, 45 and 46) has been produced by the Natural Environment Team at Norfolk County Council. It has been written by suitably qualified and experienced officers of Norfolk County Council who are full members of Chartered Institute of Ecology and Environmental Management (CIEEM).

1.4 Four compensation ponds were created for great crested newts in the EMA (Ponds A, B, C and D) as compensation measures, and as a translocation site for great crested newts. There is a separate method statement for the compensation ponds in Appendix B of the Gazebo Farm Ecological Mitigation Area Habitat Management Plan.

1.5 The compensation ponds and pre-existing ponds are all subject to an extant GCN EPS mitigation licence. Any maintenance to the great crested newt ponds will only be undertaken in a manner compatible with the extant EPS Mitigation licence and with the agreement of the licence holder.

1.6 NCC will liaise with the license holder regarding the timing of works and seek approval.

2 Aim and Objectives

2.1 The aim of management of the ponds at Gazebo Farm EMA is to maintain the ponds in a suitable condition to enable them to support great crested newts.

2.2 The objectives have been identified within the NDR Ecological Post-Construction Monitoring - Great Crested Newts (Mott McDonald; October 2020) report and habitat management recommendations for ponds have been provided in Table 1 of this report.

2.3 This Method Statement has been prepared with reference to guidelines produced by Natural England Pond Management Work and Great Crested Newts and the GCN Conservation Handbook .

3 Works Schedule

3.1 This section defines the specific management requirements recommended in the NDR Ecological Post-Construction Monitoring - Great Crested Newts (Mott McDonald; October 2020) report, the actions that will be undertaken, timing of the proposed works and precautionary methods of working that will be followed to ensure that the management recommendations are met and a precautionary approach is followed to reduce the likelihood of impacts on great crested newts.

The NDR Ecological Post-Construction Monitoring - Great Crested Newts (Mott McDonald; October 2020) management recommendations and precautionary methods of working that will be followed:

Pond Number (Pond locations shown in Appendix A, Figure 3)

- 42

Recommended Management (NDR Ecological Post-Construction Monitoring - Great Crested Newts (Mott McDonald; October 2020)

- Trim willows and other scrub species to reduce shading around pond.
- Plant emergent vegetation suitable for egg laying.

Action

- Coppice the group of willows in the centre of the pond and selective coppicing of willows around the pond margins to reduce shading.
- Top up existing hibernacula in the woodland with logs and branches from coppicing, maintaining suitable niches for GCN and other amphibians (existing locations shown in Appendix A, Figure 2).
- Where hibernacula does not require topping up new log piles will be created. New log piles will be located near to the ponds and the exact location will be guided by the supervising competent officer from the Natural Environment Team.
- Plant a combination of the following emergent vegetation on the east and south side of the pond margins (where the pond is more open and has gently sloping sides):
    - marsh marigold Caltha palustris
    - marsh cinquefoil Potentilla palustris
    - water forget-me-not Myosotis scorpioides
    - common water-plantain Alisma plantago-aquatica meadowsweet Filipendula ulmaria
- All emergent plants will be sourced for aquatic compost, free from fertilizers and contaminants such as herbicides.

Timing 2021

- Coppice – 1st August to 31st January if water levels permit

Timing 2022

- Where it was not possible to coppice willows due to the water levels being too high works will be rescheduled for 1st August to 31st January 2022 if water levels permit.
- Plant emergent vegetation following coppicing in Spring (ideally March).

Precautionary Methods of Working

- All works to be supervised by a competent officer from the Natural Environment Team.
- If the coppicing is undertaken during the bird nesting season in August, then a suitably qualified ecologist will undertake a check for nesting birds prior to the works being undertaken.
- The planting must be proceeded by a check of the location where planting is proposed for great crested newts.
- If GCN are found works will be rescheduled or amended to avoid committing an offence.

Pond Number (Pond locations shown in Appendix A, Figure 3)

- 44

Recommended Management (NDR Ecological Post-Construction Monitoring - Great Crested Newts (Mott McDonald; October 2020)

- Plant emergent vegetation suitable for egg laying. Trim willows and other scrub species to reduce shading around pond.

