PORTISHEAD BRANCH LINE PRELIMINARY ENVIRONMENTAL INFORMATION REPORT
VOLUME 4

APPENDIX 9.4

Great Crested Newt Survey Report

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Table of Contents

Table(s)

Annexes

Executive Summary

CH2M was commissioned by North Somerset District Council ("NSDC") on behalf of the West of England Authorities to undertake and report on Great crested newt surveys for the Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme ("the DCO Scheme").

Great crested newts and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and under the Conservation of Habitats and Species Regulations 2010 (as amended). Following an Ecological Appraisal Report (CH2M, 2015), surveys were performed to establish the presence of Great crested newts.

Surveys were undertaken between 2015 and 2017 along the length of the disused railway corridor between Portishead and Pill and the operating railway line (Portbury Freight Line) from Pill to Parson Street Junction.

Forty-seven potential waterbodies, including ponds and ditches, were identified within 250 m of the proposed route between Portishead and Parsons Street Junction. Following further inspection, nine of these were found to be unsuitable for Habitat Survey Index HSI surveys because they were either not found, or were inaccessible. HSI surveys were carried out for the remaining 38 waterbodies. Following the HSI results, great crested newt presence/absence surveys were undertaken at 20 waterbodies by experienced and great crested newt licensed ecologists.

The presence of great crested newts was confirmed in three of the 20 waterbodies surveyed in 2015 (Nos. 9, 17 and 26). In 2016, following environmental DNA (eDNA) surveys, great crested newts were confirmed at four more waterbodies (Nos. 6, 22, 28 and 37). These waterbodies were then surveyed on six further occasions to ascertain likely population sizes. Despite positive eDNA and additional surveys no great crested newts were found in waterbodies 6, 22 and 37. The remaining four waterbodies with great crested newts (Nos. 9, 17, 26 and 28) indicated the presence of small populations, that is less than 10 individuals found at the peak count in any one waterbody. In 2017, eDNA surveys also confirmed the presence of great crested newts in an additional waterbody (No. 14c).

As part of the ongoing surveys to support the project, an additional pond located within 250 m of the scheme boundary was identified (No. 38). The pond is located within Leigh Woods National Nature Reserve on National Trust land (referred to as Stokeleigh Pond by the National Trust). This pond does not show up on aerial photography and a visit in late spring 2016 found it was dry.

No waterbodies supporting great crested newts will be affected by the DCO Scheme. However, the DCO Scheme's footprint has the potential to adversely affect great crested newts and their habitat. This may occur during site clearance, the construction phase, and operation, due to the loss of habitat (including fragmentation) within the railway corridor, and physical injury or fatality. Mitigation is being developed to reduce and/or avoid potential adverse impacts on great crested newt populations and will be presented in the Environmental Statement to be submitted with the DCO Application .

SECTION 1

Introduction

1.1 Background to the DCO Scheme

1.1.1 As part of the MetroWest Phase 1 proposals to enhance local rail services across Bristol, it is proposed to re-open for passenger services the whole of the branch line between Portishead and Bristol. A Development Consent Order ("DCO") application to build the scheme will be submitted to the Planning Inspectorate under the Planning Act 2008.

1.1.2 The Portishead Branch Line (MetroWest Phase 1) DCO Scheme ("the DCO Scheme") is being led by North Somerset District Council ("NSDC") on behalf of the four West of England authorities, also comprising Bristol City Council, South Gloucestershire District Council, and Bath and North East Somerset District Council, as a third-party rail project, working with Network Rail.

1.1.3 The Portishead Branch Line was built in the 1860s. Passenger services continued between Portishead and Bristol until 1964, and freight services continued to 1981. The Royal Portbury Dock opened in 1978 and in 2002 the currently operational part of the former Portishead Branch Line was re-opened to service the port for freight only. The owner of the Royal Portbury Dock, Bristol Port Company, has commercial rights to run up to 20 freight trains per day in each direction along the operational railway line. The current volume of freight trains operating is substantially less than this.

1.1.4 MetroWest Phase 1 proposes to re-open the disused section of the Portishead Branch Line from Portishead to Pill and operate an hourly passenger service between Portishead and Bristol Temple Meads. In order to reintroduce passenger services the remaining section of disused railway between Portishead and Pill has to be rebuilt including a new station at Portishead and the re-opening of the former Pill station. The project is a nationally significant infrastructure project ("NSIP") as defined by the Planning Act 2008 and therefore a Development Consent Order ("DCO") is required for powers to build and operate the railway, as well as to acquire land, where it cannot be acquired by negotiation.

1.1.5 The DCO Scheme also comprises a number of associated improvements to the rail network from Pill to Ashton Vale (Ashton Junction) to enable the operation of an hourly train service (or an hourly service plus) between Portishead and Bristol Temple Meads.

1.1.6 The NSIP as defined under the Planning Act 2008, is a permanent railway of approximately 5,450 metres long from Quays Avenue, Portishead, North Somerset (OSGR ST471765) to Pill in North Somerset (OSGR ST520762). It comprises the reconstruction of 4,750 metres of disused railway from Quays Avenue in Portishead to the existing operational railway (the Portbury freight line) to the east of the M5 Motorway). The NSIP then comprises 750 metres of new track through Pill village parallel to the operational railway line from Portbury Dock. The NSIP terminates at a new junction east of Pill Viaduct (Pill Junction), where it connects with the existing operational railway.

1.1.7 The associated permanent works in summary include:

- A new station, station building, forecourt, car parks and highway modifications in Portishead;
- New Trinity Primary School footbridge in Portishead;
- A new maintenance compound and road rail access point off the highway of Sheepway near Portishead;

- A new access for agricultural purposes to the west of Station Road, Portbury from the Portbury Hundred;
- Minor works to bridges and structures along the disused railway;
- Works to widen and strengthen the embankment where the disused railway meets the operational railway at Lodway Close, Pill;
- Replacing an existing rail bridge over the Avon Road / Lodway Close pedestrian and cycle underpass (to the west of Pill station) with a new wider bridge to support a new double track section of railway;
- Minor alterations to the Bridleway (LA8/66/10) and National Cycle Route 26 south of Royal Portbury Dock;
- Extension of bridleway LA8/67/10 north of the M5 underbridge to connect with the National Cycle Route 41 to the east of the M5 that connects with Pill;
- Construction of a new station at Pill on the site of the existing southern platform, with new access, forecourt and car park located on Monmouth Road;
- A new emergency and maintenance accesses to Pill Tunnel eastern portal;
- A new vehicular maintenance road rail access point from the highway of Clanage Road, Bower Ashton to the Portishead Branch Line Railway;
- Various improvement works along the operational railway line between Pill and Ashton Junction;
- Whilst the Ashton Vale Road (Ashton Junction) level crossing will remain operational, the following works are proposed to reduce the highway traffic impact from the increased use of the level crossing:
  - Extension of the left turn flare lane on Winterstoke Road;
  - Optimisation of the Ashton Vale Road signals, and upgrade of signals to “MOVA”; and
  - Provision of a ramp to the north of the level crossing to connect pedestrians and cyclists from Ashton Vale Road to Ashton Road.
- In light of the possibility that Baron’s Close pedestrian level crossing may not be closed permanently before MetroWest Phase 1 opens, MetroWest Phase 1 is proposing to close it as part of the DCO Scheme. Alternative pedestrian access will be provided, using a pedestrian and cycle path (currently under construction by the MetroBus scheme) linking to the Ashton Vale Road level crossing and the proposed MetroWest Phase 1 pedestrian / cycle ramp.
- Improvements are also required along the operational railway line between Pill Junction and Ashton Junction, including replacement of ballast, minor works to bridges and structures, minor modifications to the vertical and horizontal alignment of the railway and new signalling, telecommunications including a mast in Avon Gorge and aerials at Pill Tunnel and Portishead station and new fencing for the entire branch line, where natural boundaries are not sufficient.

