

Cardiff Parkway Developments Ltd
Cardiff Hendre Lakes
2017 Amphibian and Reptile Survey
Report

Environmental Statement Appendix 7.13

Issue | 11 August 2018

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 252199

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Contents

	Page
1 Introduction	1
1.1 Background to the Project	1
1.2 Survey Objectives	1
1.3 Study Area	1
1.4 Legislation	2
2 Methodology	3
2.1 Desk Study	3
2.2 Survey Methods	3
2.3 Reporting Methods	5
2.4 Limitations and Assumptions	5
3 Results	7
3.1 Desk Study	7
3.2 Field surveys	7
4 Conclusions	12

Figure 1: Habitat suitability assessment results
 Figure 2: Amphibian presence/absence survey results
 Figure 3: Reptile survey results
Appendix A
 Survey Weather Conditions

Appendix B

Figures

1 Introduction

Ove Arup & Partners Ltd has been commissioned by Cardiff Parkway Ltd to undertake baseline ecological surveys in relation to the proposed new station at St. Mellons on the Bristol to South Wales railway line.

This report provides information on amphibian and reptile surveys undertaken in 2017, to inform the development of the project. Surveys were undertaken to determine the presence and/or likely absence of great crested newt (*Triturus cristatus*) within the site, to inform any additional survey or mitigation measures that may be required. This report also details other amphibian species incidentally recorded during the surveys. This report provides commentary on the reptile species range present and distribution of reptile records within the area surveyed.

1.1 Background to the Project

Cardiff Parkway Developments Ltd are proposing to develop a scheme that is an employment led development including a new railway station and park & ride facility. The site, centred on National Grid Reference (NGR) ST251808, and surrounding area are shown on Figure 1.

The site currently consists of predominantly arable and pastoral farming on the western edge of St. Mellons. The site's field boundaries are formed by hedge and tree lines with reens throughout. There is a lake, recreational grassland and woodland to the west of the site. The wider landscape comprises residential and commercial properties, and broad-leaved woodland to the north and west. To the south the land is bisected by the railway line with further neighbouring agricultural land. To the east there is agricultural land.

An extended Phase 1 habitat survey was undertaken in January 2017 (Arup, 2017) to establish the habitats present on site and to assess the potential for legally protected species to be present. As a result of that survey and a desk study of available records, it was considered that there was the potential for amphibians and reptiles to be present and therefore detailed species-specific surveys were required.

1.2 Survey Objectives

The aims and objectives of the surveys were to:

- Determine the presence and distribution, or likely absence of great crested newt within the study area;
- Record the presence of other amphibian species within the study area;
- To determine the presence of reptile species within the study area; and
- To provide sufficient information to inform the assessment of the impacts of the proposed development and design appropriate mitigation.

1.3 Study Area

For the purposes of this study, the great crested newt survey area was based on the initial Phase 1 survey area as shown on Figure 1 and Figure 2, whilst the reptile

survey was undertaken later in the year, and was therefore based on the updated masterplan boundary at the time of the survey, as shown on Figure 3.

1.4 Legislation

European Protected Species

Great crested newt, natterjack toad (*Epidalea calamita*) smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) are protected as a European Protected Species (EPS), under the Conservation of Habitats and Species Regulations 2017(as amended), commonly referred to as the Habitats Regulations. Under this legislation it is an offence to:

- deliberately or recklessly kill, injure or capture them;
- to deliberately or recklessly disturb them such as to affect its ability to breed or its local distribution, and;
- Or to damage, destroy or obstruct access to a breeding site or resting place (e.g. shelter) used by these species.

UK Protected Species

Great crested newt, sand lizard and natterjack toad and smooth snake are also fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Legal protection makes it an offence to:

- intentionally kill, injure or take (capture) these species;
- possess or control alive or dead animal of these species, or any part of them, and;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place which these species use for shelter or protection, or disturb them while they are using such a place.

The Wildlife and Countryside act also provides protection to certain common species of reptiles in relation to killing and injury only. These species are grass snake (*Natrix natrix*), slow worm (*Anguis fragilis*), adder (*Vipera berus*) and common lizard (*Zootoca vivipara*).

