Clydesmuir Industrial Estate

Preliminary Ecological Appraisal

Document Ref: 30295735-AUK-00-XX-RP-TC-0001-01

Revision: 01

October 2025

Contacts

SIAN CARR
Principal Consultant

m +44 7738 140159

e Sian.Carr@arcadis.com

Arcadis Consulting (UK) Limited

Suite 4D, Fourth Floor

Hodge House

114-116 St Mary Street

Cardiff CF10 1DY

Clydesmuir Industrial Estate

Preliminary Ecological Appraisal

Author	Rachel Turcan
Reviewer	Sian Carr
Approver	Harriet Webb
Document Ref.	30295735-AUK-00-XX-RP-TC-0001-01
Date	07 October 2025

Revision Control

Revision	Date	Author	Reviewer	Approver	Changes
01	**07/10/25**	**Rachel Turcan**	**Sian Carr**	**Harriet Webb**	**First Issue**
02	**13/01/26**	**Rachel Turcan**	**Ellen Hopkins**	**Sian Carr**	**Minor changes to unit numbers to match final design**

Contents

Appendices

Executive Summary

Arcadis Consulting (UK) Limited was commissioned by Pegasus Developments to produce a Preliminary Ecological Appraisal (PEA) report for a proposed housing development at Clydesmuir Industrial Estate ('the site'). The PEA report identifies any ecological constraints associated with the proposed development and informs the design process by outlining appropriate mitigation measures.

The site is located in Tremorfa, Cardiff (grid reference: ST 20677 77524) and is hardstanding with industrial building units throughout. There is a small unmanaged area with ephemeral/tall ruderal vegetation in the northern corner of the site. There are no statutory designated sites located within the site boundary, and no statutory designated sites will be impacted by the proposed development, due to the localised scale and their proximity to the site. A non-statutory designated site (B-Line) runs throughout the site.

Habitats including buildings within the survey boundary were considered suitable to support bats. As such a bat roost assessment of the buildings was performed and this assessment identified several features with low potential suitability to support individual crevice dwelling bat-species.

A follow up dusk emergence survey on each of the low suitability features identified three bat species (Common pipistrelle (*Pipistrellus pipistrellus)*, common noctule (*Nyctalus noctule*) and Nathusius' pipistrelle (*P. nathusii*)) foraging and commuting on site but no emergences were noted, and no roost was confirmed. Demolition of the existing building therefore has a residual risk for potential to damage and remove bat roosting habitat for a low number of individuals that may later inhabit the buildings. This is a legal offence without applicable safeguards.

The following mitigation is therefore recommended:

- Buildings should be demolished in winter during bat hibernation season (late November – March), when bats are least likely to be using the features OR the features could be removed under a precautionary working method statement with a licenced bat ecologist outside hibernation season.
- Sensitive lighting should be used on site, maintaining a dark corridor along the northern boundary, adjacent to the railway track.
- Bat boxes should be incorporated into new landscaping and buildings.
- Landscape proposals should include native planting to maximise biodiversity and enhance the B-Line throughout the site.

Additional enhancements that should be considered for incorporation into the design to ensure a net benefit to biodiversity in line with legislation include:

- Bird boxes on buildings and new landscaping.
- Green or red roofs with native plant species on any bicycle sheds or bin stores planned for the development.
- Wildlife piles to support reptiles and hedgehog in the vicinity of the railway.
- Bee bricks and bug boxes.

In line with guidance on the lifespan of surveys and reports, this report is valid for 18 months (i.e. until May 2027) [1]. Once the design is finalised it is recommended that this report is updated to include a statement in relation to green infrastructure and net benefit to biodiversity to help inform planning.

1 Introduction

1.1 Background

Arcadis Consulting (UK) Limited was commissioned by Pegasus Developments to produce a Preliminary Ecological Appraisal (PEA) report regarding a proposed housing development at Clydesmuir Industrial Estate ('the site').

The PEA report identifies any ecological constraints associated with the proposed development and informs the design process by outlining appropriate mitigation measures.

1.2 Site Location

The site is located in Tremorfa, Cardiff, with a central grid reference of ST 20677 77524. The site boundary is shown below in Figure 1.