Action

- Leave the fallen willow in the pond
- Coppice the group of willows in the centre of the pond.
- Top up existing hibernacula in the woodland with logs and branches from coppicing, maintaining suitable niches for GCN and other amphibians (existing locations shown in Appendix A, Figure 2).
- Where hibernacula does not require topping up new log piles will be created. New log piles will be near to the ponds and the exact location will be guided by the supervising competent officer from the Natural Environment Team.
- Plant a combination of the following emergent vegetation on the east and south side of the pond margins (where the pond is more open and has gently sloping sides):
    - marsh marigold Caltha palustris
    - marsh cinquefoil Potentilla palustris
    - water forget-me-not Myosotis scorpioides

- common water-plantain Alisma plantago-aquatica meadowsweet Filipendula ulmaria
- All emergent plants will be sourced for aquatic compost, free from fertilizers and contaminants such as herbicides.

Timing 2021

- Coppice – 1st August to 31st January if water levels permit

Timing 2022

- Where it was not possible to coppice willows due to the water levels being too high works will be rescheduled for 1st August to 31st January 2022 if water levels permit.
- Plant emergent vegetation following coppicing – Spring (ideally March)

Precautionary Methods of Working

- All works to be supervised by a competent officer from the Natural Environment Team.
- If the coppicing is undertaken during the bird nesting season in August, then a suitably qualified ecologist will undertake a check for nesting birds prior to the works being undertaken.
- The planting must be proceeded by a check of the location where planting is proposed for great crested newts.
- If GCN are found works will be rescheduled or amended to avoid committing an offence.

Pond Number (Pond locations shown in Appendix A, Figure 3)

- 45

Recommended Management (NDR Ecological Post-Construction Monitoring - Great Crested Newts (Mott McDonald; October 2020)

- Plant emergent vegetation suitable for egg laying.

Action

- Plant a combination of the following emergent vegetation on the east and south side of the pond margins (where the pond is more open and has gently sloping sides):
  - marsh marigold Caltha palustris
  - marsh cinquefoil Potentilla palustris
  - water forget-me-not Myosotis scorpioides
  - common water-plantain Alisma plantago-aquatica meadowsweet Filipendula ulmaria
- All emergent plants will be sourced for aquatic compost, free from fertilizers and contaminants such as herbicides

Timing 2021

Timing 2022

- Plant emergent vegetation in Spring (ideally March)

Precautionary Methods of Working

- All works to be supervised by a competent officer from the Natural Environment Team.
- The planting must be proceeded by a check of the location where planting is proposed for great crested newts.
- If GCN are found works will be rescheduled or amended to avoid committing an offence.

Pond Number (Pond locations shown in Appendix A, Figure 3)

- 46

Recommended Management (NDR Ecological Post-Construction Monitoring - Great Crested Newts (Mott McDonald; October 2020)

- Pond is very shallow and could be dug out to increase capacity if the ground conditions are appropriate.
- Remove some of the dense macrophytes present to allow more light into the pond and for other emergent species to grow.

Action

- Coppice a small number of goat willow to the south of pond 46.
- Top up existing hibernacula in the woodland with logs and branches from coppicing, maintaining suitable niches for GCN and other amphibians ((existing locations shown in Appendix A, Figure 2).
- Where hibernacula does not require topping up new log piles will be created. New log piles will be near to the ponds and the exact location will be guided by the supervising competent officer from the Natural Environment Team.
- Remove the macrophytes with a grapple or rake the surface carefully.
- Remove approximately <1m of silt from the pond using a mini digger/ mini excavator.

Timing 2021

- Coppicing - 1st August to 31st January if water levels permit
- Removal of macrophytes - 1st November to 31st January
- The timing of the silt removal will be determined by ground conditions.
- The works shall be carried out only if the pond is dry or partially dry and it is possible to confirm no great crested newts are present in the pond between autumn and early winter (August - October).

Timing 2022

- If the ground conditions were not suitable for pond dredging in 2021 this work will be rescheduled for 2022.

