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A487 New Dyfi Bridge

Environmental Statement -
Volume 3: Appendix 9.5

Amphibian Survey Report

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1 Introduction

1.1 Background

Ove Arup and Partners Ltd was commissioned by Alun Griffiths (Contractors) Ltd to undertake ecological surveys to inform an Environmental Impact Assessment (EIA) of the proposed A487 New Dyfi Bridge scheme (The Scheme) on land to the north of Machynlleth, Mid-Wales, located at National Grid Reference SH747017.

Welsh Government proposes to provide a new section of the A487 trunk road which also incorporates the provision of a new crossing of the River Dyfi upstream of the existing road bridge, Pont-ar-Ddyfi. The existing A487 trunk road leading northward from Machynlleth has been subject to increased traffic and repeated flooding over the years, and the continued deterioration of the existing masonry bridge (Pont-ar-Dyfi) which leads to the junction of the A487 and the A493 has resulted in structural strengthening works and repairs being required to keep the bridge in operation.

The Scheme is a 900m new section of single carriageway road. The proposed route is to the south east of the existing route and Pont-ar-Dyfi Bridge. The scheme includes a 570m viaduct and river bridge across the river Dyfi and associated floodplain. The existing A487 will be de-trunked between the two ends of the scheme.

1.2 Scope of this Report

The aim of the amphibian surveys was to ascertain the following:

- Presence/likely absence of great crested newts *Triturus cristatus*;
- Population size-class of great crested newts, if present;
- Distribution of great crested newts, if present;
- Whether a European Protected Species (EPS) licence is required to ensure legal compliance;
- To gain an appreciation of other species of amphibians that may be present; and
- Any mitigation measures that need to be employed.

This report details the methodology used, describes the results and makes recommendations for protection of ecological features.

1.3 Relevant Legislation

Great crested newts, having suffered a decline in population throughout Europe in recent decades, are a European Protected Species (EPS), protected under the Conservation of Habitats and Species Regulations 2010 (as amended), known as the Habitats Regulations.

Under the Habitats Regulations, it is an offence to deliberately capture, injure or kill any wild animal of an EPS, deliberately disturb wild animals of any such species, deliberately take or destroy the eggs of such an animal or damage or destroy a breeding site or resting place of such an animal.

Great crested newts receive further protection through inclusion on Schedule 5 of the Wildlife and Countryside Act (WCA) 1981 (as amended) and the Countryside and Rights of Way (CROW) Act 2000. Under these Acts it is an offence to: intentionally kill, injure or take any protected species; intentionally or recklessly damage, destroy or obstruct access to any structure or place which a protected species uses for shelter or protection; and intentionally or recklessly disturb any protected species while it is occupying a structure or place which it uses for shelter or protection.

Actions which are prohibited by legislation can be made lawful on the approval and granting of a licence from Natural Resource Wales (NRW), subject to conditions.

Other amphibians in the UK receive legal protection and consideration. The palmate newt *Lissotriton helveticus*, smooth newt *Lissotriton vulgaris*, common frog *Rana temporaria* and common toad *Bufo bufo* are all listed on Schedule 5 of the WCA but are only protected with respect to the prohibition of their sale and advertising for sale.

Common toads are also a Section 42 (S42) species of the Natural Environment and Rural Communities (NERC) Act 2006. The list of species on S42 are used to guide decision makers, including local and regional authorities, in implementing their duty under section 40 of the Act, to have regard to the conservation of biodiversity in Wales.

The reader should refer to the original legislation for the definitive interpretation.

2 Methodology

All waterbodies within 500 m of the proposed route were identified and are shown on Figure 1.

2.1 Desk Study

A biodiversity information request was submitted to the Biological Information Service (BIS), and also the North Wales Environmental Information Service (Cofnod). For amphibians the desk study area extends for 5 km around the centre line of the scheme.

