Cyfoeth Naturiol Cymru
Natural Resources Wales

Llyn Tegid Reservoir Safety Improvements

Bat Roost Potential Survey Report

October 2018

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BAT ROOST POTENTIAL REPORT

CONTENTS

Details of document preparation and issue:

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P01	Matt Rung	Emma Stevens	Rob Moore	12/04/18	FINAL
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1. INTRODUCTION

1.1 Background

Natural Resources Wales (NRW) are undertaking a flood risk management appraisal study for Llyn Tegid, Gwynedd, North Wales. Llyn Tegid is a natural lake with approximately 2,950m of embankment. The outflow is controlled by Bala Sluices, which is a gated control structure that controls the combined outflow from Llyn Tegid and the Afon Tryweryn. This allows Llyn Tegid to be used for flood control and to regulate the River Dee downstream.

Llyn Tegid is registered as a Category A Large Raised Reservoir under the Reservoirs Act 1975. As such there are additional legal duties on NRW which include formal inspection by an Inspecting Engineer (IE) from a Reservoir Panel (registered with DEFRA) and compliance with recommendations made by the IE within their report (known as a Section 10 report). Following a Section 10 report in November 2014, modifications to impounding structures at Llyn Tegid are required to satisfy Measures in the Interest of Safety (MIOS).

A Preliminary Ecological Appraisal (Enfys Ecology, 2017) assessed the survey area for bats and stated '*if it is necessary to fell or cut any of the mature trees here then the tree (s) must be subject to a bat inspection'.* Planning permission for the Scheme is anticipated to be sought in Summer 2018.

1.2 Site Context and Scope

The site is situated along the banks of the eastern edge of Llyn Tegid and the River Dee/Tryweryn. The embankments at Llyn Tegid provide a mature, extensive and continuous band of trees close to water which are likely to support a high volume of invertebrate prey for bats. The river corridor is also well connected to the adjacent field boundary network, allowing commuting and dispersal across the wider landscape.

There are individual trees potentially subject to felling to enable the flood protection works within the survey area and an annotated diagram of these can be found in Appendix A.

The survey methodology is detailed in Section 2. The survey results are presented in Section 3 with detailed survey results provided in Appendix B. Recommendations are discussed in Section 4.

At this stage detailed design for the works has not been confirmed therefore this report builds on current design information to provide recommendations. The current scope of works involves protecting the embankments (keep embankments at existing level and install erosion protection on the downstream slopes).

At the time of writing, removal of most of trees on the downstream (landward side) slope and 2-3m past the toe are likely. There is the potential to remove all trees along the upstream (lake side) slope of the embankment and for the purposes of this report this has been assumed. A compound/lay down area will be located in one field to the north west of the Scheme with most trees likely to be undisturbed but trees to the southern corner of the field may need to be removed. Trees likely to be retained during the Scheme works are also shown in Appendix A.

The objective of the survey was to establish which trees that may potentially be felled have bat roost potential. This would allow an assessment of potential impacts to be made, along with proposals for further survey recommendations.

1.3 Legislative Framework

All native UK bat species are fully protected by UK law under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended), and under Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended).

The relevant sections of the Wildlife and Countryside Act make it an offence to:

- Deliberately kill, injure or capture bats;
- Intentionally, deliberately or recklessly disturb roosting bats or obstruct access to their roosts. Disturbance includes any activity that is likely to impair their ability to survive, breed or reproduce, or to rear or nurture young or to hibernate or to affect significantly the local distribution or abundance of the species to which they belong; and
- Damage or destroy bat roosts (including if bats are absent).

Offences under this legislation carry a maximum penalty of imprisonment for up to six months and/or a fine not exceeding Level 5 on the standard scale, or both (currently up to £5000).

Where it is considered likely that proposals would result in an offence in respect of the Conservation of Habitats and Species Regulations (2010) (as amended), it may be necessary to apply for a European Protected Species Licence (EPSL) in respect of bats from NRW to allow the activity to proceed. A licence can only be issued where the following three tests are satisfied, namely:

- to preserve public health and safety or other imperative reasons of overriding public interest;
- there is no satisfactory alternative; and
- that the proposals will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

1.4 Environment (Wales) Act 2016

In addition to species protected by UK law, searches were made for protected species and notable habitats and species i.e. Section 7: Priority species and Habitats covered by The Environment (Wales) Act 2016,

The following priority bat species of relevance to the Llyn Tegid Scheme are represented within Section 7 of The Environment (Wales) Act and form part of the Bat Action Plan for Wales:

- common pipistrelle;
- soprano pipistrelle bat;
- greater horseshoe;
- lesser horseshoe;
- noctule;
- barbastelle;

- bechstein's; and
- brown long-eared.

The local BAP for Snowdonia National Park Authority [April 2018] contains an action plan for lesser horseshoe bats.

2. METHODOLOGY

2.1 Bat Roost Potential Field Survey

All Black & Veatch bat surveys are undertaken according to standard best practice survey guidelines, which include: The Bat Mitigation Guidelines (2004); The Bat Workers Manual (2004); and The Bat Conservation Trust, Bat Surveys for Professional Ecologists – Good Practice Guidelines 3rd Edition 2016.

A bat roost potential survey was undertaken on 26th/27th/28th March 2018. Black & Veatch Senior Ecologist Matt Rung MCIEEM carried out inspections of trees within the survey area which were considered likely to be directly or indirectly affected by the Scheme proposals.

