

# **High Speed Rail (Crewe – Manchester)**

## **Background information and data accompanying SES1 and AP1 ES**

### **Ecology and biodiversity**

BID EC-007-00000 SES1 and AP1 ES

Ecological baseline data – amphibians

MA01: Hough to Walley's Green

MA02: Wimboldsley to Lostock Gralam

MA03: Pickmere to Agden and Hulseheath

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## Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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Additional Provision 1 Environmental Statement**

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## 1 Introduction

- 1.1.1 This document sets out Background Information and Data (BID) that accompanies the High Speed Two (HS2) High Speed Rail (Crewe – Manchester) Supplementary Environmental Statement 1 (SES1) and Additional Provision 1 Environmental Statement (AP1 ES)<sup>1</sup>.
- 1.1.2 This document sets out baseline data for amphibians not reported in the Background Information and Data report<sup>2</sup> (the main BID report) that accompanied High Speed Rail (Crewe – Manchester) Environmental Statement published in 2022<sup>3</sup> (the main ES). It should be read in conjunction with the main BID report.
- 1.1.3 Baseline data covering other habitats and species are contained in the following SES1 and AP1 ES ecological baseline data reports:
- Ecological baseline data – National Vegetation Classification and ancient woodland (BID EC-004-00000 SES1 and AP1 ES);
  - Ecological baseline data – bats (BID EC-011-00000 SES1 and AP1 ES); and
  - Ecological baseline data – other, containing data relating to habitats, hedgerows, birds, ponds and canals, river habitat, otter and water vole (BID EC-017-00000 SES1 and AP1 ES).
- 1.1.4 This document covers the following community areas (CA):
- Hough to Walley's Green (MA01);
  - Wimboldsley to Lostock Gralam (MA02); and
  - Pickmere to Agden and Hulseheath (MA03).
- 1.1.5 Maps referred to in this report are contained in the Background Information and Data, Ecology Map Book: Map Series EC-04, that accompanies the SES1 and AP1 ES.

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<sup>1</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>.

<sup>2</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data*. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

<sup>3</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

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1.1.6 In order to differentiate between the original scheme and the subsequent changes, the following terms are used:

- ‘the original scheme’ – the Bill scheme submitted to Parliament in January 2022, which was assessed in the main ES;
- ‘the SES1 scheme’ – the original scheme with the changes described in SES1 that are within the existing powers of the Bill; and
- ‘the AP1 revised scheme’ – the original scheme as amended by the SES1 changes and AP1 amendments.

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## 2 Amphibians

### 2.1 Methodology

- 2.1.1 The assessment scope, key assumptions and limitations are as set out in the main ES Environmental Impact Assessment Scope and Methodology Report (SMR) (see Volume 5, Appendix: CT-001-00001 in the main ES)<sup>4</sup>.
- 2.1.2 Details of the standard methodology utilised for amphibian (great crested newt) surveys are provided in the Technical note - Ecology and biodiversity - Ecological field survey methods and standards, which is included within the SMR which accompanied the main ES.
- 2.1.3 The scoping, desk study exercises and surveys reported in the main ES can be found in BID EC-007-00001<sup>5</sup>. This section contains the outcomes of surveys undertaken that were not reported in the BID document that accompanied the main ES. This is either because the survey reporting process had not been completed to inform the assessment within the main ES, or because the surveys have been undertaken since production of the main ES, including on additional land required for the construction of the AP1 revised scheme.
- 2.1.4 The scope of additional amphibian surveys undertaken in 2021 was informed by the pond scoping exercise for the original scheme, as reported in the main BID report, BID EC-007-00001.
- 2.1.5 Since completion of additional amphibian surveys in 2021, a subsequent pond scoping exercise was undertaken on the basis of the AP1 revised scheme and the results of the additional surveys. The intention of this scoping exercise was to identify any additional un-surveyed water bodies that are considered relevant to the assessment of the AP1 revised scheme. These water bodies are included within the Background Information and Data, Ecology Map Book: maps EC-04-503 to EC-04-512 which accompany the SES1 and AP1 ES. The methodology for the updated scoping exercise followed that described within the main BID report, BID EC-007-00001.

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<sup>4</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Report*, Volume 5, Appendix: CT-001-00001. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

<sup>5</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data, Ecology and biodiversity, Ecological baseline data – amphibian and pond and canal surveys* (BID EC-007-00001). Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

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## 2.2 Deviations, constraints and limitations

2.2.1 In addition to the deviations and limitations reported in the main BID report, BID EC-007-00001, deviations from the methodology stated in the SMR in the main ES for great crested newt surveys were applied as follows:

- a deviation from the Field Survey Method and Standards (FSMS) was agreed with Natural England. Ponds greater than 250m from the land required for the AP1 revised scheme were surveyed using Habitat Suitability Index (HSI) and environmental DNA (eDNA) methods only. These ponds were not subject to traditional presence/absence (P/A) surveys;
- as a result of the changes to the area of the land required for the AP1 revised scheme, some additional areas are now present within this assessment where water bodies have not been previously considered and as such have not yet been surveyed but are included in the scoping exercise;
- changes to metapopulations reported in this assessment are where marked changes have occurred to the geometry and area of an assumed metapopulation due to the addition or removal of ponds, where new assumed populations are now included or where previous metapopulations are no longer included; and
- ‘relevance to AP1’ was determined by identifying the ponds which are included in areas previously outside of the assessment and cross-referencing these with the presence of any 2021 survey data.

2.2.2 The deviations above have been undertaken using professional judgement and a risk based approach to give sufficient confidence in the survey results.

## 2.3 Survey constraints and limitations

2.3.1 Where issues related to specific surveys were encountered, these are noted here as follows:

- access to some water bodies was refused from the start or part way through the relevant survey type;
- a number of water bodies could not be surveyed for health and safety reasons (e.g. steep bank at pond edge);
- some HSI surveys were conducted outside the optimal May to September period, which may have affected the results for affected water bodies; and
- where a previous HSI survey identified a pond as suitable for great crested newts, this pond may have subsequently dried and was not suitable for survey in the 2021 survey season.



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## **2.4 Baseline**

### **Hough to Walley's Green (MA01)**

#### **Survey extent**

- 2.4.1 The BID report for the main ES, BID EC-007-00001, reported a total of 208 water bodies within the Hough to Walley's Green area (MA01) that required survey. The AP1 revised scheme would require a total of 209 water bodies to be surveyed, comprising:
- thirty-eight water bodies which have had all survey requirements completed prior to the 2021 survey season;
  - two water bodies which have had all survey requirements completed in the 2021 survey season;
  - forty-four water bodies which have received a partial suite of survey types and/or incomplete survey visits (and require completion); and
  - one hundred and twenty-five water bodies which have not been surveyed (and require completion).
- 2.4.2 In the 2021 survey season, 12 water bodies were subject to one or more survey types.
- 2.4.3 Following the 2021 survey season, a total of 169 water bodies remain that require either full or partial survey.