2.2 Habitat Suitability Index

Waterbodies were assessed for suitability between July 2015 and early spring 2016. Waterbodies were assessed using the standard Habitat Suitability Index (HSI)¹ methodology. The methodology has been designed to evaluate habitat quality in order to assess which waterbodies provide suitable habitat for great crested newts as breeding ponds. The HSI is a numerical index, which ranges from 0 and 1. It is calculated using ten key habitat criteria and is based on the assumption that habitat quality determines great crested newt presence/absence. Using this standard approach, ponds with higher scores, are considered more likely to support great crested newts compared to those with low scores (see Table 1 below). However, the system is not sufficiently precise to conclude that any particular pond with a high score will support great crested newt, or that any pond with a low score will not do so.

Table 1. Predicted presence of great crested newts based upon HSI results

HSI	Pond suitability	Predicted occupancy (%)
<0.5	Poor	0.03
0.5-0.59	Below average	0.2
0.6-0.69	Average	0.55
0.7-0.79	Good	0.79
>0.8	Excellent	0.93

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

2.3 Presence/Absence Survey

Presence/absence surveys for great crested newt were carried out in accordance with the methodology prescribed within the Great Crested Newt Mitigation Guidelines².

Four survey visits were undertaken between April and June 2016; on 14th April, 4th May, 17th May and 7th June. In line with the guidelines, at least two of these visits were undertaken during the mid-April to mid-May period.

During each visit, at least three survey methods were employed where possible, including torch survey, bottle traps, egg search, refuge searches and netting, as described below:

Torch Survey: The banks of each waterbody were walked after dark, using a high powered torch (1 million CP) to search for newts and other amphibians. In this case, the only sections suited to this technique were ditches and ponds that were free from duckweed/macrophytes. Animals observed were identified to species, sex and life stage where possible.

Bottle traps: Bottle traps were placed around the perimeter of the waterbodies at approximately 2 m intervals shortly before dusk and checked the following morning to determine whether amphibians were present or absent. Each trap was made from a 2 litre plastic bottle with the top cut off and inverted, to make a funnel leading into the bottle. Bamboo canes were used to anchor the traps into the waterbody, taking care to ensure that each bottle included an air bubble. The number of bottle traps used varied dependent upon waterbody size but ranged from three to 20 traps on each survey visit. Any animals caught were immediately returned to the water body after identification.

Egg searches: Submerged and peripheral vegetation was searched for the presence of newt eggs. The eggs are usually folded in the leaves of aquatic plants, dead leaves or overhanging grass leaves. It is necessary to unfold the leaf to identify the egg. The unfolding increases the risk of predation, therefore once an egg is found the use of this technique is ceased. Recommended survey effort for this method is 15 minutes searching per 50m of bank. In this case the method was adapted to the ditches and focussed on areas of suitable aquatic vegetation in accessible locations. The presence of eggs of other amphibians was also noted, where observed.

Refuge searches: Searches of existing refuges such as logs, wooden planks and debris within the terrestrial habitats immediately surrounding the waterbody was undertaken. Any amphibians found were identified to species and sex where possible.

Surveys were led on each occasion by Arup ecologists holding Natural Resource for Wales (NRW) licences or their accredited agents permitting survey for this species (NRW Great Crested Newt Licence no 70241:OTH:SA:2016 and NRW Great Crested Newt Licence no. 70176:OTH:SA:2016). The dates, times and

² English Nature. (2001) Great Crested Newt Mitigation Guidelines. English Nature.

weather conditions of each survey are detailed below in Table 2. Survey limitations are discussed below.

Table 2. Details of weather conditions for the presence/absence survey

Visit No.	Date	Weather Conditions			
		Temp (°C)	Wind speed (Beaufort Scale)	Cloud cover (%)	Precipitation
1	14/04/16	9	2	50	Light drizzle
2	04/05/16	9	1	10	Dry
3	17/05/16	11	2	75	Light drizzle
6	07/06/16	13	2	50	Dry

2.4 Survey Limitations

In a few situations physical limitations meant that fewer than three survey methods were employed at some water bodies. These are discussed below.

Surveyor safety was an important consideration which meant that some survey methods could not be used in some situations. Surveys on 17th May were restricted to bottle trapping as later that night cows restricted access to the ponds when torching was planned.

Most waterbodies identified and subject to an assessment of suitability dried up by later surveys and consequently were not surveyed further.

