



Report Type: Ecological Appraisal

Client Name: James

**Site Address: The Former Engine House
Llwynpia Colliery Site
Tonypandy
CF40 2EL**

Report Reference: PEA 23-08 196.1

Date of Issue: 12th October 2023

**Author: Logan Maggs BSc (hons)
logan@greenscape.pm 07519 105793**





Report Details	
Classification	Ecological Appraisal
Status	Final
Reference	PEA 23-08 196.1

Version History	
Report Reference	Date of Revision
PEA 23-08 196.1	12 th October 2023

Quality Assurance		
	Name	Date
Author:	L. Maggs BSc(hons) Senior Consultant	6 th October 2023
Reviewed by:	B. Jones BSc(hons) MSc MCIEEM Senior Consultant	12 th October 2023

Greenscape Environmental Ltd.
Registered Office: Long Acres, Lyth Bank, Shrewsbury, Shropshire, SY3 0BW
Company Reg number: 5364283

This report is the copyright of Greenscape Environmental Ltd. Any unauthorised reproduction or usage by any person without the specific authority of Greenscape is prohibited.

The report should be read in its entirety. Questions arising from the survey report should be directed to the author of the report who will be pleased to clarify any technical issues raised.

Whilst the surveyors make every reasonable effort, Greenscape Environmental Ltd cannot guarantee that all protected species have been identified and survey results are definitive. Many species are cryptic and transitional in habit.

Reports are considered valid for two years for planning purposes, after which time further survey information may be required.

Greenscape Environmental Ltd can provide advice and support for recommendations and planning conditions.

The use of this report or survey data for any form of formal submission to an NGO or other authority implicitly implies acceptance of the terms and conditions.



Table of Contents

1 EXECUTIVE SUMMARY.....	1
1.1 Purpose of the Report.....	1
1.2 Methodology	1
1.3 Key Impacts and Mitigation Measures.....	1
1.4 Conclusion.....	2
2 INTRODUCTION	3
2.1 Project Background	3
2.2 Purpose of the Report.....	3
2.3 Site Context and Location	3
3 METHODOLOGY & CONSTRAINTS.....	4
3.1 Desk Study.....	4
3.2 Field Survey.....	4
3.3 Species Survey.....	4
4 BASELINE ECOLOGICAL CONDITIONS.....	6
4.1 Nearby Features of Importance	6
4.2 Habitats on Site.....	8
4.3 Mammals	16
4.4 Birds	18
4.5 Amphibians & Reptiles	19
4.6 Invasive Species.....	20
5 DESCRIPTION OF PROPOSED DEVELOPMENT.....	21
6 IMPACTS, ENHANCEMENTS AND MITIGATION	22
6.1 Nearby Features of Importance	22
6.2 Habitats on Site.....	23
6.3 Mammals	25
6.4 Birds	30
6.5 Amphibians.....	32
6.6 Invasive Species.....	33
7 CONCLUDING REMARKS.....	34
APPENDIX A – SURVEYOR DETAILS.....	35
APPENDIX B – METHODOLOGY	36
APPENDIX C – POLICY	39
APPENDIX D - BIBLIOGRAPHY	43



Table of Figures

Figure 4.1. Identifying any designated areas near site, a 1km buffer is shown.....	6
Figure 4.2. Desk study results.....	7
Figure 4.3. A map showing the UKHabs classification codes for the site © UKHAB LTD, under licence. No onward licence implied or provided. All rights reserved [https://ukhab.org/register/].....	8
Figure 4.4. Overview of the site	9
Figure 4.5. Areas H1 and H2.....	9
Figure 4.6. Clematis in H3.....	10
Figure 4.7. Trees in H4	10
Figure 4.8. Himalayan balsam in H5.....	11
Figure 4.9. Southern gable of H6.....	11
Figure 4.10. Typical view inside H6.....	12
Figure 4.11. Showing the metal trusses supporting the roof in H6.....	12
Figure 4.12. Sub-floor of H6	13
Figure 4.13. H7 along the building	13
Figure 4.14. H8 along the eastern aspect of the site	14
Figure 4.15. Bracken in the understorey of H9.....	14
Figure 4.16. Stream coming down from culvert under road	15
Figure 4.17. Frost damaged bricks.....	16
Figure 4.18. Limited gaps around windows.....	17
Figure 4.19. Light visible through other openings	17
Figure 4.20. Muddy slab on bank of stream, clear of prints	18
Figure 4.21. Perching platform near roof of building.....	18
Figure 4.22. OS Map showing a 250m buffer around site, showing lack of ponds.....	19
Figure 4.23. Himalayan balsam in southwestern part of site	20
Figure 6.1. Vegetation obscuring east face	25
Figure 6.2. Example external down light design	28
Figure 6.3. Example woodcrete bat box: Schwegler 1FF & Beaumaris Bat Box Midi	28
Figure 6.4. Example integrated bat box	28
Figure 6.5. Example hedgehog dome	29
Figure 6.6. Bird boxes	31

Table of Tables

Table 3.1. Survey conditions.....	4
Table 4.1. Details of statutory designated sites within 1km	6
Table 4.2. UK Habitat codes © UKHAB LTD, under licence.....	8
Table 6.1. Summary of potential impacts on habitats recorded	23
Table 6.2. New hedge planting scheme.....	24
Table 6.3. Fruiting plant enhancement	24
Table 6.4. Trees proposed for enhancement	24
Table 6.5. Timing of works as recommended by the UK Bat Mitigation Guidelines (2023)	26
Table A.1. Details of surveyors' experience and licences held	35
Table B.1. Data sources	36
Table B.2. UK Habs metadata	36
Table B.3. Criteria of ecological values	37
Table B.4. Categorisation of trees for bats.....	37



1 Executive Summary

1.1 Purpose of the Report

Greenscape Environmental Ltd was commissioned by Stoneleigh Architectural Ltd on behalf of the client, Mr S James, to undertake a preliminary ecological appraisal of The Former Engine House to provide supporting information for a planning application for conversion of the building to residential apartments.

The survey report has these principal aims:

- To provide an initial assessment of the ecological value of the site in local context.
- To provide details supporting further surveys that may be required.
- To identify potential ecological constraints relating to the development, and recommend measures to avoid, reduce or manage negative effects, and to provide a net ecological gain.

1.2 Methodology

The appraisal included a desktop study for nearby designated sites and previously recorded protected species and a site visit undertaken at the site, OS grid reference SS99369328 on 5th September 2023 by L Maggs.

1.3 Key Impacts and Mitigation Measures

The desktop study revealed no bat records within 500m, and some typical roof nesting birds. It was considered that the site could provide potential habitat for bat and bird species and these should be the main focus of the ecological appraisal.

The site comprises approximately 0.47 ha. The site is a former engine house for the colliery and consists of a large brick building with a heavily damaged roof.

The site is isolated between two busy roads that are both street-lit, with light industry/commercial properties to the south. No evidence of bats was found, but it was not possible to conclusively say they would not be present. However, due the size of the building, and the ease with which temporary roosts can be missed **it is recommended that work follows a PWMS for bats.**

No active or old nests were seen, but pigeons were noted throughout the building, and the vegetation around the building could support nesting birds. **Work will follow a method statement to protect nesting birds.**

No evidence of other mammals was seen on site, so the risk of a negative impact is considered to be low.

There are no bodies of standing water within 250m so no impacts on amphibians are expected.

Himalayan balsam was found on site, this must be managed appropriately and not allowed to spread from site due to construction works.



1.4 Conclusion

It is recommended that the biodiversity value of the site will be enhanced post-construction with the inclusion of bat and bird boxes. The landscaping will also be improved by planting new native species hedgerows and trees in the grounds.