All trees were inspected externally from the ground, to determine their suitability for access by roosting bats. Close focusing binoculars, powerful spot-lamps and an endoscope were used where necessary and a photographic record was made of trees with roost potential. Photographs are provided in Appendix C. Searches were made for bat presence, including:

- Actual bat presence (live or dead);
- Accumulation of bat droppings;
- Feeding remains (e.g. butterfly wings);
- Smear or scratch marks around roost entrance holes; and
- Urine staining.

Trees

A number of trees were identified within the survey area. The surveyor recorded a general description of each group of tree (e.g. tree species, age, description of features, etc).

Groups of trees identified during the survey were labelled using the following numbering system ‘G1’, ‘G2’, ‘G3’ etc. as shown on Figure 1, Appendix A. Individual trees of interest were labelled using numerical values ‘1’, ‘’2’ etc. as shown on Figure 1.

Bat Roost Potential Assessment

Upon completion of the inspections, each tree/group of trees was categorised according to its potential to support roosting bats (termed its ‘bat roost potential’). The categories used are: ‘Confirmed’, ‘High’, ‘Medium’, ‘Low’ and ‘Negligible’ potential for use by bats. See Table 1 for descriptions of these categories (based on Mitchell-Jones, 2004 and Collins, 2016.

The value of the surrounding habitat for foraging and commuting bats was also quantified on a continuum from low to high in accordance with the BCT Survey Guidelines (Collins, 2016) and used to inform the overall bat roost potential scoring.

Table 1: Bat Roost Potential Assessment Scorings

Value	Description
Confirmed	Confirmed signs of bat presence/occupation (droppings, oily staining around entry points, food remnants, odour, scratching) and actual bat presence.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by large numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
Low	A tree of sufficient size and age to contain potential roost features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.
Negligible	Negligible habitat features on site likely to be used by roosting bats

2.2 Survey Limitations

There were no limitations to this survey.

3. RESULTS

3.1 Bat Roost Potential Field Survey

(a) Tree/Tree Group Assessment

The survey identified a number of trees that were considered to have some potential to be affected by the Scheme's proposals. These were as follows:

- 26 groups of trees; and
- 125 trees.

None of these trees were assessed as having a 'confirmed' bat roost potential i.e. no signs of bat presence (e.g. droppings, urine staining, feeding remains, or actual bats) were recorded at this time.

A summary of the bat roost potential assessment results for the Scheme are provided in Table 2 below.

Table 2: Bat Roost Potential Assessment Scorings

Bat Roost Potential	Tree groups	Trees
Confirmed	0	0
High	0	6
Moderate	1	26
Low	4	14
Negligible	21	79
Inaccessible	0	0
TOTAL	**26**	**125**

Details for each tree can be found in Appendix B and tree locations are shown in Appendix A.

(b) Foraging and Commuting Habitat

It is considered that the survey area supports moderate value foraging and commuting habitats. Although moderate value, the survey area supports pockets of moderate/high quality habitat with rows of trees alongside Llyn Tegid and part of Afon Tryweryn which are linked to hedgerows and the wider landscape. However, the area surrounding the Dee is of less value, the space open and pastoral with scattered trees, and overall the survey area is considered to be moderate value. The survey area is linked to high quality bat habitat to the north of Station Rd with both sides of Afon Tryweryn lined with trees and adjacent to woodland.

There is the potential to remove the line of trees on the embankments at Llyn Tegid/Afon Tryweryn and it is considered that the development is likely have an impact on foraging and/or commuting bats. Further recommendations to assess the level of impact on foraging/commuting bats are outlined in Section 4 and this should be used to inform any mitigation for habitat compensation.

4. RECOMMENDATIONS

The following recommendations are made in respect of bats for the proposed Llyn Tegid Scheme. Please note that any revision to the Scheme design relating to tree or works proposals following issue of this report, may necessitate revision of these recommendations. Recommendations are provided in the below table (Table 4) with survey recommendations made based on both bat roost potential and type of feature (ivy present or absent). In addition to recommendations in Table 4, recommendations are also made with regards to bat commuting and foraging value.

Table 4: Bat Survey Recommendations for Trees/Tree Groups

Bat Roost Potential and Features Present	Survey Recommendation	Number of Trees and Tree/Group number requiring further survey	Trees not planned to be removed and/or no survey required
High bat roost potential and trees with cavities/splits etc. but little or no ivy present.	Aerial inspection of individual trees **or three** emergence/re-entry surveys per tree (May-September)	**4 trees** (trees 7, 8, 15, 94)	**2 trees** (41, 64)
Moderate bat roost potential with cavities/splits etc. but little or no ivy present.	Aerial inspection of individual trees **or two** emergence/re-entry surveys per tree (May-September)	**6 trees** (trees 4, 5, 18, 19, 95, 125)	**1 tree** (58)
Moderate bat roost potential with moderate/dense ivy and sometimes observed cavities/splits etc.	**Two** emergence/re-entry surveys per tree (May-September); Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy.	**16 trees plus 1 group** (trees 12, 32, 33, 34, 53, 54, 55, 96, 97, 99, 103, 104, 105, 106, 115, 116 Group 2 (6 trees)	**3 trees** (61, 63, 66)
Low bat roost potential trees with moderate covering of ivy having the	Remove trees during winter to avoid individual summer/transition	**7 trees and 2 groups** (49, 50, 51, 91, 92, 107,	**4 trees** (46, 62, 67, 68). In addition 3 trees and two groups contained low bat roost potential

Bat Roost Potential and Features Present	Survey Recommendation	Number of Trees and Tree/Group number requiring further survey	Trees not planned to be removed and/or no survey required
potential to support summer transition roosts and unlikely to support other potential roots features.	roosts (November-March). If this cannot be achieved ivy should be severed at the base and supervise the ivy removal for potential roost features.	108 Groups 3, 4)	and are potentially due to be removed, but no further survey is considered necessary owing to limited risk to bats (sparse ivy covering for example) (35, 36, 85, Groups 21 and 22)

Surveys where aerial inspections and emergence/re-entry surveys have been recommended have the potential for just one survey type to be undertaken (either aerial or emergence/re-entry). Aerial inspections have the potential to be quicker involving one climb and inspect but if this fails (health and safety, endoscope can't reach some features) then emergence/re-entry survey may need to be undertaken in addition to aerial inspections.