It should be noted that the survey was designed around detecting great crested newts. Other species of amphibians were recorded where observed. Some species (such as common frog) may breed earlier in the season; however the methods used frequently record eggs/larval stages of these species and as such this is not considered a significant limitation.

As with many ecological surveys, the effectiveness of these types of survey are subject to a range of seasonal, environmental and behavioural factors. The absence of evidence of a particular species in a survey should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

3 Results

3.1 Desk Study

There are five historic records (before 2000) of great crested newt in various garden ponds on the Newlands Estate, Machynlleth, within 1 km of the scheme.

There are 19 records of common frog and 10 records of common toad from around the 5 km search area. There are three records of palmate newt and two records of smooth newt from around the 5 km search area. No other amphibian species were recorded.

3.2 Habitat Suitability Index

The results of the HSI assessment are presented in Appendix A and locations of waterbodies shown on Figure 1.

31 waterbodies were assessed for suitability to support great crested newts. 23 waterbodies produced scores of < 0.5 equating to “poor” suitability for great crested newts with a predicted occupancy of 0.03 %. Eight of the waterbodies produced scores of 0.5 – 0.59 equating to “below average” suitability for great crested newts with a predicted occupancy of 0.2 %. No waterbodies produced scores > 0.59, equating to “average”, “good” or “excellent” suitability for great crested newts.

3.3 Presence/Absence Survey

No great crested newts were recorded during the course of the surveys.

A summary of survey findings are presented in Appendix B and locations of waterbodies where presence/absence surveys were undertaken are shown on Figure 2. It should be noted that the study area, located within a flood plain, initially supported many waterbodies that, when using the HSI system, appeared superficially suitable for breeding great crested newts. However many of these were in fact ephemeral features that rapidly dried out during spring 2016.

From the 31 waterbodies initially assessed 15 waterbodies were chosen for further survey as they had some suitability for supporting great crested newts. The remaining 16 waterbodies were not surveyed for great crested newts as they were dry by April 2016.

Of the 15 waterbodies surveyed at the start of the programme, all but four (waterbodies 3, 19, 38 and 41) became dry later in the season.

During the surveys a small number of adult palmate newts, adult common frogs and common toads were found, as well as frog and toad spawn.

Common frogs were found in six of the waterbodies surveyed, common toads in three waterbodies and palmate newts in just one (waterbody 19, which held all three species of amphibians recorded during the survey).

The permanent waterbodies 19 and 41 were most suited to great crested newts containing aquatic vegetation, suitable prey and terrestrial habitat nearby for hibernation. However, habitat suitability was below average and both ponds contained numbers of stickleback and waterfowl. Only two other waterbodies, 3 and 38, still contained water at the end of the survey period (beginning of June). Both of these waterbodies had poor habitat suitability for great crested newt, were heavily disturbed by cattle and contained high densities of sticklebacks with little aquatic vegetation.

4 Discussion and Recommendations

4.1 Discussion

No great crested newts were found during the survey and it is considered unlikely that populations of great crested newt are present on site. The only amphibians observed during the survey were small numbers of palmate newts, frogs and toads.

Although a large number of waterbodies were assessed for their suitability in supporting great crested newts, many of these waterbodies dried up throughout the season and were considered sub-optimal for great crested newts. Given the targeted survey effort and the absence of recent and local records of great crested newts within 5 km of the site, confidence can be placed in the negative result obtained.

