M5 Junction 10 Improvements Scheme

Environmental Statement

Appendix 7.11 Great Crested Newt surveys

TR010063 – APP 6.15

Regulation 5 (2) (a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Gloucestershire COUNTY COUNCIL

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

M5 Junction 10 Improvements Scheme

Development Consent Order 202[x]

6.15 Environmental Statement

Appendix 7.11 Great Crested Newt surveys

Regulation Number:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010063
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1. Introduction

1.1. Terms of Reference

1.1.1. Atkins, member of the SNC-Lavalin group, was commissioned by Gloucestershire County Council (GCC) to undertake great crested newt (*Triturus cristatus*) surveys to inform the Environmental Statement (ES) for the M5 Junction 10 Improvements Scheme (hereafter referred to as 'the Scheme').

1.1.2. The purpose of the great crested newt surveys was to determine whether great crested newts are likely to be present within the Scheme; provide recommendations to enable compliance with legislation and policy; and, if necessary, identify the need for avoidance, mitigation, compensation or enhancement measures.

1.1.3. This Technical Appendix summarises the results of the great crested newt surveys undertaken, including the methods used, results of the field surveys, and provides an evaluation of the nature conservation value of great crested newts within the survey area.

1.1.4. This report provides factual information to support the ES, which will accompany the planning application for the Scheme.

1.2. Legislation and Policy

1.2.1. Relevant legislation in relation to great crested newts is provided in Table 1-1 below.

Table 1-1 - Summary of Relevant Legislation

Species	Legislation	Offences	Licensing procedures and guidance
Great crested newt European protected species (EPS)	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 43	Deliberately[1] capture, injure or kill a great crested newt; deliberate disturbance[2] of a great crested newt; deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by a great crested newt.	Licences issued for development by Natural England. Guidance documents: • NE Standing Advice for great crested newts 2022[3]. • Great Crested Newt Mitigation Guidelines[4].
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb[5] a great crested newt in such a place.	Licences issued for science (survey), education and conservation by Natural England.

[1] Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing.
[2] Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to significantly affect the local distribution or abundance of the species to which they belong
[3] https://www.gov.uk/guidance/great-crested-newts-advice-for-making-planning-decisions
[4] English Nature (2001) Great Crested Newt Mitigation Guidelines.
[5] Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 (as amended) remain an offence under the Wildlife and Countryside Act 1981 (as amended) although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

2. Methodology

2.1. Introduction

2.1.1. The term 'Scheme Boundary' refers to the Order limits, excluding areas of the Order limits that extend approximately 2 km north and 2 km south of the Scheme alignment, along the M5. In these locations the Scheme Boundary is the Scheme alignment. The Order limits and the Scheme alignment are shown on Figure 7-11A in Appendix A.

2.1.2. Within the areas of the Order limits that extend north and south of the Scheme alignment, the only works proposed are the installation of signs in discrete locations, which will require vegetation clearance of up to approximately 20 m^2 plus some minor trimming back of vegetation up to a distance of 180 m in front of the sign to ensure visibility. These signage locations can be micro sited to avoid/ minimise ecological impacts. These small-scale works are consistent with routine highway maintenance works. The results of desk study and field surveys here would not have any bearing on the impact assessment for the Scheme, and these areas have been excluded from assessments to inform the ES. Pre-construction surveys of the discrete signage locations and working with the contractor to micro site locations where appropriate to avoid or minimise ecological impacts will be undertaken and is considered to be proportionate.

2.2. Desk Study

2.2.1. The Defra MAGIC website[6] was reviewed to identify statutory designated nature conservation sites, designated on account of their great crested newt population, within 2 km of the Scheme Boundary. Details of non-statutory designated sites for nature conservation within 1 km of the Scheme Boundary were requested from Gloucestershire Centre for Environmental Records (GCER) in September 2019 and again in April 2021 and July 2022, to identify those non-statutory designated sites citing great crested newts as a reason for designation.

2.2.2. GCER also provided recent records[7] of great crested newts from within 1 km of the Scheme Boundary. The MAGIC website[8] was reviewed to identify granted great crested newt European Protected Species (EPS) licences[9] and great crested newt survey records within 1 km of the Scheme Boundary.

2.3. Field Survey

2.3.1. Surveys were led by suitably experienced ecologists (considered competent to undertake great crested newt surveys in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM)[10]), registered with Natural England to use Class Licence CL08 to survey great crested newt, who are members of CIEEM.