Other Legislation Related to Species

A number of amphibian and reptile species are listed as a priority for nature conservation (Priority Species) within the 'UK Post-2010 Biodiversity Framework' Biodiversity Action Plan (UKBAP). Those specifically listed for Wales are slow worm, common toad, natterjack toad, sand lizard, grass snake, great crested newt, adder, and common lizard.

The Environment (Wales) Act 2016 includes a duty on all public authorities to have regard to the conservation of biodiversity in the exercise of their functions. This duty applies to government bodies, local authorities and statutory undertakers. The Act also requires lists to be published of Habitats and Species considered to be of Principal Importance for the Conservation of Biological Diversity. These are referred as Section 7 habitats and species after the sections of the Act which require the publication of lists in each devolved area. The above species are listed as Section 7 Species considered of Principal Importance for the Conservation of Biological Diversity.

2 Methodology

2.1 Desk Study

Biodiversity Information was obtained from the South East Wales Biodiversity Records Centre (SEWBRc)¹ on the 31st January 2017. The search included information for amphibians and reptiles up to 2km from the site centre point, and data was limited to the last 10 years.

2.2 Survey Methods

2.2.1 Amphibians

Habitat Suitability Index (HSI) assessment

A great crested newt habitat suitability index (HSI) assessment was undertaken at the same time as the Extended Phase 1 Survey. The assessment was undertaken in accordance with the methodology set out in Advice Note 5 published by the Amphibian and Reptile Group UK (ARGUK, 2010).

The HSI methodology has been developed to assess the suitability of ponds for use as breeding sites by great crested newts. It was therefore necessary to adapt the methodology to take into account the reens and ditches which characterise the Gwent Levels, and which great crested newts have been found to use to the east of Newport. This was achieved by discounting the area, waterfowl and pond density indices from the HSI assessment. This adaptation of the methodology has previously been accepted by Natural Resources Wales (NRW) on other projects which Arup have undertaken.

A standard form was used to record the assessment for each water body, including the GPS location.

Presence / absence surveys

Great crested newt presence / absence surveys were undertaken in accordance with best practices guidance (Froglife, 2001). This comprised four surveys between mid-March and mid-June, with two surveys being between mid-March and mid-May. The following survey methods were employed:

- Torch survey: A 1 million candlepower Clulite torch was used to search the waterbody margins at dusk. Surveyors walked slowly around or along the entire waterbody using the torch to search for any great crested newts.
- Bottle-trapping: bottle traps made using 2-litre plastic bottles were placed at 45-degree angle within the margins of the waterbodies using bamboo canes tagged with red tape. Bottles were placed at dusk, at different depths within the water column (where there was access). Bottles were left overnight and collected the following morning – with any animals being carefully removed from the bottle, identified and returned to the waterbody. Considerations were given to animal welfare during these surveys, as detailed in the guidance, including not undertaking surveys at during extreme weather conditions and

¹ <http://www.sewbrec.org.uk/home.page>

not being used when air temperatures were $<5^{\circ}\text{C}$. Care was taken to ensure all bottles contained an air bubble.

- **Egg searching:** live and dead vegetation within the waterbodies was searched for great crested newt eggs. Surveyors walked slowly around the margins where possible and checked vegetation within a reachable distance. Any potential eggs were checked by “unwrapping” vegetation, to determine if any eggs were enclosed, and identify whether these were great crested newt eggs.

In accordance with guidance (Froglife, 2001), on each visit all three of the above survey methods were employed where conditions allowed.

For the purposes of the habitat suitability assessment, each waterbody within the survey area was defined as:

- **Pond / Lake** – A semi-stagnant and isolated water body, using filled by a stream or by man-made means and which can dry out;
- **Reen** – Major man-made drainage channel or canalised stream which stays dry for the majority of the year;
- **Ditch** - Minor man-made drainage channel which dries out on a regular basis e.g. field ditches.

The initial survey visit was led by Arup ecologist Claire Pooley MCIEEM; who holds a personal great crested newt survey licence for work in Wales (NRW:67821:OTH:SA:2015) and has over five years’ experience of undertaking great crested newt surveys, completing impact assessments and designing great crested newt mitigation. An Arup ecologist also assisted with these surveys.

The remaining three survey were led by Matthew Attril Grad CIEEM, an ecologist at Wildwood Ecology² who holds a great crested newt survey licence for work in Wales (NRW:75476a:OTH:SA:2017). He was assisted by Wildwood ecologists: Peter Hacker Grad CIEEM and Martin Smith. The weather conditions for each survey visit are provided in **Appendix A**.