4.2 Recommendations

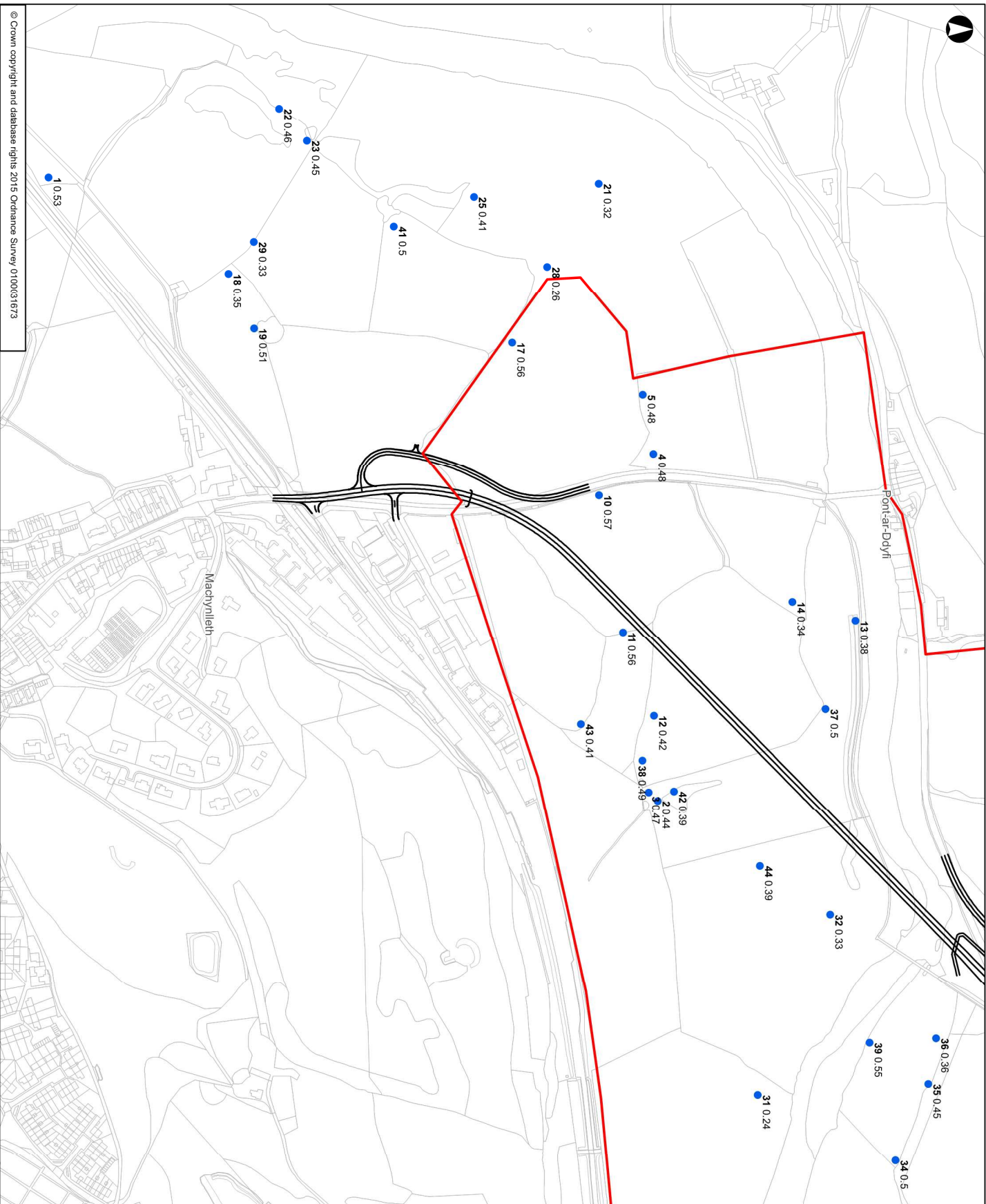
Given the lack of any great crested newt observations during the survey it appears that they are absent from the current study area. A European Protected Species licence for great crested newts will therefore not be required for the proposed Scheme, and no specific mitigation will be necessary for great crested newts

Consideration should be given to other amphibian species, notably common toad, found to be present in the study area. This should be subject to assessment within the Environmental Statement for the project and suitable mitigation prescribed.

This may include staged vegetation clearance in suitable habitats under ecological supervision. Any animals encountered should be moved to a suitable place of safety nearby in habitat that will not be affected by the works.