#### **Field survey**

##### **HSI/walkover**

- 2.4.4 A HSI survey was conducted at one water body in 2021. This water body was not previously subject to HSI. HSI results are reported from multiple years in Table 1. This is to capture HSI survey results that have not previously been reported, but have become relevant due to changes for the AP1 revised scheme.
- 2.4.5 Two water bodies were scoped out of requiring further survey due to updates for the AP1 revised scheme and are identified in Table 1.

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**Table 1: Summary of locations where requirement for further survey was scoped out following HSI/walkover survey within MA01**

Ecology survey code	Location	Ordnance Survey (OS) centroid grid reference	Brief rationale for scoping out (with HSI score)	CA	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
AH1_Pond1	East of Hough	SJ7184351277	Not a pond at time of survey. HSI – 0.00 (Poor)	MA01	215m east	Y	N
AH1_Pond997	North of Warmingham Moss	SJ6980760391	Not a pond at time of survey. HSI – 0.00 (Poor)	MA01	300m north-east	Y	N

2.4.6 HSI surveys in 2021 identified great crested newt suitability for the one water body surveyed in the Hough to Walley’s Green area, this water body was recommended for eDNA and/or presence/absence (P/A) surveys.

**eDNA surveys**

2.4.7 Three water bodies in the Hough to Walley’s Green area had eDNA survey in the 2021 survey season. The summary of results of the eDNA surveys from 2021 are detailed in Table 2.

2.4.8 The eDNA analysis confirmed presence of great crested newt in three water bodies.

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**Table 2: Summary of relevant results from eDNA presence/absence surveys for MA01**

Ecology survey code	Location	OS centroid grid reference	Date water sample taken	Approximate % pond margin accessible <sup>6</sup>	Presence of inflows	GCN eDNA test result	CA	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
AA3_Pond995	North of Moss Field Farm	SJ6982560392	21/04/2021	65	No inflows present	Positive	MA01	322m east	Y	Y
AA3_Pond3998	South of Coppenhall Moss	SJ7051658020	22/04/2021	100	No inflows present	Positive	MA01	151m east	Y	Y
AA3_Pond1508	East of Warmingham	SJ6853060328	17/06/2021	60	No inflows present	Positive	MA01	303m south-west	Y	N

<sup>6</sup> At least 80% access to the pond perimeter is deemed necessary to detect a valid positive eDNA result (Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R. A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F., 2014), *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

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## **Presence/absence and population size class estimate surveys**

- 2.4.9 Eleven P/A or population size class assessment (PSC) surveys have been conducted in the Hough to Walley's Green area (MA01). The summary of results of the P/A and PSC surveys are detailed in Table 3. This table includes those water bodies supporting great crested newt (any life stage) and/or those with good populations of the other common amphibian species (smooth newt, palmate newt, common frog and/or common toad).
- 2.4.10 Great crested newt was confirmed present in seven of the 11 water bodies subject to P/A or PSC survey. These additional water bodies comprised six medium and one small population size classes. One water body from the medium populations size class water bodies only supported lower life stages of great crested newt (no adults recorded present).
- 2.4.11 Four water bodies (one with an incomplete set of visits) from the 2021 survey season were identified as not supporting great crested newt, or only supported low numbers of the other common amphibian species (smooth newt, palmate newt, common frog and/or common toad) and are not shown in Table 3.
- 2.4.12 A full six visits are required in order to obtain a robust PSC assessment. An indication of the corresponding minimum PSC, based on the known peak count, is provided for any water body in Table 3 with fewer than six visits completed.

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**Table 3: Summary of results from surveys for amphibian presence/absence and population size class assessment with associated amphibian populations within MA01**

Ecology survey code	Location	OS centroid grid reference	Survey type	Number of visits completed	First survey visit	Last survey visit	Peak count during single visit with single method					Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
							Great crested newt	Smooth newt	Palmate newt	Common frog	Common toad			
AA1_Pond3998	South of Coppenhall Moss	SJ7051658020	PSC (partial)	4	15/04/2021	01/06/2021	9 (S)	3 (L)	–	Tadpoles only	–	151m east	Y	Y
AA1_Pond28	West of Coppenhall Moss	SJ7003458376	PSC (partial)	1	27/05/2021	27/05/2021	4 (Assumed M)	2 (L)	–	5 (L)	–	Within	Y	Y
AA1_Pond916	North of Coppenhall Moss	SJ7061758905	PSC (partial)	1	15/04/2021	15/04/2021	Eggs only (Assumed M)	5 (L)	–	–	Tadpoles only	117m south	Y	Y
AA1_Pond917	North of Coppenhall Moss	SJ7046159018	PSC (partial)	1	25/05/2021	25/05/2021	2 (Assumed M)	–	–	–	–	62m south	Y	Y
AA1_Pond47	North of Coppenhall Junction	SJ6962260155	PSC (partial)	4	14/04/2021	18/05/2021	14 (M)	7 (L)	–	1 (L)	2 (L)	33m north-west	Y	Y
AA1_Pond49	North of Coppenhall Junction	SJ6964560233	PSC (partial)	3	06/05/2021	18/05/2021	2 (Assumed M)	–	–	1 (L)	–	102m north	Y	Y

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Ecology survey	Location	OS centroid	Survey type	Number of visits	First survey	Last survey	Peak count during single visit with single method					Approximate distance	Relevant to SES1	Relevant to AP1
AA1_Pond50	North of Coppenhall Junction	SJ6953760334	PSC (partial)	4	14/04/2021	18/05/2021	16 (M)	3 (L)	–	2 (L)	1 (L)	21m east	Y	Y

Key:

\*Bracketed text within species column indicates the relevant population size class for the peak count obtained as follows:

- Great crested newt = peak count 1-10 individuals = Small (S); 11-100 individuals = Medium (M); greater than 100 individuals = Large (L);
- Smooth and palmate newt = peak count less than 10 = Low (L); 10-100 = Good (G); greater than 100 = Exceptional (E);
- Common frog = spawn clumps less than 50 = Low (L); 50-500 = Good (G); greater than 500 = Exceptional (E); and
- Common toad = peak count of less than 100 = Low (L); 100-1000 = Good (G); greater than 1000 = Exceptional (E).