Defining the survey area

2.3.2. Ordnance Survey maps and publicly available aerial imagery were used to identify waterbodies within 500 m of the Scheme Boundary, in order to establish if the land within and immediately surrounding the Scheme could be used as terrestrial habitat for great crested newts. This species typically uses suitable terrestrial habitat up to 500 m from a

[6] Defra. c2019. Magic Map Application. [Online]. [Accessed July 2021]. Available from: https://magic.defra.gov.uk/MagicMap.aspx
[7] Records of observations within the last 10 years.
[8] Defra. c2019. Magic Map Application. [Online]. [Accessed July 2021]. Available from: https://magic.defra.gov.uk/MagicMap.aspx
[9] Licences granted by Natural England to permit activities that might otherwise cause a breach of the Conservation of Habitats and Species Regulations 2018, with respect to species protected by that legislation.
[10] https://cieem.net/resource/competencies-for-species-survey-css/

breeding pond[11]. However, there is a notable decrease in great crested newt abundance beyond a distance of 250 m from a breeding pond[12].

2.3.3. An extended Phase 1 habitat survey which was undertaken in 2018 by Ecus, and in 2019 by Atkins, identified habitats and features that could potentially support great crested newts within and up to 250 m from the Scheme Boundary.

Habitat Suitability Index

2.3.4. Habitat Suitability Index (HSI)[13] assessments were undertaken on in June 2019, June 2020, May 2021 and June 2021 accordance with good practice guidance[14].

2.3.5. The extent of the HSI assessments was based on the zone of influence for this species and included all waterbodies within 500 m of the Scheme Boundary where access allowed (the great crested newt study area). Where major barriers to great crested newt dispersal (such as a large flowing watercourse or major roads) were present between a given waterbody and the Scheme, the waterbody was omitted from HSI assessment and further survey for great crested newts. Where the waterbody was considered to be completely unsuitable for great crested newts (for example, it was completely dry and had been dry for a considerable length of time, evidenced by the lack of any aquatic vegetation), the waterbody was omitted from HSI assessment and further survey for great crested newts.

2.3.6. The HSI is a quantitative predictor of habitat suitability for great crested newts. The HSI is a numerical index between 0 and 1, derived from an assessment of ten habitat variables known to influence the presence of great crested newts. These variables include (amongst others): geographic location, water body size and permanence, the presence of predatory fish and wildfowl, availability of suitable terrestrial habitat and the waterbody count within 1 km of the survey waterbody, and each variable is scored based on its level of suitability. A HSI of 1 indicates optimal habitat (high probability of great crested newt occurrence), whilst a HSI of 0 indicates very poor habitat (minimal probability of great crested newt occurrence). The HSI is calculated on a single water body basis but takes into account surrounding terrestrial habitat and local water body density. If a water body has a very low HSI score (<0.5) then there would typically be a minimal chance of great crested newt presence.

2.3.7. Table 2-1 below explains the categories for the waterbody scores.

Table 2-1 - Categorisation of HSI Scores

HSI score	Waterbody suitability
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good

[11] English Nature (2001) Great Crested Newt Mitigation Guidelines.
[12] Natural England (2004) An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt. (ENRR:576) http://publications.naturalengland.org.uk/publication/134002.
[13] Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*) Herpetological Journal 10 (4), 143-155 (2000). Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. The great crested newt Habitat Suitability Index (HSI) is a quantitative measure of aquatic habitat quality for great crested newt. The HSI is a number between 0 and 1, derived from an assessment of ten habitat variables known to influence the presence of newts.
[14] Amphibian and Reptile Groups of the United Kingdom (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. ARGUK

>0.8	Excellent

2.3.8. As stated in good practice guidance[15], the HSI for great crested newts is not a substitute for great crested newt presence/likely absence surveys. In general, waterbodies with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to conclude that any particular waterbody with a high score will support great crested newts, or that any waterbody with a low score will not do so. There is a positive correlation between HSI scores, and the numbers of great crested newts observed. In general, high HSI scores are likely to be associated with greater numbers of great crested newts. The relationship is not sufficiently strong, however, to allow estimations of the numbers of newts in any particular waterbody.

Environmental DNA sampling

2.3.9. The environmental DNA (eDNA) survey involved the collection of water samples from suitable waterbodies within the great crested newt study area to be tested for the presence of great crested newt DNA, which would indicate the species is present in a particular waterbody.