Figures

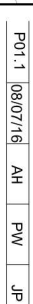
Figure 1 Waterbodies - HSI Assessment



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- Legend**
- Waterbody Location
 - Ecology Survey Area
 - Proposed Scheme

Labels relate to Waterbody ID
(in bold) and HSI score



P01.1	[08/07/16]	AH	PW	JP
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Rev	Date	By	Chkd	Appd

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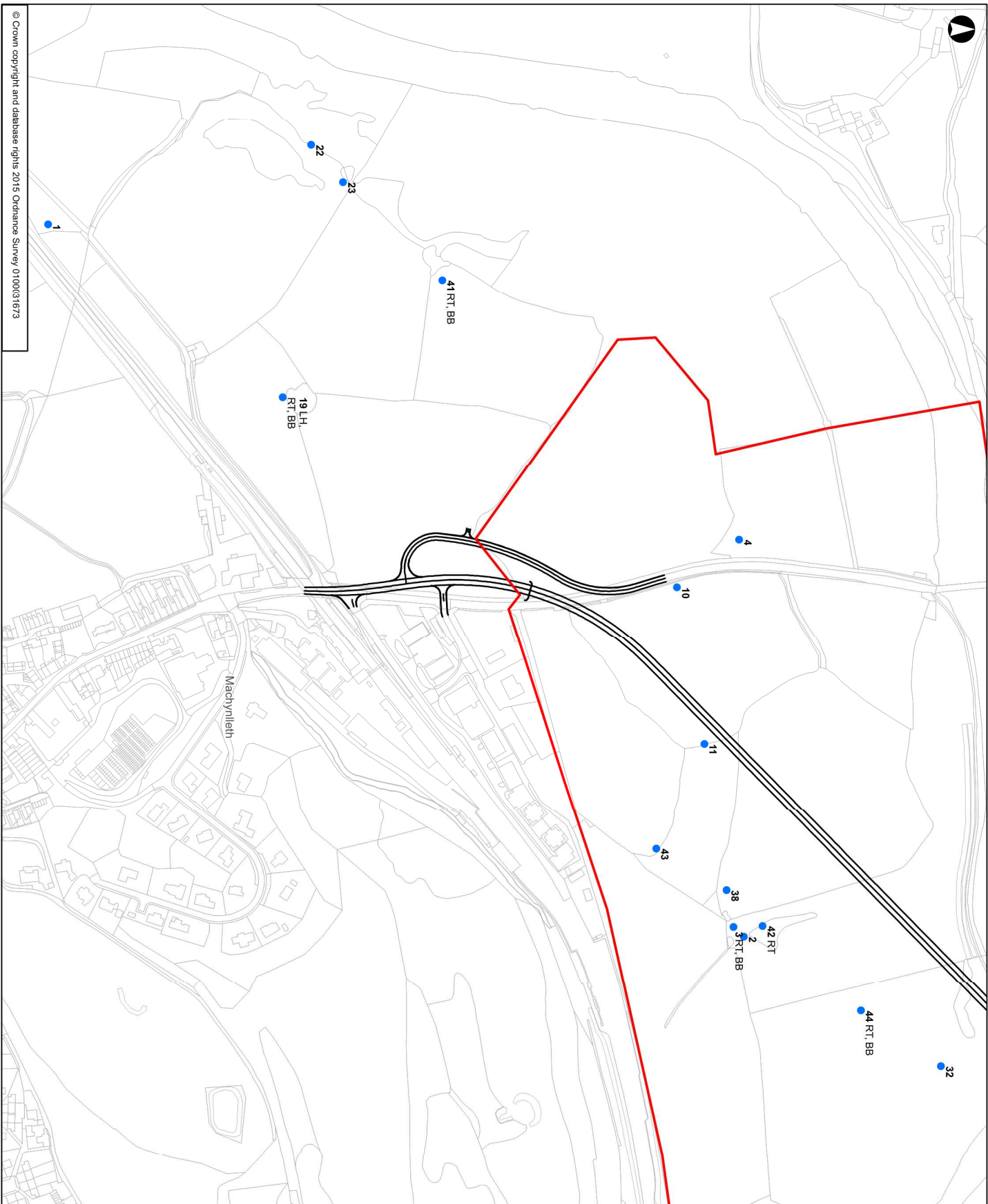
Client

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Project Title
A487 New Dyff Bridge

Drawing Title	Figure 1		
	Amphibian HSI Results		
Scale at A3	1:4,000		
Role	Specialist Designer - Environmental		
Suitability	S0 - Initial non-contractual		
Arup Job No	244562-00	Rev	P01.1
Name	900237-ARP-ZZ-ZZ-DR-YE-00122		