Biosecurity measures

The following measures were employed to avoid the spread of amphibian diseases including chytridiomycosis and ranavirus, in accordance with UK Advice Note 4 (ARG UK, 2017):

- Ensure that all surveyors are aware of disease issues and precautions;
- Use survey equipment and footwear dedicated solely to the target site; and
- Store field equipment on site where possible.

All equipment used and which had come into contact with water or amphibians was disinfected at the end of the surveys, using Virkron©, ensuring that all disinfected solutions were poured directly into a sewerage system and flushed with clean water.

2.2.2 Reptile Surveys

The methodology used in this survey followed standard guidance for reptile surveys (Froglife, 1999). The methodology involved the placement of artificial refugia within suitable areas of habitat for reptiles. Given the habitats present on

² <https://wildwoodecology.com/>

site it has been assumed that grass snake are present, and therefore the surveys were targeted to determine the presence of common lizard and slow worm in areas of dryer habitats within the site.

The refugia used during the survey were made from rectangles of roofing felt measuring approximately 1m x 0.5m. A total of 62 refugia were installed on 23rd August 2017, two weeks prior to survey commencement, to allow the refugia to settle and increase the chance of use by reptile populations. The positions of all refuges were recorded via GPS on tablet computers. These were subsequently used to record results of the reptile survey. In addition, any pre-existing suitable artificial or natural refugia on site were also checked as part of the survey.

Seven subsequent survey visits were carried out between 6th September and the 4th October 2017, by ecologists experienced in conducting reptile surveys. At the completion of the survey, all refugia were removed from the study area.

The artificial refugia were checked during early to late morning and/or early afternoon with a starting air temperature of between 13°C until a maximum of 20°C. The weather conditions for each survey visit are provided in **Appendix A**.

Each refuge was lifted carefully to search for reptile species and, where feasible, details of the reptile species, sex, age class and condition of the reptiles encountered were recorded. Once the reptiles had been allowed to escape, the refugia were replaced.

Additional signs of reptile presence such as sloughed skins were also recorded where evident and any live animals observed away from refugia were also recorded.

2.3 Reporting Methods

Information was recorded using standard recording sheets. GPS was used to record the location for recording sheets completed. Field signs or features relevant to the survey were photographed, with a GPS location attached to the digital image.

2.4 Limitations and Assumptions

The findings presented in this study represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys are limited by factors which affect the presence of flora and fauna, factors such as the time of year and natural behaviour of the animals. Nevertheless, these surveys were conducted at the optimal survey periods and using methodologies which are in accordance with published guidelines.

Where there were limitations, surveyors still strove to collect as much relevant information within the survey criteria as possible.

A number of limitations were encountered during the great crested newt presence/absence surveys which included:

- Dense vegetation including vegetation growing in and adjacent to water body stopping access;

- Health and safety concerns with regard to livestock in fields (in particular south of the railway) and steep banks;
- High levels of algae and other vegetation within waterbodies reducing visibility of water;
- Public access, vandalism and theft of bottle traps;
- Security alarms preventing access;
- Dry weather resulting in many waterbodies drying out.

Despite these limitations it is considered that sufficient survey effort has been undertaken to have confidence in the validity of the results.

During the course of the reptile surveys three mats at the northern end of the site were damaged by machinery cutting grass on the end of Faendre Reen. It is not considered that the loss of these mats has compromised the validity of the reptile survey.

3 Results

3.1 Desk Study

There was one record of great crested newt provided by SEWBRcC in the data search, located 950m to the north east from 2008. There were also records of slow worm and common lizard (750m north-east), and grass snake (500m). The full desk study results are provided in the Extended Phase 1 Habitat Survey Report (Arup, 2017).

3.2 Field surveys

3.2.1 Amphibians

HSI Assessments

HSI assessments were undertaken for most water bodies during the initial Extended Phase 1 Habitat Survey. The results of these assessments are shown in Table 1 with locations shown on Figure 1.

