MOTT MACDONALD

NDR Ecological Post-Construction Monitoring - Great Crested Newts

16 October 2020

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1 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 Way. 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 Distributer 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, at Dog Lane, Horsford (three ponds), Quaker Lane, Spixworth (one pond) and Gazebo Farm, Rackheath (nine 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 2020 (year three post-construction) surveys of all GCN ponds
- Provide a comparison to previous year's survey results
- 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 protected under the Conservation of Habitat and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). They are also listed on Section 41 of the NERC Act 2006. In summary it is an offence to:

- Intentionally or deliberately kill, injure, disturb or capture a great crested newt; and
- damage, destroy or obstruct access to any structure used for breeding or resting.

2 Methodology

2.1 Surveys

Three survey methods were employed at each the ponds in 2020, 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.
- Torch survey: Use of a high powered Clulite torch at night to illuminate the pond and visually see any newts in the pond.
- 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 as required by the guidelines (1 April to 30 June). 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).
- Bottle trapping was not used during the surveys in 2020 due to the Covid-19 global pandemic. This was to reduce the number of site visits required, to minimise touching and transfer of objects between staff and to reduce the risk to staff working in close proximity at a time when social distancing measures were being employed. All visits were undertaken in accordance with government social distancing guidelines and using guidelines from the Chartered Institute of Ecology and Environmental Management (Chartered Institute of Ecology and Environmental Management, 2020).
- Netting was not used in 2020 due to avoid damaging the gills of larvae, which are likely to be present in ponds from May and were identified on an early survey. Due to these two survey constraints, it is likely that GCN were under-recorded during the 2020 surveys, to a greater extent than has previously been the case.
- No access was available to Pond 37 for all surveys during 2019 and 2020. Therefore survey results for Pond 37 are not included in this report.
- Turbid water and/or the presence of pond weed, dense vegetation and pollen from the overhanging trees and scrub limited torching efforts in Ponds 7, 42, 47, NE, NW, SE and SW.
- Ponds 45 and 46 had areas of filamentous algae which also restricted the torching survey effort.
- Pond 6 dried out between surveys 4 and 5, so torching could not be undertaken during survey 5 or 6.

- Pond 46 gradually dried up between surveys 3 and 5 and was entirely dry during survey 6, therefore torching could not be undertaken during survey 6.

3 Results

3.1 Results up to 2019

The details of the survey results for Ponds 5, 6 and 7 at Dog Lane, Horsford, Pond 16 at Quaker Farm, Spixworth, and Ponds 37, 42, 44, 45, 46, 47 and 48 at Gazebo Farm, Rackheath between 2007 and 2019 are found in Table 3.1 .

Peak counts of GCN from 2007, 2009, 2012, 2013, 2016, 2017,2018 and 2019 surveys by metapopulation are presented below in Table 3.2.

Table 3.1: Previous results from 2007, 2009, 2012, 2013, 2016, 2017, 2018 and 2019.

Site name	Pond no.	Date	Peak count of GCN
Dog Lane	5	2019	42
		2018	68
		2017	13
		2016	27
		2013	14
		2012	8
		2007	28
	6	2019	1
		2018	22
		2017	1
		2016	1
		2013	0
		2007	1
	7	2019	4
		2018	3
		2017	0
		2016	10
		2013	12
		2007	6
Quaker Farm	16	2019	25
		2018	27
		2017	30
		2016	28
		2012	27
		2009	5
		2007	7
Rackheath	37[1]	2016	17
		2012	17
		2009	2
		2007	38
	42	2019	5

[1] not included in 2017, 2018 and 2019 surveys as access was no longer permitted.

Site name	Pond no.	Date	Peak count of GCN
		2018	8
		2017	0
		2016	11
		2013	19
		2012	15
		2009	2
		2007	5
	44	2019	2
		2018	19
		2017	0
		2016	9
		2013	9
		2012	9
		2009	6
		2007	4
	45	2019	1
		2018	18
		2017	8
		2016	4
		2013	2
		2012	0
		2009	1
		2007	5
	46	2019	0
		2018	3
		2017	0
		2016	2
		2013	1
		2012	0
	47[2]	2019	32
		2018	20
		2013	19
		2012	9
		2009	24
		2007	24
	NW	2019	5
		2018	9
		2017	2
	NE	2019	5
		2018	11
		2017	5
	SW	2019	8
		2018	5

[2] Not included in 2016, 2017 and 2020 surveys.