1.1.8 Refer to the Preliminary Environmental Information Report (“PEI Report”) Chapter 4 for the fully detailed project description.

1.2 Protected Species Survey

1.2.1 CH2M was commissioned by NSDC on behalf of the West of England Authorities to undertake and report on great crested newt surveys for the DCO Scheme. The need for great crested newt surveys was recommended in the findings of the Ecological Appraisal Report (CH2M HILL, 2015).

1.2.2 The study area for the Great crested newt survey extends to 250 m of the centreline of the railway between the proposed new station in Portishead and Parson Street Junction.

1.3 Objectives

1.3.1 This report aims to assess the presence of great crested newts within the study area using the following approach:

- To establish if any waterbodies within 250 m of the disused railway line are suitable for great crested newts by undertaking a great crested newt Habitat Suitability Index (HSI) (Oldham et. al. 2000) survey; and
- Where waterbodies have the potential for great crested newts, to establish presence or absence and indicate whether surveys to estimate population sizes are required.

1.3.2 The findings from this survey will inform the ecological impact assessment. Appropriate measures to remove or reduce potential impacts of the DCO Scheme on great crested newts will be developed and included in the Environmental Statement which will be submitted with the DCO application.

1.4 Structure of this Report

1.4.1 This report is structured along the following lines:

- Chapter 1 provides a brief introduction to the DCO Scheme and the great crested newt survey;
- Chapter 2 sets out the legislative framework for the protection of great crested newts in England;
- Chapter 3 describes the approach to the great crested newt survey; and
- Chapter 4 presents the results of the survey in the form of the baseline conditions and evaluates the importance of the study area with regards to great crested newts.

1.4.2 Supporting documentation is provided in the accompanying annexes comprising pond photographs and presence/absence survey results. The survey locations are presented in the PEI Report, Volume 3, Figure 9.4.

SECTION 2

Legislative and Planning Context

2.1 Legislative Framework

2.1.1 Great crested newts ("GCN") and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (as amended) and under the Conservation of Habitats and Species Regulations 2010 (as amended). Taken together, these make it an offence to:

- Deliberately capture, injure or kill a great crested newt;
- Deliberately disturb any great crested newt, in particular disturbance which is likely to: (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.
- To be in possession or control of any live or dead great crested newt or any part of, or anything derived from a great crested newt;
- Damage or destroy a breeding site or resting place of a great crested newt;
- Intentionally or recklessly obstruct access to any place that a great crested newt uses for shelter or protection;
- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place that it uses for shelter or protection.

2.1.2 Under the Conservation of Habitats and Species Regulations 2010, Natural England may grant a licence to permit activities that would otherwise be unlawful for several purposes. Natural England must be satisfied of the following three tests to grant a licence:

- Regulation 53(2)(e) states that licences may be granted to *"preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment."*
- Regulation 53(9)(a) states that a licence may not be granted unless "*there is no satisfactory alternative*".
- Regulation 53(9)(b) states that a licence cannot be issued unless the action proposed "*will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range*".

2.1.3 Great crested newt is included under Section 41 of the Natural Environment and Rural Communities ("NERC") Act 2006 as a species of principal importance for conserving biodiversity in England. Under the NERC Act, all local and public authorities in England and Wales have a duty to promote and enhance biodiversity in all their functions.

2.2 Local Biodiversity Action Plans

2.2.1 The Avon Biodiversity Action Plan aims to help inform the production of the Local Development Framework for the four unitary local authorities: North Somerset, Bristol City, Bath and North East Somerset, and South Gloucestershire Council. The Avon BAP also provides a mechanism to contribute towards meeting the Local Agenda Agreement targets, national policy and legislation, including the NERC Act 2006.

2.2.2 The Avon BAP identifies a variety of species that are relevant to the DCO Scheme, including great crested newt.

SECTION 3

Methodology

3.1 Desk Study

3.1.1 A desk study was carried out as part of the Ecological Appraisal Report (CH2M HILL, 2015), in which records of protected species, including great crested newts, were provided by Bristol Regional Environmental Records Centre ("BRERC") and previous survey reports. These records, along with the following data sources were consulted to locate waterbodies within 250 m of the centreline of the DCO Scheme.

- Ordnance Survey maps; and
- Multi-Agency Geographic Information for the Countryside website ("MAGIC").

3.1.2 This review exercise is valuable in identifying past great crested newt records and identifying potential waterbodies. Understanding nature conservation issues within the wider area helps in the assessment of the ecological value of a site and the habitats and species that a site supports.

3.1.3 Mott MacDonald undertook a great crested newt survey of the disused section of track in 2011. One population was identified at pond 26 (see the PEI Report Figure 9.4 for waterbody locations) where three adult great crested newts were recorded.

3.1.4 In addition, great crested newt derogation licence data were sought from Natural England for nearby sites to gain a better understanding of the populations in the area. Two sets of licence data were received**,** one for Sainsbury's in Portishead (Licence No. EPSM2013-6056-E) which lies immediately adjacent to the DCO Scheme**,** and another for St Katherine's School in Ham Green (Licence no. EPSM2010-2258-B) approximately 300 m from the operational railway line.

3.1.5 Survey data were also received from the Avon Wildlife Trust ("AWT") for surveys within Portbury Wharf Nature Reserve (Cornthwaite, 2012).

3.1.6 Additional information was also obtained on the Hinkley Point C Connection Project (National Grid, 2014).

3.2 Habitat Suitability Index (HSI) Assessment

3.2.1 Waterbodies within 250 m of the centreline the DCO Scheme were identified from Google Earth and maps and prior to the site visit, given a reference number (i.e. 'Waterbody 1').

3.2.2 The survey strategy used the guidance provided by Natural England to determine that a 250m zone was required. This states: *"In keeping with a proportionate and risk-based approach, surveys need reasonable boundaries. For developments resulting in permanent or temporary habitat loss at distances over 250m from the nearest pond, carefully consider whether a survey is appropriate. Surveys of land at this distance [over 250m] from ponds are normally appropriate when all of the following conditions are met: (a) maps, aerial photos, walk-over surveys or other data indicate that the pond(s) has potential to support a large great crested newt population, (b) the footprint contains particularly favourable habitat, especially if it constitutes the majority available locally, (c) the development would*

have a substantial negative effect on that habitat, and (d) there is an absence of dispersal barriers" (Natural England, 2013). [1]

3.2.3 Using the above criteria, waterbodies beyond 250 m were considered providing interconnecting habitat to ponds within 250 m of the DCO scheme was present, supporting potential meta-populations.