Table 1 HSI scores recorded during Extended Phase 1 Survey

Water body	HSI score	HSI Category
1	0.32	Poor
2	0.63	Average
3	0.58	Below average
4	0.63	Average
5	0.69	Average
6	0.69	Average
7	0.63	Average
8	0.71	Good
9	0.57	Below average
10	0.48	Poor
11	No score ³	
12	0.41	Poor
13	0.53	Below average
14	No score	
15	0.6	Average
16	0.68	Average
17	0.62	Average
18	0.62	Average
19	0.53	Below average

³ Some waterbodies were not subject to a HSI assessment or subsequent presence/absence survey due to various limitations as described above

Water body	HSI score	HSI Category
20	0.53	Below average
21	0.62	Average
22	No score	
23	No score	
24	No score	
25	No score	
26	0.63	Average
27	0.45	Poor
28	No score	
29	No score	
30	0.71	Good
31	Not included ⁴	
32	0.63	Average
33	No score	
34	Not included	
35	Not included	
36	Not included	
37	Not included	
38	0.45	Poor
39	Not included	

Presence / Absence Surveys

Presence / absence surveys were undertaken on all water bodies which were of Average or above suitability for great crested newts, although four complete visits could not be undertaken on all water bodies due to the limitations described above. The results of the presence / absence are shown in Table 2 below, with locations shown on Figure 2.

No great crested newts were recorded during the surveys. Palmate newt were recorded in one waterbody (waterbody 5 in the north of the site), and smooth newts were recorded in four of the waterbodies. These were waterbody 5 (in the north of the site), waterbody 8 (Ty Ffynnon reen in the centre of the site), waterbody 16 (south of the railway line), and waterbody 19 (south of the railway line and connected to water body 16). European eel (*Anguilla anguilla*) were also recorded in waterbody 8.

Other notable species recorded during the surveys included common frog and common toad. Stickleback were also recorded, as well as range of aquatic invertebrates such as water scorpion, great diving beetle, dragonfly nymph.

⁴ Waterbodies that are listed as 'Not included' were outside of the 2017 survey boundary but have been included here for ease of comparison between the 2017 and 2019 survey results.

Table 2 Presence / Absence Survey Results⁵

Water body	HSI Score	First visit		Second Visit		Third visit		Forth visit	
		Methods	Results	Methods	Results	Methods	Results	Methods	Results
1	0.32	B,T,E	Bottles stolen	Not surveyed due to human disturbance					
2	0.63	B,T,E	No amphibians	Not surveyed due to human disturbance					
3	0.58	Not included							
4	0.63	T	No amphibians	Dry					
5	0.69	B,T,E	1 smooth, 1 palmate newt	Dry					
6	0.69	B	Stickleback	T	No amphibians	T	No amphibians	T	No amphibians
7	0.63	B,T,E	Great diving beetle	B,T	No amphibians	B,T	No amphibians	B,T	Juvenile fish
8	0.71	B,T,E	1 male, 2 female smooth newts	B,T	1 smooth newt, eel, frog, toad, fish	B,T	Frog, fish	B,T	Frog, fish
9	0.57	Not included							
10	0.48	Not included							
11	No score	Not included							
12	0.41	Not included							
13	0.53	Not included							
14	No score	Not included							
15	0.6	T	No amphibians	Dry					
16	0.68	B,T	1 male, 1 female smooth newt	T	No amphibians	T	No amphibians	T	No amphibians
17	0.62	B,T,E	No amphibians	Dry					
18	0.62	B,T	No amphibians	B,T	No amphibians	Inaccessible			

⁵ B = Bottle trapping; T = Torching; E = Egg searching

Water body	HSI Score	First visit		Second Visit		Third visit		Forth visit	
		Methods	Results	Methods	Results	Methods	Results	Methods	Results
19	0.53	B,T,E	1 male smooth newt	T	No amphibians	Inaccessible			
20	0.53	Not included							
21	0.62	B,T,E	No amphibians	Dry		Inaccessible			
22	No score	Not included							
23	No score	Not included							
24	No score	Not included							
25	No score	Not included							
26	0.63	B,T,E	No amphibians	B,T	No amphibians	B,T	No amphibians	B,T	Juvenile fish
27	0.45	Not included							
28	No score	Not included							
29	No score	Not included							
30	0.71	B,T,E	No amphibians	B, T	Frog	B,T	Fish present	B, T	No amphibians
31	Not included	Not included							
32	0.63	T	No amphibians	T	No amphibians	T	No amphibians	T	No amphibians
33	No score	Not included							
34	Not included								
35	Not included								
36	Not included								
37	Not included								
38	0.45	Not included							
39	Not included								

3.2.2 Reptiles

Grass snake were recorded on two occasions under one refuge. This was a juvenile snake approximately 15cm long recorded under refuge number 121 in the north of the site. In addition, an adult grass snake was recorded basking on an area of grass during the deployment of the refugia. The locations of these records are shown on Figure 3. No other reptile species were recorded during the surveys. Common toad were recorded using the refugia in the west of the site.