The method statements provided in sections 6.1.2, 6.3.2, 6.3.5, 6.4.2, 6.5.2 and 6.6.2 of this report will be followed, and work will be conducted at a suitable time of year to minimise potential impacts.

There are no other ecological constraints to the development as currently proposed.



2 Introduction

This report has been compiled by Logan Maggs BSc (hons) who has over 10 years' experience conducting ecological appraisals. It has been reviewed in line with Greenscape's Quality Management System.

For full details of surveyors and licences please see Appendix A.

2.1 Project Background

Greenscape Environmental Ltd was commissioned by Stoneleigh Architectural Ltd to conduct a survey to determine the presence of protected species and potential for the damage or destruction of habitats of value. This forms part of the planning application for the conversion of The Former Engine House to residential apartments.

2.2 Purpose of the Report

This report aims to:

- Identify the key ecological constraints to the proposed development relating to priority habitats and species and protected species (HMSO, 1981).
- Inform planning to allow significant ecological effects to be minimised or avoided where possible.
- Allow any necessary mitigation or compensation measures to be developed following the mitigation hierarchy.
- Identify any additional surveys that may be required to inform the assessment.
- Identify the opportunities offered by a project to deliver ecological enhancement (Ministry of Housing, Communities and Local Government, 2021).
- Provide information to assist landowners with avoiding committing legal offences in relation to wildlife (HMSO, 2000)

The development triggered the requirement for a preliminary bat survey as it involves the conversion, modification, demolition or removal of buildings which are:

- Pre 1914 buildings with gable ends or slate roofs regardless of location;

2.3 Site Context and Location

The site is located in Tonypany, OS grid reference SS99369328. It is set in an urban environment surrounded by busy roads. There is moderate to good connectivity to Rhondda River to the east via a series of hop-over copses and lines of trees that cross the A4508 and railway line, there is no direct connectivity to Craig Pont Rhondda to the northeast except by roadways and private gardens. The site is framed by busy roads with streetlighting evident down the east and west boundaries.



3 Methodology & Constraints

Broad methodologies for data collection and interpretation were informed by PEA guidance (CIEEM, 2017). Full details can be found in Appendix B.

3.1 Desk Study

The desk study provides contextual information such as the site's proximity to designated areas and previously granted licences (Natural England, 2018). Previously recorded species in the vicinity are obtained from local records centres (South East Wales Biodiversity Records Centre, 2023) and NBN Atlas Wales (NBN, 2023).

3.2 Field Survey

3.2.1 Date and Survey Conditions

Table 3.1. Survey conditions

Date	Time	Study Area	Equipment Used	Weather
05/09/2023	11:30	Site	Camera, strong torch, 12x55 monocular, DJI Mini 3 Pro	24°C, no/light cloud, F0 wind, dry
Comments	One surveyor used. Constraints: No safe access to sub-floors. All undated photographs in this document were taken on this date by author unless otherwise stated.			

3.2.2 Habitats

The habitats on site were assessed for their potential to support protected species and therefore assist in the determination of site value.

The habitats on site were assessed in line with current UKHab classifications and secondary codes (UKHab Ltd, 2023).

The survey was conducted in September which meant that full floral diversity and habitat potential may not have been fully evident.

The site had not been subject to any form of specific management, maintenance or cleaning and was in a natural overgrown state.

3.3 Species Survey

3.3.1 Bats

An assessment of the suitability of site to support roosting bats was conducted following best practice guidance looking for evidence of roosting or potential access points (Collins, J. BCT, 2016). Constraints to this methodology include the presence of a sub-floor that could not be safely accessed by a lone worker.

3.3.2 Other Mammals

An assessment of the suitability of site and its surrounds to support badgers was conducted following best practice guidance looking for tracks, signs or setts (Scottish Badgers, 2018). There were no constraints to this methodology.



3.3.3 Birds

An assessment of the suitability of site and its surrounds to support nesting birds was conducted, looking for current/old nests and listening for bird calls. There were no constraints to this methodology.

3.3.4 Amphibians & Reptiles

An assessment of terrestrial habitats of site and its surrounds to support great crested newts was conducted by looking for potential shelter and commuting features (Langton, et al., 2001).

An assessment of the suitability of site and its surrounds to support reptiles was conducted following best practice guidance by turning over detritus and other refugia and checking for suitable basking sites (Edgar, et al., 2010).

3.3.5 Invasive Species

Signs of invasive non-native plant species were searched for throughout the site.



4 Baseline Ecological Conditions

4.1 Nearby Features of Importance

4.1.1 Designated Sites

The map from Natural England presented in Figure 4.1 indicated that the site is within 1km of one designated area. There are no designated sites within 10km that are notified for bats.

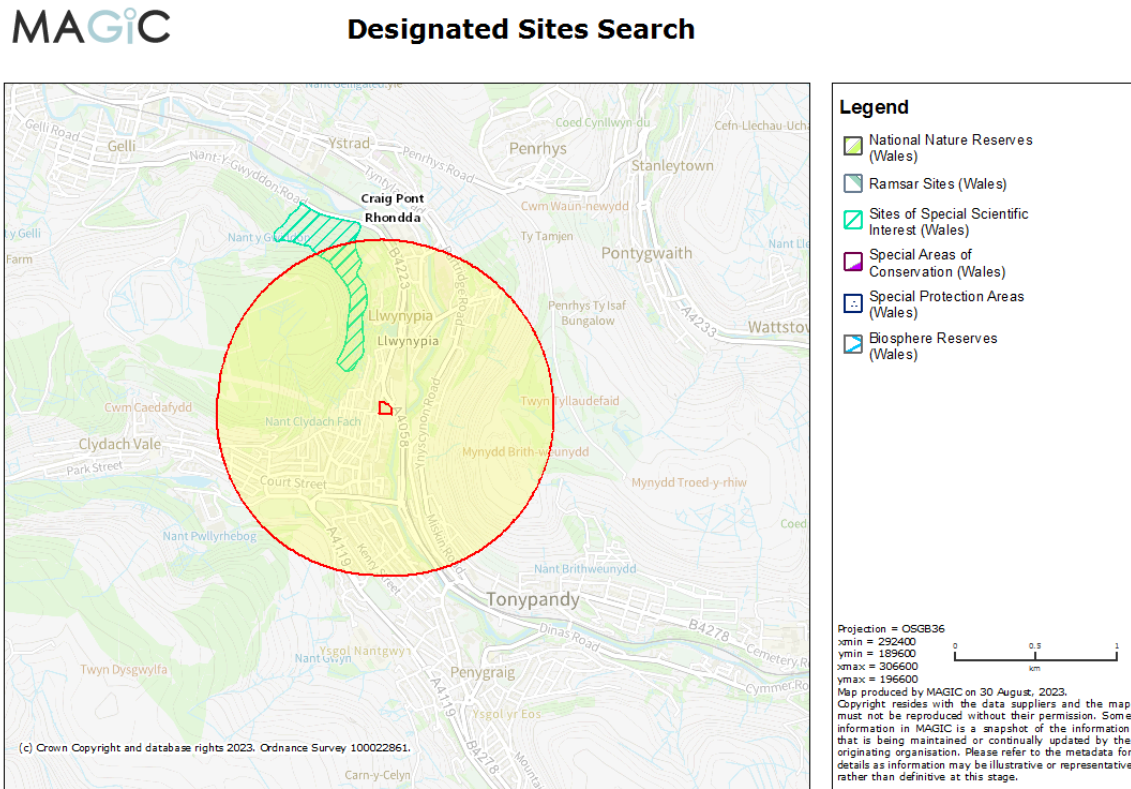


Figure 4.1. Identifying any designated areas near site, a 1km buffer is shown

Table 4.1. Details of statutory designated sites within 1km

Type of Designation	Site Name & Ref	Reason for Designation	Distance & Direction
Statutory – SSSI	Craig Pont Rhondda (33WLF)	A coppiced sessile oakwood on east-facing Pennant Sandstone slopes, interrupted by gullies and rocky exposures. The flora, except in wet flushes, is typically acidophilous.	250m Northwest