3.2.4 Although habitat within the DCO Scheme area is valuable for amphibians, it does not provide much of the good quality habitat available locally. Furthermore, no waterbodies beyond 250 m were considered to have potential to support a large great crested newt population based on the HSI survey.

3.2.5 The surveys were undertaken during March 2015 and June 2017, using standard HSI methodology (Oldham et. al. 2000), by licensed ecologists experienced in surveying for great crested newts.

3.2.6 The HSI survey comprised an assessment of the features of the waterbodies and the adjacent landscape to enable an evaluation to be made on waterbody habitat quality for breeding great crested newts. Standard methodology incorporates ten Suitability Indices ("SI") comprising factors that influence great crested newt habitat, namely:

- SI^1 Location;
- SI^2 Waterbody area;
- SI^3 Waterbody drying;
- SI^4 Water quality;
- SI^5 Shade;
- SI^6 Fowl;
- SI^7 Fish;
- SI^8 Waterbodies (i.e. number of ponds within 1 km of survey pond);
- SI^9 Terrestrial habitat; and
- SI^{10} Macrophytes (i.e. percentage of pond surface occupied by macrophyte [aquatic plant] cover).

3.2.7 A value for each of these indices is calculated between 0.01 (unsuitable) and 1.0 (optimal). The geometric mean of the index values is subsequently calculated to provide an individual pond's HSI score between 0 and 1. Table 3-1 explains the categories for the waterbody scores.

Table 3-1: Categorisation of HSI Scores

HSI Score	Pond Suitability
<0.5	Poor
0.5 – 0.59	Below Average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

[1] Template for Method Statement to support application for licence under Regulation 53(2)(e) in respect of great crested newts *Triturus cristatus.* Form WML-A14-2 (Version April 13) Survey Data (1) Tab in spreadsheet.

3.2.8 The HSI guidance notes that a high scoring waterbody is more likely to support great crested newts than those with a low score, but it also states, *"The HSI for great crested newts is a measure of habitat suitability. It is not a substitute for newt surveys. In general, ponds 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 pond with a high score will support newts, or that any pond with a low score will not do so"*[2].

3.2.9 Although the HSI provides useful guidance when assessing the suitability of waterbodies for great crested newts, it is not a substitute for undertaking a detailed presence/absence survey during the optimal survey months. Therefore, a waterbody with a low HSI score may be recommended for presence/likely absence surveys particularly if it is part of a cluster or within proximity to the site.

3.3 Environmental DNA (eDNA) Sampling

3.3.1 Due to advances in survey techniques, in 2016 and 2017 waterbodies deemed to be suitable for great crested newts were tested for presence of great crested newt environmental DNA ("eDNA"). In addition**,** ponds previously surveyed in 2015 that had access constraints such as safety issues or dense vegetation were identified for eDNA sampling to ensure that results were as accurate as possible.

3.3.2 Sampling of eDNA is a relatively new methodology, which has now been approved for use by Natural England for presence/absence surveys. It is based on testing for the presence of great crested newt DNA on a single visit by taking water samples between 15th April and 30th June by ecologists that hold a Natural England Great Crested Newt Class licence.

3.3.3 eDNA survey methodology follows a strict protocol on obtaining water samples and avoiding cross-contamination. The general methodology is as follows:

- Walk around the waterbody and identify 20 locations where you can take a water sample;
- Collect 20 samples of waterbody water from around the waterbody (in the areas you have already identified) using a sampling ladle, and emptying each sample into a Whirl-Pak bag;
- Using the clear plastic pipette take water from the Whirl-Pak bag, and transfer into one of the six conical tubes containing preserving fluid, ensuring each one is fully closed before sending to a specialist laboratory for DNA analysis that follows the Natural England eDNA protocols.

3.3.4 eDNA surveys were undertaken on the 26th and 27th April 2016, and 8th June 2017 by ecologists with a Natural England Great Crested Newt Class licence.

3.4 Presence/Absence Survey

3.4.1 Waterbodies identified as having the potential to support great crested newts or received a positive eDNA result were surveyed for presence/absence between March and June 2015 and May to June 2016 (before eDNA surveys were approved as a standalone presence/absence method by Natural England). Temperatures during the surveys were optimal for bottle trapping methods, i.e. >5°C.

[2] Amphibian and Reptile Groups of the United Kingdom ARG UK Advice Note 5, Great Crested Newt Habitat Suitability Index, May 2010. Page 1 paragraph 5.

3.4.2 Great crested newt surveys were undertaken in accordance with the Great Crested Newt Mitigation Guidelines (English Nature, 2001) and Herpetofauna Workers' Manual (Gent and Gibson, 2003). All surveys were carried out by an appropriately licensed surveyor.

3.4.3 Presence/ absence surveys require suitable weather conditions and four visits to each location during mid-March to mid-June with at least two of these visits during mid-April to mid-May. Three survey techniques were used per visit where possible, which included the following methods:

- Bottle trapping - bottle traps (made from 2-litre plastic bottles) were set out around the edge of the waterbodies and left overnight at a density of one trap per 2m of bank at locations where the bank was accessible.
- Egg search - any live or dead submerged vegetation that was within reach from the waterbody margin, especially folded leaves, were examined for newt eggs.
- Torch survey - the waterbodies were searched for great crested newt at night by shining a powerful 1,000,000 candlepower torch around the pond margins to reveal any newts present.
- Netting - a perimeter walk of the waterbody margins was undertaken and a long-handled dip net was used to sample the area around the pond edge where access to open areas of water was possible.

3.4.4 The methods applied at each of the waterbodies are detailed in Annex B.

3.4.5 If great crested newts are shown not to be present after four visits, then likely absence can be assumed and the survey can cease.

3.5 Population Size Class Assessment

3.5.1 If great crested newts are present, a population size-class assessment may be required in order to devise and implement a mitigation strategy. The Great Crested Newt Mitigation Guidelines (English Nature, 2001) state that population size class assessment surveys should be undertaken over six visits in suitable weather conditions from mid-March to mid-June, with at least three of these visits during mid-April to mid-May.

3.5.2 The maximum adult count per waterbody per night gained through torch survey or bottle trapping is noted. For waterbodies where there is reasonable certainty of regular interchange of animals (waterbodies within 250 m and with no barriers to dispersal), counts can be summed across waterbodies.

3.5.3 Populations are classed as:

- Small - for maximum counts to 10 individuals;
- Medium - for maximum counts between 11 and 100; and
- Large - for maximum counts over 100.

3.6 Limitations

3.6.1 The waterbodies were surveyed per the best-suited surveying techniques available based on the waterbody environment and accessibility. Several waterbodies were surrounded by dense vegetation and /or supported steep side slopes so safe access was not possible. This was a constraint at Waterbody 6. Dense silting and vegetation at Waterbody 26 decreased the likelihood of finding newts and limited the survey effort and dense vegetation and deep silt along the entire eastern boundary of Waterbody 37 prevented any access along one side. The presence of water shrew at Waterbody 22 prevented the use of bottle traps

and dense vegetation both around and in the waterbody prevented adequate torching surveys from being completed.