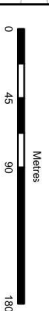
Figure 2 Waterbodies – Presence/Absence Survey



Legend

- Waterbody Location
- Ecology Survey Area
- Proposed Scheme

Labels relate to Waterbody ID
(in bold) and species found



P01.1 | 08/07/16 | AH | PW | JP

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Client
Project Title
A487 New Dyff Bridge

Drawing Title	Figure 2 Amphibian Presence / Absence Results		
Scale at A3	1:3,500		
Role	Specialist Designer - Environmental		
Suitability	S0 - Initial non-contradictal		
Arup Job No	244562-00	Rev	P01.1
Name	900237-ARP-ZZ-ZZ-DR-YE-00123		

Appendix A

HSI Assessment Results

A1

Waterbody number	Waterbody type	HSI score	HSI assessment	Comments
1	Pond	0.53	Below Average	
2	Pond	0.44	Poor	
3	Pond	0.47	Poor	Pond with defunct sluice adjacent, in corner of grazed field
4	Pond	0.48	Poor	
5	Pond	0.48	Poor	
10	Reen	0.57	Below Average	
11	Pond	0.56	Poor	
12	Reen	0.42	Poor	
13	Pond	0.38	Poor	Small ditch at end of hedgerow
14	Pond	0.34	Poor	
17	Reen	0.56	Below Average	
18	Pond	0.35	Poor	Flood in improved grassland
19	Pond	0.51	Below Average	
21	Ditch	0.32	Poor	Wet ditch in marshy improved grassland
22	Reen	0.46	Poor	
23	Pond	0.45	Poor	
25	Pond	0.41	Poor	
28	Pond	0.26	Poor	
29	Pond	0.33	Poor	Flood in marshy grassland
31	Pond	0.24	Poor	
32	Pond	0.33	Poor	
34	Pond	0.50	Below Average	
35	Pond	0.45	Poor	
36	Pond	0.36	Poor	
37	Pond	0.50	Below Average	
38	Pond	0.49	Poor	
39	Pond	0.55	Below Average	

41	Pond	0.50	Below Average	
42	Pond	0.39	Poor	
43	Pond	0.41	Poor	
44	Pond	0.39	Poor	

Appendix B

Presence/Absence Survey Results

B1

Waterbody Number	1	2	3	4	10	11	19	22	23	32	38	41	42	43	44
Survey Visit 1 14/04															
Torching	0	0	0	0	3 Ecls, SB	0	0	RT tadpole	0	0	0	0	0	0	RT tadpole, BB spawn
Bottle Trapping	0	0	1 RT, 1 BB	0	-	0	RT tadpole, SB	-	0	0	0	SB	RT tadpole	0	-
Egg Search	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Refuge Search	0	-	-	0	0	0	0	0	0	0	-	0	0	0	0
Peak GCN count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Survey Visit 2 04/05															
Torching	0		0				2 LH				0	RT tadpole			
Bottle Trapping	-		SB				1 LH, SB, RT and BB spawn				SB	0			
Egg Search	0		0				0				0	0			
Refuge Search	0		-				0				-	-			

Waterbody Number	1	2	3	4	10	11	19	22	23	32	38	41	42	43	44
Peak GCN count	0		0				0				0	0			
Survey Visit 3 17/05															
Torching			-				1 BB, BB tadpole				-	SB, RT spawn			
Bottle Trapping			SB				0				SB	0			
Egg Search			0				0				0	0			
Refuge Search			0				-				0	-			
Peak GCN count			0				0				0	0			
Survey Visit 4 07/06															
Torching			SB				3 LH, RT spawn				SB	RT spawn, SB			
Bottle Trapping			-				1 LH				-	0			
Egg Search			0				0				0	0			
Refuge Search			0				-				0	0			
Peak GCN count			0				0				0	0			

LH = palmate newt, SB = sticklebacks, BB = common toad, RT = common frog. Where acronyms are used without reference to life stage adult forms are assumed.