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### Discussion of combined results

- 2.4.13 Surveys in 2021 identified eight water bodies that support populations of great crested newt. These comprise one water body identified through eDNA survey alone and seven through P/A survey and/or PSC surveys.
- 2.4.14 Of the eleven water bodies subject to P/A and/or PSC survey in 2021, six had assumed medium and one had assumed small population size classes. One water body from the six with assumed medium size class populations only supported lower life stages of great crested newt (no adults were recorded).
- 2.4.15 Over the 2021 and previous survey seasons, a total of 43 water bodies were found to support populations of great crested newts. These comprise nine water bodies identified through eDNA survey alone and 35 identified through P/A and/or PSC survey. Of the 35 water bodies identified through P/A survey and/or PSC survey, there were eight medium and 27 small population size classes.
- 2.4.16 Of the 12 water bodies surveyed in 2021, three are within the land required for the AP1 revised scheme. Of the three water bodies, one was found to support a population of great crested newts and two had previously supported great crested newts.
- 2.4.17 Of the 99 water bodies surveyed in 2021 and previous survey seasons, 19 are within the land required for the AP1 revised scheme. Of the 19 water bodies, 14 were found to support populations of great crested newts and two were confirmed as not supporting great crested newts. The potential for great crested newt presence at the remaining three water bodies is undetermined.
- 2.4.18 Six of the seven water bodies found to support populations of great crested newts through P/A and/or PSC surveys in 2021 also support low populations of other amphibian species (smooth newt, palmate newt, common frog and/or common toad).

### Metapopulations

- 2.4.19 Following a review of the 2021 survey results and the update to the AP1 revised scheme, no new great crested newt metapopulations have been identified, or previously identified metapopulations removed. Combined with survey data from previous years there are a total of 22 great crested newt metapopulations identified in the Hough to Walley's Green area (MA01).
- 2.4.20 Three of the metapopulations identified in the main ES BID have changed following the 2021 surveys and the updates to the AP1 revised scheme. The number of water bodies in these metapopulations has changed due to new water bodies being included or water bodies being removed. The estimated population size class of these metapopulations has not changed.

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2.4.21 Table 4 provides details of the three revised metapopulations and the revised list of Ecology Survey Codes for these metapopulations.

**Table 4: Summary of assumed great crested newt metapopulations within MA01**

Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
GCNMP1.1.1	Pond850, Pond848, Pond852, Pond851, Pond1115, Pond847; and 64 additional ponds more than 500m from the AP1 revised scheme.	Assumed medium	170m south-west	Y	N
GCNMP1.1.10	Pond4514, Pond3640, Pond3782, Pond3783, Pond3785, Pond3788, Pond3787, Pond3791; and 5 additional ponds more than 500m from the AP1 revised scheme.	Assumed medium	121m north-east	Y	N
GCNMP1.1.19	AA1_Pond902, AA1_Pond903, AA1_Pond905, AA1_Pond28, Pond1103, Pond1054, AA1_Pond916, AA1_Pond917, AA3_Pond1753, AA1_Pond1752, Pond3821, AA1_Pond908, AA3_Pond907, AA3_Pond3717, AH1_Pond3720, AA1_Pond906, Pond1111, AA1_Pond40, Pond3992, Pond4124, AA1_Pond42, Pond1105, Pond4110, AA1_Pond47, AA1_Pond49, Pond3812, AA1_Pond50, Pond995, Pond996, Pond998, Pond3732, Pond999, Pond1005,	Assumed large	Within	Y	Y



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Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	AA1_Pond51, Pond1522, Pond3914, Pond3739, Pond3901, Pond4015, Pond4014, Pond4000, AA1_Pond54, AA1_Pond55, AA3_Pond1001, AA1_Pond57, AA1_Pond60, AA3_Pond1000, AA1_Pond61, Pond3286, AA1_Pond63, Pond3300, Pond3301, Pond2914, Pond3307, Pond2913, Pond3049, Pond3046, Pond3299, AA1_Pond1002, AA1_Pond1003, AA1_Pond66, AH1_Pond904, Pond3303, AA1_Pond68, AA1_Pond69, Pond3305, Pond3304, AA3_Pond1051, Pond2992, Pond2993, AA1_Pond74, AH1_Pond1794, Pond3986, Pond1035, AA3_Pond923, Pond1037, Pond1036, Pond1039, Pond81, Pond82, AA3_Pond1038, Pond1633, AH1_Pond920, Pond1640, AA1_Pond88, AA3_Pond1791, AA1_Pond91, AA1_Pond854, AA1_Pond856, AA1_Pond97, Pond1042; and 36 additional ponds more than 500m from the AP1 revised scheme.				

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## **Wimboldsley to Lostock Gralam (MA02)**

### **Survey extent**

- 2.4.22 The BID report for the main ES, BID EC-007-00000, reported a total of 336 water bodies within the Wimboldsley to Lostock Gralam area (MA02) that required survey. The AP1 revised scheme would require a total of 318 water bodies to be surveyed, comprising:
- one hundred and twenty water bodies which have had all survey requirements completed prior to the 2021 survey season;
  - five water bodies which have had all survey requirements completed in the 2021 survey season;
  - seventy-five water bodies which have received a partial suite of survey types and/or incomplete survey visits (and require completion); and
  - one hundred and eighteen water bodies which have not been surveyed (and require completion).
- 2.4.23 In the 2021 survey season, 30 water bodies were subject to one or more survey types.
- 2.4.24 Following the 2021 survey season, a total of 193 water bodies remain that require either full or partial survey.

### **Field survey**

#### **HSI/walkover**

- 2.4.25 HSI surveys were conducted on a total of 11 water bodies in 2021 which were not previously subject to HSI survey. No water bodies were scoped out of requiring further survey following the HSI surveys.
- 2.4.26 HSI surveys in 2021 indicated great crested newt suitability for the eleven water bodies surveyed in the Wimboldsley to Lostock Gralam area (MA02), these water bodies were recommended for eDNA and/or P/A surveys.

#### **eDNA surveys**

- 2.4.27 Thirteen water bodies in the Wimboldsley to Lostock Gralam area (MA02) had eDNA survey in the 2021 survey season. The summary of results of the eDNA surveys from 2021 are detailed in Table 5.
- 2.4.28 The eDNA analysis confirmed presence of great crested newt in one water body.

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**Table 5: Summary of relevant results from eDNA presence/absence surveys for MA02**

Ecology survey code	Location	OS centroid grid reference	Date water sample taken	Approximate % pond margin accessible	Presence of inflows	GCN eDNA test result	CA	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
AA3_Pond3993	North of Stanthorne	SJ6873567284	17/06/2021	60	No inflows present	Positive	MA02	122m south-east	Y	N

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## **Presence/absence and population size class estimate surveys**

- 2.4.29 Fifteen P/A or PSC surveys were conducted at water bodies in the Wimboldsley to Lostock Gralam area (MA02). The summary of results of the P/A and PSC surveys are detailed in Table 6. This table only includes those water bodies with good populations of the other common amphibian species (smooth newt, palmate newt, common frog and/or common toad). This is because no great crested newt populations were identified at the 15 water bodies which had P/A or PSC surveys in the 2021 survey season.
- 2.4.30 Thirteen water bodies (five with an incomplete set of visits) from the 2021 survey season were identified as not supporting great crested newt, or only supported low numbers of the other common amphibian species (smooth newt, palmate newt, common frog and/or common toad) and are not shown in Table 6.
- 2.4.31 Two water bodies were identified as not supporting great crested newt in 2021 but supported good populations of smooth newt and are shown in Table 6.
- 2.4.32 A full six visits are required in order to obtain a robust PSC assessment for great crested newt. An indication of the corresponding minimum PSC, based on the known peak count, is provided for any water bodies in Table 6 with fewer than six visits completed.