Site name	Pond no.	Date	Peak count of GCN
		2017	2
		2016	12
	SE	2019	0
		2018	9
		2017	3
		2016	13

Source: Mott MacDonald, 2019

Table 3.2: Metapopulation peak counts from surveys 2007 to 2019 based on the peak counts in Table 3.1.

Site name	Peak count per meta-population
Dog Lane	2019 – 47 2018 – 93 2017 – 14 2016 – 38 2013 – 26 2012 – 8 (only 1 of 3 ponds surveyed) 2007 – 35
Quaker Farm	2019 – 25 2018 – 27 2017 – 30 2016 – 28 2012 – 27 2009 – 5 2007 – 7
Rackheath	2019 – 58 2018 – 102 2017 – 20 2016 – 68 2013 – 43 2012 – 51 2009 – 57 2007 – 45

Source: Mott MacDonald, 2019

Owing to the works being undertaken to construct the NDR, ongoing monitoring of the GCN population is required to ensure the population is not affected as part of the mitigation licence granted by Natural England. Pond 48 was lost as part of the works in early 2017 and four ponds have been created. They are known as Ponds SW, SE, NW and NE based on their location within the Site.

3.2 Survey results 2020

Detailed results from the 2020 GCN surveys can be found in Appendix B. Peak counts from the 2020 surveys are shown in Table 3.3 below, with the peak counts from 2007 to 2019 for comparison.

Table 3.3: Results from 2007 – 2020 combined

Site name	Pond no.	Date	Peak count of GCN
Dog Lane	5	**2020**	**5**
		2019	42
		2018	68
		2017	13
		2016	27
		2013	14
		2012	8
		2007	28
	6	**2020**	**0**
		2019	1
		2018	22
		2017	1
		2016	1
		2013	0
		2007	1
	7	**2020**	**1**
		2019	4
		2018	3
		2017	0
		2016	10
		2013	12
		2007	6
Quaker Farm	16	**2020**	**3**
		2019	25
		2018	27
		2017	30
		2016	28
		2012	27
		2009	5
		2007	7
Rackheath	42	**2020**	**0**
		2019	5
		2018	8
		2017	0
		2016	11
		2013	19
		2012	15
		2009	2
		2007	5
	44	**2020**	**9**
		2019	2
		2018	19
		2017	0
		2016	9

Site name	Pond no.	Date	Peak count of GCN
		2013	9
		2012	9
		2009	6
		2007	4
	45	**2020**	**9**
		2019	1
		2018	18
		2017	8
		2016	4
		2013	2
		2012	0
		2009	1
		2007	5
	46	**2020**	**5**
		2019	0
		2018	3
		2017	0
		2016	2
		2013	1
		2012	0
	NW	**2020**	**3**
		2019	5
		2018	9
		2017	2
	NE	**2020**	**10**
		2019	5
		2018	11
		2017	5
	SW	**2020**	**3**
		2019	8
		2018	5
		2017	2
		2016	12
	SE	**2020**	**8**
		2019	0
		2018	9
		2017	3
		2016	13

Source: Mott MacDonald, 2020

The peak count per metapopulation is shown in Table 3.4 below for surveys between 2007 and 2020.

Table 3.4: Metapopulation peak counts from surveys 2007 to 2020 combined based on the peak counts in Table 3.3.