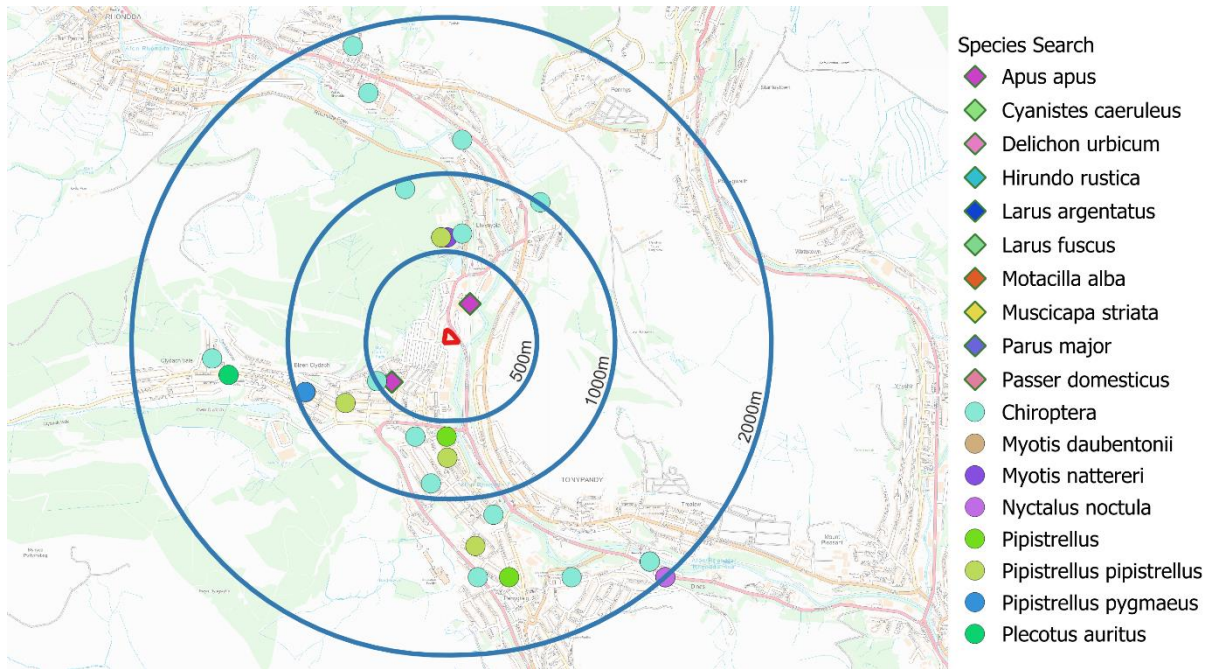


Figure 4.2. Desk study results



4.2 Habitats on Site



Figure 4.3. A map showing the UKHabs classification codes for the site © UKHAB LTD, under licence. No onward licence implied or provided. All rights reserved [https://ukhab.org/register/]

Table 4.2. UK Habitat codes © UKHAB LTD, under licence.

Label	Description	UK Habs
H1	Roadside verge	g4 106
H2	Road	u1e 800
H3	Woodland with clematis dominant	w1g7 31 202 319 847
H4	Scattered woodland on bank	w1g 731 202 519
H5	Bramble scrub with sedges and Himalayan balsam	h3h 16 82 519
H6	Former Engine House	u1b5 817
H7	Mixed scrub with buddleia and ornamental species	h3h 519 523 847
H8	Tall ruderal grassland and mixed forbs	g3c 16 82 519
H9	Secondary woodland with bracken	w1g7 12 31 202 519 532
L1-4	Fencing	u1e 612
L5	Stream into culvert	r2b 851



Figure 4.4. Overview of the site

The site is an overgrown former engine house. The grounds are becoming overgrown with successional growth with woodland and mixed scrub forming.

H2 and H1 form the access to the site, being a tarmac road and grass verge.



Figure 4.5. Areas H1 and H2



H3 is a small corner of woodland almost completely taken over by clematis.



Figure 4.6. Clematis in H3

H4 is a small strip of woodland along the western bank with the main road.



Figure 4.7. Trees in H4



H5 is a bramble scrub with Himalayan balsam along the southern edge and sedges in the middle.



Figure 4.8. Himalayan balsam in H5

H6 is the former engine house. This is a large open structure with open doorways and windows and a heavily damaged room.



Figure 4.9. Southern gable of H6



Figure 4.10. Typical view inside H6



Figure 4.11. Showing the metal trusses supporting the roof in H6



Figure 4.12. Sub-floor of H6

H7 is a patch of outgrown mixed scrub that has formed along the eastern face of the building.



Figure 4.13. H7 along the building



James

H8 is an area of unmanaged grassland that wraps around the eastern side of the building, running between the scrub and the woodland.



Figure 4.14. H8 along the eastern aspect of the site

H9 is a small corner of woodland in the southeast part of the site. The understorey is dominated by bracken, with some rose and buddleia evident too.



Figure 4.15. Bracken in the understorey of H9



James

There is a small length of stream at L5. This enters the site down a waterfall from a culvert under the road, and quickly leaves the site through a culvert on the southern boundary.



Figure 4.16. Stream coming down from culvert under road



4.3 Mammals

4.3.1 Records

Records of bats within 2km include 16 records of bat (*Chiroptera*), Daubenton's bat (*Myotis daubentonii*), Natterer's bat (*M. nattereri*), noctule (*Nyctalus noctula*), *Pipistrellus spp.* common pipistrelle (*P. pipistrellus*), soprano pipistrelle (*P. pygmaeus*) and brown long-eared bat (*Plecotus auritus*).

4.3.2 Field Observations

No evidence of bats was found on site during the walkover. No droppings, urine splashes, feeding remains, or greasing were seen. No live or dead bats were found.

The roof of the building offers negligible roosting potential for bats, it is formed of unlined slate supported by a metal trussed frame. A large proportion of the roof is missing, allowing light and rain through to the main building.

The walls are largely in good repair and are formed of brick. The walls are several courses deep, with no known open cavity. A few notable areas of damage were seen. On the western face are areas of frost damaged bricks, these broken bricks do not lead to any crevices. On the north face there are some cracks running up through the wall due to subsidence. These could lead to a crevices, but examination through the monocular did not see any evidence of greasing or staining.



Figure 4.17. Frost damaged bricks



Figure 4.18. Limited gaps around windows

The sub-floor could not be accessed, as no stairs were found. From what could be seen, light is visible throughout provided by a number of openings in the ground floor. The walls were in generally good repair with no gaps or crevices visible.



Figure 4.19. Light visible through other openings

No trees were identified with obvious PRF from the ground level assessment. Most are not mature enough to have developed features naturally.

The banks of the stream were examined for potential for small mammals such as water vole, the very short length open between the culverts did not have any suitable banks that might support burrows. No evidence of mammals was seen in the form of tracks, prints or leavings.



Figure 4.20. Muddy slab on bank of stream, clear of prints

4.4 Birds

4.4.1 Records

Records of birds within 150 m include Spotted Flycatcher (*Muscicapa striata*), Great Tit (*Parus major*), Blue Tit (*Cyanistes caeruleus*), Herring Gull (*Larus argentatus*), Lesser Black-backed Gull (*Larus fuscus*), Swift (*Apus apus*), Pied Wagtail (*Motacilla alba*), House Sparrow (*Passer domesticus*), House Martin (*Delichon urbicum*), Swallow (*Hirundo rustica*).