3.6.2 Despite a positive eDNA result, Waterbody 14c did not receive a population size class assessment due the timing of sample collections (8th June 2017) which would not have adhered to the recommended survey time-scale of at least three visits during mid-April to mid-May.

3.6.3 The results take full account of these limitations.

3.7 Evaluation

3.7.1 The ecological value of the great crested newt population has been determined based on the guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2016). The value of specific ecological receptors is assigned using a geographic frame of reference, i.e. international value being most important, then national, regional, county, district, local and lastly, within the immediate zone of influence of the scheme area only.

3.7.2 The evaluation is made using a variety of characteristics, including the rarity of populations, either locally or within a wider area, the vulnerability of species (for example, to disturbance or fragmentation from other populations), and statutory recognition of biodiversity importance through inclusion in local or national biodiversity action plans. Note that legal protection alone is not a consideration in the evaluation of species.

SECTION 4

Baseline Conditions

4.1 Context

4.1.1 Forty-seven potential waterbodies, including ponds and ditches, were identified within 250 m of the railway corridor from Portishead to Pill. The operational freight line section was also considered as part of the survey but no waterbodies were identified within 250 m of the freight line, although subsequently one pond was identified in Leigh Woods from local knowledge.

4.1.2 Following further inspection, nine of the forty-seven waterbodies were found to be unsuitable for HSI surveys as they were not found or were inaccessible. The remaining 38 were subject to Habitat Suitability Index surveys.

4.1.3 The disused section of railway is bordered by commercial and residential areas at Portishead; passes through rural fields around Sheepway; passes commercial areas at Portbury Dock along the north side of the railway and fields and the M5 to the south; and crosses residential areas through Pill.

4.1.4 The location of each waterbody is shown in the PEI Report, Volume 3, Figure 9.4; with photographs of key waterbodies and their immediate surroundings presented in Annex A.

4.2 HSI Assessment

4.2.1 A summary of waterbodies and their HSI scores is presented Table 4-1.

Table 4-1: HSI Scores and Waterbody Suitability

Waterbody Number	HSI Score and suitability	Waterbody Description	Recommended for presence/ absence survey
1, 2, and 3	Unsuitable	1 – Large flowing stream, not suitable for newts, 2 and 3 – Dry ditches.	NO
4 and 5	0.56 Below average	Concrete sided shallow drains with no vegetation and linked to Pumping Station.	NO
6	0.78 Good	A large pond with frogs spawn present and good vegetation cover.	YES
7	0.76 Good	A long narrow ditch channel is steep sided and shallow.	YES
7a	0.70 Average	The pond is surrounded by houses and gardens but has links to hedgerow and railway via ditch to the northeast. The pond is heavily silted with ducks present in small numbers.	YES
7b	0.56 Below average	Highly shaded with little water and no access to water.	NO
8	Not undertaken	Dry ditch.	NO

Table 4-1: HSI Scores and Waterbody Suitability

Waterbody Number	HSI Score and suitability	Waterbody Description	Recommended for presence/ absence survey
9	0.83 Excellent	High density of frog spawn within the pond and good cover and habitat for amphibians.	YES
9a	0.69 Average	Swans and ducks present on the waterbody and lack of vegetation make the pond less desirable although the surrounding habitat is of value.	NO
10	0.78 Good	Shallow drainage ditch system both sides of the railway track. Some sections are shallow with little macrophyte cover but others are better.	YES
11	0.60 Below average	The drain in the field is heavily shaded and poor water quality due to poaching[3] from livestock. The ditch running along the hedgerow is of reasonable quality but unlikely to be a stronghold for newts but may provide dispersal habitat. The drain is not deep enough to trap newts.	YES
12	0.74 Good	Wide channel very uniform and steep sided, recently dredged therefore lacking in channel vegetation.	YES
13	0.68 Average	Good habitat in places where there is ponding, other sections recently dredged.	YES
13a	0.41 Poor	Small ditch alongside the railway track with shallow water likely to dry out.	NO
14	0.50 Below average	Ditch running from Sheepway Gate Farm under the railway track. The farmer said it dries out frequently and is choked with vegetation.	NO
14a	0.57 Below average	A small well-shaded pond with little macrophyte coverage. Good terrestrial habitat surrounding the pond nonetheless (wooded hedgerows and long meadow pasture) and good connectivity to the wider area.	Yes - eDNA
14b	0.64 (2016) Average 0.70 (2017) Good	The pond is in a field grazed by a horse. The pond dries out annually (usually May or June) and is not very deep. The homeowner has seen newts around the property but not at the pond.	YES –
14c	0.53 (2016) Below average 0.55 (2017) Below average	The pond is in a field regularly grazed by horses. The homeowner has seen great crested newts around the property but not at the pond.	Yes - eDNA
15	0.51	This drain has some limited potential as there was no flow and some macrophyte cover. There is limited	NO

[3] Poaching is damage done to the grass or sward due to trampling by livestock.

Table 4-1: HSI Scores and Waterbody Suitability

Waterbody Number	HSI Score and suitability	Waterbody Description	Recommended for presence/ absence survey
	Below average	access particularly on the south side where there is 100% shade.	
16	0.47 Poor	This is a fishing lake or pond with platforms and duck houses.	NO
17	0.63 Average	This is a small pond with limited vegetation cover but very close to the railway.	YES
18	Not undertaken	Dry ditch and drain.	NO
19 and 20	0.81 Excellent	A ditch network, parts of which are unsuitable for great crested newts, but wider areas where ponding occurs may provide suitable breeding habitat.	YES
21	0.70 Average	Ditch alongside railway with potential in wider areas where ponding occurs.	YES
21a	0.60 Below average	Ditch network recently excavated and widened in one section.	NO
22	0.76 Good	Clear water, dense reeds but limited macrophytes for egg laying. The pond is linked to pond 23 by an outfall.	YES
23	0.72 Good	Stream running in from dock area but has bunded sections which may be suited to amphibians. It is connected to pond 22 by an outflow.	YES
24	0.56 Below average	Linear canal like large water body with flowing water in some sections.	NO
25	0.77 Good	A linear watercourse/ ditch. No flow was observed and is stagnant in areas. Macrophyte density varies as does the water quality and shade. The ditch is heavily silted but deep in places. Could trap some sections and torch for newts.	YES
26	0.73 Good	Not able to establish water quality as steep to access. Very shaded. Historic records of great crested newts.	YES
27	Not undertaken	No access permitted. Parts of the ditch near the railway appear polluted.	YES (if access given)
27a	0.52 Below average	Concrete lined channel next to footpath possibly connected to 27.	NO
28	0.73 Good	Geese are seasonal visitors to the pond along with ducks and a heron. Fish are present. Good vegetation and terrestrial habitat with known GCN population close by.	YES
28a	0.38 Poor	Small duck pond with resident ducks. The pond is rectangular and steep sides surrounded by stone wall.	NO