4 Conclusions

The surveys have confirmed the presence of common amphibian species such as common frog, common toad, smooth newt and palmate newt. No great crested newts were recorded during the survey and it is therefore assumed that this species is likely to be absent from the site.

The surveys also confirmed the assumption that grass snake are present within the site. No slow worms or common lizards were recorded using the site, however these species are known to occur at low densities within areas and are not always detected during surveys. It cannot therefore be discounted that they may be present within the site at such low densities.

This report is the result of survey work undertaken between April and October 2017. This report refers, within the limitations stated, to the condition or proposed works of the site at the time of the surveys. Changes in legislation, guidance, best practice, etc. may necessitate a re-assessment/survey. No warranty is given as to the possibility of future changes in the condition of the site.

References

References

- ARG UK. (2017). *Amphibian Disease Precautions: A Guide for UK fieldworkers*. London: ZSL Institute of Zoology.
- ARGUK. (2010). *Advice Note 5: Great Crested Newt Habitat Suitability Index*.
- Arup. (2017). *Cardiff Hendre Lakes | 2017 Extended Phase 1 Habitat Survey Report*. Bristol: Ove Arup & Partners Ltd.
- Froglife. (1999). *Froglife Advice Sheet 10: Reptile Survey*. London.
- Froglife. (2001). *Great Crested Newt Conservation Handbook*.

Appendix A

Survey Weather Conditions

Table 3 Amphibian Survey Weather Conditions

Date	Temp. °C	Wind Speed	Wind Direction	Cloud Cover	Conditions
20/04/2017 (PM)	13	1	SW	100	Dry
21/04/2017 (AM)	8	1	SW	90	Dry
19/05/2017 (PM)	13	1	W	75	Dry
20/05/2017 (AM)	9	1	W	75	Dry
14/06/2017 (PM)	21	1	NW	80	Dry
15/06/2017 (AM)	13	1	NW	80	Dry
19/06/2017 (PM)	29	1	NW	50	Dry
20/06/2017 (AM)	20	1	NW	50	Dry
23/08/2017	20	2	NE	90	Sunny
06/09/2017	17	1	W	70	Dry
08/09/2017	16	1	W	100	Light showers
15/09/2017	16	1	S	70	Heavy showers
18/09/2017	14	1	SW	85	Sunny
22/09/2017	16	2	S	50	Sunny
27/09/2017	16	1	SE	100	Dry
04/10/2017	13	1	NE	90	Dry

Table 4 Reptile Survey Weather Conditions

Survey Visit	Date	Temp. °C	Wind Speed	Wind Direction	Cloud Cover	Conditions
Deployment	23/08/2017	20	2	NE	90	Sunny
#1	06/09/2017	17	1	W	70	Dry
#2	08/09/2017	16	1	W	100	Light showers
#3	15/09/2017	16	1	S	70	Heavy showers
#4	18/09/2017	14	1	SW	85	Sunny
#5	22/09/2017	16	2	S	50	Sunny
#6	27/09/2017	16	1	SE	100	Dry
#7	04/10/2017	13	1	NE	90	Dry