As the survey area contains moderate value commuting and foraging habitat and this habitat has the potential to be severed, it is recommended that one transect survey per month (April-October inclusive) should be conducted, with at least one of the surveys comprising dusk and pre-dawn within one 24 hour period. In addition to this, two static detectors should be deployed within the survey area per month (April to October inclusive) for five consecutive nights in appropriate weather conditions for bats.

European Protected Species Licence (EPSL). Should the presence of roosting bats be confirmed during any further survey, it may be necessary to apply for a Natural Resources Wales European Protected Species Licence (EPSL). The EPSL includes a full mitigation package, which is likely to include: appropriate timing of works; use of appropriate bat friendly demolition/exclusion methodologies; provision of replacement roosting; and monitoring of replacement roosts. A licence application will take approximately 10-12 weeks to obtain once all necessary surveys have been completed.

Compensation Measures. As trees are planned to be removed as part of the Scheme it is recommended that compensation for features damaged or destroyed during the Scheme is sought.

5. REFERENCES

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). The Bat Conservation Trust, London.

Enfys Ecology (2017) Llyn Tegid Embankments, Bala, Gwynedd: Preliminary Ecological Appraisal

Hundt L (2012) Bat Surveys: Good Practice Guidelines, 2nd edition, Bat Conservation Trust

Mitchell-Jones, A.J, & McLeish, A.P. Ed., (2004) Bat Workers' Manual.

APPENDICES

APPENDIX A: PRELIMINARY BAT GROUND INVESTIATION PLAN

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

LEGEND:

BAT ROOST POTENTAL SCORE

- HIGH
- MODERATE
- LOW
- NEGLIGIBLE
- TREES NOT PLANNED TO BE REMOVED

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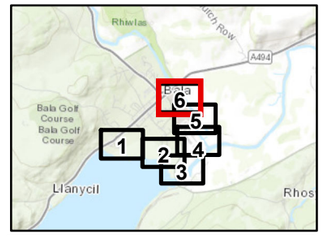

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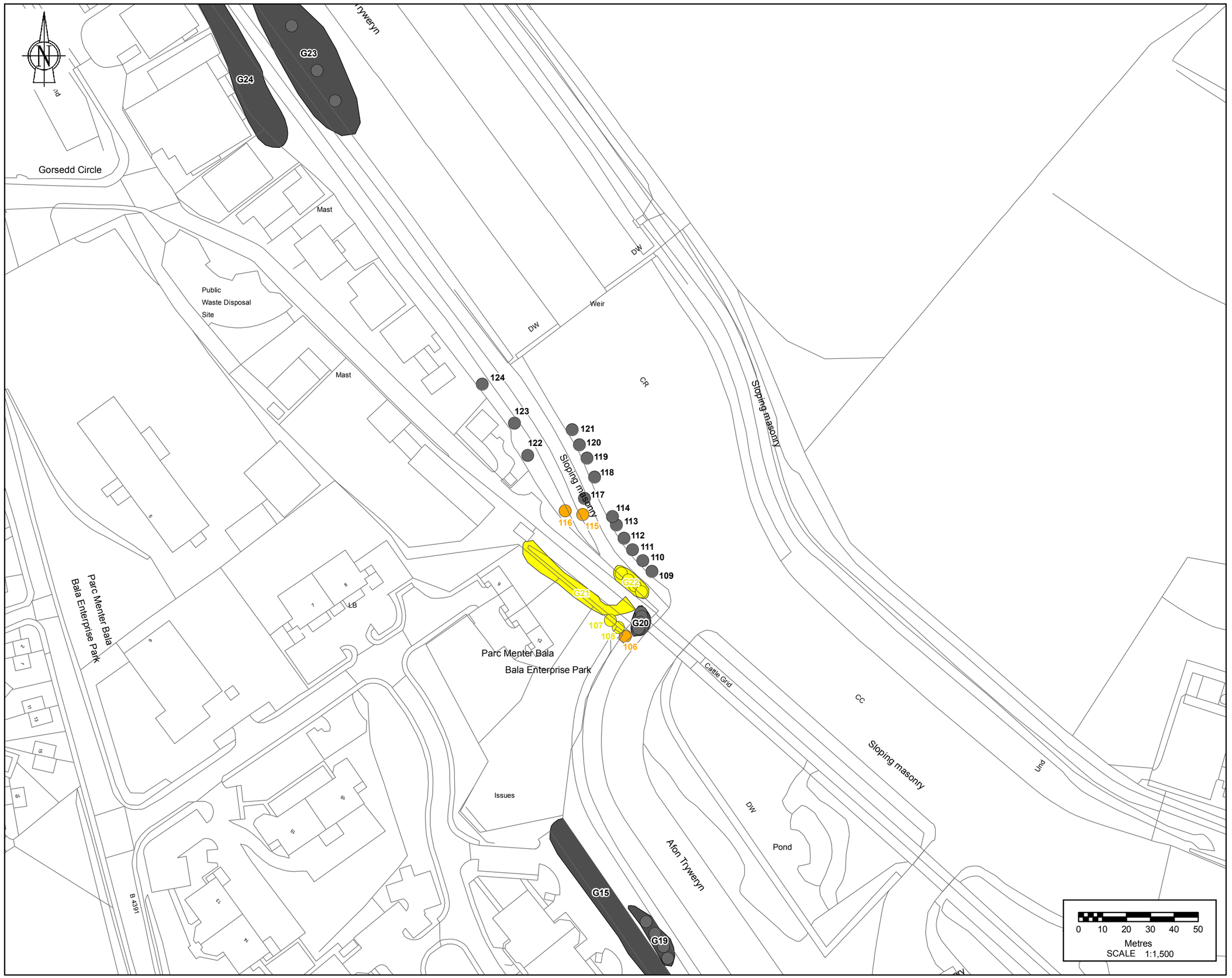