2.3.10. Suitably experienced ecologists with at least one great crested newt survey licenced surveyor present undertook eDNA sampling of a number of waterbodies in June 2019, June 2020, May 2021 and June 2021.

2.3.11. Surveys followed the Natural England approved methodology described by Biggs, et al. (2014)[16]. Field sampling equipment was supplied as sterile kits by the laboratory that was to carry out the DNA analysis (ADAS and SureScreen Scientifics). In total, 20 water samples were collected from each waterbody sampled. Areas that may be used by great crested newts for displaying or egg-laying were selected for sampling and the sampling was carried out in daylight hours and in dry weather. Following completion of the sampling, the collected water samples were stored under suitable conditions (as set-out in the approved methodology) before being sent to the laboratory for testing[17]. Results are reported in three categories: positive results (where great crested newt DNA is confirmed as present); indeterminate results (where eDNA sampling was inconclusive), and negative results (where no great crested newt DNA is confirmed as present).

2.4. Assessment

2.4.1. The importance of great crested newts in relation to the Scheme has been valued in a geographical context following the framework provided in LA 108[18]. The evaluation is based on the information gathered from the desk study and field surveys, using a combination of professional judgement and accepted criteria[19] (e.g. diversity, rarity and naturalness).

2.5. Limitations

2.5.1. The search for waterbodies within 500 m of the Scheme Boundary was undertaken by using Ordnance Survey plans and aerial imagery. These sources may not show all waterbodies within 500 m of the Scheme Boundary (for example, some garden ponds may not be shown on maps or aerial images) and, therefore, some waterbodies may not

[15] English Nature (2001) Great Crested Newt Mitigation Guidelines.
[16] Biggs J., Ewald N., Valentini A., Gaboriaud C., Griffiths R.A., Foster J., Wilkinson J., Arnett A., Williams P. & Dunn F. (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.
[17] SureScreen Scientifics is a participant in Natural England's eDNA proficiency testing scheme and achieved 80% in blind tests undertaken in 2020. ADAS is a participant in Natural England's eDNA proficiency testing scheme and has achieved perfect scores in blind tests undertaken in 2017, 2018, 2019 and 2020.
[18] Highways England. March 2020. LA 108 Biodiversity [Online]. [Accessed October 2020]. Available from: https://www.standardsforhighways.co.uk/dmrb/search?discipline=SUSTAINABILITY_AND_ENVIRONMENT
[19] Set out in Ratcliffe, D.A (1977). A Nature Conservation Review. Cambridge University Press.

have been identified and have not been included in the surveys. However, habitat surveys were also undertaken, which would have recorded any additional waterbodies up to 250 m from the Scheme Boundary, where access was available. It is therefore considered that the majority of waterbodies within 500 m of the Scheme Boundary will have been identified, and this is considered sufficient to determine the presence or likely absence of great crested newts within or adjacent to the Scheme.

2.5.2. Full access to the study area was not available for the field surveys. Pond 22 could not be accessed due to the presence of a fence and extremely dense vegetation around the waterbody. The presence of great crested newts is assumed here given the proximity of other waterbodies (pond 23 and pond 24) with confirmed great crested newt presence.

2.5.3. Landowners refused access to a number of waterbodies, including pond 28, pond 29, pond 39, pond 40, drain 5, drain 6 and drain 7.

2.5.4. From a review of documents to support a nearby outline planning application (Elms Park, North West Cheltenham (reference16/04000/OUT)[20]), pond 28 appears to be absent. Pond 29 was described as being approximately 4 m by 6 m and utilised for slurry/manure storage in 2012 and 2014, taking rainwater and accumulated slurry from yards and buildings at Swindon Farm. On this basis, it was not considered suitable for supporting great crested newts. From an internet search, pond 39 appears to be a fishing lake and is, therefore, highly unlikely to be suitable for supporting great crested newts. Pond 40 is located approximately 30 m east of pond 39, within the same land parcel. The information gathered indicates that pond 28, pond 29, pond 39 and pond 40 are either no longer present, or are unlikely to be suitable for supporting great crested newts. Nevertheless, if access can be obtained in future, these waterbodies will be surveyed to confirm this assessment.

2.5.5. Drain 5, drain 6 and drain 7 were surveyed in 2019 as part of the otter and water vole habitat suitability assessment. Drain 5 and drain 6 were completely dry and no aquatic vegetation was recorded. Drain 7 was not present (no ground depression, standing water or aquatic vegetation was present) when the Site was visited. On this basis, these three drains have been scoped out of the great crested newt assessment, and lack of access for targeted great crested newt surveys is not considered to be a limitation.