4.4.2 Field Observations

Pigeons were seen roosting within the building, using the struts and trusses, and are likely to be nesting inside through no nesting behaviour was seen during the survey. No other nests were confirmed during the survey.



Figure 4.21. Perching platform near roof of building



4.5 Amphibians & Reptiles

4.5.1 Records

Great Crested Newt (*Triturus cristatus*) Sites in Wales to 2003 (Licence OGL) has one record of great crested newt at a site over 1.5km to the south of the site. NRW Regional Data: South East Wales Non-sensitive species (licence OGL) has records of slow worm (*Anguis fragilis*) and grass snake (*Natrix helvetica*) within 2km. Records of amphibians and reptiles via iRecord (licence CC-BY) has a record of adder (*Vipera berus*) within 2km. There are no records within 500m of the site.

4.5.2 Field Observations

The site had limited features for amphibians and reptiles, with no significant refugia or hibernacula beyond limited scrub coverage. There are no ponds within 250m, and the site sits in an island of busy roads and light industry cutting it off from higher value habitat to the east and west.

There were no ponds marked on the OS map within 250m.

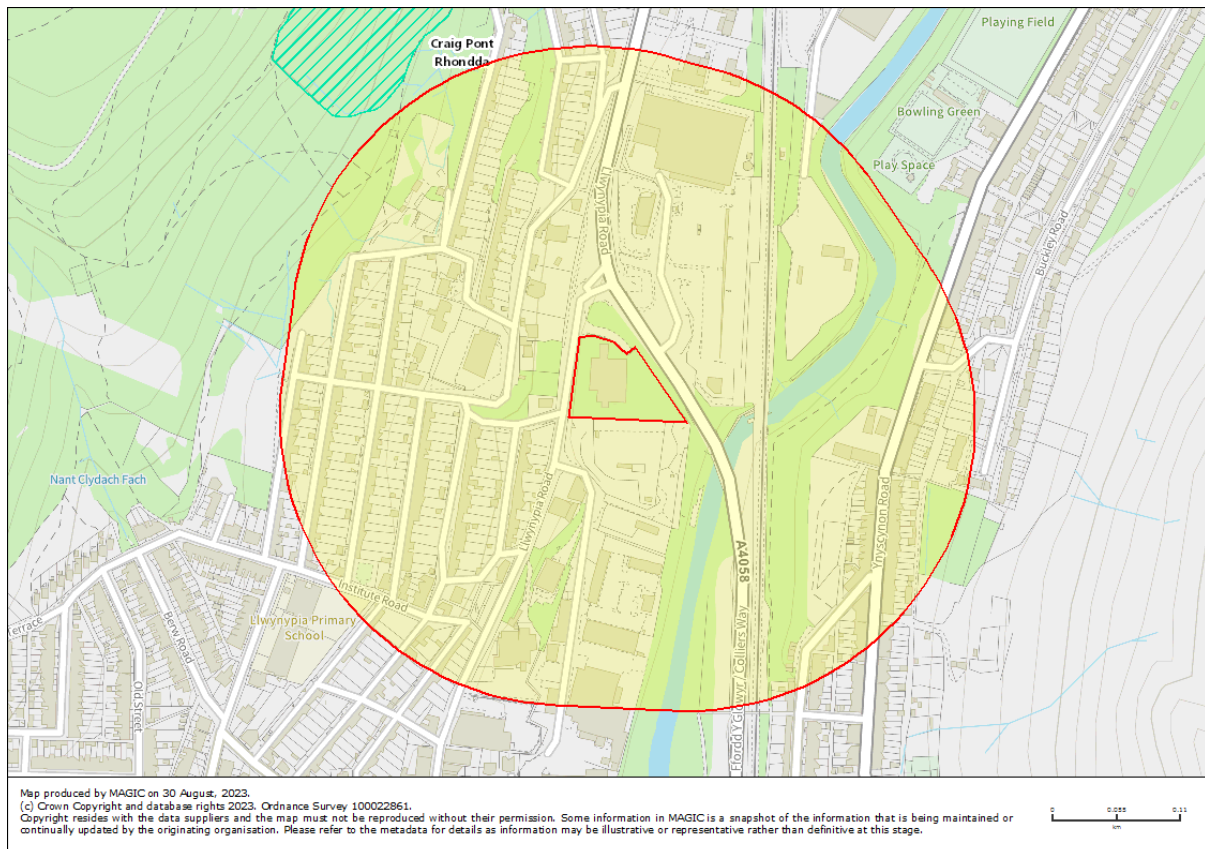


Figure 4.22. OS Map showing a 250m buffer around site, showing lack of ponds



4.6 Invasive Species

4.6.1 Records

INNS Data: All Taxa (South East Wales) (licence CC-BY) holds records of Japanese knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*) within 2km of the site.

4.6.2 Field Observations

Evidence of invasive species was found throughout the western part of site, with Himalayan balsam being identified near the culvert. Buddleia was also recorded on site, typically associated with areas of shrub planting.



Figure 4.23. Himalayan balsam in southwestern part of site



5 Description of Proposed Development

The current plans are for the conversion of the building to residential apartments with associated landscaping and parking.



6 Impacts, Enhancements and Mitigation

6.1 Nearby Features of Importance

6.1.1 Impacts

Figure 4.1 shows that the nearest SSSI is approximately 250m to the northwest. This is designated for its woodland assemblage and no direct impacts would be expected from the conversion works.

There is a culverted stream in the southwest corner of the site. It is not clear where this connects. To minimise the risk to other areas and the SSSI a basic method statement will be followed to minimise the risk of water and air pollution.

6.1.2 Mitigation

- i. The water course will be protected from the risks of dust run-off during works by installing Heras fencing between the development site and the watercourse.
 - o The fencing will have a plastic skirt installed along the base, with the plastic flap facing in towards the site and weighted down.
 - o The plastic skirt will be checked daily for tears or gaps and repaired where necessary.
 - o The plastic skirting will be cleaned if there is a build-up of dirt and waste
- ii. Materials stockpiled on site, such as solid hardcore and sand can pollute water and air with silt and dust.
 - o Materials will be stockpiled away from the watercourse and kept in bulk bags
 - o Once opened, easily dispersible materials such as dry cement will be stored in a sealed bag or storage unit
 - o All empty bags will be appropriately stored and disposed of
- iii. Sufficient spills kits will be available on site, and all workers will be aware of their location and how to use them.
 - o Any diesel/oil/chemical spills on site must be cleared as a matter of urgency. Where spills become absorbed into the ground it may be necessary to excavate the contaminated soil and remove from site.
 - o Chemicals will be stored in the site compound in a suitably protected environment.



6.2 Habitats on Site

6.2.1 Impacts

Table 6.1. Summary of potential impacts on habitats recorded

Habitat	Value to Protected Species	Impact Without Consideration
Roadside verge	Negligible	None
Road	Negligible	None
Woodland with clematis dominant	Will support foraging and nesting birds	Disturbance of nesting birds if work is done during breeding season
Scattered woodland on bank	Will support foraging and nesting birds	Disturbance of nesting birds if work is done during breeding season
Bramble scrub with sedges and Himalayan balsam	Will support foraging birds and mammals	Loss of foraging habitat
Former Engine House	Potential for nesting birds, no evidence of roosting bats	Disturbance of nesting birds if work is done during breeding season, Potential to disturb occasional/lesser used roosts
Mixed scrub with buddleia and ornamental species	Will support foraging and nesting birds	Disturbance of nesting birds if work is done during breeding season
Tall ruderal grassland and mixed forbs	Will support foraging birds and mammals	Loss of foraging habitat
Secondary woodland with bracken	Will support foraging and nesting birds	Disturbance of nesting birds if work is done during breeding season
Fencing	Negligible	None
Stream into culvert	No direct value for protected species	Potential for run-off to enter watercourse

As the site is not comprised of any habitats of principal importance listed in Section 7 of the Environment (Wales) Act (HMSO, 2016), mitigation will be delivered at a species level.