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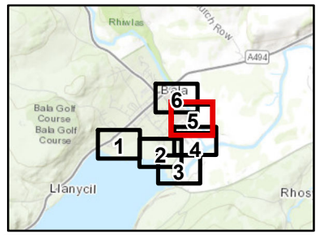

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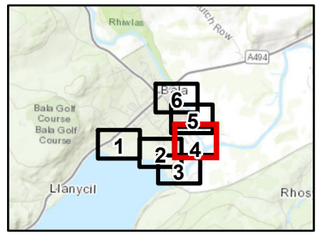

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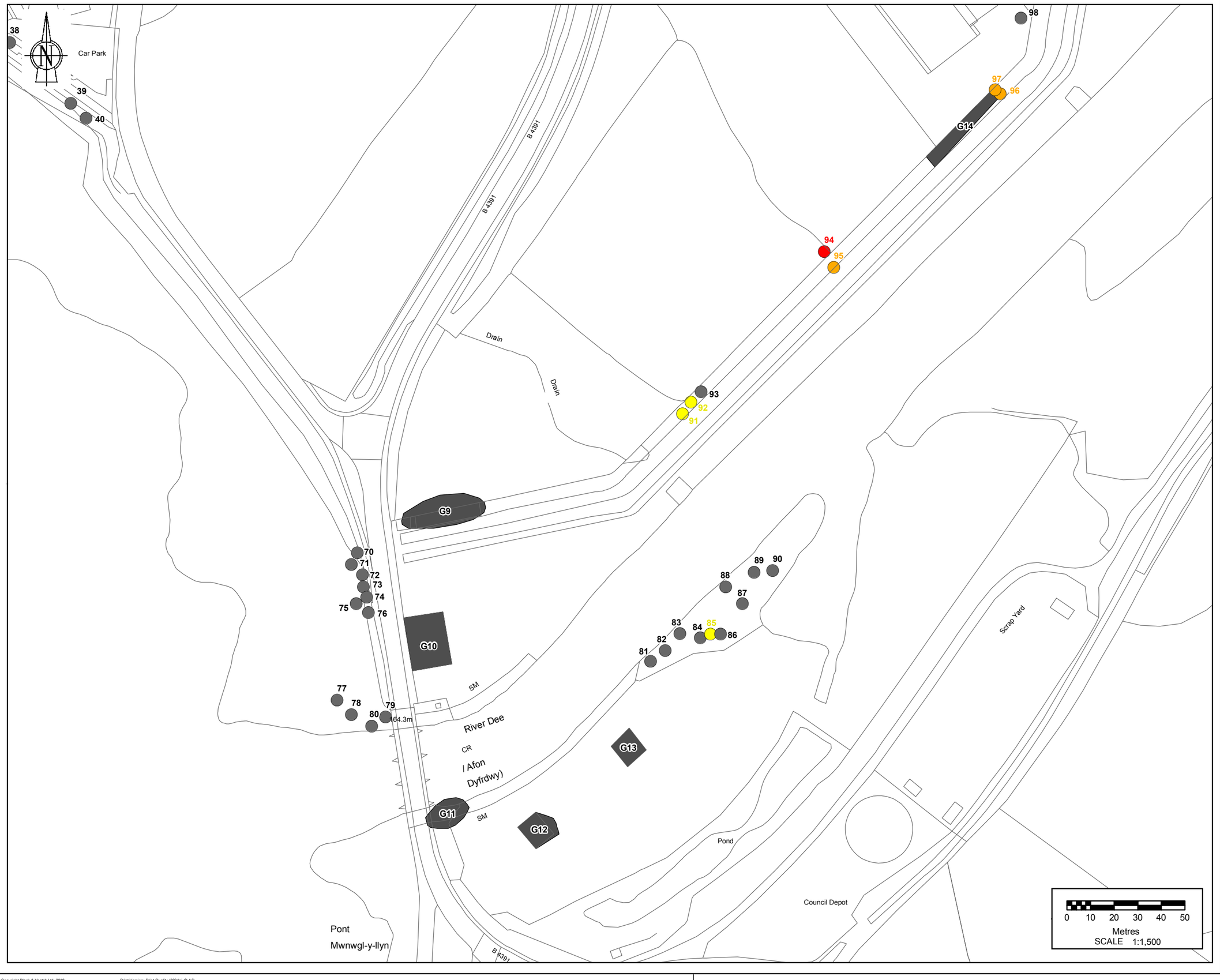