2.5.6. During the eDNA surveys the waterbody perimeter accessible for sampling was less than 75% for the following 13 waterbodies: pond 17, pond 23, pond 24, pond 25, pond 26, pond 27, drain 8, drain 14, drain 15, drain 17, drain 19, drain 20 and drain 22). However, as the areas that could be accessed were considered to be suitable for great crested newt utilisation this is not considered to impact the validity of the survey.

2.5.7. During the eDNA surveys more than 50% of samples were taken in very shallow water (less than 10 cm in depth) for the following waterbodies: drain 13, drain 13a, drain 14, drain 15, drain 17, drain 19, drain 20, drain 21 and drain 22. However, as this reflects the depth of the drains it is not considered to impact the validity of the survey.

2.5.8. Population size class assessment surveys have not been undertaken of waterbodies with confirmed great crested newt presence. If a district level licensing option is pursued then population size class assessments will not be required. If a 'traditional' Natural England licensing route is pursued, then population size class assessment surveys will be undertaken during detailed design in order to inform the licence. The size of the great crested newt population present will not affect the assessment, or the approach to mitigation or compensation for this species, therefore lack this data is not considered to be a limitation.

2.5.9. Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Therefore, the absence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, the great crested newt surveys were

[20] Bloor Homes/Persimmon Homes Elms Park, Northwest Cheltenham, Phase 1 and Protected Species Survey Appendix J1 (August 2015)

undertaken in line with best practice guidance and the conclusions drawn from the data are considered valid.

3. Results

3.1. Desk Study

3.1.1. There are no designated sites within the search area designated specifically, or in part, for great crested newts. Additionally, no Natural England great crested newt EPS licences were identified within the study area for the Scheme.

3.1.2. GCER provided three recent records of great crested newts within the study area:

- A record at Hayden Road Allotments (SO917244) 150 m south of the Scheme Boundary in 2014.
- A record from approximately 900 m north west (SO917244) of the Scheme Boundary from 2018.
- A record from 2018 that appears to be close to the Scheme at its northern extent, but only a four figure grid reference was provided (SO9126).

3.1.3. Thirty-seven waterbodies were identified within 500 m of the Scheme Boundary, as shown on Figure 7-11A in Appendix A.

3.2. Field Survey

Habitat Suitability Index

3.2.1. Out of the 39 waterbodies identified within 500 m of the Scheme Boundary, four of these (pond 41, pond 42, pond 43 and pond 44) were scoped out as they are located on the opposite side of the River Chelt from the Scheme. The River Chelt is a large, flowing watercourse which is considered to represent a barrier to great crested newt dispersal.

3.2.2. As described in the Limitations section, it was not possible to access eight waterbodies, and HSI assessments of these waterbodies were not possible (pond 22, pond 28, pond 29, pond 39, pond 40, drain 5, drain 6, and drain 7). Drain 5, drain 6 and drain 7 were surveyed in 2019 as part of the otter and water vole habitat suitability assessment. Drain 5 and drain 6 were completely dry and no aquatic vegetation was recorded. Drain 7 was not present (no ground depression, standing water or aquatic vegetation was present) when the site was visited. On this basis, these three drains have been scoped out of the great crested newt assessment.

3.2.3. A further six waterbodies were scoped out as they were dry at the time of the survey and had clearly been dry for some time, so were not considered suitable for supporting great crested newts. These include pond 30, drain 4, drain 9, drain 11, drain 12 and drain 16. Drain 3 was also scoped out as it was completely saturated in dense algae which provided no suitable egg laying material, no open water for newts to display and would have inhibited newt movement. Therefore, it was not considered suitable for supporting great crested newts.

3.2.4. HSI assessments were not undertaken of these scoped out waterbodies but were undertaken of the remaining 20 waterbodies.

3.2.5. Five waterbodies were classed as having poor suitability, six as below average suitability, seven as average suitability, one as good suitability, and one as excellent suitability. The full HSI assessments are included in Appendix B, along with a description of each waterbody, and photos of each waterbody are included in Appendix C.

Environmental DNA

3.2.6. Water samples were taken from 19 of the 20 waterbodies surveyed. No samples were taken from drain 10 as it was not safe for the surveyors to take water samples from, being filled with litter and contaminated with human waste. Due to the highly polluted nature of

drain 10, it is not considered suitable for supporting great crested newts and has been scoped out from further assessment. Of the 19 waterbodies sampled, five returned positive eDNA results for great crested newts: 14a, 15, 17, 23 and 24.