Table 4-1: HSI Scores and Waterbody Suitability

Waterbody Number	HSI Score and suitability	Waterbody Description	Recommended for presence/ absence survey
29	0.58 Below average	Flooded cattle crossing unlikely to provide enough to sustain a great crested newt population.	NO
30	0.58 Below average	Large shallow pond at Lodway Farm	YES
31 & 32	0.64 Average	Large waterbody with geese present good macrophyte cover.	YES
33 & 34	Not undertaken	Unable to locate waterbodies as no safe access.	NO
35	0.56 Average	Pond is quite isolated and disturbed by dogs. A member of the public stated that the pond has been drying out frequently.	If works are impacting habitat within 250 m
36	0.49 Poor	Ham Lakes consists of two large fishing lakes stocked with large carp and pike.	NO
37	0.58 Below average	Pond is heavily shaded and covered in weed and a green film. The pond is heavily silted, which made it unsafe for entry.	NO as unsafe

4.2.2 Based upon the results of the HSI survey along with other factors such as location and historic records, 20 waterbodies were identified as requiring presence/absence surveys for great crested newt as they obtained HSI scores in the “Below average” category or better.

4.3 Environmental DNA Sampling

4.3.1 Water samples were taken for waterbodies deemed to have potential for great crested newts and for waterbodies previously assessed for HSI but not surveyed due to access or safety constraints. Table 4-2 summarises the results of the eDNA surveys.

Table 4-2: eDNA Survey Results

Waterbody Number	Date of Survey	eDNA Results for GCN	Further Survey Required
6	27/07/15	Positive for GCN (survey data provided via NSDC)	YES
7a	27/04/16	Negative for GCN	NO
22	26/04/16	Positive for GCN	YES
28	26/04/16	Positive for GCN	YES
29	27/04/16	Negative for GCN	NO
30	27/04/16	Negative for GCN	NO
35	27/04/16	Negative for GCN	NO
37	27/04/16	Positive for GCN	YES
14a	08/06/17	Negative for GCN	NO
14c	08/06/17	Positive for GCN	YES

4.4 Presence/Absence Survey

4.4.1 Presence/absence survey results are provided in Annex B and show the dates visits were undertaken, the methods used for each visit and the survey results.

4.4.2 Table 4-3 shows the maximum number of adult GCN recorded in each of the waterbodies with positive results of great crested newts (including positive eDNA results), as well as any other indicators of great crested newt in the waterbodies surveyed.

Table 4-3: Great Crested Newt Survey Results

	Great Crested Newt	
Waterbody Ref. No.	Adult Peak Count	Other (eggs, efts[4])
6	0	-
9	4	-
17	6	-
22	0	-
26	4	-
28	1	-
37	0	-

4.4.3 The presence of great crested newts was confirmed in three of the 16 waterbodies surveyed in 2015 (Nos. 9, 17 and 26). As presence was confirmed in these waterbodies two extra surveys were carried out at waterbodies 9 and 17 to gain a population estimate.

[4] Efts are terrestrial juvenile newts.

No extra surveys were undertaken at Waterbody 26 due to the risks to newts associated with the heavy silting which is believed to have led to a female newt being found unconscious in a trap (but later recovered).

4.4.4 In September 2015 eDNA survey data received from NSDC indicates that great crested newts were present within Waterbody 6 in spring 2015. It is likely that surveys carried out at the waterbody did not detect great crested newts due to the limited access in relation to safety and dense vegetation. Following these results and some vegetation clearance as part of drainage works at the waterbody, six surveys were undertaken but no great crested newts were found. It is likely that they are present but the access constraints and deep water prevented a survey of at least 50% of the perimeter habitat.

4.4.5 In 2016, following eDNA surveys by CH2M ecologists, great crested newts were confirmed at four more waterbodies (Nos. 6, 22, 28 and 37). These waterbodies were then surveyed on six occasions to ascertain population estimates. Despite positive eDNA results and the additional surveys no great crested newts were found at waterbodies 6, 22 and 37. This absence is likely to be due to both small population size and the survey limitations associated with these waterbodies (see section 2.6).

4.4.6 The remaining four waterbodies with great crested newts (Nos. 9, 17, 26 and 28) showed results indicating presence of small populations e.g. less than 10 individuals found at the peak count.

4.4.7 In 2017, eDNA sampling confirmed the presence of great crested newts at Waterbody 14c. Follow up surveys for population assessments were not performed due to the lateness in the survey season.

4.4.8 Additional data in relation to land off Serbert Way, Portishead was requested from Natural England under the Environmental Information Regulations 2004. This information included details of an existing great crested newt development licence issued for the development of Sainsbury's supermarket. The data within this licence confirm that a small population of great crested newts was present within a waterbody located approximately 275 m south of the disused railway. The licence also details the creation of additional ponds, which have been excavated within 180 m of the disused railway along with connective planting to Portbury ditch, which is located 15 m from the disused railway line.

4.4.9 Licence data were also received for St Katherine's School in Ham Green, where a medium population of great crested newts was identified. This site lies approximately 300 m south of the Portbury Freight line.

4.4.10 Smooth newts were recorded in ten of the waterbodies surveys (Nos. 6, 7, 7a, 9, 10, 17, 21 28, 32 and 37), palmate newts were recorded in one waterbody (No. 28), toads and/or toad tadpoles were recorded in six waterbodies (Nos. 7, 7a, 9, 13, 28 and 32) and frog/frogs spawn and tadpoles were recorded in five of the waterbodies (Nos. 8, 9, 28, 32 and 37).

SECTION 5

Evaluation and Conclusions

5.1 Evaluation

5.1.1 The result of the great crested newt presence/absence surveys confirmed populations of great crested newts within four of the waterbodies: 9, 17, 26, 28.

5.1.2 Waterbody 9 is located approximately 200 m north of the disused railway line and lies within the Portishead Ecology Park and proximity 70 m east of the Portbury Wharf Nature Reserve where the AWT has recorded populations of great crested newts (Cornthwaite, 2012; personal communication with AWT, April 2015). The peak count at Waterbody 9 was five great crested newts indicating a small population is present. The waterbody itself is shallow and densely vegetated. It is also known to dry out in some areas during the summer months. These factors affected the survey methods as trapping and torching was limited due to water depth and vegetative cover. The waterbody is also subject to disturbance from dogs running in and out of the water, which is also likely to be impacting the population by trampling the vegetation and causing disturbance to the pond bottom sediments. There are several waterbodies within the vicinity of the pond that are known to hold great crested newts. Records from AWT confirmed great crested newts at three ponds adjacent waterbody 9, with peak counts at 11, 13, and 11 per pond, suggesting a medium sized meta-population (personal communication with AWT, April, 2016).

5.1.3 Waterbody 17 is an isolated small pond with limited vegetative cover located at the top of the embankment within 10 m of the disused railway on private land. The pond is very small with very little macrophyte cover. The peak count of great crested newts here was six indicating a small population is present. Due to the small population and size of the pond further exploration of ponds within 250 m of this pond was actioned to gain a better understanding of the population of great crested newts in this particular area.