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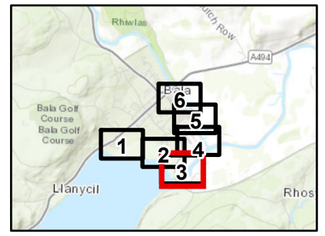

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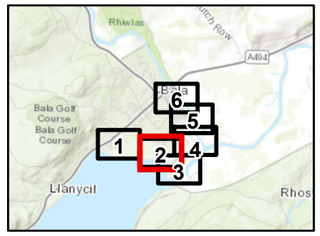

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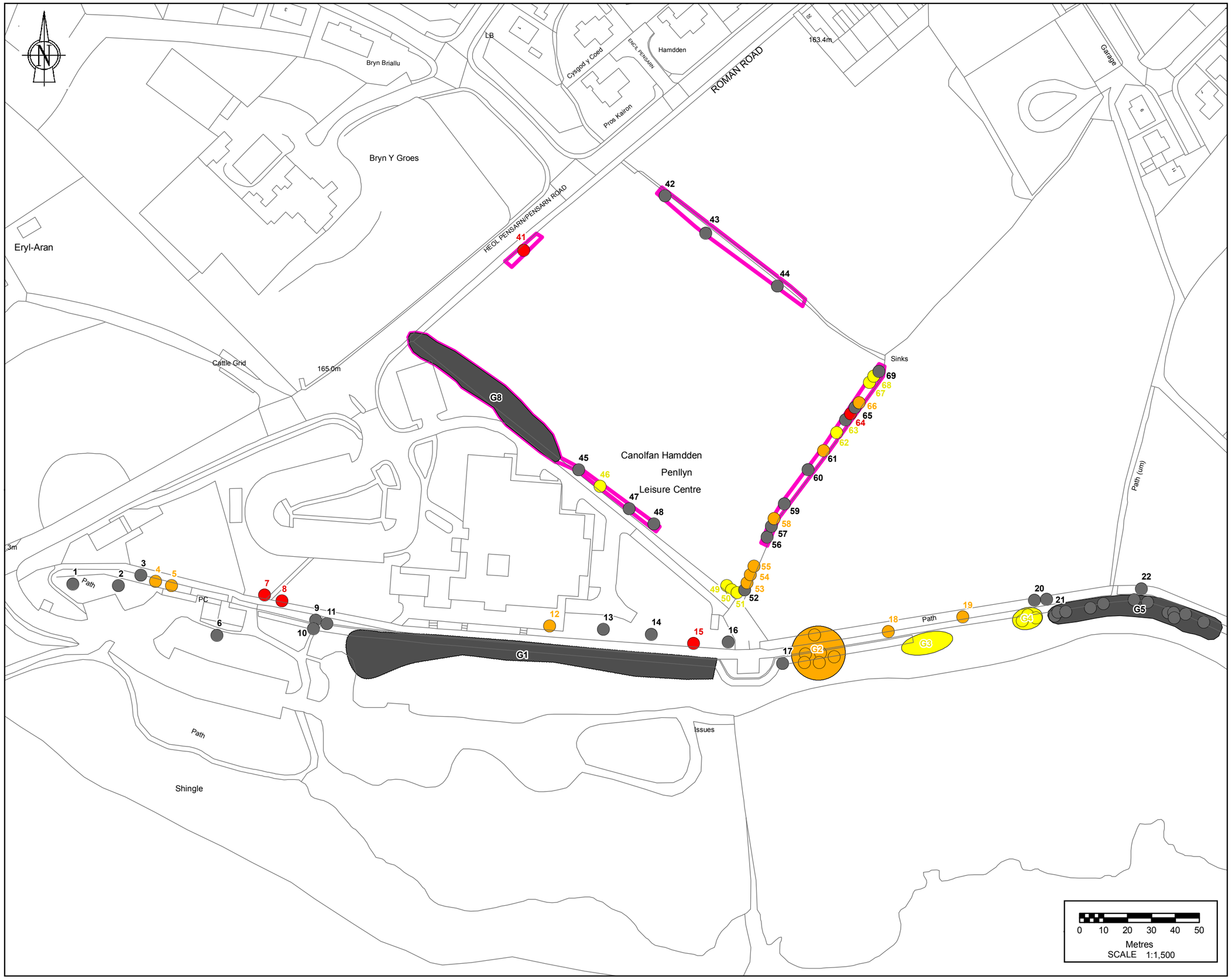

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- NEGLIGIBLE
- TREES NOT PLANNED TO BE REMOVED

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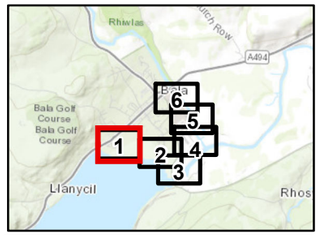

SAFETY HEALTH AND ENVIRONMENT INFORMATION

IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

CONSTRUCTION

NOT APPLICABLE

MAINTENANCE / CLEARING / OPERATION

NOT APPLICABLE

DECOMMISSIONING / DEMOLITION

NOT APPLICABLE

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	ZO	MR	EAS	RM	12/04/2018	SUITABLE FOR INFORMATION

Designed by: ZO Date: APRIL 2018

Client

Cyfoeth Naturiol Cymru Natural Resources Wales

Client Drawing No. | Revision

BLACK & VEATCH
Building a world of difference.
Black & Veatch Limited
Registered Office
60 High Street, Redhill, Surrey RH1 1SH, United Kingdom
Tel: +44(0)1737 774155 E-mail: bvl@bv.com

Project:

LLYN TEGID

Drawing title:

PRELIMINARY BAT GROUND INVESTIGATION PLAN PAGE 1 OF 6

Drawing scale: 1:1,500 @ A3 Sheet size: A3

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APPENDIX B: BAT ROOST POTENTIAL OF TREES

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
1	Cherry	0.6-1	5-7	M								No suitable potential roost features (PRF) present				X	Potentially removing	None
2	Cherry	0.6-1	5-7	M								No suitable potential roost features (PRF) present				X	Potentially removing	None
3	Beech	1-1.5	10-12	M								No suitable potential roost features (PRF) present				X	Potentially removing	None
4	Unknown	1-1.5	10-12	M		X						Two small sections of loose bark (8m) and possible cavity but couldn't see due to height.		X			Potentially removing	Aerial inspection or emergence/re-entry (2 visits) May-September
5	Horse chestnut?	1.5	10-12	M			X					Three upward leaning cavities on all sides 4-		X			Potentially removing	Aerial inspection or emergence/re-entry (2 visits) May-September

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												6m						
6	Horse chestnut?	0.8-1.2	6-8	M								No suitable potential roost features (PRF) present				X	Potentially removing	None
7	Ash	1.5	12	M			X					One east and downward facing cavity at 6m from ground on main trunk	X				Potentially removing	Aerial inspection or emergence/re-entry (3 visits) May-September
8	Horse Chestnut	1-1.5	10	M	X		X					Cracks fissures and holes in several places (between 4-8m)	X				Potentially removing	Aerial inspection or emergence/re-entry (3 visits) May-September
9/10/11	Birch/Ash	0.8-1.2	6-8	EM/ M								No suitable potential roost features (PRF) present				X	Potentially removing	None
12	Ash	1	8	EM/ M					X			Ivy cover from ground to 5m. Dense covering and		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												potential to conceal a roost/PRF.						
13	Lime?	1-1.5	8	M								No suitable potential roost features (PRF) present				X	Potentially removing	None
14	Lime?	1-1.5	8	M								No suitable potential roost features (PRF) present				X	Potentially removing	None
15	Ash	1	8	M			X					Up to 3 cavities on trunk facing west at 5m high	X				Potentially removing	Aerial inspection or emergence/re-entry (3 visits) May-September
G1	Various	0.3-0.6	6-10	EM/ M								Largely immature species some with ivy covering but no PRF's. Bark is easily visible between trees with ivy covering				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												and therefore exposed.						
G2	Various	0.3-0.7	6-8	EM					X			Trees with moderate/ dense ivy coverage. Possibility of hiding roost features		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy
16	Ash	1-1.5	6-10									No suitable potential roost features (PRF) present				X	Potentially removing	None
17	Ash	1-1.5	8	M								No suitable potential roost features (PRF) present				X	Potentially removing	None
18	Ash	0.8	10-12	M			X					One south facing cavity 3m off ground		X			Potentially removing	Ground endoscope with ladder/aerial inspection or Emergence/re-entry survey (2 visits) May-September
G3	Various (inc. oak, ash)	0.6-0.8	10	EM					X			Group of 10 trees with moderate ivy cover but bark visible. Potential to be used as			X		Potentially removing	Removal of trees in winter (November-March). If this cannot be done ivy cutting at the base followed by removal under supervision by a suitably qualified ecologist.