Summary of Results

3.2.7. Table 3-1 below summaries the results of the great crested newt surveys carried out.

Table 3-1 - Summary of great crested newt survey results

Waterbody Reference	Date Surveyed	Distance from Works (m)	HSI Score and Suitability	eDNA Result
Pond 14a	05/06/19	490	0.47 (poor)	Positive
Pond 15	05/06/19	480	0.53 (below average)	Positive
Pond 17	06/06/19	470	0.82 (excellent)	Positive
Pond 23	14/06/19	5	0.66 (average)	Positive
Pond 24	14/06/19	60	0.71 (good)	Positive
Pond 25	11/05/21	Adjacent	0.49 (poor)	Negative
Pond 26	22/06/20	200	0.58 (below average)	Negative
Pond 27	22/06/20	230	0.53 (below average)	Negative
Pond 31	06/06/19	110	0.56 (below average)	Negative
Drain 8	12/05/21	Within the Scheme	0.64 (average)	Negative
Drain 10	11/05/21		0.41 (poor)	N/A
Drain 13	11/05/21	10	0.64 (average)	Negative
Drain 13a	11/05/21	257	0.6 (average)	Negative
Drain 14	11/05/21	Within the Scheme	0.67 average)	Negative
Drain 15	11/05/21	Within the Scheme	0.64 (average)	Negative

Waterbody Reference	Date Surveyed	Distance from Works (m)	HSI Score and Suitability	eDNA Result
Drain17	11/05/21	50	0.61 (average)	Negative
Drain 19	14/05/21	368	0.58 (below average)	Negative
Drain 20	14/05/21	Within the Scheme	0.44 (poor)	Negative
Drain 21	12/05/12	Within the Scheme	0.4 (poor)	Negative
Drain 22	16/06/21	Within the Scheme	0.52 (below average)	Negative

3.2.8. Pond 22 is located approximately 6 m south of the Scheme Boundary, 16 m west of Pond 23, and approximately 100 m north-west of Pond 24, and connected to both of these waterbodies by suitable terrestrial habitat comprising trees and scrub. On this basis, the presence of great crested newts is assumed at Pond 22.

3.2.9. Although they could not be surveyed, the information gathered indicates that pond 28, pond 29, pond 39 and pond 40 are either no longer present, or are unlikely to be suitable for supporting great crested newts.

3.2.10. The remaining 14 waterbodies within the great crested newt study area were scoped out of further assessment.

4. Evaluation

4.1.1. The waterbodies where great crested newts have been confirmed, or are assumed, can be grouped into two metapopulations[21]:

- Ponds 14a, 15 and 17 form one metapopulation located approximately 470 m north of the Scheme Boundary. Ponds 17a and 10, which are now beyond the great crested newt study area, but which were surveyed and confirmed to support great crested newts when the Scheme design extended further north, are also likely to be part of this metapopulation.
- Ponds 22, 23 and 24 form another metapopulation located immediately south of the Scheme Boundary at Uckington.

4.1.2. The survey results indicate that the study area supports two great crested newt metapopulations. One of these is located some distance from the Scheme, at the edge of the great crested newt study area for the Scheme. Given this distance, the study area is unlikely to be of particular importance to this metapopulation. The other metapopulation is located immediately south of the Scheme, and the great crested newt study area is likely to be important in maintaining this metapopulation.

4.1.3. Great crested newts receive the highest level of protection, being an EPS. Great crested newts are also a species of Principal Importance for the conservation of biodiversity in England, as listed under Section 41 of the NERC Act (2006) and are identified as a priority species in the Gloucestershire County Council Biodiversity Action Plan[22].

4.1.4. Surveys have shown that great crested newts are widespread throughout the South Midlands, being present in around a third (32%) of ponds in the South Midlands region, although this varies in places it is usually higher than the national average (13%)[23].