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**Table 6: Summary of results from surveys for amphibian presence/absence and population size class assessment with associated amphibian populations within MA02**

Ecology survey code	Location	OS centroid grid reference	Survey type	Number of visits completed	First survey visit	Last survey visit	Peak count during single visit with single method					Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
							Great crested newt	Smooth newt	Palmate newt	Common frog	Common toad			
AA1_Pond97	North-east of Lea House Farm	SJ6897564 822	PSC	3 (partial)	22/04/2021	27/05/2021	–	11 (G)	–	2 (L)	–	90m south	Y	Y
AA1_Pond161	West of Gad Brook	SJ6816371 558	PSC	3 (partial)	26/04/2021	01/06/2021	–	46 (G)	–	2 (L)	1 (L)	134m west	Y	N

Key:

\*Bracketed text within species column indicates the relevant population size class for the peak count obtained as follows:

- Great crested newt = peak count 1-10 individuals = Small (S); 11-100 individuals = Medium (M); greater than 100 individuals = Large (L);
- Smooth and palmate newt = peak count less than 10 = Low (L); 10-100 = Good (G); greater than 100 = Exceptional (E);
- Common frog = spawn clumps less than 50 = Low (L); 50-500 = Good (G); greater than 500 = Exceptional (E); and
- Common toad = peak count of less than 100 = Low (L); 100-1000 = Good (G); greater than 1000 = Exceptional (E).

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### Discussion of combined results

- 2.4.33 Surveys in 2021 identified one water body that supports a population of great crested newt. This water body was identified through eDNA survey alone.
- 2.4.34 Over the 2021 and previous survey seasons, a total of 45 water bodies were found to support populations of great crested newts. These comprise 17 water bodies identified through eDNA survey only and 28 water bodies identified through P/A and/or PSC survey. Of the 28 water bodies identified through P/A survey and/or PSC survey, there were six medium and 22 small population size classes.
- 2.4.35 Of the 30 water bodies surveyed in 2021, one is within the land required for the AP1 revised scheme. This water body was not found to support populations of great crested newts in 2021 but has previously been found to support great crested newts.
- 2.4.36 Of the 255 water bodies surveyed in 2021 and previous survey seasons, 57 are within the land required for the AP1 revised scheme. Of the 57 water bodies, 16 were found to support populations of great crested newts and 26 were confirmed as not supporting great crested newts. The potential for great crested newt presence at the remaining 15 water bodies is undetermined.
- 2.4.37 Two water bodies surveyed in 2021 and found not to support great crested newt, support a good population of one of the other amphibian species. These two ponds were found to support a good population of smooth newt.

### Metapopulations

- 2.4.38 Following a review of the 2021 survey results and the update to the AP1 revised scheme, two new assumed great crested newt populations (GCNP1.2.38 and GCNP1.2.39) have been identified. Three metapopulations have been removed (GCNMP1.2.20, GCNMP1.2.21 and GCNMP1.2.22) as they are not within 500m of the AP1 revised scheme. One population (GCNP1.2.31) has been removed because the two ponds within it were deemed not suitable to support great crested newts. Combined with survey data from previous years there are a total of 35 great crested newt metapopulations identified in the Wimboldsley to Lostock Gralam area.
- 2.4.39 GCNP1.2.38 is situated within Stanthorne and lies within 250m of the land required for the AP1 revised scheme. It consists of one water body, situated within 250m of the land required for the AP1 revised scheme. The population size class of this population is assumed medium, due to the presence of an un-surveyed water body. Within Stanthorne, the surrounding landscape principally comprises farmland with hedgerows and scattered trees. A small residential area borders the population to the east. There is potential for this population to be connected to GCNMP1.2.11 due to their proximity and terrestrial habitat connectivity.

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- 2.4.40 GCNP1.2.39 is situated south of Lostock Gralam and lies within 250m of the land required for the AP1 revised scheme. It consists of one water body, situated within 250m of the land required for the AP1 revised scheme. Desk study records from Pond3159 suggest that great crested newts are likely to be present. The population size class of this population is assumed medium, due to the presence of an un-surveyed water body. South of Lostock Gralam, the surrounding landscape is farmland with hedgerows and scattered trees and residential development areas. There is potential for this population to be connected to GCNMP1.2.30 across the Mid-Cheshire railway line.
- 2.4.41 In addition, five of the populations and metapopulations identified in the main BID have changed following the 2021 surveys and the updates to the AP1 revised scheme. The number of water bodies in these metapopulations has changed due to new water bodies being included or water bodies being removed. The estimated population size class of these metapopulations has not changed.
- 2.4.42 Table 7 provides details of the five revised metapopulations or populations (GCNP1.2.11, GCNMP1.2.25, GCNMP1.2.26, GCNMP1.2.35 and GCNMP1.2.36) and two new populations (GCNP1.2.38 and GCNP1.2.39) and the revised list of Ecology Survey Codes for these metapopulations.

**Table 7: Summary of assumed great crested newt populations and metapopulations within MA02**

Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
GCNP1.2.11	AH1_Pond107, AH1_Pond109.	Assumed medium	Within	Y	N
GCNMP1.2.25	AA1_Pond166, AA1_Pond167, Pond4496, AH1_Pond169.	Medium	Within	Y	N
GCNMP1.2.26	Pond3367, Pond3360, Pond3369, Pond3375, Pond3368, Pond3377, Pond3373, Pond3366, Pond3359, Pond3363, Pond3376, Pond3398, Pond3374, Pond3364, Pond3400, Pond3402, Pond3365, Pond3503,	Assumed large	Within	Y	Y

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Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	Pond3496, Pond3388, Pond3498, Pond3421, Pond3264, Pond3382, Pond3389, Pond3386, Pond3380, Pond3387, Pond3258, Pond3391, Pond3384, Pond3390, Pond3385, Pond182, Pond3393, Pond3392, Pond1531, Pond1100, Pond1529, Pond1533, Pond184, Pond1532, Pond1530, Pond185, Pond1549, AH1_Pond927, Pond186, Pond1550, Pond189, Pond1124, Pond1551; and 96 additional ponds more than 500m from the AP1 revised scheme.				
GCNMP1.2.35	Pond1325, Pond3608, Pond3607, Pond3581, Pond3565; and 64 additional ponds more than 500m from the AP1 revised scheme.	Assumed medium	199m south	Y	N
GCNMP1.2.36	AA1_Pond206, AA1_Pond207, AH1_Pond929, AA1_Pond208, AA1_Pond209, AH1_Pond934, AH1_Pond933, AA1_Pond210, AH1_Pond932, AH1_Pond930, AA1_Pond211, AA1_Pond213, AA1_Pond216,	Medium	Within	Y	Y