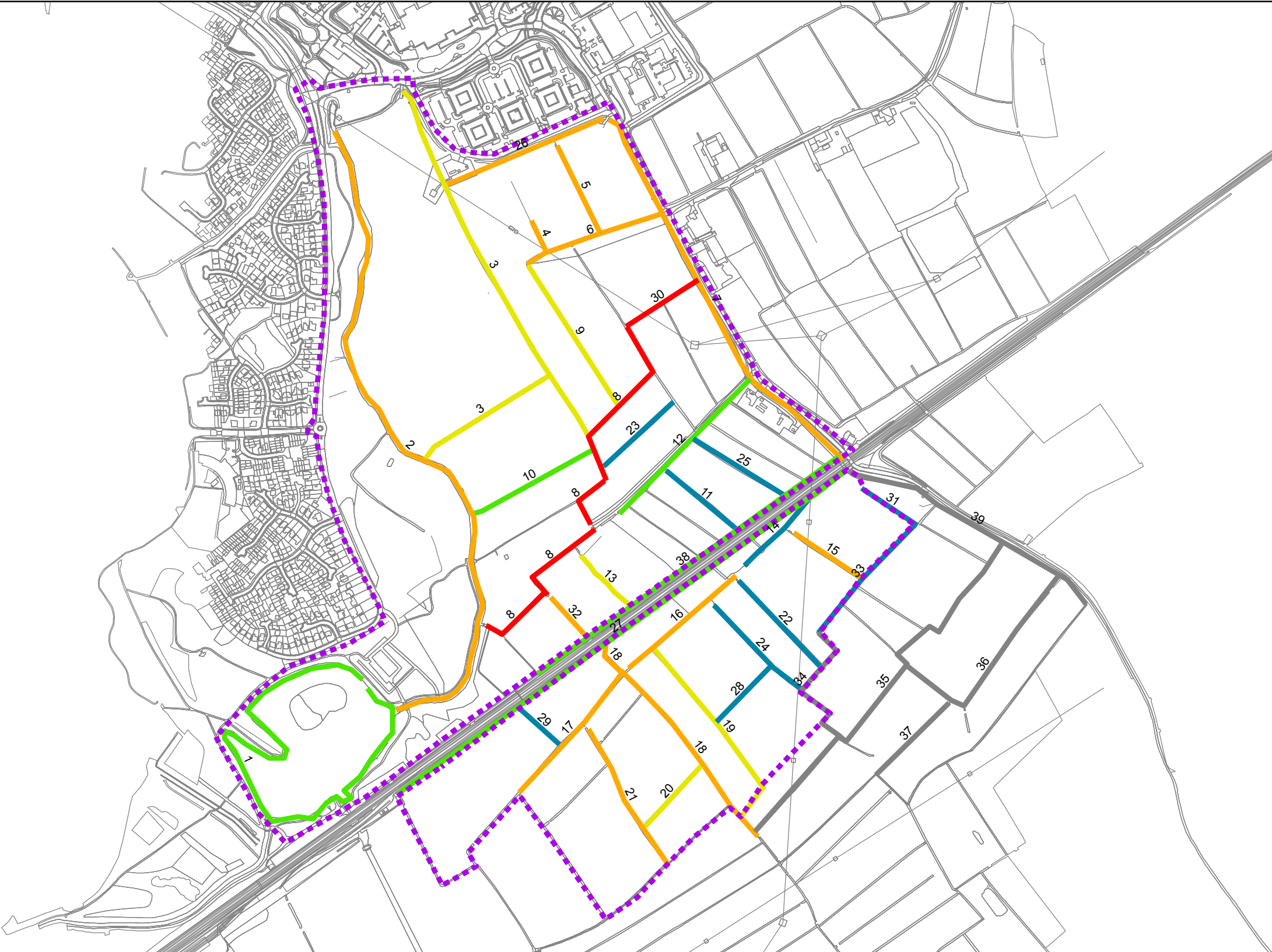
Appendix B

Figures

Figure 1: Habitat suitability assessment results

Figure 2: Amphibian presence/absence survey results

Figure 3: Reptile survey results

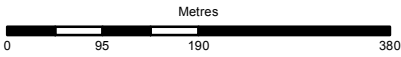


Legend

- Survey area boundary
- Good
- Average
- Below average
- Poor
- Unsuitable
- Not included