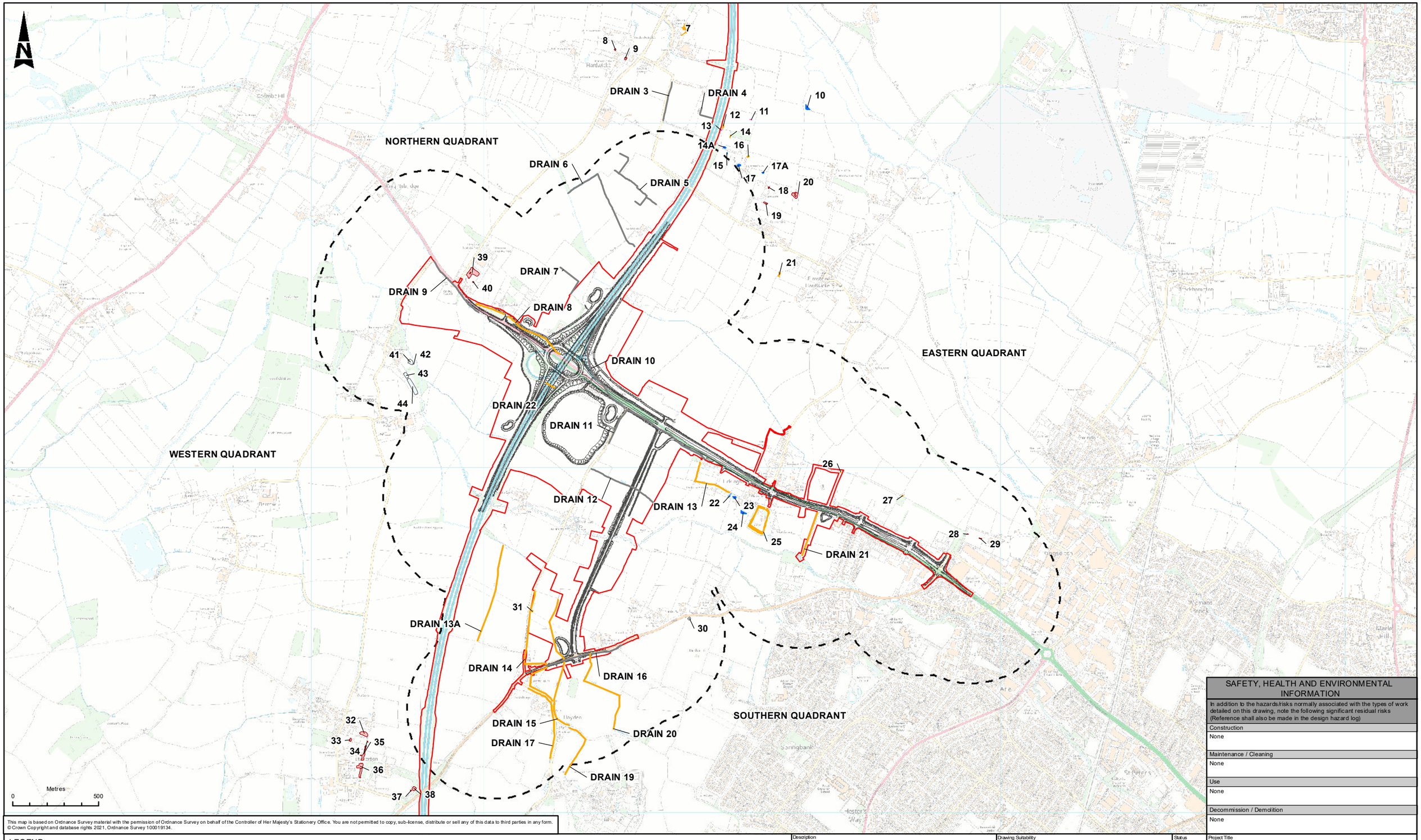
4.1.5. Despite being widespread in the region, given their high level of protection, and the proximity, and therefore the potential importance of the study area for great crested newts, this species has been ascribed a value of County nature conservation importance.

[21] Groups of spatially separated waterbodies, generally within 500 m of one another and linked by suitable terrestrial habitat, where presence has been confirmed or assumed and interchange of individual great crested newts is likely or possible.
[22] Gloucestershire Biodiversity Partnership (2000) Summary of the Biodiversity Action Plan for Gloucestershire
[23] Gloucestershire County Council, the great crested newt district licensing scheme document available to download from: https://www.gloucestershire.gov.uk/media/2098673/gcn_district_licence_option_note_gcc.pdf

Appendices

Appendix A. Schedule of figures included in this application document

Figure reference	Document title	Sheet	Document number	Revision
7-11A	Great Crested Newt survey results	1 of 1	GCCM5J10-ATK-EBD-ZZ-GS-GI-000030	0