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Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	AA1_Pond217, AA1_Pond218, AA1_Pond220, AA1_Pond222, AA1_Pond224, AA1_Pond1495, AA1_Pond225, AA1_Pond226, AA1_Pond231, AA1_Pond232, AA1_Pond233, AA1_Pond234, AA1_Pond236, AA3_Pond1553, AH1_Pond237, AA1_Pond238, AA3_Pond1327, AA1_Pond239, AA1_Pond242, AA1_Pond241, AA1_Pond243, AA1_Pond244, Pond3566, AA1_Pond247, AA1_Pond248, AA1_Pond249, Pond250, AH1_Pond1494, Pond1493, Pond1328, Pond3567, AA1_Pond252, AH1_Pond1492, Pond1497, Pond3564, Pond1498, Pond1336, Pond1338, Pond1499, Pond1500, Pond1331, AA3_Pond1335, AH1_Pond1333, Pond3588, Pond2786, Pond3985, Pond2614, Pond2712, Pond1193, Pond2702; and 41				

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Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	additional ponds more than 500m from the AP1 revised scheme.				
GCNP1.2.38	Pond4512.	Assumed medium	20m north-west	Y	N
GCNP1.2.39	Pond3159.	Assumed medium	139m south	Y	Y

## Pickmere to Agden and Hulseheath (MA03)

### Survey extent

- 2.4.43 The BID report for the main ES, BID EC-007-00000, reported a total of 485 water bodies within the Pickmere to Agden and Hulseheath area (MA03) that required survey. The AP1 revised scheme would require a total of 451 water bodies to be surveyed, comprising:
- one hundred and five water bodies which have had all survey requirements completed prior to the 2021 survey season;
  - seventy-nine water bodies which have had all survey requirements completed in the 2021 survey season;
  - one hundred and nine water bodies which have received a partial suite of survey types and/or incomplete survey visits (and require completion); and
  - one hundred and fifty-eight water bodies which have not been surveyed (and require completion).
- 2.4.44 In the 2021 survey season, 136 water bodies were subject to one or more survey types.
- 2.4.45 Following the 2021 survey season, a total of 267 water bodies remain that require either full or partial survey.

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## Field survey

### HSI/walkover

- 2.4.46 HSI surveys were conducted on 89 water bodies in 2021. Of these, 83 water bodies were not previously subject to HSI and six were repeat survey on water bodies that had been previously surveyed. HSI results are reported from multiple years in Table 8. This is to capture HSI survey results that have not previously been reported, but have become relevant due to changes for the AP1 revised scheme.
- 2.4.47 Following the completion of the HSI surveys in the 2021 survey season 12 water bodies were scoped out of requiring further survey and are identified in Table 8.
- 2.4.48 Two water bodies were scoped out of requiring further survey due to updates for the AP1 revised scheme and are also identified in Table 8.

**Table 8: Summary of locations where requirement for further survey was scoped out following HSI/walkover survey within MA03**

Ecology survey code	Location	OS centroid grid reference	Brief rationale for scoping out (with HSI score)	CA	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
AH1_Pond2 14	East of Higher Wincham	SJ70071764 56	Not a pond at time of survey. HSI - 0.00 (Poor)	MA03	246m south-west	Y	N
AH1_Pond2 15	East of Higher Wincham	SJ70058764 79	Not a pond at time of survey. HSI - 0.00 (Poor)	MA03	242m south-west	Y	N
AH1_Pond2 19	North-east of Higher Wincham	SJ70453767 33	Not a pond at time of survey. HSI - 0.00 (Poor)	MA03	10m west	Y	N
AH1_Pond2 23	East of Pickmere	SJ70069768 40	Pond between arable and grazing fields along hedgeline, fed by dry (at time of survey) ditch. Surrounded by trees and dense scrub. Likely to dry annually and	MA03	281m north-west	Y	N

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Ecology survey code	Location	OS centroid grid reference	Brief rationale for scoping out (with HSI score)	CA	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
			not be suitable for GCN breeding in any year. HSI - 0.47 (Poor)				
AH1_Pond1 496	West of Manor Farm	SJ71101769 06	Pond in area of trees between two grazing fields along a hedgeline. Attached to Pond1495 by a drainage channel in wetter seasons. HSI - 0.46 (Poor)	MA03	191m north-east	Y	N
AH1_Pond2 35	North-east of Higher Wincham	SJ70979770 61	Not a pond at time of survey. HSI - 0.00 (Poor)	MA03	200m east	Y	N
AH1_Pond2 40	North-east of Higher Wincham	SJ70753772 35	Not a pond at time of survey. HSI - 0.00 (Poor)	MA03	Within	Y	N
AH1_Pond1 329	South of Clay House Farm	SJ71367773 42	Dry pond in sheep field. Pond considered unsuitable for great crested newts. HSI - 0.00 (Poor)	MA03	264m west	Y	N
AH1_Pond2 72	North-east of Higher Wincham	SJ71155784 21	Pond was dry at time of survey. HSI - 0.00 (Poor)	MA03	206m south-east	Y	N
AH1_Pond2 86	South-west of Over Tabley	SJ71004788 85	Pond was dry at time of survey. HSI - 0.00 (Poor)	MA03	11m east	Y	N
AH1_Pond1 158	North-west of Knutsford	SJ70130806 45	Pond in field depression surrounded by scrub. HSI - 0.38 (Poor)	MA03	339m west	Y	N

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Ecology survey code	Location	OS centroid grid reference	Brief rationale for scoping out (with HSI score)	CA	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
AH1_Pond3 34	North-west of Over Tabley	SJ70767807 77	Pond considered unsuitable for great crested newts. HSI - 0.00 (Poor)	MA03	77m north-west	Y	N
AH1_Pond4 12	North-east of Hop Green	SJ72274835 66	Pond was dry at time of survey. HSI - 0.00 (Poor)	MA03	71m north-west	Y	N
AH1_Pond4 49	East of High Legh	SJ71454840 75	Well established waterbody within a grazed field. Geese were present. Likely to be highly unsuitable for GCN based on HSI and evidence of waterfowl impacts and habitat quality. HSI - 0.43 (Poor)	MA03	55m north-west	Y	N

- 2.4.49 HSI surveys in 2021 indicated great crested newt suitability for 58 water bodies surveyed in the Pickmere to Agden and Hulseheath area (MA03), these water bodies were recommended for eDNA and/or P/A surveys.
- 2.4.50 Prior to 2021, the HSI score indicated great crested newt suitability for 170 water bodies in the Pickmere to Agden and Hulseheath area (MA03), these water bodies were recommended for eDNA and/or P/A surveys.