F1	2018-07-31	PW	PC	PC
Issue	Date	By	Chkd	Appd

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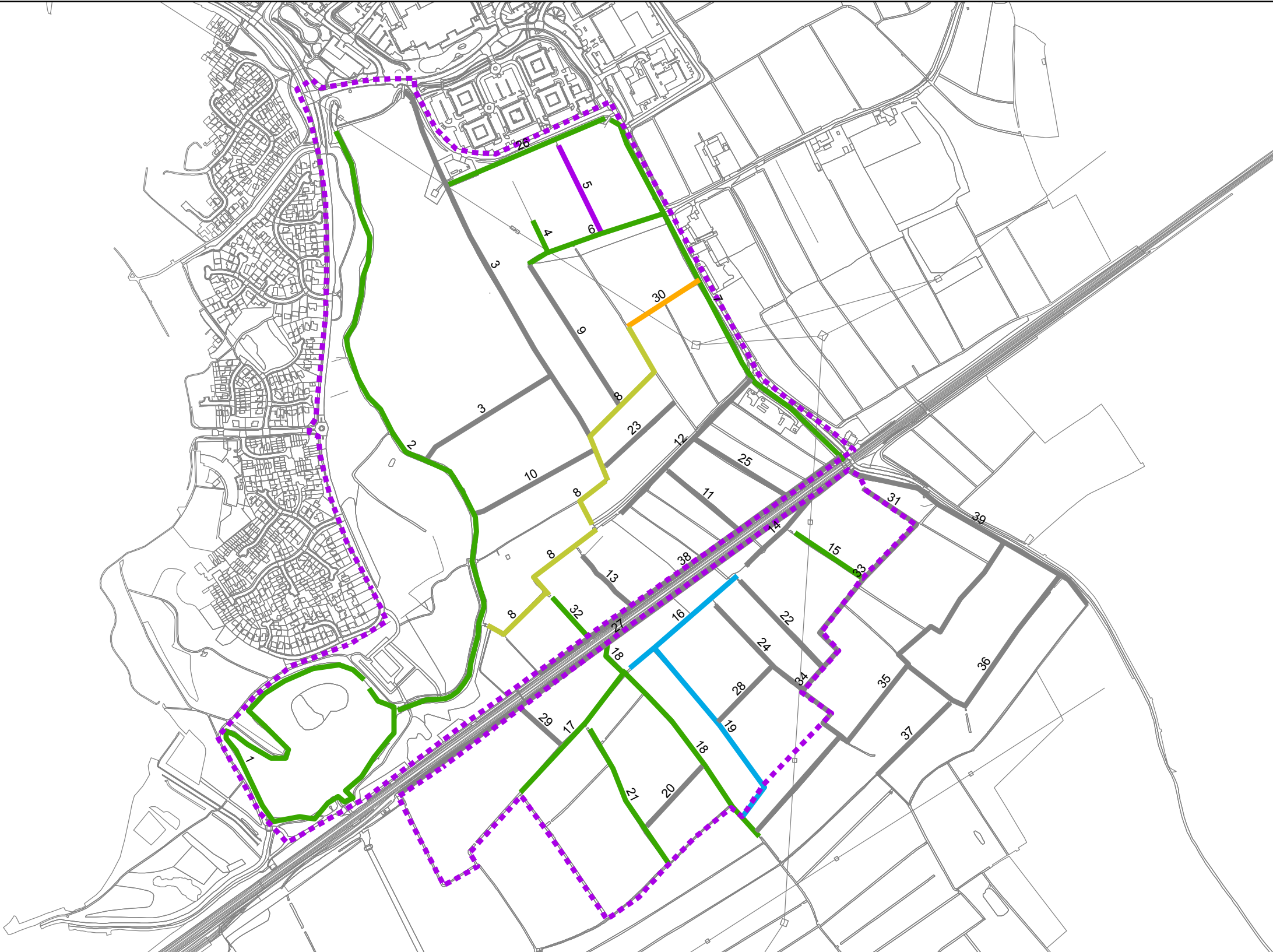
Job Title
Cardiff Hendre Lakes

Habitat Suitability Assessment Results

Scale at A3

1:7,500

Job No 252199-00	Drawing Status For Issue
Drawing No 001	Issue F1



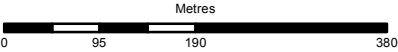
Legend

- Survey area boundary
- Smooth newt
- Smooth newt; frog; toad
- Smooth newt; palmate newt
- Frog
- Absent
- Not included