Site name	Peak count per meta-population
Dog Lane	**2020 - 6** 2019 – 47 2018 – 93 2017 – 14 2016 – 38 2013 – 26 2012 – 8 (only 1 of 3 ponds surveyed) 2007 – 35
Quaker Farm	**2020 - 3** 2019 – 25 2018 – 27 2017 – 30 2016 – 28 2012 – 27 2009 – 5 2007 – 7
Rackheath	**2020 - 46** 2019 – 58 2018 – 102 2017 – 20 2016 – 68 2013 – 43 2012 – 51 2009 – 57 2007 – 45

Source: Mott MacDonald, 2020

4 Discussion and Recommendations

The number of GCN recorded in 2020 within each meta-population was lower than in 2019 and many of the previous years. Small populations of GCN were recorded at Dog Lane (peak count 6) and Quaker Farm (peak count 3). A medium population was recorded at Rackheath (peak count 46).

Peak counts have decreased in all meta-populations; however, it is highly likely that this could be at least partly explained by the change in methodology, avoiding the use of bottle trapping during 2020, due to the Covid-19 pandemic. Because of this, it is difficult to make comparisons between the 2020 results and previous years.

Several otter spraints were identified on the bank between ponds 42 and 47. Otters will eat both smooth and great crested newts, and this may have impacted population levels at Rackheath.

Weather conditions were very dry in late April and May causing ponds 6 and 46 to dry out entirely during the surveys. The water levels in ponds 7, 42, 45, SE, SW, NE and NW also declined during this period.

Although no adults were recorded in ponds 42 and 7, eggs and efts were identified (which are not included in peak counts), indicating that GCN are utilising the ponds for breeding.

Some of the ponds require some management 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). Habitat management and site maintenance must be undertaken until 2022 as a condition of the licence.

Due to land ownership restrictions, maintenance is only recommended for ponds 42, 44, 45, 46, SE, SW, NW and NE at Rackheath. GCN monitoring surveys will continue in 2021.

Table 4.1: Habitat management recommendations for ponds

Pond number	Constraint	Recommended management	Timing of works	Details
42	Heavy shading from trees and scrub. Limited egg laying vegetation available.	Plant emergent vegetation suitable for egg laying. Trim willows and other scrub species to reduce shading around pond.	November to January	Work must be carried out under a method statement. Information regarding appropriate aquatic plants for GCN egg laying can be provided.
44	Heavy shading from trees and scrub. Limited egg laying vegetation available.	Plant emergent vegetation suitable for egg laying. Trim willows and other scrub species to reduce shading around pond.	November to January	Work must be carried out under a method statement. Information regarding appropriate aquatic plants for GCN egg laying can be provided.
45	Limited egg laying vegetation available.	Plant emergent vegetation suitable for egg laying.	November to January	Work must be carried out under a method statement. Information regarding appropriate aquatic

Pond number	Constraint	Recommended management	Timing of works	Details
				plants for GCN egg laying can be provided.
46	Dries out in periods of dry weather. Dense pondweed and filamentous algae.	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.	November to January	Work must be carried out under a method statement.
NW	Emergent and marginal vegetation overgrown.	Careful removal of *Typha* sp by hand to increase the areas of open water to allow GCN to display.	November to January	Work must be carried out under a method statement.
NE	Emergent and marginal vegetation overgrown.	Careful removal of *Typha* sp by hand to increase the areas of open water to allow GCN to display.	November to January	Work must be carried out under a method statement.
SW	None.	None.	N/A	N/A
SE	None.	None.	N/A	N/A

5 References

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

Chartered Institute of Ecology and Environmental Management (2020). Advice on COVID-19 and Undertaking Field Surveys.

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.

Mott MacDonald (2019). Norwich Northern Distributor Road Great Crested Newt Monitoring 2019. .

A. Pond Locations and Numbers


NDR GCN Monitoring 2020
Quaker Farm - Pond Location
Legend
Waterbodies surveyed in 2020
Pond 16
Google Earth
90 m
N


NDR GCN Monitoring 2020
Rackheath - Pond Locations
Legend
Waterbodies surveyed in 2020
Pond NW
Pond NE
Pond SE
Pond SW
Pond 46
Pond 47
Pond 45
Pond 42
Pond 44
Google Earth
100 m
N