LEGEND

- ORDER LIMITS
- SCHEME ALIGNMENT
- 500M STUDY AREA

GCN SURVEY WATERCOURSES AND DRAINS

- E-DNA TEST NEGATIVE
- SCOPED OUT

GCN SURVEY WATERBODIES

- E-DNA TEST POSITIVE
- ASSUMED PRESENCE
- E-DNA TEST NEGATIVE
- DRY AT TIME OF SURVEY
- NO DATA
- SCOPED OUT

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
PUBLISHED	A1	P02	EM	LH	CC	LJ	12/09/23

Drawing Suitability: PUBLISHED

Status: A1

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)

Construction
None

Maintenance / Cleaning
None

Use
None

Decommission / Demolition
None

Project Title: M5 Junction 10 Improvements Scheme

Drawing Title: FIGURE 7-11 A
GREAT CRESTED NEWT SURVEY
RESULTS

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Drawing Number: GCCM5J10 - ATK - EBD
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(Project | Originator | Volume; Location | Type | Role | Number)

Original Size:	Scale	Project Ref:	Sheet:	Rev:
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Appendix B. Habitat Suitability Index (HSI) Results

Waterbody Reference	Waterbody description	Date undertaken	SI1 - Location	SI2 - Pond area (m2)	SI3 - Pond drying	SI4 - Water quality	SI5 - Shade	SI6 - Fowl	SI7 - Fish	SI8 - Ponds	SI9 - Terrestrial habitat	SI10 - Macrophytes	HSI	Waterbody suitability
Pond 14a	Mostly dry due to grass and rush growth	05/06/19	A	<50	Dries annually	Moderate	100	Absent	Absent	13+	Good	100	**0.47**	**Poor**
Pond 15	Mostly dry due to grass and rush growth	05/06/19	A	<50	Dries annually	Moderate	40	Absent	Absent	13+	Good	100	**0.53**	**Below average**
Pond 17	Densely vegetated around edges. Reed mace and duckweed dominate in pond.	06/06/19	A	250	Never dries	Moderate	20	Minor	Possible	13+	Good	80	**0.82**	**Excellent**
Pond 23	Dense vegetation on half of the bank, mown grass on the other half of the bank. Duckweed dominates pond surface.	14/06/19	A	200	Never dries	Good	80	Minor	Possible	7	Moderate	0	**0.66**	**Average**
Pond 24	Steep sided bank. Dense scrub on half of the bank, mown grass on the other half of the bank. Duckweed dominates pond surface.	14/06/19	A	350	Never dries	Good	80	Minor	Possible	7	Moderate	5	**0.71**	**Good**
Pond 25	Very large moat surrounding a house. Outer circumference is approximately 450 m, inner circumference is approximately 350 m. Water was clear and > 1 m depth in the centre.	11/05/21	A	>2000	Never dries	Good	80	Major	Absent	6	Moderate	5	**0.49**	**Poor**
Pond 26	Small pond connected to field ditch. Pond dry but ditch surveyed.	22/06/20	A	<50	Sometimes dries	Moderate	90	Absent	Absent	10	Good	40	**0.58**	**Below average**
Pond 27	Very shaded, shallow pond. Stagnant water in area of scrub in the corner of a field.	22/06/20	A	<50	Rarely dries	Moderate	100	Absent	Absent	9	Good	0	**0.53**	**Below average**
Pond 31	In a field with grasses growing in pond and scrub and a hedgerow adjacent.	06/06/19	A	<50	Sometimes dries	Moderate	20	Absent	Absent	1	Moderate	30	**0.56**	**Below average**
Drain 8	Shallow and narrow drainage ditch, dry in places. Surrounded by trees and scrub.	12/05/21	A	100	Sometimes dries	Moderate	50	Absent	Absent	1	Good	10	**0.64**	**Average**
Drain 10	Very shallow and narrow drainage ditch with very steep banks next to busy road layby.	11/05/21	A	250	Sometimes dries	Bad	90	Absent	Absent	5	Poor	20	**0.41**	**Poor**
Drain 13	Shallow and narrow drainage ditch between fields. Very steep in places.	11/05/21	A	150	Sometimes dries	Moderate	90	Absent	Absent	5	Moderate	30	**0.64**	**Average**
Drain 13a	Shallow drainage ditch in between two fields. Very steep banks with scrub growing over drain in places.	11/05/21	A	50	Sometime dries	Moderate	90	Absent	Absent	3	Moderate	80	**0.60**	**Average**
Drain 14	Drainage ditch between road and field. Steep banks and had dense aquatic vegetation.	11/05/21	A	100	Sometime dries	Moderate	75	Absent	Absent	3	Moderate	95	**0.67**	**Average**
Drain 15	Drainage ditch between two fields. Dry in places with scrub growing over drain.	11/05/21	A	100	Sometimes dries	Moderate	95	Absent	Absent	7	Moderate	70	**0.64**	**Average**
Drain 17	Shallow and narrow drainage ditch between road and field. Steep banks.	11/05/21	A	100	Rarely dries	Poor	90	Absent	Absent	7	Moderate	15	**0.61**	**Average**
Drain 19	Drainage ditch between track and field. Some areas of dense vegetation.	14/05/21	A	150	Sometimes dries	Moderate	80	Absent	Minor	7	Moderate	10	**0.58**	**Below average**