6.2.2 Enhancements

In order to obtain an ecological net gain for the site, the remaining green spaces and site boundaries will require enhancement for local wildlife.

Hedgerows

It is recommended that the landscaping around the site will include some hedge planting to enhance the area for biodiversity.

Plants to use for landscaping and gapping-up of existing boundaries will include locally sourced native species. These will be planted in accordance with BS3936 (part 1, 1992, Nursery Stock, Specifications for trees and shrubs). Planting will occur between November and April depending on the timing of the development.



Table 6.2. New hedge planting scheme

Common Name	Latin Name	Distribution (%)
Hawthorn	<i>Crataegus monogyna</i>	35%
Blackthorn	<i>Prunus spinosa</i>	35%
Hazel	<i>Corylus avellana</i>	10%
Holly	<i>Ilex aquifolium</i>	10%
Wild Service Tree	<i>Sorbus torminalis</i>	10%

Table 6.3. Fruiting plant enhancement

Common Name	Latin Name
Crab Apple	<i>Malus sylvestris</i>
Wild Cherry	<i>Prunus avium</i>
Wild Pear	<i>Pyrus communis</i>

Trees

Trees to be used should be from the list below. These should also be native species, locally sourced where possible. Oak should particularly be encouraged because it supports a large diversity of invertebrates.

Table 6.4. Trees proposed for enhancement

Common Name	Latin Name
English Oak	<i>Quercus robur</i>
Sessile Oak	<i>Quercus petraea</i>
Lime	<i>Tilia cordata</i>
Rowan	<i>Sorbus aucuparia</i>
Silver Birch	<i>Betula pendula</i>

6.2.3 Monitoring

All habitat enhancements will be monitored post-development and any failing plants or features will be addressed as appropriate to maintain the value of the enhancement.



6.3 Mammals

6.3.1 Impacts on bats

No evidence of bats was found on site, and what few potential roost features were seen were clear of greasing or staining as viewed from ground level. No obvious potential roost features were seen in the trees around the boundaries from the ground level assessment.

The site is in an urban location with street lighting along each side, there are no records of bats within 500m, this may be due to a lack of recording, but could also reflect the light levels present with busy roads and shopping centres nearby.

The building is of low value for bats, with limited roost features that are unlikely to support large numbers of bats. However, these types of roost features can be difficult to confirm usage, with bat presence being easily missed through bats not being on site on the exact survey dates. The building also makes traditional surveys difficult due to its scale. The roof cannot be seen in detail from anywhere close enough for bat detectors to record emergence, and vegetation obscures many walls and viewpoints.



Figure 6.1. Vegetation obscuring east face

The building is unlikely to support cavity dwelling bats like lesser horseshoe bats and brown long-eared bats due to the surrounding streetlighting limiting flight paths and commuting corridors. Similarly the main potential for hibernation, the sub-floor rooms, are unlikely to be used as there may be fragmented access due to street lighting disrupting possible corridors.

Without consideration there may be a loss or damage of roosts along with the potential for death or damage of individual bats during repair works to the walls. These impacts are noted due to the transient nature of some day roosts.

Determination of conservation significance of roosts was taken from Table 3.2: Modification and disturbance impacts to roosts: simple examples (Reason & Wray, 2023).



6.3.2 Mitigation for bats

Work which can be conducted immediately once planning permission has been granted includes:

- Installation of scaffolding
- Vegetation clearance in line with the method statements for birds

A non-licensable Precautionary Working Method Statement (PWMS) is recommended and includes:

- Repair work to the bricks
- Sealing the building

Table 6.5. Timing of works as recommended by the UK Bat Mitigation Guidelines (2023)

Roost type	Months to avoid	Optimum period for carrying out works (some variation between species and weather-dependent)
Maternity	May-August (potentially September)	September to end April
Hibernation (not used for swarming)	November to March	April to end October
Hibernation and swarming site	August to March (key); potentially July until April	April to July
Mating/swarming; not used for hibernation	August to October (key); potentially July until mid-November	Mid-November – end March (potentially later, maybe species-specific)
	Also April-early May in at least some species	Broader restrictions if site also used for hibernation
Non-breeding summer roost	None	No restrictions – assuming bats can be excluded if present in small numbers or otherwise safely managed

Precautionary Working Method Statement (PWMS)

1. Construction will need to follow a rigid method statement. It will need to be conducted under a PWMS.
2. A suitably licensed ecologist will be employed as an Ecological Clerk of Works (ECoW) to oversee works in areas sensitive to bats and provide expert advice.
3. A toolbox talk will be provided by the ECoW. The developer and the contractors will be made aware that there is a possibility that bats may be found during works, and will be advised to work in a way to ensure bats are not harmed during work in areas sensitive to bats. They will be provided with a simple emergency procedure to follow if bats are found at any stage of the work on site. It will be ensured that the method statement is retained on site at all times.
4. A pre-commencement check will be conducted by the ECoW using a strong torch and borescope where appropriate.



James

- a. Once scaffolding is installed it will be possible to conduct an up close investigation of gaps in the brickwork that cannot be clearly seen from ground level.
 - b. These will be assessed for any evidence of use including current or historic usage.
5. If a bat is found during the pre-commencement check, then work will stop and a licence will be applied for from Natural Resources Wales with the new information gained.
 6. Bats can only be handled by the ECoW or authorised person unless it is in immediate danger. The bat must be carefully placed in a well-ventilated lidded box with a small container (i.e. a plastic bottle lid) with water in it. The container must be kept in a quiet and safe place.
 7. Care should be taken to avoid rousing the bat whilst transferring to a suitable location, such as a suitable roost box or alternative roost space that provides a safe, quiet environment with a stable cool temperature and relatively high humidity.
 8. If the bat is underweight or injured it will be cared for by an experienced bat carer until such time that it is strong enough to be released into a suitable alternative replacement roost on site.
 9. The bat compensation will be created following the instructions in the method statement and the client will agree that any bat box erected must stay in place for a minimum of five years post-development.
 10. The removal of the roof will not take place if the temperature has been below 6°C for four consecutive days and nights.
 11. Once the building has been reroofed, bat access will be limited by sealing all doors and windows, thus reducing the potential for bats to re-enter where they are not expected.

Lighting

Lighting needs to be designed to have minimal impact on bats and their commuting and foraging areas. This results in the recommended use of downlights and the horizontal spread of lighting to be kept to a minimum.

Where it is not possible to reduce the horizontal spread of light, a 2700°K to 3000°K LED light bulb is recommended, which will provide a warm white light. This range has the least impact on bats and invertebrates.

1. A lighting scheme will be drawn up in line with best guidance (ILP, 2023).
2. All newly proposed external lighting will be directed away from any vegetated boundary features to retain dark corridors for commuting bats.
3. There will be no direct illumination of any enhancement features erected for bats.
4. All domestic lighting will be orientated towards the ground and controlled by PIR (Passive Infra-red), set on a short timer.



Figure 6.2. Example external down light design

6.3.3 Compensation & Enhancements

It is recommended that provision be made for roosting opportunities for bats with the erection of two woodcrete bat boxes suitable for day roosts in trees around the boundary. These will be erected at a height of 3-4 m and in a southerly, westerly or easterly facing direction.