B. 2020 GCN Survey Results

Table 1: Detailed results from GCN surveys undertaken in 2020

Site name	Pond no.	Date	Air temperature (°C)	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search	GCN peak count
Dog Lane	5	01/05/2020	9	2 male, 1 female, 2 undetermined GCN; 1 female smooth newt	Yes - none identified	No	Yes - none identified	5
		06/05/2020	7	None identified	Yes - none identified	No	Yes - one juvenile GCN	
		13/05/2020	6	None identified	Yes - none identified	No	Yes - none identified	
		20/05/2020	21	1 male, 1 female, 1 undetermined GCN	Yes - GCN eggs found	No	Yes - none identified	
		29/05/2020	13	None identified	N/A	No	Yes - none identified	
		02/06/2020	17	None identified	N/A	No	Yes - none identified	
	6	01/05/2020	10	1 female smooth newt	Yes - none identified	No	Yes - none identified	0
		06/05/2020	7	None identified	Yes - none identified	No	Yes - none identified	
		13/05/2020	6	1 male smooth newt, 1 unknown smooth newt	Yes - none identified	No	Yes - none identified	
		20/05/2020	21	None identified	Yes - none identified	No	Yes - none identified	
		29/05/2020	13	Pond entirely dried out	Not possible	No	Yes - female smooth newt identified	
		02/06/2020	17	None identified	Yes - none identified	No	Yes - none identified	
	7	01/05/2020	10	1 eft (indeterminate species)	Yes - GCN eggs identified	No	Yes - none identified	0
		06/05/2020	8	1 common toad	N/A	No	Yes - none identified	
		13/05/2020	7	None identified	N/A	No	Yes - none identified	
		20/05/2020	22	1 GCN eft, 2 smooth newt efts, 1 male smooth newt	N/A	No	Yes - none identified	
		29/05/2020	13	None identified	N/A	No	Yes - none identified	
		02/06/2020	17	None identified	N/A	No	Yes - none identified	

Site name	Pond no.	Date	Air temperature (°C)	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search	GCN peak count
Quaker Farm	16	01/05/2020	9	1 GCN (sex unknown), 1 common toad, 1 fish (possible crucian carp)	Yes - GCN eggs identified	No	Yes - none identified	3
		06/05/2020	7	1 male GCN, 2 female GCN, 1 common frog, 1 common toad	N/A	No	Yes - none identified	
		13/05/2020	6	None identified	N/A	No	Yes - none identified	
		20/05/2020	20	1 GCN (sex unknown), 2 common toads, 2 smooth newts (1 female, one unknown), 1 fish (possible crucian carp)	N/A	No	Yes - none identified	
		29/05/2020	12	1 female GCN	N/A	No	Yes - none identified	
		02/06/2020	17	None identified	N/A	No	Yes - none identified	
Rackheath	NW	01/05/2020	8	4 male and 2 female smooth newts	Yes - GCN eggs identified	No	Yes - none identified	3
		06/05/2020	5	3 female GCN and 3 female smooth newts	N/A	No	Yes - none identified	
		13/05/2020	6	1 male GCN	N/A	No	Yes - none identified	
		20/05/2020	13	1 male and 2 female GCN, 1 female smooth newt	N/A	No	Yes - none identified	
		26/05/2020	12	1 female GCN and 1 female smooth newt	N/A	No	Yes - none identified	
		02/06/2020	12	1 female GCN	N/A	No	Yes - none identified	
	NE	01/05/2020	9	1 male smooth newt	Yes - GCN eggs identified	No	Yes - none identified	10
		06/05/2020	5	2 male GCN	N/A	No	Yes - none identified	
		13/05/2020	6	1 female GCN	N/A	No	Yes - none identified	
		20/05/2020	13	1 male and 2 female GCN	N/A	No	Yes - none identified	
		26/05/2020	12	1 male and 1 female GCN	N/A	No	Yes - none identified	