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												transient roost.						
19	Ash	2	12	M			X					One south facing cavity and one north facing cavity 5-6m off ground.		X			Potentially removing	Aerial inspection or emergence/re-entry (2 visits) May-September
20/21	Horse chestnut	0.8-1	8	EM/ M								No suitable potential roost features (PRF) present				X	Potentially removing	None
G4	Various	0.3-0.8	6	Y					X			Moderate ivy on young trees but hard to see bark. Unlikely to conceal a PRF but potential to be used as transient roost within ivy.			X		Potentially removing	Removal of trees in winter (November-March). If this cannot be done ivy cutting at the base followed by removal under supervision by a suitably qualified ecologist.
G5	Ash	0.3-0.6	6-8	Y								No potential roost features present				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
22	Sycamore	0.8	10	M								No potential roost features present				X	Potentially removing	None
23	Sycamore	0.8	8	M								No potential roost features present				X	Potentially removing	None
24	Sycamore	0.8	8	EM/ M					X			Sparse ivy on main trunk but bark easily visible and narrow stems.				X	Potentially removing	None
G7	Ash/sycamore	0.3-0.6	8	Y/EM								No potential roost features present				X	Potentially removing	None
25	Sweet chestnut	1	10	M								No potential roost features present				X	Potentially removing	None
26	Ash	0.8	8	EM/ M								No potential roost features present				X	Potentially removing	None
27/28/ 29	Sycamore	0.3-0.6	6-8	EM								Sparse ivy on multi-trunked tree.				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
30	Ash	0.6-1	6-8	EM								No potential roost features present				X	Potentially removing	None
31	Lime?	0.8	10	EM/ M								No potential roost features present				X	Potentially removing	None
32/33	Ash	1.5	1	M					X			Moderate/ dense ivy present and bark not easily visible.		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy
34	?	0.8	6	M					X			Moderate/ dense ivy present and bark not easily visible.		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy
35	Ash	1	10	M					X			Sparse ivy covering low down on tree and bark clearly visible			X		Potentially removing	None
36	Sycamore	1	10	M					X			Sparse ivy covering low down on tree and bark clearly visible			X		Potentially removing	None
37	Unknown			M								Multi-stemmed. No				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												potential roost features present						
38	Ash	1	8	M							X	Several very small holes noted but too small for bats to use				X	Potentially removing	None
39/40	Sycamore	0.8-1	6	EM/ M								No potential roost features present				X	Potentially removing	None
41	Maple/Plane	1.5-2	12	M			X					Two cavities on roadside (north) and west of trunk at 5m from the ground. By busy road with possible light pollution.	X				Not being removed	Aerial inspection or emergence/re-entry (3 visits) May-September
42	Unknown species	1	10	M								No potential roost features present				X	Not being removed	None
43	Unknown species	0.6	8	M								No potential roost features				X	Not being removed	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												present						
44	Unknown species	0.7	7	M								No potential roost features present				X	Not being removed	None
G8	Various	0.3-0.5	<4	EM/ M								No potential roost features present				X	Not being removed	None
45	Holly	0.6	5	EM/ M								No potential roost features present				X	Not being removed	None
46	Ash	1-1.5	10	M					X			Moderate ivy cover with some visible bark and likely not concealing cavities. But could be used a transition roost within ivy			X		Not being removed	None
47	Cherry	0.3	4	EM/ M								No potential roost features present				X	Not being removed	None
48	Elder	0.3	4	M								No potential roost				X	Not being removed	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												features present						
49/50/51	Ash	0.6-1	8-10	EM/M					X			Moderate ivy coverage on main trunk and bark visible. But could be used a transition roost within ivy			X		Potentially removing	Removal of trees in winter (November-March). If this cannot be done ivy cutting at the base followed by removal under supervision by a suitably qualified ecologist.
52	Ash	0.5	7	EM								Multi-stemmed. No potential roost features present				X	Potentially removing	None
53/54/55	Ash	0.8-1	7-9	M					X			Dense ivy coverage and bark not obviously visible. Could conceal PRF.		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy
56/57	Ash	0.5	8	EM								No potential roost features present				X	Not being removed	None
58	Ash	2	12	M	X							Split on deadwood at 5m		X			Not being removed	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												from ground						
59	Ash	0.6	9	M					X			Sparse ivy present with bark easily visible				X	Not being removed	None
60	Ash	1.5	12	M							X	Upward leaning deadwood that is exposed and shallow				X	Not being removed	None
61	Ash	1.5	12	M					X			Dense ivy that could hide features		X			Not being removed	None
62	Unknown	0.3-0.6	5-7	Y					X			Young tree with moderate amounts of ivy present but limited potential for bats (only potential for transitionary summer roost).			X		Not being removed	None
63	Ash	1	12	M					X			Moderate ivy with some bark visible,		X			Not being removed	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												but couldn't be confident a PRF wasn't present.						
64	Ash	1.5	12	M			X		X			Dense ivy that could hide features and cavity 5m from ground north facing.	X				Not being removed	None
65	Ash	1	12	M								No potential roost features present				X	Not being removed	None
66	Ash	1-1.5	12	M					X		X	Deadwood and moderate ivy cover present that could hide a roost feature		X			Not being removed	None
67/68	Ash	1.5	12	M					X			Moderate ivy coverage on main trunk but unlikely to conceal PRF as a lot of bark			X		Not being removed	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												is visible.						
69	Ash	1.2	10	M								No potential roost features present				X	Not being removed	None
70	Sycamore	1	10	M								No potential roost features present				X	Potentially removing	None
71/72/ 73/74/ 75/76	Alder/Sycamore/Ash	0.3-0.8	6-8	EM								No potential roost features present				X	Potentially removing	None
77/78/ 80	Alder	0.6-1	8	M								Sparse ivy present but bark clear and no cavities				X	Potentially removing	None
79	Ash	0.3	6	EM								No potential roost features present				X	Potentially removing	None
G9	Ash	0.3-0.5	6	EM								Some trees with sparse ivy but largely clean trees free of PRFs				X	Potentially removing	None
G10	Alder/Ash	0.3-0.5	8	EM								No potential roost features				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												present						
G11	Ash/oak	0.3-0.6	6-8	EM								No potential roost features present				X	Potentially removing	None
G12	Oak/birch/alder	0.3-0.5	6-8	EM								No potential roost features present				X	Potentially removing	None
G13	Oak/birch/alder	0.3-0.5	6-8	EM								No potential roost features present				X	Potentially removing	None
81	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None
82	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None
83	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None
84	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None
86	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
87	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None
88	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None
89	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None
90	N/A	N/A	N/A	Y								Species too young to support a bat roost				X	Potentially removing	None
93	Oak	0.4	5	EM					X			Sparse ivy present and bark clearly visible. No cavities present and no potential roost features observed.				X	Potentially removing	None
85	Ash	1.5	10-12	M			X					Hollow at ground level on each side to 1m. Shallow on inspection so very little bat			X		Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												roost potential						
91	Oak	0.5	6	EM					X			Moderate ivy coverage but bark easily visible so unlikely to conceal a PRF.			X		Potentially removing	Remove during winter (November-March). If this is not possible ivy should be cut at the base followed by removal under supervision by a suitably qualified ecologist
92	Sycamore	0.8	10	M					X			Moderate ivy coverage but bark easily visible so unlikely to conceal a PRF.			X		Potentially removing	Remove during winter (November-March). If this is not possible ivy should be cut at the base followed by removal under supervision by a suitably qualified ecologist
94	Sycamore	1.5	12	M			X					Two cavities on south side at 2-3m from ground. One woodpecker hole at 6m from ground facing south east.	X				Potentially removing	Aerial inspection or emergence/re-entry (3 visits) May-September
95	Sycamore	2	12	M		X						Some loose bark and small holes present at		X			Potentially removing	Aerial inspection or emergence/re-entry (2 visits) May-September