Waterbody Reference	Waterbody description	Date undertaken	SI1 - Location	SI2 - Pond area (m2)	SI3 - Pond drying	SI4 - Water quality	SI5 - Shade	SI6 - Fowl	SI7 - Fish	SI8 - Ponds	SI9 - Terrestrial habitat	SI10 - Macrophytes	HSI	Waterbody suitability
Drain 20	Very shallow and polluted drainage ditch between track and field. Dense vegetation.	14/05/21	A	<50	Dries annually	Poor	10	Absent	Absent	7	Moderate	0	**0.44**	**Poor**
Drain 21	Very shallow drainage ditch within hedgerow between fields.	12/05/12	A	<50	Dries annually	Moderate	100	Absent	Absent	4	Moderate	0	**0.4**	**Poor**
Drain 22	Service culvert underneath motorway. Shallow water in corrugated metal pipe.	16/06/21	A	50	Sometimes dries	Poor	95	Absent	Absent	7	Good	5	**0.52**	**Below average**

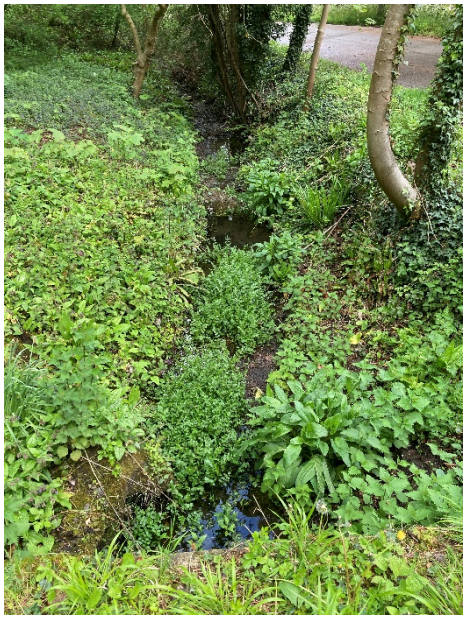
Appendix C. Waterbody Photographs

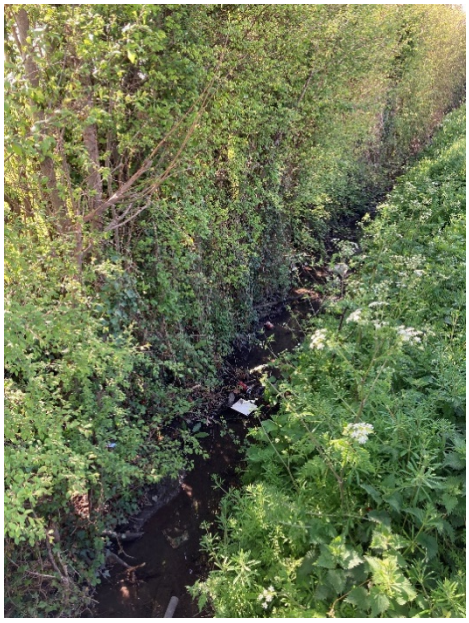
Waterbody Reference	Photograph
Pond 14a	
Pond 15	

Waterbody Reference	Photograph
Pond 17	
Pond 23	

Waterbody Reference	Photograph
Pond 24	
Pond 25	

Waterbody Reference	Photograph
Pond 26	
Pond 27	

Waterbody Reference	Photograph
Pond 31	
Drain 8	

Waterbody Reference	Photograph
Drain 10	
Drain 13	

Waterbody Reference	Photograph
Drain 13a	
Drain 14	

Waterbody Reference	Photograph
Drain 15	
Drain 19	

Waterbody Reference	Photograph
Drain 20	
Drain 21	

Waterbody Reference	Photograph
Drain 22	

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