**eDNA surveys**

- 2.4.51 Fifty-five water bodies in the Pickmere to Agden and Hulseheath area (MA03) had eDNA survey in the 2021 survey season. The summary of results of the eDNA surveys from 2021, including those with anomalies are detailed in Table 9.
- 2.4.52 The eDNA analysis confirmed presence of great crested newt in seven water bodies. Those with negative results due to partial access, that were inconclusive, or that were found to

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have anomalies were put forward for traditional P/A surveys. Table 9 includes four water bodies with negative eDNA results, that were subsequently found to support great crested newts through traditional P/A surveys.

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**Table 9: Summary of relevant results from eDNA presence/absence surveys for MA03**

Ecology survey code	Location	OS centroid grid reference	Date water sample taken	Approximate % pond margin accessible	Presence of inflows	GCN eDNA test result	CA	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
AA3_Pond217	North-east of Higher Wincham	SJ7017176604	19/04/2021	80	Present and wet	Positive	MA03	76m west	Y	Y
AA3_Pond220	North-east of Higher Wincham	SJ7029176782	19/04/2021	90	Present and wet	Negative (with positive results from subsequent P/A survey)	MA03	66m north-west	Y	Y
AA3_Pond1495	North-east of Higher Wincham	SJ7110976923	20/04/2021	80	No inflows present	Negative (with positive results from subsequent P/A survey)	MA03	208m north-east	Y	Y
AA3_Pond234	North-east of Higher Wincham	SJ7081677054	20/04/2021	100	No inflows present	Negative (with positive results from subsequent P/A survey)	MA03	28m east	Y	Y
AA3_Pond238	East of Pickmere	SJ7106177180	20/04/2021	80	No inflows present	Positive	MA03	241m east	Y	Y
AA3_Pond239	North-east of	SJ7084777208	20/04/2021	100	No inflows	Negative	MA03	22m east	Y	Y

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Ecology survey code	Location	OS centroid grid reference	Date water sample taken	Approximate % pond margin accessible	Presence of inflows	GCN eDNA test result	CA	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	Higher Wincham				present	(with positive results from subsequent P/A survey)				
AA3_Pond2649	South-east of Bucklow Hill	SJ7321582580	21/04/2021	100	No inflows present	Positive	MA03	211m east	Y	N
AA3_Pond1182	Within High Legh Park (east)	SJ7088484307	12/04/2021	100	Present and dry	Positive	MA03	344m south-west	Y	Y
AA3_Pond1229	North-east of High Legh	SJ7080084364	12/04/2021	100	No inflows present	Positive	MA03	390m south-west	Y	Y
AA3_Pond1184	North-east of High Legh	SJ7076084372	12/04/2021	95	Present and dry	Positive	MA03	415m south-west	Y	Y
AA3_Pond1179	North-east of High Legh	SJ7080084480	12/04/2021	95	Present and dry	Positive	MA03	332m west	Y	Y



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### Presence/absence and population size class estimate surveys

- 2.4.53 Eighty-eight P/A or PSC surveys have been conducted in the Pickmere to Agden and Hulseheath area (MA03). The summary of results of the P/A and PSC surveys are detailed in Table 10. This table includes those water bodies supporting great crested newt (any life stage) and/or those with good populations of the other common amphibian species (smooth newt, palmate newt, common frog and/or common toad).
- 2.4.54 Great crested newt was confirmed present in 30 of the 88 water bodies subject to P/A or PSC survey. These water bodies comprised three medium and 27 small population size classes. Three water bodies from the small population size class water bodies only supported lower life stages of great crested newt (no adults recorded present).
- 2.4.55 Three (of the 30) water bodies with confirmed great crested newt were more than 500m from the land required for the AP1 revised scheme and are not reported in Table 10.
- 2.4.56 Fifty-seven water bodies (23 with an incomplete set of visits) from the 2021 survey season were identified as not supporting great crested newt, or only supported low numbers of the other common amphibian species (smooth newt, palmate newt, common frog and/or common toad) and are not shown in Table 10.
- 2.4.57 One water body that did not support great crested newt in 2021 did support a good population of smooth newt and is also shown in Table 10.
- 2.4.58 A full six visits are required in order to obtain a robust PSC assessment. An indication of the corresponding minimum PSC, based on the known peak count, is provided for any pond in Table 10 with fewer than six visits completed.

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Table 10: Summary of results from surveys for amphibian presence/absence and population size class assessment with associated amphibian populations within MA03

Ecology survey code	Location	OS centroid grid reference	Survey type	Number of visits completed	First survey visit	Last survey visit	Peak count during single visit with single method					Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
							Great crested newt	Smooth newt	Palmete newt	Common frog	Common toad			
AA1_Pond208	West of Smoker Hill Farm	SJ7033076 206	PSC	6	20/04/2021	16/06/2021	5 (S)	46 (G)	–	1 (L)	1 (L)	Within	Y	Y
AA1_Pond209	West of Smoker Hill Farm	SJ7031776 226	PSC	6	20/04/2021	16/06/2021	1 (S)	18 (G)	–	10 (L)	1 (L)	Within	Y	Y
AA1_Pond211	South-west of Smoker Hill Farm	SJ7052176 321	PSC	6	20/04/2021	16/06/2021	1 (S)	5 (L)	–	3 (L)	–	Within	Y	Y
AA1_Pond213	East of Higher Wincham	SJ7019776 419	PSC	6	20/04/2021	16/06/2021	22 (M)	10 (G)	–	10 (L)	1 (L)	124m west	Y	Y
AA1_Pond216	West of Smoker Hill Farm	SJ7057576 509	PSC	6	20/04/2021	16/06/2021	1 (S)	8 (L)	–	3 (L)	Tadpoles only	<1m east	Y	Y
AA1_Pond217	North-east of Higher Wincham	SJ7017176 604	PSC	6	20/04/2021	16/06/2021	4 (S)	5 (L)	–	2 (L)	–	76m west	Y	Y
AA1_Pond	North-east	SJ7029176	PSC	6	20/04/	16/06/	3 (S)	9 (L)	–	2 (L)	–	66m north-	Y	Y