F1	2018-07-31	PW	PC	PC
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Issue	Date	By	Chkd	Appd
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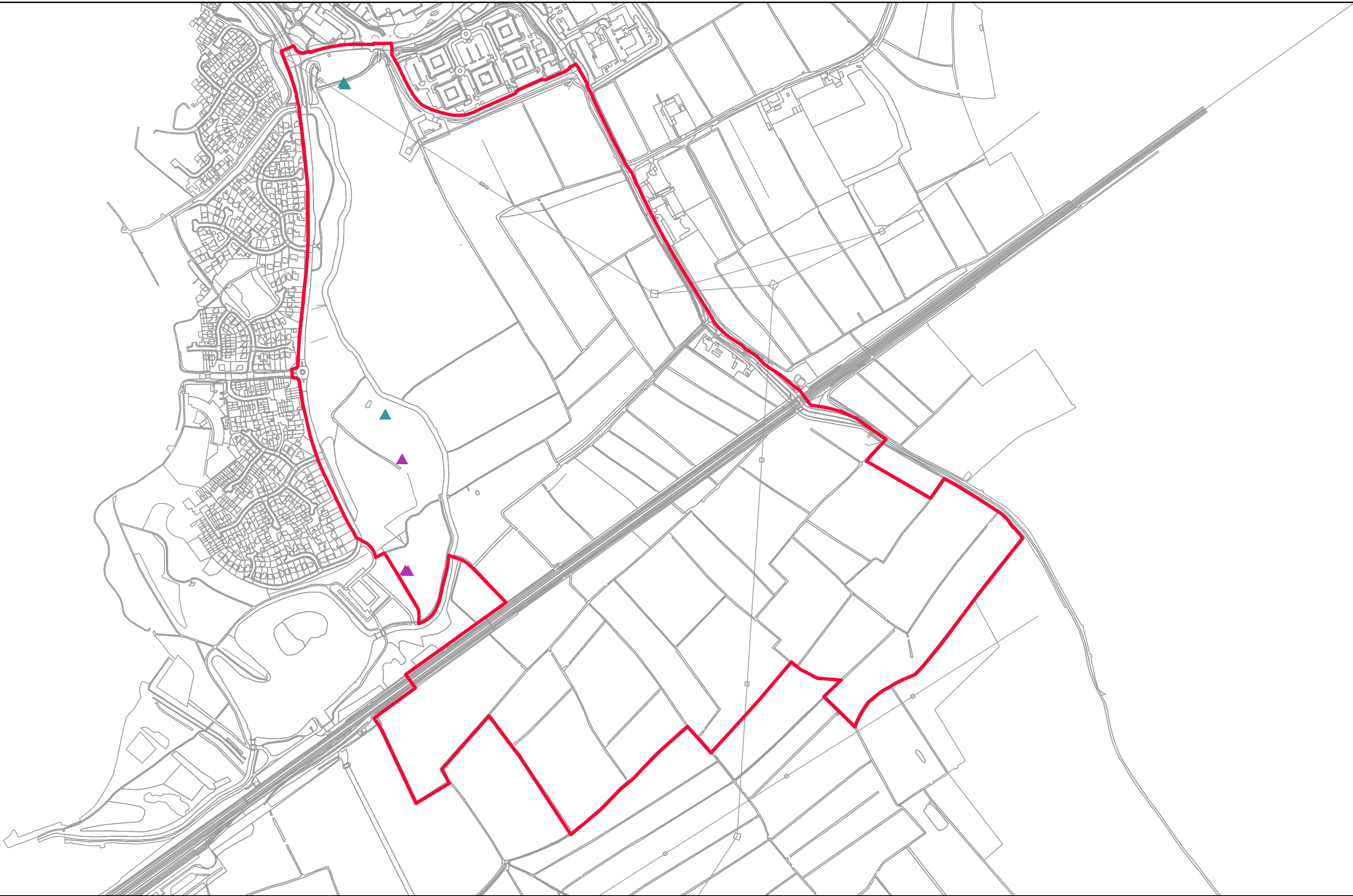
Client
Cardiff Parkway Developments Ltd

Job Title
Cardiff Hendre Lakes

Amphibian Presence/Absence
Survey Results

Scale at A3
1:7,500

Job No 252199-00	Drawing Status For Issue
Drawing No 002	Issue F1



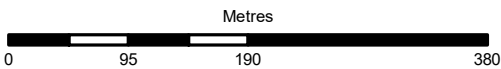
Legend

- Grass snake;
- Toad;
- Study Area Boundary

F1	2018-07-03	PW	PC	PC
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Issue	Date	By	Chkd	Appd
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Client
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Job Title
Cardiff Hendre Lakes

Reptile Survey Results

Scale at A3
1:7,500

Job No 252199-00	Drawing Status For Issue
Drawing No 003	Issue F1