5.1.4 In June 2017, three waterbodies (14a, 14b, and 14c) within 250 m of Waterbody 17 were investigated. This resulted in subsequent eDNA sampling of two of the ponds (14a and 14c) following HSI surveys. eDNA sampling confirmed the presence of great crested newts at waterbody 14c. This is a small pond located within a pasture that at the time of visit appeared to be heavily used by horses. The abundance of hedgerows surrounding this pond may serve as connectivity to Waterbody 17, supporting a potential meta-population. Further surveys are recommended for Waterbody 14c to establish population size.

5.1.5 Waterbody 26 is located approximately 15 m north from the disused railway line. The peak count for the ditch was four great crested newts indicating a small population is present. Due to the dense vegetation surrounding the pond, dense leaf litter, silt and reed covering much of the open water, it was extremely difficult to survey. It is therefore likely that there are greater numbers present here particularly as one of the newts found was gravid (carrying eggs) at the time of capture. However, it is likely that the lack of management in recent decades and natural processes of sedimentation and vegetation colonisation have affected the water quality and suitable habitat for great crested newts.

5.1.6 Waterbody 28 is located on farmland adjacent to the disused railway line close to Waterbody 26. The peak count here was one great crested newt which indicates a small population is present in the waterbody. The waterbody is mature, of good size and has adequate vegetation cover but it does host several geese at certain times of the year and fish are present. Although this is unlikely to account for the low numbers of great crested newt as good numbers of smooth newts were found within the shallow vegetated areas of

the pond. It may be that great crested newts are only present in low numbers and or are decreasing in the area perhaps due to factors such as the progressive deterioration of nearby Waterbody 26. A kingfisher (a Schedule 1 Species under the Wildlife and Country Act 1981 (as amended)) was nesting in the bank of the waterbody at the time of survey.

5.1.7 The location of Waterbody 28 is on land being developed by the Bristol Port Company as a cargo storage area. The development involves removal of this waterbody and vegetation in the surrounding fields occupying the development site, the creation of an asphalted impermeable storage area with security lighting, and a new access off Royal Portbury Dock road and a new bridge over the disused railway line into this area. As part of the planning application and subsequent planning conditions, the Bristol Port Company is undertaking ecological mitigation, including the translocation of great crested newts from Waterbody 28 to a new location on port land.

5.1.8 Further environmental DNA surveys also confirmed presence of great crested newts in another three waterbodies (Nos. 6, 22 and 37). These waterbodies were then surveyed on six occasions to ascertain population estimates. Despite positive eDNA and the additional surveys no great crested newts were found. However, populations of great crested newts cannot be ruled out. The survey of these waterbodies was limited by access and safety concerns. Waterbodies 6 and 37 are both deep, heavily vegetated with areas of deep silt, therefore less than 50% of the perimeter was surveyed at these sites. Shrew were present at Waterbody 22 which prevented the use of bottle traps. The waterbody is also dense with reeds which limited access and restricted torching efforts.

5.1.9 Although great crested newts were not found within the other waterbodies surveyed it is possible that great crested newt are using some of the ditches close to and crossing under the railway which may act as corridors between ponds.

5.1.10 Correspondence with White Young Green consultants in June 2017 confirmed a peak count of two great crested newts at a compensation pond and 25 great crested newts at a large attenuation pond installed adjacent the Sainsbury's, suggesting a medium population present in this area.

5.1.11 The great crested newt is a European Protected Species and is listed as a priority species within the National/Local BAP. Considering the location of the site and the population of great crested newts recorded, great crested newts are considered to be of **Local value** (CIEEM, 2016).

5.2 Impacts

5.2.1 None of the waterbodies containing great crested newts will be lost or directly impacted by the construction works or the operation of the DCO Scheme. However, some of the surrounding terrestrial habitat in which great crested newts spend much of the year foraging / hibernating will be lost.

5.2.2 Table 5-1 illustrates the total loss of great crested newt terrestrial habitat from works within the red line boundary.

Table 5-1: Great Crested Newt Terrestrial Habitat Loss in Relation to Red Line Boundary

Waterbody Ref. No.	Construction Proximity to Pond Habitat (meters)	Terrestrial Habitat to be Lost (hectares) within 50 m *(core)*	Terrestrial Habitat to be Lost (hectares) within 250 m *(intermediate)*	Terrestrial Habitat to be Lost (hectares) within 500 m *(distant)*
6	5	0.3	1.2	1.2
9	225	0	0	1.1
14c	245	0	0.1	1.5
17	10	0.2	1	1.8
22	10	0.2	1	2.5
26	0	0.8	1.8	3.4
28	25	0.2	1.3	2.5
37	240	0	0.1	0

5.2.3 As illustrated in Table 5-1, the impact level to great crested newts at waterbodies 6, 17, 22, 26, and 28 is anticipated to be **high** as there will be destruction / alteration to *core* terrestrial habitat within 50 m of breeding waterbodies. The impacts to waterbodies 37 and 14c is assumed to be at a **medium** level (destruction / alteration to *intermediate* terrestrial habitat within 50-250 m of breeding waterbodies) and impacts to waterbody 9 is assumed to be **low** (destruction / alteration to *distant* terrestrial habitat >500 m of breeding waterbodies).

5.2.4 The removal of some foraging habitat along the railway corridor and the construction and operation of the railway line may reduce access to foraging habitat within and on the south side of the railway corridor, thus causing fragmentation of the terrestrial habitat available to great crested newts.

5.3 Conclusions

5.3.1 The DCO Scheme will impact great crested newts primarily through the loss of foraging/hibernating habitat and fragmentation of terrestrial habitat. No waterbodies that are currently used for breeding by great crested newts will be directly affected.

5.3.2 There is a risk of injuring / killing great crested newts from site clearance; construction; and operation of the DCO Scheme. Measures are being developed to alleviate the risks of harming great crested newts during construction works and the operational phase of the DCO Scheme, and the subsequent fragmentation to terrestrial habitat that will occur. These measures will be included in the Environmental Statement to be submitted to the Planning Inspectorate with the DCO application.

SECTION 6

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MAGIC: http://magic.defra.gov.uk/

SECTION 7

Abbreviations

AWT	Avon Wildlife Trust
BRERC	Bristol Regional Environmental Records Centre
DCO	Development consent order
eDNA	Environmental DNA
GCN	Great crested newts
HSI	Habitat Suitability Index
NERC Act	Natural Environment and Rural Communities Act
NSDC	North Somerset District Council
NSIP	Nationally significant infrastructure project

Annex A - Photographs of Waterbodies

Waterbody Number	Photograph
6 A large pond with frogs spawn present and good vegetation cover.	 *Date taken: 12/03/15*
7 A long narrow ditch channel is steep sided and shallow.	 *Date taken: 12/03/15*
7a The pond is surrounded by houses and gardens but has links to hedgerow and railway via ditch to the northeast. The pond is heavily silted with ducks present in small numbers.	**No photograph**
9 High density of frog spawn within the pond and good cover and habitat for amphibians. Small population of great crested newts recorded.	 *Date taken: 12/03/15*

Waterbody Number	Photograph
10 Shallow drainage ditch system both sides of the railway track. Some sections are shallow with little macrophyte cover but others are better.	 *Date taken: 12/03/15*
11 Drain in field is heavily shaded and poor water quality due to poaching from livestock. Ditch running along the hedgerow is of reasonable quality but unlikely to be a stronghold for newts but may provide dispersal habitat. Not deep enough to trap.	 *Date taken: 13/03/15*
12 Wide channel very uniform and steep sided, recently dredged therefore lacking in channel vegetation	 *Date taken: 12/03/15*
13 Good habitat in places where there is ponding, other sections recently dredged.	