Site name	Pond no.	Date	Air temperature (°C)	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search	GCN peak count
		02/06/2020	12	3 male and 7 female GCN and 1 female smooth newt	N/A	No	Yes - none identified	
	SW	01/05/2020	9	1 female GCN	Yes - GCN eggs identified	No	Yes - none identified	2
		06/05/2020	4	1 male and 1 female GCN, 2 female smooth newts	N/A	No	Yes - none identified	
		13/05/2020	6	1 female smooth newt	N/A	No	Yes - none identified	
		20/05/2020	13	1 female smooth newt	N/A	No	Yes - none identified	
		26/05/2020	12	1 female smooth newt	N/A	No	Yes - none identified	
		02/06/2020	12	2 female GCN	N/A	No	Yes - none identified	
	SE	01/05/2020	8	2 female GCN and 3 female smooth newts	Yes - GCN eggs identified	No	Yes - none identified	8
		06/05/2020	5	2 male and 1 female GCN, 1 male and 2 female smooth newts	N/A	No	Yes - none identified	
		13/05/2020	6	1 female smooth newt	N/A	No	Yes - none identified	
		20/05/2020	13	3 male and 5 female GCN	N/A	No	Yes - none identified	
		26/05/2020	12	1 male and 2 female GCN, 1 female smooth newt	N/A	No	Yes - none identified	
		02/06/2020	12	None identified	N/A	No	Yes - none identified	
	42	01/05/2020	10	1 male and 5 female smooth newts	Yes - none identified	No	Yes - none identified	0
		06/05/2020	7	1 female smooth newt	Yes - smooth newt eggs identified	No	Yes - none identified	
		13/05/2020	7	1 male and 1 female smooth newt	Yes - GCN eggs identified	No	Yes - none identified	
		20/05/2020	14	None identified	N/A	No	Yes - none identified	
		26/05/2020	13	None identified	N/A	No	Yes - none identified	
		02/06/2020	12	1 female smooth newt	N/A	No	Yes - none identified	
	44	01/05/2020	9	7 male and 2 female GCN	Yes - none identified	No	Yes - none identified	9

Site name	Pond no.	Date	Air temperature (°C)	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search	GCN peak count
		06/05/2020	7	4 male and 5 female GCN	Yes - none identified	No	Yes - none identified	
		13/05/2020	6	None identified	Yes - none identified	No	Yes - none identified	
		20/05/2020	14	5 male and 2 female GCN	Yes - none identified	No	Yes - none identified	
		26/05/2020	13	2 male GCN	Yes - none identified	No	Yes - 2 juvenile smooth newts	
		02/06/2020	12	None identified	Yes - none identified	No	Yes - none identified	
	45	01/05/2020	9	1 male and 2 female smooth newts	Yes - none identified	No	Yes - none identified	9
		06/05/2020	6	1 male and 1 female GCN, 5 male and 6 female smooth newts	Yes - none identified	No	Yes - none identified	
		13/05/2020	7	4 male GCN and 5 female smooth newts	Yes - none identified	No	Yes - none identified	
		20/05/2020	14	6 male and 1 female GCN, 1 male and 3 female smooth newts	Yes - none identified	No	Yes - none identified	
		26/05/2020	13	2 male and 7 female GCN and 2 male and 8 female smooth newts	Yes - none identified	No	Yes - none identified	
		02/06/2020	12	1 male and 4 female GCN and 1 male and 10 female smooth newts	Yes - none identified	No	Yes - none identified	
	46	01/05/2020	9	1 male and 1 female GCN	Yes - none identified	No	Yes - none identified	5
		06/05/2020	6	1 male GCN, 4 male and 2 female smooth newts	Yes - smooth newt eggs identified	No	Yes - none identified	
		13/05/2020	6	3 male and 2 female GCN, 4 male and 3 female smooth newts	Yes - none identified	No	Yes - none identified	
		20/05/2020	13	None identified - pond has largely dried out	Yes - none identified	No	Yes - 1 juvenile GCN and 4 juvenile smooth newts	
		26/05/2020	12	None identified - pond has dried out further	Not possible	No	Yes - none identified	

Site name	Pond no.	Date	Air temperature (°C)	Amphibians recorded through torching	Egg search	Sweep net	Terrestrial habitat search	GCN peak count
		02/06/2020	12	None identified, pond has entirely dried out	Not possible	No	Yes - none identified	

Source: Mott MacDonald, 2020