Figure 6.3. Example woodcrete bat box: Schwegler 1FF & Beaumaris Bat Box Midi

It is recommended that permanent provision be made for roosting opportunities for bats with the inclusion of an integrated bat box in the southern gable end if possible (i.e. if repair works allow for the box to be installed). This will be erected at a minimum height of 4m.

Enclosed Bat Box (B and C)

- Designed specifically for the pipistrelle bat
- Available in all brick types
- Discrete home for bats
- Various sizes
- Several roosting zones are created inside the box
- Bats are contained within the bat box itself
- Maintenance free with entrance at the base
- Ideal for new build & conservation work



Eco Habitats for Bats	Sizes (mm)	Durability
Bat Box Type A	215 x 65	F2 S2 – Fully Frost Resistant
Bat Box Type B	215 x 215 or 215 x 290	F2 S2 – Fully Frost Resistant

Figure 6.4. Example integrated bat box



6.3.4 Impacts on other mammals

Without consideration there is unlikely to be any direct impact on other mammals.

6.3.5 Mitigation and Enhancements

Hedgehog

Fences within and around the development will include holes at the base to allow hedgehogs to move freely.

The holes will measure 13x13cm. Hedgehog Highway signs will be installed above the holes to highlight their purpose, these can be purchased from <https://ptes.org/shop/just-in/hedgehog-highway/>.

The new homeowners welcome pack will include details of hedgehog friendly features.

Permanent hedgehog nesting provision will be implemented around site by including purpose-built hedgehog dome. These will be used in quiet parts of a garden and covered with leaf-litter for further camouflage.



Figure 6.5. Example hedgehog dome

6.3.6 Monitoring

Failing boxes or enhancements will be replaced at the cost of the developer if deterioration or damage is noted within five years post-development.



6.4 Birds

6.4.1 Impacts

Work at this site will include vegetation clearance and sealing the building which could affect nesting birds if conducted during the nesting season.

6.4.2 Mitigation

1. The developer will be responsible for ensuring no nesting birds will be impacted by the proposed development, either by timing the work for outside of the nesting season (1st March to 31st August inclusive) or if this is not possible, after a visual inspection within 24hours prior to the development commencing shows no birds are nesting.
2. Should a nesting bird be found, a 4m buffer will be left around the nest, and no further disturbance conducted until the young have fledged and the nesting bird season has finished, which is March to August inclusive.
3. Once work has commenced on the building and it is confirmed that there are no nesting birds present, the building will be sealed to prevent birds gaining access during works and potentially causing further delay.

6.4.3 Compensation and Enhancements

It is recommended that a range of woodcrete boxes are erected around the site to provide an enhancement for passerine birds, and a selection of the following would be appropriate.

- a. Sparrow Terraces should be erected under the eaves of a building at a minimum height of 3m, in a westerly, northerly or easterly aspect.
- b. 26/32mm hole nest boxes (e.g. Schwegler 1b) should be installed at a minimum height of 3m in a westerly, northerly or easterly aspect.
- c. House martin boxes should be erected on the eastern or northern walls as high as possible under the eaves
- d. Integrated swift boxes should be placed as high as possible, preferably over 5m high, beneath an overhang or eaves.



James



Cedarwood Sparrow Terrace



House Martin Nest Box



Schwegler 16S Integrated Swift Box



Schwegler 1b Bird Box

Eco Habitats for swifts



Swift Box

Size (Width x Depth x Height) (mm)
327 x 140 x 140

Figure 6.6. Bird boxes

6.4.4 Monitoring

Failing boxes or enhancements will be replaced at the cost of the developer if deterioration or damage is noted within five years post-development.



6.5 Amphibians

6.5.1 Impacts

Potential impacts were ascertained in conjunction with chapter 6 of the mitigation guidelines (English Nature, 2001). As there are no ponds within 250m of the site, and the site is bordered on two sides by busy roads, there is unlikely to be any direct impact on amphibians. The site does not offer much basking habitat, and no evidence of reptiles was seen.

6.5.2 Mitigation and Enhancements

Working Method Statement

1. Clearance of site will be conducted by hand.
 - Large shrubs will be cut to a stump of ~100mm and the base checked for reptiles
2. If a reptile is found during any works on site, the ecologist will be informed, after which it will be carefully moved by hand and placed at the base of the southeaster corner
3. All cabins and equipment will be located on firm compacted ground
4. Stored subsoil must be kept in skips or used on day of delivery to prevent the accidental creation of refugia.
5. Stored materials will be raised on pallets to reduce the potential they might act as a temporary resting place. This reduces the potential for damage or destruction of individual reptiles.
6. All waste will be placed straight into skips to reduce the potential of creating refugia.
7. A copy of this document will always be kept on site.

Enhancements

1. A brush pile will be created with material taken from vegetation clearance, this will create a suitable hibernaculum.
 - Material used for the creation of the pile will be of varying lengths, thickness and shapes.
 - Brush piles will be created in sunny locations and set within existing vegetation. It should be located away from areas of high or frequent disturbance, and with free-draining soil.
 - The central core will be compacted, and the outer layers will be laid loosely to provide a variable structure.

6.5.3 Monitoring

The brush pile will be monitored, and more material added when notable decomposition is seen.



6.6 Invasive Species

6.6.1 Impacts

As there was evidence of Himalayan balsam on site, there is potential for the development to cause it to spread further.

6.6.2 Management

Himalayan Balsam

In order to manage Himalayan balsam, it will be removed from the site by hand. The stems will be pulled in May-June before the seed pods have developed. The stems are notoriously easy to pull as they have very short root systems.

The pulled stems will be composted away from any features that might spread parts of the plant.

The pulling and composting will be done every year for the next few years where necessary to avoid the recurrence of species from seeds currently dormant in the soil.

6.6.3 Monitoring

Any invasive plant species on site will be treated as per the recommendations in this report, and any recurrence will be noted and treated in the same way as an ongoing process.



7 Concluding Remarks

The survey has focussed on the potential habitats or protected species to be damaged or destroyed as part of this development.

No evidence of bats was found on site, but as transitory and temporary roosts can be hard to identify it is recommended that work follows a PWMS. Method statements have also been provided to protect the watercourse, nesting birds, hedgehogs, and reptiles. Himalayan balsam on site will need to be managed appropriately,

The development can proceed without the loss of habitat of significant value, and without the loss of the favourable conservation status of any protected species. As there is no evidence of protected species within and around the development site, there is no requirement to address the three tests under Regulation 55 of The Conservation of Habitats and Species (HMSO, 2019).

The method statements provided in sections 6.1.2, 6.3.2, 6.3.5, 6.4.2, 6.5.2 and 6.6.2 of this report will be followed and works will be done at a suitable time of year. Other than those listed above, there are no ecological constraints to the development as currently proposed.