Precautionary Methods of Working

- All works to be supervised by a competent officer from the Natural Environment Team.
- The planting must be proceeded by a check of the location where planting is proposed for great crested newts.
- The mini digger will access the site via the existing access. An access track to the pond and for the mini digger to deposit the silt will be established using directional mowing to lower the grass in stages allowing reptiles and amphibians to move out of that zone temporarily prior to works (if necessary). The access track grassland to the site appears to be maintained as a short sward.
- A pre-commencement check for great crested newts shall be carried out by a suitably qualified ecologist one week prior to the dredging commencing and any refugia will be searched (such as rocks, logs, discarded debris). A second check will be carried out prior to works commencing. If any great crested newts are found the works will be rescheduled. If any other amphibians are found these will be translocated to a nearby pond.

- A suitably qualified ecologist will be present during the dredging and will guide the exact location of the dredged silt which shall be spread above the north side of the pond being careful not to bury any open tree roots and avoiding creating artificial bunds.
- If GCN are found the works will be rescheduled or amended to avoid committing an offence.

Appendix A – Maps

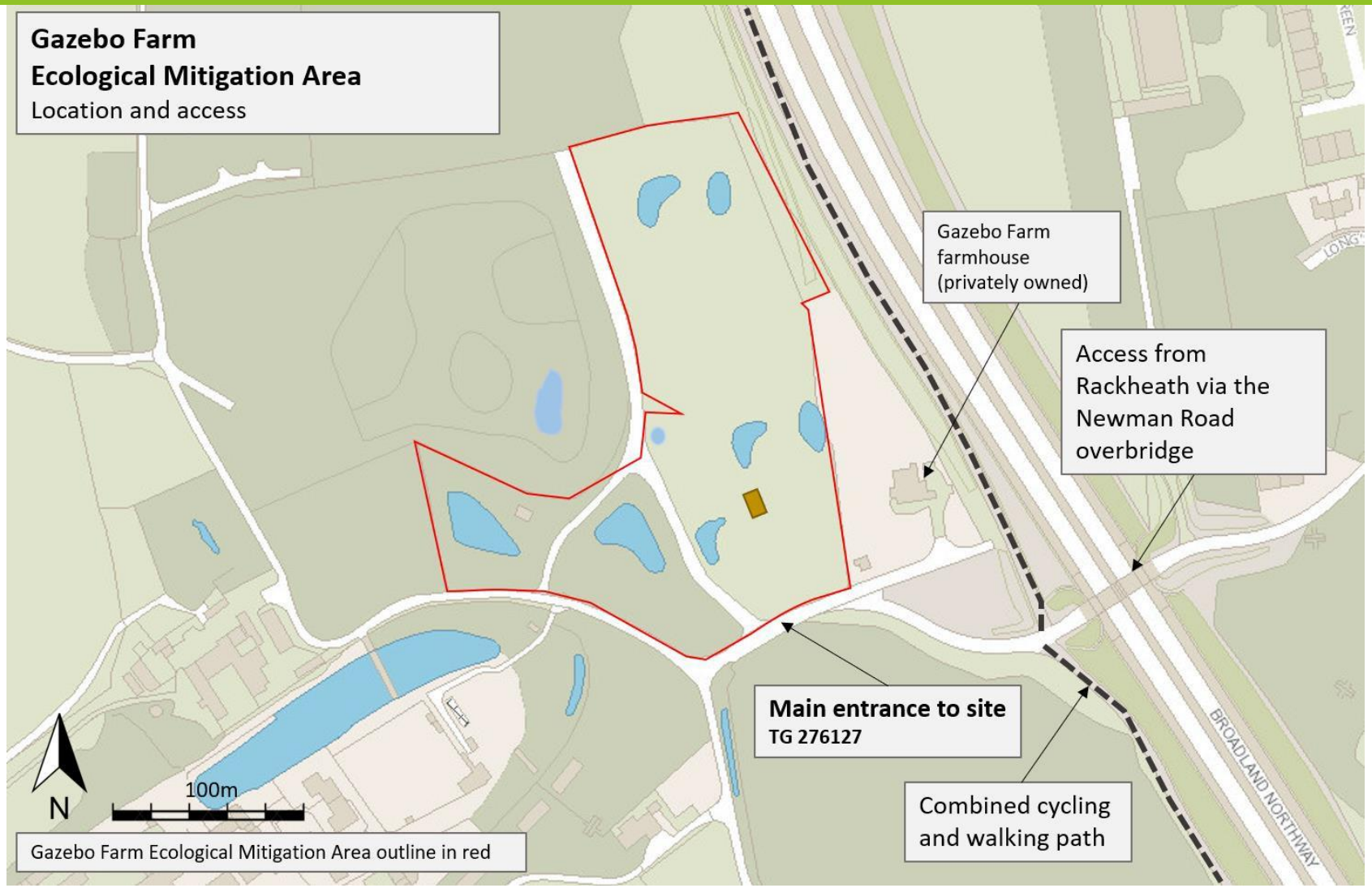

Figure 1: Location and Access to the Gazebo Farm Mitigation Area

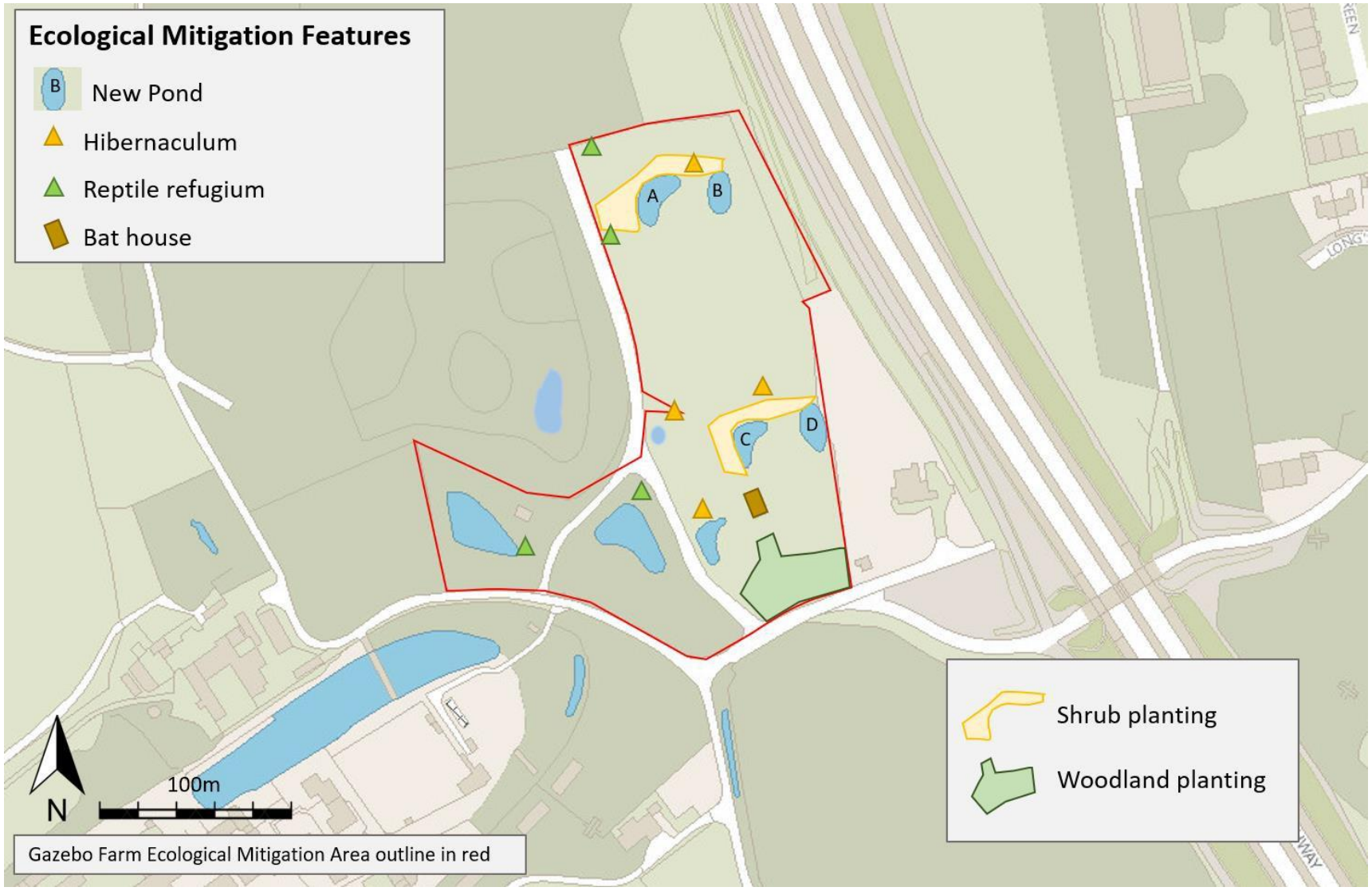

Figure 2: Locations of Ecological mitigation features

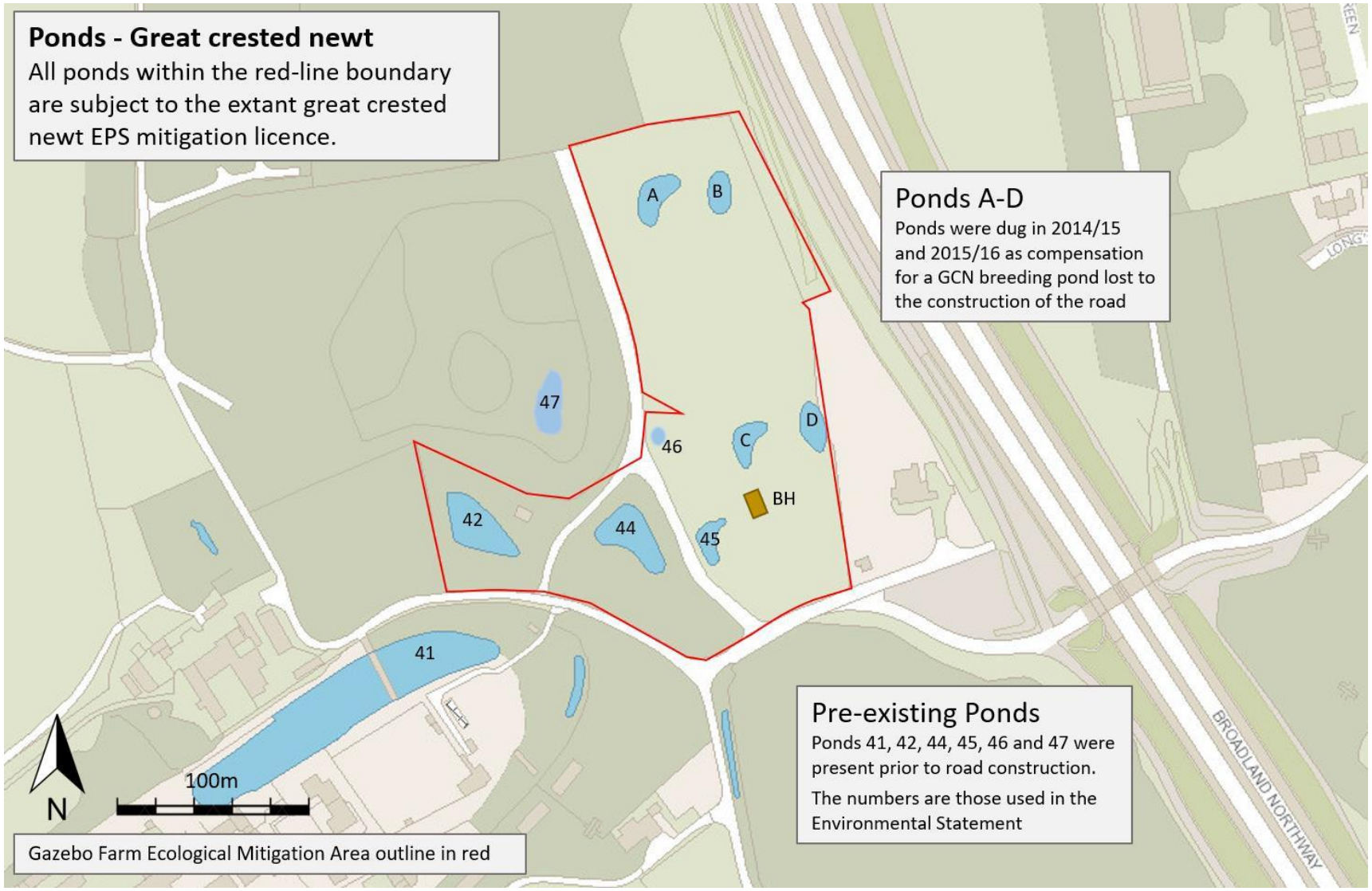

Figure 3: Locations of great crested newt ponds – new and pre-existing