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Ecology survey code	Location	OS centroid grid reference	Survey type	Number of visits completed	First survey visit	Last survey visit	Peak count during single visit with single method					Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)	
							Great crested newt	Smooth newt	Palmate newt	Common frog	Common toad				
nd220	of Higher Wincham	782			2021	2021							west		
AA1_Pond222	South-east of Providence Farm	SJ7052376818	PSC	6	20/04/2021	16/06/2021	1 (S)	6 (L)	–	3 (L)	–		Within	Y	Y
AA1_Pond1495	North-east of Higher Wincham	SJ7110976923	PSC	6	21/04/2021	17/06/2021	4 (S)	–	–	–	1 (L)		208m north-east	Y	Y
AA1_Pond225	East of Providence Farm	SJ7058676925	PSC	6	20/04/2021	16/06/2021	2 (S)	2 (L)	–	2 (L)	–		Within	Y	Y
AA1_Pond234	North-east of Higher Wincham	SJ7081677054	PSC	6	21/04/2021	17/06/2021	3 (S)	4 (L)	–	6 (L)	–		28m east	Y	Y
AA1_Pond238	East of Pickmere	SJ7106177180	P/A	6	21/04/2021	17/06/2021	1 (S)	Eggs only	–	1 (L)	–		241m east	Y	Y
AA1_Pond239	North-east of Higher Wincham	SJ7084777208	PSC	6	21/04/2021	17/06/2021	1 (S)	3 (L)	–	4 (L)	2 (L)		22m east	Y	Y
AA1_Pond	East of	SJ7089877	PSC	6	21/04/	17/06/	7 (S)	3 (L)	–	3 (L)	–		90m east	Y	Y

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Ecology survey code	Location	OS centroid grid reference	Survey type	Number of visits completed	First survey visit	Last survey visit	Peak count during single visit with single method					Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
							Great crested newt	Smooth newt	Palmate newt	Common frog	Common toad			
nd242	Pickmere	291			2021	2021								
AA1_Pond243	East of Pickmere	SJ7104377329	PSC	6	21/04/2021	17/06/2021	Eggs only (S)	2 (L)	–	1 (L)	–	224m east	Y	Y
AA1_Pond285	North of Roses Farm	SJ7062078873	PSC	4 (partial)	22/04/2021	15/06/2021	1 (Assumed S)	2 (L)	–	1 (L)	–	13m west	Y	Y
AA1_Pond332	North of Hollowood Farm	SJ7092480704	PSC	3 (partial)	27/04/2021	25/05/2021	–	12 (G)	–	2 (L)	–	Within	Y	Y
AA1_Pond864	North-west of Over Tabley	SJ7170780792	PSC	5 (partial)	27/04/2021	17/06/2021	1 (S)	1 (L)	–	Tadpoles only	–	47m south	Y	Y
AA1_Pond341	South of Hoo Green	SJ7152181141	PSC	4	13/04/2021	25/05/2021	Eggs only (Assumed S)	–	–	–	–	5m east	Y	Y
AA1_Pond346	West of Mere	SJ7143781537	PSC	6	28/04/2021	02/06/2021	1 (S)	10 (G)	–	2 (L)	–	Within	Y	Y
AA1_Pond350	South of Daisy Bank Farm	SJ7130881643	PSC	6	13/04/2021	17/06/2021	2 (S)	–	–	2 (L)	–	Within	Y	Y
AA1_Pond	East of	SJ7139981	PSC	6	13/04/	17/06/	1 (S)	2 (L)	–	1 (L)	–	Within	Y	Y

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							Great crested newt	Smooth newt	Palmate newt	Common frog	Common toad			
nd361	Daisy Bank farm	926			2021	2021								
AA1_Pond395	East of High Legh	SJ7129183395	PSC	6	22/04/2021	15/06/2021	5 (S)	3 (L)	–	1 (L)	–	Within	Y	Y
AA1_Pond399	North-west of Hoo Green	SJ7131883414	PSC	6	22/04/2021	15/06/2021	1 (S)	18 (G)	–	1 (L)	1 (L)	3m east	Y	Y
AA1_Pond1340	East of High Legh	SJ7102583547	PSC	6	22/04/2021	15/06/2021	2 (S)	6 (L)	–	3 (L)	–	229m west	Y	Y
AA1_Pond1182	Within High Legh Park (east)	SJ7088484307	P/A	6	13/04/2021	27/05/2021	3 (S)	3 (L)	–	–	–	344m south-west	Y	Y
AA1_Pond1229	North-east of High Legh	SJ7080084364	PSC	6	13/04/2021	27/05/2021	2 (S)	1 (L)	–	–	–	390m south-west	Y	Y
AA1_Pond1179	North-east of High Legh	SJ7080084480	PSC	6	12/04/2021	25/05/2021	Eggs only (S)	–	–	–	–	332m west	Y	Y

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### Discussion of combined results

- 2.4.59 Surveys in 2021 identified 32 water bodies that support populations of great crested newt. These comprise two water bodies identified through eDNA survey alone and 30 through P/A survey and/or PSC surveys.
- 2.4.60 Of the 30 water bodies subject to P/A and/or PSC survey in 2021, three had medium and 27 had small population size classes. Of the 27 small population size class water bodies, three supported only lower life stages of great crested newt (no adults were recorded).
- 2.4.61 Over the 2021 and previous survey seasons, a total of 75 water bodies were found to support populations of great crested newts. These comprise 16 water bodies identified through eDNA survey alone and 59 identified through P/A and/or PSC survey. Of the 59 water bodies identified through P/A survey and/or PSC survey, there were 10 medium and 49 small population size classes.
- 2.4.62 Of the 136 water bodies surveyed in 2021, 23 are within the land required for the AP1 revised scheme. Of the 23 water bodies, nine were found to support populations of great crested newts, five were previously found to support great crested newts and two were confirmed as not supporting great crested newts. The potential for great crested newt presence at the remaining seven water bodies is undetermined.
- 2.4.63 Of the 334 water bodies surveyed in 2021 and previous survey seasons, 86 are within the land required for the AP1 revised scheme. Of the 86 water bodies, 28 were found to support populations of great crested newts and 35 were confirmed as not supporting great crested newts. The potential for great crested newt presence at the remaining 23 water bodies is undetermined.
- 2.4.64 Four of the water bodies surveyed in 2021 and listed as supporting great crested newt (AA1\_Pond220, AA1\_Pond234, AA1\_Pond239, and AA1\_Pond1495) were found to be negative for presence of great crested newt through eDNA survey, but through traditional P/A and PSC survey were found to support this species.
- 2.4.65 Three of the water bodies (AA1\_Pond347, AA1\_Pond1184 and AA1\_Pond2649) which previously had a positive eDNA result for great crested newts were found to have no evidence of great crested newts following a P/A and PSC survey in 2021. Twenty-eight of the 30 water bodies found to support populations of great crested newts through P/A and/or PSC surveys in 2021, also support other amphibian species (smooth newt, palmate newt, common frog and/or common toad). Five of these water bodies were found to support good populations of smooth newt (AA1\_Pond208, AA1\_Pond209, AA1\_Pond213, AA1\_Pond346 and AA1\_Pond399).
- 2.4.66 One water body (AA1\_Pond332) surveyed in 2021 and found not to support great crested newt, did support a good population of smooth newt.