Appendix A – Surveyor Details

Table A.1. Details of surveyors’ experience and licences held

Name	Membership of associations/ experience	Licenses
Logan Maggs BSc(hons)	Senior Consultant Logan has a degree in Conservation and Land Management. He has over 10 years’ experience conducting environmental appraisals and phase 2 surveys for bats and newts in England and Wales.	Holder of survey licenses for bats and newts in England and Wales. <u>England:</u> Bats - 2016-24901-CLS-CLS GCN - 2017-29218-CLS-CLS <u>Wales:</u> Bats – S091096/1
Ben Jones BSc(hons) MSc	Senior Consultant MCIEEM Ben has a degree in Marine and Freshwater biology and a Master’s degree in “Managing the Environment”. He has 8 years’ experience conducting environmental appraisals and phase 2 surveys for bats and newts in England and Wales. As a member of the CIEEM he is bound by professional conduct.	Holder of survey licenses for bats and newts in England and Wales. <u>England:</u> Bats - 2017-29112-CLS-CLS GCN - 2016-25209-CLS-CLS <u>Wales:</u> Bats – S091847/1 GCN – S091242/1



Appendix B – Methodology

Desk Study

Table B.1. Data sources

Organisation/Resource	Information Assessed
Freely available online species datasets (NBN Atlas)	Protected/Priority Species records (2km)
Local Records Centre	Bats in 2km, Roof nesting birds in 150m.
MAGIC website	International statutory designations (1km) <ul style="list-style-type: none"> • Special Protection areas (SPA) • Special Areas of Conservation (SAC) • RAMSAR sites National statutory designations (1km) <ul style="list-style-type: none"> • Sites of Special Scientific Interest (SSSI) • National Nature Reserves (NNR) EPS Licenses for protected species (2km)

A data search was purchased from the SEWBREC on the 31st August 2023.

A search on Multi Agency Geographic Information for the Countryside (Magic Maps) determined nearby designated areas. The map is presented in Section 4.1.

Field Survey

An assessment of habitats was conducted broadly following the UK Habitat Classification.

Table B.2. UK Habs metadata

Metadata	Information
Scope and purpose of survey	Preliminary ecological appraisal
Area surveyed	~0.47ha
Edition of UKHAb used	The UK Habitat Classification Version 2.0
Minimum Mapping Unit	200m ²
UKHab Primary Hierarchy used	Level 5
Secondary groups recorded	All secondary Codes
Year of survey	2023
Organisation and individual undertaking survey	Greenscape Environmental Ltd Logan Maggs

The level of survey is aimed to identify field signs of or habitats with the potential to support protected species and therefore assist in the determination for detailed phase 2 surveys.

Determination of Ecological Value is based on the general criteria provided by CIEEM (2017).



Table B.3. Criteria of ecological values

Ecological Value	Description and Examples
High	Habitats or features that have high importance for nature conservation, such as statutory designated nature conservation sites of international or national importance or sites maintaining viable populations of species of international or national importance (e.g. Red Data Book species; European protected species).
Medium	Sites designated at a county or district level, e.g. Local Wildlife Site (LWS), ancient woodland site, ecologically 'important' hedgerows or ecological features that are notable within the context of a region, county or district (e.g. a viable area of a Priority Habitat or a site that supports a viable population of a priority species).
Low	Sites of nature conservation value within the context of a parish or neighbourhood, low-grade common habitats, such as arable fields and improved grasslands and sites supporting common, widespread species.

Species Surveys

Bats

Features on site were assessed for potential for bat roosts, foraging and commuting.

An external assessment of all structures on site was undertaken to determine potential roost features (PRF) The potential suitability of the structures assessed was assigned a rating of low to high in accordance with table 4.1 of Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition.

An internal assessment of all structures was undertaken by a suitably licensed surveyor for evidence of roosting bats such as droppings, feeding remains and staining.

All trees were assessed from ground level (BTHK, 2018). All trees examined were categorised on their potential roost features (PRF). These features include cracks, splits in limbs, cavities, loose bark and thick stemmed ivy. Where appropriate and accessible these features were assessed using binoculars and/or endoscopes.

Table B.4. Categorisation of trees for bats

Value for Bats	Example Features
Negligible	A tree that lacks the requisite features to support roosting bats
Low	A tree that contains a feature or features that clearly offer little roosting habitat for bats
Moderate/High	A tree that provides one or more potentially suitable roosting features for bats
Confirmed roost	Bat presence has been confirmed

Daytime surveys were conducted with the aid of a strong torch and a 12x55 monocular. Bat species may leave little evidence of their presence.

Evidence for the presence of bats includes:

- Holes, cracks and rot holes used as roosts, marked by streaks of urine and faeces.
- Smoothed, darkened edges where bats have rubbed and left natural body oils when entering and exiting a space.
- Faeces under a roof access point, a well-used feeding point or a resting spot.
- Feeding signs such as discarded insect wings under a feeding point.



- Lack of cobwebs around eaves, roof spaces, beams or ceilings where routes are kept clear by bats or presence of droppings in a cobweb.
- Presence of roosting or dead bats in or behind any object.

Badgers

Surveys were conducted in line with Harris, S., Cresswell, P. and Jefferies, D. (1989) Surveying Badgers. Mammal Society - No9.

Daytime surveys for badgers involved looking for:

- Scrapings where badgers have dug for food or used as latrines.
- Signs of a sett, including signs of use such as presence of badger hair.
- Tracks and prints.

Water Vole

An assessment of habitat suitability for water vole and otter was conducted by methods adapted from Harris *et al.*, (2009). The standard survey methodology; Strachan and Moorhouse (2006), was used for surveying for water vole. This involved searching for latrines, burrows, footprints, runs, feeding remains or lawns within 30m either side of the site boundary/where the site intersects with the watercourse.

Otter

An assessment of habitat suitability for otters was conducted using guidance from Natural England Standing Advice and the Scottish Borders Council Technical Advice Note#2.

Daytime surveys for otter include searching for:

- Otter prints
- Paths and slides along the riverbank
- Spraints (droppings)
- Feeding remains
- A holt
- Couches (resting places used in the day)

Signs of mink are also recorded.

Birds

Searching for evidence of nesting birds, including barn owls, involved looking for:

- Presence of nests
- Collections of droppings and/or feathers
- Highly distinctive droppings or splats under roosting points.
- Presence of owl pellets/feathers
- Listening for bird song
- Recording bird activity

Amphibians and Reptiles

The terrestrial habitats at the application site were surveyed and assessed for their suitability and potential value for the support of GCN. The general topography, ground conditions and presence or absence of vegetation were recorded. A refugia search was conducted for amphibians and reptiles by looking under any logs, large stones and other debris.



Appendix C – Policy

The following areas of policy and legislation are of relevance to ecology and provide context to the surveys conducted. Findings presented in this report are in line with the following:

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 – as listed in:

- Schedule 2. European protected species of animals
- Schedule 5. European protected species of plants

The Wildlife and Countryside Act (1981) – as listed in:

- Schedule 1. Birds protected by special penalties at all times
- Schedule 5. Protected animals
- Schedule 8. Protected plants

Countryside and Rights of Way Act (2000)

Environment Act (2021) – Part 6 – Nature and Biodiversity

The Protection of Badgers Act (1992)

Natural Environment and Rural Communities (NERC) Act (2006)

Planning Policy Wales 2002, updated Dec 2018

Section 6.4 – Biodiversity and Ecological Networks

The Nature Recovery Plan for Wales – Setting the course for 2020 and beyond (2015)

Environment Act (Wales) (2016)

Section 7

Bats

All bat species are protected under The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 which implements the EC Directive 92/43/EEC in the United Kingdom. It is an offence, with certain exceptions, to:

- Deliberately capture or kill any wild animal of a European Protected Species.
- Deliberately disturb any such animal.
- Damage or destroy a breeding site or resting place of such a wild animal.
- Keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal or plant of a European Protected Species, or any part of, or anything derived from such a wild animal or plant.

A person found guilty of an offence is liable on summary conviction to imprisonment for a term not exceeding six months or to an unlimited fine or to both .

Seven bat species are on the UK Biodiversity Action Plan and are listed as Species of Principal Importance under the provisions of the Natural Environment and Rural Communities (NERC) Act 2006. The National Planning Policy Framework (NPPF) states that to minimise impacts on biodiversity and geodiversity, *“planning policies should... promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations”*.



To allow a development that might result in an offence, a derogation licence can be sought via the implementation of a European Protected Species Licence. This is provided by Natural Resources Wales.