Waterbody Number	Photograph
	Date taken: 12/03/15
14A A small pond with good surrounding terrestrial habitat.	 *Date taken: 08/06/2017*
14B Good macrophyte coverage, however pond dried up at time of visit.	 *Date taken: 08/06/2017*

Waterbody Number	Photograph
14C Waterbody evidently used by grazing horses, with signs of heavy trampling.	 ***Date taken: 08/06/2017***
17 A small pond with limited vegetation cover within very close proximity to the railway.	 *Date taken: 02/04/15*

Waterbody Number	Photograph
19 A ditch network parts are unsuitable but wider areas where ponding occurs may provide suitable breeding habitat.	 *Date taken: 13/03/15*
21 Ditch alongside the railway, with potential for amphibians in wider areas where ponding occurs.	 *Date taken: 13/03/15*
22 Clear water, dense reeds but limited macrophytes for egg laying. The pond is linked to pond 23 by an outfall.	 *Date taken: 25/02/15*

Waterbody Number	Photograph
23 Stream running in from Portbury Dock area but has bunded sections, which may be suited to amphibians. It is connected to pond 22 by an outflow.	 *Date taken: 25/02/15*
26 Very shaded, full of leaf litter and silt with weed covering much of the open water. A small population of great crested newts was recorded along with a gravid female and historic records are known.	 *Date taken: 25/02/15*
28 Large pond within historic farmland.	 *Date taken: 21/04/16*

Waterbody Number	Photograph
30 Large shallow pond at Lodway Farm	 *Date taken: 21/04/16*
31 Linear ditch with dense reeds.	 *Date taken: 02/04/15*
32 Large waterbody with geese present and good macrophyte cover.	

Waterbody Number	Photograph
	Date taken: 02/04/15
37 Large waterbody with wildfowl present and dense vegetation across the eastern side.	 *Date taken: 07/04/15*

Annex B Great Crested Newt Presence/Absence Survey Results

Waterbody Number	Comments and initial observations	Survey Date	Results	Temperature and weather conditions	Methods used
6	Frogs spawn present in the pond and toad crossing nearby. 3 ducks on the pond.	02.04.15	Fish x 2	8 °C Drizzle, cloud	10 bottle traps Torch Egg search
		23.04.15	nothing	9.5 °C Clear and dry	10 bottle traps Torch Egg search
		29.04.15	1 x gravid smooth newt, water scorpion	8 °C Showers	10 bottle traps Torch Egg search
		06.05.15	3 smooth newt	12 °C Cloudy and breezy	10 bottle traps Torch Egg search
	Positive eDNA results in 2016 prompted further survey.	11/05/16	12 smooth newts	14 °C Overcast	12 bottle traps Torch Egg search
		12/05/16	9 smooth newts	16 °C 60% Cloud	15 bottle traps Torch Egg search
		16/05/16	6 smooth newts	14 °C 5% Cloud	15 bottle traps Torch Egg search
		23/05/16	Fish	10 °C 20% Cloud	15 bottle traps Torch Egg search
		31/05/16	5 smooth newts, fish and a toad.	16 °C 10% Cloud	15 bottle traps Torch Egg search
		02/06/16	1 smooth newt, fish and a toad.	14 °C 60% Cloud	15 bottle traps Torch Egg search
7	Due to shallow depth and steep banks the ditch is only suitable for torching	01.04.15	6 x smooth newt	8 °C Drizzle, cloud	Torch
		23.04.15	31 x smooth newt and 4 x fish	9.5 °C Clear and dry	Torch
		29.04.15	25 x smooth newt, 2 x fish	8 °C Showers	Torch
		06.05.15	20 x smooth newt	12 °C Cloud and breezy	Torch
7a	Heavily silted and close to residential properties. Waterfowl present on the pond.	02.04.15	3 x stickleback	8 °C Drizzle, cloud	12 bottle traps Torch Egg search
		23.05.15	1 x smooth newt, 2 x fish	9.5 °C Clear and dry	12 bottle traps Torch Egg search
		29.04.15	2 x smooth newt, 8 x fish, frog tadpoles	8 °C Showers	12 bottle traps Torch Egg search
		6.05.15	3 smooth newt	12 °C eve, 10 °C morning	12 bottle traps Torch Egg search

Waterbody Number	Comments and initial observations	Survey Date	Results	Temperature and weather conditions	Methods used
				Cloud and breezy	
9	High density of frog spawn within the pond and good cover and habitat for amphibians including GCN.	02.04.15	4 x smooth newt	8 °C Drizzle, cloud	30 bottle traps Torch Egg search
		23.04.15	4 x GCN, 37 x smooth newt, frog tadpoles	9.5 °C Clear and dry	30 bottle traps Torch Egg search
		29.04.15	13 x smooth newt, frog tadpoles	8 °C Showers	24 bottle traps Torch Egg search
		06.05.15	1 male GCN, 19 x smooth newt	12 °C Cloud and breezy	18 bottle traps Torch Egg search
		03.06.15	3 x smooth newt	9 °C Clear and dry	18 bottle traps Torch Egg search
		11.06.15	5 x smooth newt	15 °C Clear and dry	18 bottle traps Torch Egg search
10	Shallow drainage ditch system both sides of the railway track. Some sections are shallow and poor with little macro cover but others are better - particularly north side into Portbury Wharf Nature Reserve and far south off of the Sheepway bridge in the farmer's field. It is recommended these sections are surveyed as they run directly onto the line.	02.04.15	Nothing	8 °C Drizzle, cloud	Torch Egg search
		23.04.15	Nothing	9.5 °C Clear and dry	Torch Egg search
		29.04.15	1 x gravid smooth newt	8 °C Showers	Torch Egg search
		06.04.15	Nothing	12 °C Cloud and breezy	Torch Egg search
11	Drain in field is heavily shaded and poor water quality due to poaching from livestock. Ditch running along the hedgerow is of reasonable quality but unlikely to be a stronghold for newts but may provide dispersal habitat.	02.04.15	Nothing	8 °C Drizzle, cloud	Torch Egg search
		23.04.15	Dried up survey stopped	9.5 °C Clear and dry	-
12	Wide channel very uniform and recently dredged therefore lacking in channel vegetation. Too steep sided to trap and very long. Too much veg impacting torching with steep banks 21/04/15 surveys stopped.	02.04.15	fish x 3	8 °C Drizzle, cloud	Torch
		21.04.15	fish x 4	9 °C Clear and dry	Torch
13	Good habitat in places where there is ponding, other sections recently dredged. Too much veg to torch 21/04/15 surveys stopped	02.04.15	toad x 5	8 °C Drizzle, cloud	Torch
		21.04.15	Vegetation covering all surface	9 °C Clear and dry	-
17	A small pond with limited vegetation cover within but very close to the railway. Lots of weed across surface	08.04.15	GCN: 1 f and 5 m. 14 smooth	8 °C Clear and dry	12 bottle traps Torch Egg search