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## Metapopulations

- 2.4.67 Following a review of the 2021 survey results and the update to the AP1 revised scheme, one new great crested newt population has been identified. One population has been removed (GCNP1.3.6) due to negative great crested newt eDNA survey results for both of its water bodies in the 2021 survey season. One metapopulation has been removed due to the water bodies within it being more than 500m from the AP1 revised scheme. Combined with survey data from previous years, a total of 11 great crested newt metapopulations or populations have been identified in the Pickmere to Agden and Hulseheath area (MA03).
- 2.4.68 GCNP1.3.13 is situated north of Tabley Brook Farm and lies within 250m of the land required for the AP1 revised scheme. It consists of one water body, situated within 250m of the land required for the AP1 revised scheme. The population size class of this population is assumed medium, due to the presence of an un-surveyed water body. The surrounding landscape is farmland with hedgerows and pockets of semi-improved grassland, scrub, woodland and agricultural buildings. There is potential for this population to connect to GCNMP1.2.36 and GCNMP1.3.3 across the B5391.
- 2.4.69 In addition, three of the metapopulations identified in the main BID have changed following the 2021 surveys and the updates to the AP1 revised scheme. The number of water bodies in these metapopulations has changed due to new water bodies being included or water bodies being removed. The estimated population size class of these metapopulations has not changed.
- 2.4.70 Table 11 provides details of the revised metapopulations (GCNMP1.3.3, GCNMP1.3.4 and GCNMP1.3.9) and new population (GCNP1.3.13) and the revised list of Ecology Survey Codes for them.

**Table 11: Summary of assumed great crested newt populations and metapopulations within MA03**

Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
GCNMP1.3.3	AA1_Pond287, Pond1319, AA1_Pond289, AA1_Pond291, Pond1321, Pond1155, Pond2698, Pond2658, Pond2666, AH1_Pond293,	Medium	Within	Y	N

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Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	EES_AA3_Pond294, Pond295, AH1_Pond296, AH1_Pond2669, Pond2663, AH1_Pond963, Pond1478, Pond297, AH1_Pond2699, Pond2681, AH1_Pond2697, AA1_Pond298, Pond2683, Pond2657, Pond299, Pond300, AH1_Pond965, Pond4025, AH1_Pond966, Pond301, AA1_Pond302, Pond303, AA1_Pond306, Pond2676, AA1_Pond304, Pond305, Pond2613, Pond2696, AA1_Pond307, Pond308, Pond1191, Pond1192, AH1_Pond309, Pond1320, AA1_Pond2783, AA1_Pond310, AA1_Pond865, Pond2798, AA1_Pond312, Pond313, Pond953, Pond314, Pond315, Pond2781, Pond316, Pond1555, Pond317, AA1_Pond318, Pond2777, AH1_Pond319, AA1_Pond320, Pond954, Pond956, Pond955, AA1_Pond322, Pond4035, AA1_Pond323, Pond1163, Pond1162, Pond1160, Pond1164, Pond1118; and 24 additional ponds more than 500m from the AP1 revised scheme.				
GCNMP1.3.4	Pond1126, Pond1305, Pond1266, Pond1395, Pond1299, Pond1273,	Assumed large	Within	Y	N



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Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	Pond1397, Pond1195, Pond326, AA3_Pond1307, AA3_Pond1194, Pond1350, AA1_Pond328, AA1_Pond332, AA1_Pond864, AA1_Pond335, AA1_Pond336, AH1_Pond1783, AH1_Pond1784, AA1_Pond337, AH1_Pond1161, AH1_Pond1782, AA1_Pond338, AA1_Pond339, Pond1201, AA1_Pond340, AA1_Pond341, AA1_Pond1197, AA1_Pond343, Pond4009, AA1_Pond1781, AA1_Pond344, Pond1166, Pond1556, Pond1564, Pond1588, Pond4037, AA1_Pond345, Pond1167, Pond1501, Pond4629, AA1_Pond347, AA1_Pond346, Pond1138, Pond1128, AA1_Pond875, AA1_Pond350, AA1_Pond879, AA1_Pond352, Pond1481, AH1_Pond1199, Pond2622, Pond1165, AA1_Pond356, AA1_Pond357, AA1_Pond361, AA1_Pond359, Pond1217, AA1_Pond362, AA1_Pond363, AA1_Pond364, Pond365, Pond366, Pond2708,				

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Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	AH1_Pond367, AA3_Pond1202, Pond1475, Pond1477, Pond1168, Pond1476, Pond1396, Pond1371, Pond1301, Pond1169, EES_AA3_Pond377, Pond379, Pond1170, EES_AA3_Pond381, AA1_Pond382, AA3_Pond383, EES_AA3_Pond385, AA3_Pond1172; and 79 additional ponds more than 500m from the AP1 revised scheme.				
GCNMP1.3.9	AA1_Pond386, Pond1274, Pond1272, Pond1136, AA1_Pond388, Pond1127, Pond1302, Pond1226, AA3_Pond389, Pond1399, Pond1119, Pond1297, Pond1221, AA1_Pond394, AA1_Pond395, AA1_Pond396, AA1_Pond399, Pond401, AA3_Pond409, AA1_Pond1340, AA1_Pond410, AA3_Pond411, Pond1224, AA3_Pond414, AA3_Pond1204, AA1_Pond1203, Pond1205, Pond415, AH1_Pond2260, AA3_Pond1559, Pond861, AA3_Pond1558, Pond419, Pond1562, AA1_Pond952, Pond428, Pond1219, Pond1557, AA1_Pond432, AH1_Pond1561,	Assumed large	Within	Y	N

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Assumed metapopulation reference (GCNMP)	Ecology survey code of water bodies within assumed metapopulation	Estimated population size class of metapopulation (peak counts from all known great crested newt populations from a single night's survey visit within the assumed metapopulation)	Approximate distance from land required for the construction of the AP1 revised scheme (m) and orientation	Relevant to SES1 scheme (Y/N)	Relevant to AP1 revised scheme (Y/N)
	EES_AA3_Pond439, AA1_Pond438, AA1_Pond436, AA1_Pond440, Pond1218, Pond1765, Pond1755, AA3_Pond1207, AA3_Pond1398, AA1_Pond458, EES_AA3_Pond1601, AA1_Pond1182, EES_AA3_Pond1602, Pond465, Pond466, AH1_Pond980, AA1_Pond1229, AA1_Pond1184, AA1_Pond959, AA1_Pond1179, AA3_Pond477, Pond4499, AA1_Pond1181, Pond1208, Pond1175, Pond1183, EES_AA3_Pond489, AA1_Pond499, Pond1174, Pond1177, EES_AA3_Pond504, EES_AA3_Pond508, EES_AA3_Pond506, AA1_Pond977, AH1_Pond961, AA3_Pond1210, AA3_Pond510, EES_AA3_Pond512, AA1_Pond1225; and 27 additional ponds more than 500m from the AP1 revised scheme.				
GCNP1.3.13	Pond4527	Assumed medium	229m south	Y	N

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