Badgers

Badgers and their setts are specifically protected (HMSO, 1992). The act was primarily brought into force to prevent the deliberate injury to or death of badgers. Some aspects of the act affect developers. It is important that developers are aware of any badger setts located on the land they intend to develop.

All personnel working on sites where there are badgers should be aware of the Protection of Badgers Act 1992. Under this legislation it is an offence to:

- Damage a badger sett or any part of it.
- Destroy a badger sett.
- Obstruct access to, or any entrance of a badger sett.
- Causing a dog to enter a badger sett.
- Disturbing a badger when it is occupying a badger sett.

Water Vole

The water vole is protected by law and is a priority species. Under the Wildlife and Countryside Act 1981 (as amended by Variation of Schedule 5) (England) Order 2008 it is an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure of place that water voles use for protection of shelter.
- Disturb a water vole whilst it occupies such a place.
- Section 10 of the Act requires that "reasonable" steps are taken to avoid unnecessary damage to such structures.
- Capture, kill, disturb or injure water vole (on purpose or by not taking enough care).
- Damage or destroy a breeding or resting place (deliberately or by not taking enough care).
- Obstruct access to their resting or sheltering places (deliberately or by not taking enough care).
- Possess, sell, control or transport live or dead water vole, or parts of water vole.

Otter

The European Otter is a European protected species and is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended 2010). This makes it illegal to:

- Capture, kill, disturb or injure otters (on purpose or by not taking enough care).
- Damage or destroy a breeding or resting place (deliberately or by not taking enough care).
- Obstruct access to their resting or sheltering places (deliberately or by not taking enough care).
- Possess, sell, control or transport live or dead otters, or parts of otters.



Birds

Under Section 1 of the Wildlife and Countryside Act 1981 (as amended), birds, their nests and young are all protected from damage, particularly during the breeding season. The Act allows for fines or prison sentences for every bird, egg or nest destroyed. It makes it an offence to:

- Intentionally kill, injure or take any wild bird.
- Take, damage or destroy the nest of any wild bird whilst it is in use or being built.
- Take damage or destroy the egg of any wild bird.
- To have in one's possession or control any wild bird, dead or alive or egg or any part of a wild bird or egg.

Some bird species are included in the UK and local BAPS and are recognised as species of principal importance for nature conservation in accordance with section 41 of the NERC Act 2006. Such species and their habitats receive protection through the provisions of the NPPF.

Amphibians

All species of amphibians receive a measure of protection under legislation.

The Wildlife and Countryside Act 1981 has been amended by the Countryside and Rights of Way Act (CRoW) 2000. This applies to England and Wales only. The key relevant fact is:

- Section 9(4) is amended to create an additional offence of reckless damage to, destruction of, or obstruction of access to, any structure or place used for shelter or protection; and reckless disturbance while occupying such a structure or place.

Great Crested Newts

Great crested newts are protected under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 which implements the EC Directive 92/43/EEC in the United Kingdom. It is an offence, with certain exceptions, to:

- Deliberately capture or kill any wild animal of a European Protected Species.
- Deliberately disturb any such animal.
- Deliberately take or destroy eggs of any such wild animal.
- Damage or destroy a breeding site or resting place of such a wild animal.
- Keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal or plant of a European Protected Species, or any part of, or anything derived from such a wild animal or plant.

Reptiles

Smooth snakes and sand lizards are designated and protected as European protected species (EPS). They are protected via a combination of Regulation 41 of the Conservation of Habitats and Species Regulations 2010 and Sub-sections 9(4) b & c and Section 9(5) of the Wildlife & Countryside Act 1981 (as amended).



Invasive Species

Himalayan Balsam

Himalayan Balsam is identified as an invasive non-native plant. It is listed under Section 9 schedule 14 of The Wildlife and Countryside Act. It is illegal to plant or otherwise cause Himalayan Balsam to grow in the wild in the UK.

Action will be taken to prevent invasive plants on one's land to spread into the wild and cause a nuisance.

The current fine is up to £5000 or a 2-year imprisonment if contaminated soil or plant material from any waste transferred is spread into the wild. Removal of soil material containing any plant material must be treated as controlled waste.

Himalayan balsam out competes native species, causing shade and suppressing growth leaving the riverbanks prone to erosion following winter dieback. It is spread by seed dispersal and sections of plant and root travelling downstream. Removing it will benefit the land and wildlife along the riverbank.

Control of Himalayan Balsam is most effective before it blooms:

Hand pull between May and June before flowering (the plants can be composted on site away from the river)

Strim in June as low down as possible to break all the stems. (Compost on site away from the river)

The seeds remain viable for up to 2 years, so repeated management should remove/reduce the amount of plants on site in a few years.

Use of an herbicide close to the river would require permission from the Environment Agency and is a costly way, but quick to control the plant in spring.

Japanese Knotweed

The management of Japanese knotweed (*Fallopia japonica*) is regulated by several pieces of legislation:

- The Wildlife and Countryside Act (as amended) 1981
- The Environment Protection Act 1990
- The Waste (England & Wales) Regulations 2011
- Third party litigation where damages may be sought for allowing Japanese knotweed to spread onto other properties.

Japanese Knotweed is listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to plant, cause the plant, or allow the plant to grow in the wild.



Appendix D - Bibliography

BTHK, 2018. *Bat roosts in trees - A guide to identification and assessment for tree-care and ecology professionals*. 1st ed. Exeter: Pelagic Publishing.

CIEEM, 2017. *Guidelines for Preliminary Ecological Appraisal, 2nd Edition*. Winchester: Chartered Institute of Ecology and Environmental Management.

Collins, J. BCT, 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition*. London: Bat Conservation Trust.

Edgar, P., Foster, J. & Baker, J., 2010. *Reptile habitat management handbook*. Bournemouth: Amphibian and Reptile Conservation.

English Nature, 2001. *Great Crested Newt Mitigation Guidelines*. London: English Nature.

HMSO, 1981. *Wildlife and Countryside Act 1981*. London: HMSO.

HMSO, 1992. *The Protection of Badgers Act 1992*. London: HMSO.

HMSO, 2000. *Countryside and Rights of Way Act 2000*. London: HMSO.

HMSO, 2016. *Environment (Wales) Act 2016*. London: HMSO.

HMSO, 2019. *The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019)*. London: HMSO.

ILP, 2023. *Guidance Note 08/23 Bats and artificial lighting at night*. Rugby: The Institute of Lighting Professionals.

Langton, T. E. S., Beckett, C. L. & Foster, J. P., 2001. *Great Crested Newt Conservation Handbook*. 1st ed. Haylesworth: Froglife.

Ministry of Housing, Communities and Local Government, 2021. *National Planning Policy Framework 2019*. London: Ministry of Housing, Communities and Local Government.

Natural England, 2018. *Nature on the Map, Magic Maps*, <http://magic.defra.gov.uk/magicmap.aspx>. London: Natural England.

NBN, 2023. *NBN Atlas*. [Online] Available at: <http://wales.nbnatlas.org> [Accessed 04 09 2023].

Reason, P. F. & Wray, S., 2023. *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats*. s.l.:Chartered Institute of Ecology and Environmental Management.

Scottish Badgers, 2018. *Surveying for Badgers: Good Practice Guidelines version 1*. s.l.:s.n.

South East Wales Biodiversity Records Centre , 2023. *Our Commercial Enquiry Service*. [Online] Available at: <http://www.sewbrec.org.uk/enquiries> [Accessed 31 08 2023].

UKHab Ltd, 2023. *UK Habitat Classification Version 2.0*. [Online] Available at: <https://www.ukhab.org>



James