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												4-5m from the ground. One large upward facing cavity facing south east at 8m from the ground on main trunk.						
Group 14	Various (Sycamore/oak/cherry)	0.3-0.6	6-8	EM					X			Sparse ivy cover present on some trees but ivy stems narrow.				X	Potentially removing	None
96/97	Oak	0.6	7	EM					X			Dense ivy that could conceal a roost		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy
98	Cherry	0.5	6	M								No potential roost features present				X	Potentially removing	None
99	Alder	0.6	10	M					X			Dense ivy that could conceal a roost		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy
Group 15	Various (birch/pine/oak)	0.3-0.5	6	EM								No potential roost features present				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
Group 16	Willow/alder	0.2-0.4	6-8	Y/EM								No potential roost features present				X	Potentially removing	None
100	Alder	0.6	6	EM/M								No potential roost features present				X	Potentially removing	None
101/102	Cherry	0.5	6						X			Sparse ivy with easily visible bark				X	Potentially removing	None
Group 17	Ash/Cherry	0.3-0.5	6-8	EM					X			Sparse ivy from ground to 3m but no potential roost features noted or likely to be hidden behind ivy				X	Potentially removing	None
Group 18	Oak	0.3-0.5	6-8	Y					X			Sparse ivy with easily visible bark				X	Potentially removing	None
103/104/105 (within Group 18)	Oak?	0.5-0.6	8	Y/EM					X			Dense ivy that could conceal a roost		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
Group 19	Oak	0.3	6-8	EM								No potential roost features present				X	Potentially removing	None
106	Ash	1-1.5	12	M					X			Dense ivy that could conceal a roost		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy
107	Unknown	0.6	4	EM/ M					X			Ivy quite dense but tree is small and low growing. Unlikely to conceal large PRF but could be used as summer transition roost.			X		Potentially removing	Remove during winter (November-March). If this is not possible ivy should be cut at the base followed by removal under supervision by a suitably qualified ecologist
108	Unknown	0.6	4	EM/ M					X			Ivy quite dense but tree is small and low growing.			X		Potentially removing	Remove during winter (November-March). If this is not possible ivy should be cut at the base followed by removal under supervision by a suitably qualified ecologist
Group 20	Unknown species	0.60.8	6-8	EM/ M								No potential roost features present				X	Potentially removing	None
Group 21	Various (including oak and hazel)	0.3-1	8-12	EM/ M					X			Ivy present but not dense and bark			X		Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												visible.						
Group 22	Unknown	0.6-0.8	8-10	EM/ M					X			Sparse/moderate ivy covering on main trunk and branches			X		Potentially removing	None
109/110/111/112	Ash	0.5	7	EM								No potential roost features present				X	Potentially removing	None
113	Alder	0.5	8	EM								No potential roost features present				X	Potentially removing	None
114	Ash	0.6	6	EM								No potential roost features present				X	Potentially removing	None
115/116	Ash	0.6-0.8	10	M					X			Dense ivy covering and potential to conceal a roost/PRF.		X			Potentially removing	Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy
117	Sycamore	1	10	M								No potential roost features present				X	Potentially removing	None
118	Ash	0.6	8	M								No potential roost				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
												features present						
119	Birch	0.6	6	EM/ M					X			Ivy present but sparse, not dense and bark visible.				X	Potentially removing	None
120/121	Ash	0.6	6	EM/ M								No potential roost features present				X	Potentially removing	None
122	Oak	0.7	8	M								No potential roost features present				X	Potentially removing	None
123	Ash	0.8	8	M								No potential roost features present				X	Potentially removing	None
124	Ash	0.6	8	M								Multi-stemmed. No potential roost features present.				X	Potentially removing	None
125	Unknown	0.8	10	M	X							Large crack on main trunk to 3m and east facing		X			Potentially removing	Ground endoscope survey/aerial inspection or emergence/re-entry surveys 2 visits (May-September)

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation
G23	Willow	0.3-0.6	5-6	M								Multi-stemmed. No potential roost features present.				X	Potentially removing	None
Group 24	Various (including ash/alder)	0.4-1	8-10	M					X			Some trees with sparse ivy but no potential roost features present or likely to be hidden behind ivy				X	Potentially removing	None
Group 25	Various (including sycamore/ash)	0.6-0.8	8-10	EM/ M					X			Some sparse ivy on trees but bark present and no PRFs. Evidence of minor limb cutting on this group.				X	Potentially removing	None
Group 26	Scots Pine	1.5-2	10-14	M		X						Some loose bark present but very small and very unlikely to support any roost				X	Potentially removing	None

					Description of Feature								Bat Roost Potential					
Tree Ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ EM/ Y)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe type	High	Moderate	Low	Negligible	Proposed Action (Potentially removing/Not removing)	Survey recommendation

APPENDIX C: PHOTOGRAPHS TO ACCOMPANY BAT TREE ASSESSMENT

Tree 4 and 5 (middle and right)

Tree 7/8

Tree 12

Tree 15

Tree 18, 19 on the left of path

Tree 33/34/35 on right (although looks to be only 2 shown here). All similar covering of ivy.

Tree 94, 95

Tree 96/97

Tree 99 on right on near side of fence.

Tree 104/105 in centre

Tree 103 in centre

Tree 106 on right

Tree 115/116 (116 surveyed as one tree)

Tree 125 in foreground with split evident.

Tree 53/54/55. Three large trees in the centre.