Waterbody Number	Comments and initial observations	Survey Date	Results	Temperature and weather conditions	Methods used
		21.04.15	GCN: 1 m trap. 11 smooth, 2 x toad	9 °C Clear and dry	12 bottle traps Torch Egg search
		27.04.15	1 x smooth	6 °C Showers	12 bottle traps Torch Egg search
		11.05.15	Nothing - pond highly turbid	15° Sunny and dry	12 bottle traps Torch Egg search
19	Good habitat in places	31.03.15	1 small fish, 1 duck on pond	6 °C Dry	10 bottle traps Torch Egg search
		21.04.15	2 small fish	9 °C Clear and dry	10 bottle traps Torch Egg search
		27.04.15	6 fish torch, 5 fish bottle	6 °C Showers	10 bottle traps Torch Egg search
		11.05.15	15 fish torch, 6 fish bottle	15° Sunny and dry	10 bottle traps Torch Egg search
21	Parts of the ditch are unsuitable but areas where wider areas and ponding occurs have some potential.	08.04.15	6 x smooth newt, 5 X small fish	7 °C Dry and clear	10 bottle traps Torch Egg search
		21.04.15	1 x smooth newt, 4 fish	9 °C Clear and dry	10 bottle traps Torch Egg search
		27.04.15	3 x smooth newt, 7 fish, smooth newt eggs	6 °C Showers	10 bottle traps Torch Egg search
		11.05.15	2 x diving beetle, 10 x smooth newt, numerous small fish	15° Sunny and dry	10 bottle traps Torch Egg search
22	Clear water, dense reeds but limited macrophytes for egg laying. Good water vole habitat. This waterbody is linked to waterbody 23.	31.03.15	6 small fish.	6 °C Dry	10 bottle traps Torch Egg search
		21.04.15	12 fish, 1 water shrew in bottle - **bottles removed**	9 °C Clear and dry	10 bottle traps Torch Egg search
		27.04.15	6 small fish.	6 °C Showers	Torch Egg search
		11.05.15	7 fish	15 °C Sunny and dry	Torch Egg search
	Positive eDNA results in 2016 prompted further survey.	11/05/16	1 smooth newt	14 °C Overcast	Torch
		12/05/16	1 smooth newt	16 °C 60% Cloud	Torch
		16/05/16	Nothing	14 °C 5% Cloud	Torch
		23/05/16	Nothing	10 °C	Torch

Waterbody Number	Comments and initial observations	Survey Date	Results	Temperature and weather conditions	Methods used
				20% Cloud	
		31/05/16	Nothing	16 °C 10% Cloud	Torch
		02/06/16	Nothing	14 °C 60% Cloud	Torch
23	A slow moving stream running in from Portbury Dock area with bunded sections that may be suited to amphibians. It is connected to pond 22 by an outflow. Has limited egg laying vegetation.	31.03.15	3 small fish	6 °C Dry	10 bottle traps Torch Egg search
		21.04.15	5 fish	9 °C Clear and dry	10 bottle traps Torch Egg search
		27.04.15	12 fish	6 °C Showers	10 bottle traps Torch Egg search
		11.05.15	15 small fish	15° Sunny and dry	10 bottle traps Torch Egg search
26	Previous survey confirmed small population of GCN. Pond with dense scrub surrounding after water levels dropped a path was cleared to the other end where 8 traps were placed. GCN were confirmed to be present, however surveys were halted as one of the newts was unconscious in the trap (but later recovered) and it was deemed not suitable to continue.	08.04.15	Nothing	7 °C Dry and clear	5 bottle traps Egg search
		21.04.15	Nothing	9 °C Dry and clear	10 bottle traps Egg search
		27.04.15	Nothing	6 °C Light rain	15 bottle traps Egg search
		11.05.15	4 x GCN (3m, 1f) 2 x smooth in traps	15 °C Sunny and dry	8 bottles torch
28	A large pond located in historic farmland. Waterfowl are present in reasonable numbers. Positive eDNA result lead to survey.	11.05.16	10 x smooth, 1 palmate	14 °C Overcast	20 bottle traps Egg search Torch
		12.05.16	28 smooth, 1 frog, 2 toads	16 °C 60% Cloud	25 bottle traps Egg search Torch
		16.05.16	Smooth newt eggs, 8 smooth newts, 1 toad, and 1 frog.	14 °C 50% cloud	25 bottle traps Egg search Torch
		23.05.16	7 smooth newts and frog tadpoles.	9 °C 30% cloud	24 bottle traps Egg search Torch
		31.05.16	1 male great crested newt, 8 smooth, 1 palmate and frog tadpoles.	16 °C Cloud and rain	24 bottle traps Egg search Torch
		02.06.16	5 smooth and frog tadpoles.	14 °C 60% cloud	24 bottle traps Egg search Torch
31	Small ditch almost dry not enough water to survey. Found to hold water when further investigation undertaken but high numbers of small fish - not trapped as not very safe to access.	Pond was torched and netted where access	Fish only		

Waterbody Number	Comments and initial observations	Survey Date	Results	Temperature and weather conditions	Methods used
		permitted on the dates 32 was surveyed			
32	Large waterbody. Only the nearside shore had safe access for survey.	08.02.15	7 smooth newts, 2 x small fish, frog tadpoles	7 °C Dry and clear	15 bottle traps Torch Egg search
		21.04.15	2 smooth newts, tadpoles (frog and toad) fish x 2	9 °C Dry and clear	25 bottle traps Torch Egg search
		27.04.15	3 x smooth, tadpoles	6 °C eve Light rain	25 bottle traps Torch Egg search
		11.05.15	2 smooth newts, tadpoles (frog and toad) fish x 4	15 °C eve Sunny and dry	25 bottle traps Torch Egg search
37	Large pond densely vegetated and inaccessible on one side. Positive eDNA results in 2016 prompted presence absence survey.	11/05/16	1 smooth newt	14 °C Overcast	15 bottle traps Torch Egg search
		12/05/16	Nothing	16 °C 60% Cloud	15 bottle traps Torch Egg search
		16/05/16	Nothing	14 °C 50% Cloud	15 bottle traps Torch Egg search
		23/05/16	Nothing	11 °C 20% Cloud	15 bottle traps Torch Egg search
		31/05/16	1 smooth newt and a common frog.	16 °C 60% Cloud light rain	15 bottle traps Torch Egg search
		02/06/16	1 smooth newt.	14 °C 60% Cloud	15 bottle traps Torch Egg search