Figure 1 Site Survey Boundary. © Esri, Maxar, Earthstar Geographics, and the GIS User Community

1.3 Scope of Works

The scope of this assessment includes the following:

- A desk study (within 2km of the site for protected species and designated sites, excepting Special Areas of Conservation (SACs) designated for bat interest, for which a search of up to 10km was undertaken).
- An extended Phase 1 habitat survey of the site to identify key habitats, assess their potential to support protected and/or notable species, and record any presence of non-native invasive species.

- Results of bat roost assessment and bat emergence surveys undertaken on buildings.
- An outline of measures and location for mitigation and possible ecological enhancements.
- Associated habitat mapping.

1.4 Proposals

The proposed development seeks to deliver approximately 96 affordable homes and associated car parking spaces.

2 Methodology

2.1 Desk Study

A desk study was undertaken in September 2025 to identify any existing ecological information relating to the site and its surroundings. The following resources were used/consulted:

- The Multi-Agency Geographical Information for the Countryside (MAGIC) website [2] was used to search for statutory designated sites of nature conservation value within 2km of the site. The search buffer was extended to 10km for SACs designated for bats.
- South-East Wales Biodiversity Records Centre (SEWBReC) was consulted for records of protected and notable species or species of conservation concern (from data collected in the last 10 years only) and Local Nature Conservation Sites within 2km of the site. The location of Ancient Woodlands was also provided.
- Habitats and species listed under Section 7 of the Environment (Wales) Act 2016 [3]; these are Habitats of Principal Importance in Wales (HPIEs) and Species of Principal Importance in Wales (SPIEs).
- The County Ecologist was consulted and provided the citation information for Sites of Importance for Nature Conservation (SINCs).

2.2 Field Survey

2.2.1 Extended Phase 1

An extended Phase 1 habitat survey was undertaken on 28 August 2025 by Arcadis Senior Ecologist Julie Player (MCIEEM) accompanied by Consultant Ecologist Rachel Turcan. The survey was undertaken during the daytime. Weather conditions were sunny, windy, with showers encountered later.

The survey comprised a walkover survey to map habitats present within the site following the standard survey methodology [4]. Dominant plant species were noted, as were any uncommon species or species indicative of particular habitat types. Botanical names follow New Flora of the British Isles [5] for higher plants.

The habitats on site were also assessed for their potential to support protected or notable species of plants and animals, and observation was made of any incidental signs of protected or notable species.

2.2.2 Bat Roost Assessment of Buildings

During the initial field survey, buildings within the red line boundary were assessed for their potential to support roosting bats. Buildings were inspected externally and internally where possible for features that could support roosting bats and/or signs of bat presence. Roosting features in structures and the value of habitats

for foraging and commuting bats have been classified in accordance with best practice guidance [6] which is summarised below (Table 1).

Table 1 Bat Suitability Classification

Potential Suitability	Description	
	Roosting Habitats in Structures	Potential Flight Paths and Foraging Habitats
None	No features likely to be used by any roosting bats at any time of year.	No features likely to be used by commuting or foraging bats at any time of year.
Negligible	No features likely to be used by bats, but a small element of uncertainty remains.	No features likely to be used by commuting or foraging bats.
Low	Structure has limited or suboptimal features that could be used occasionally by individual bats.	Habitat offers limited or suboptimal commuting or foraging opportunities, used rarely by bats.
Moderate	Structure has several features potentially used by bats, or evidence of occasional use, but not optimal or extensive.	Continuous habitat connected to the wider landscape that could be used by bats for flight-paths.
High	Structure has numerous suitable features or clear evidence of regular or sustained bat use.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats.

2.2.3 Bat Emergence Surveys

Following the bat roost assessment of buildings on site, the three buildings assessed as having potential roost features with low suitability (Building 1, 2 and 4) were subject to a single dusk emergence survey.

On 16 September 2025 a survey led by experienced surveyor Ellen Hopkins (MCIEEM, Licence number; S088014/1) assisted by Rachel Turcan (Qualifying Member of CIEEM), Andy Pugh (Qualifying Member of CIEEM) and Vicky Snell (Qualifying Member of CIEEM) was undertaken on the main building complex (Building 4) and Building 2 (Figure 2). On 24 September 2025 a dusk survey of Building 1 in the northeast corner of the site was led by Ellen Hopkins assisted by Emily Wilson. The location of the two buildings and the surveyors' positions is provided in Figure 2. The weather conditions of these surveys are provided in Table 2.

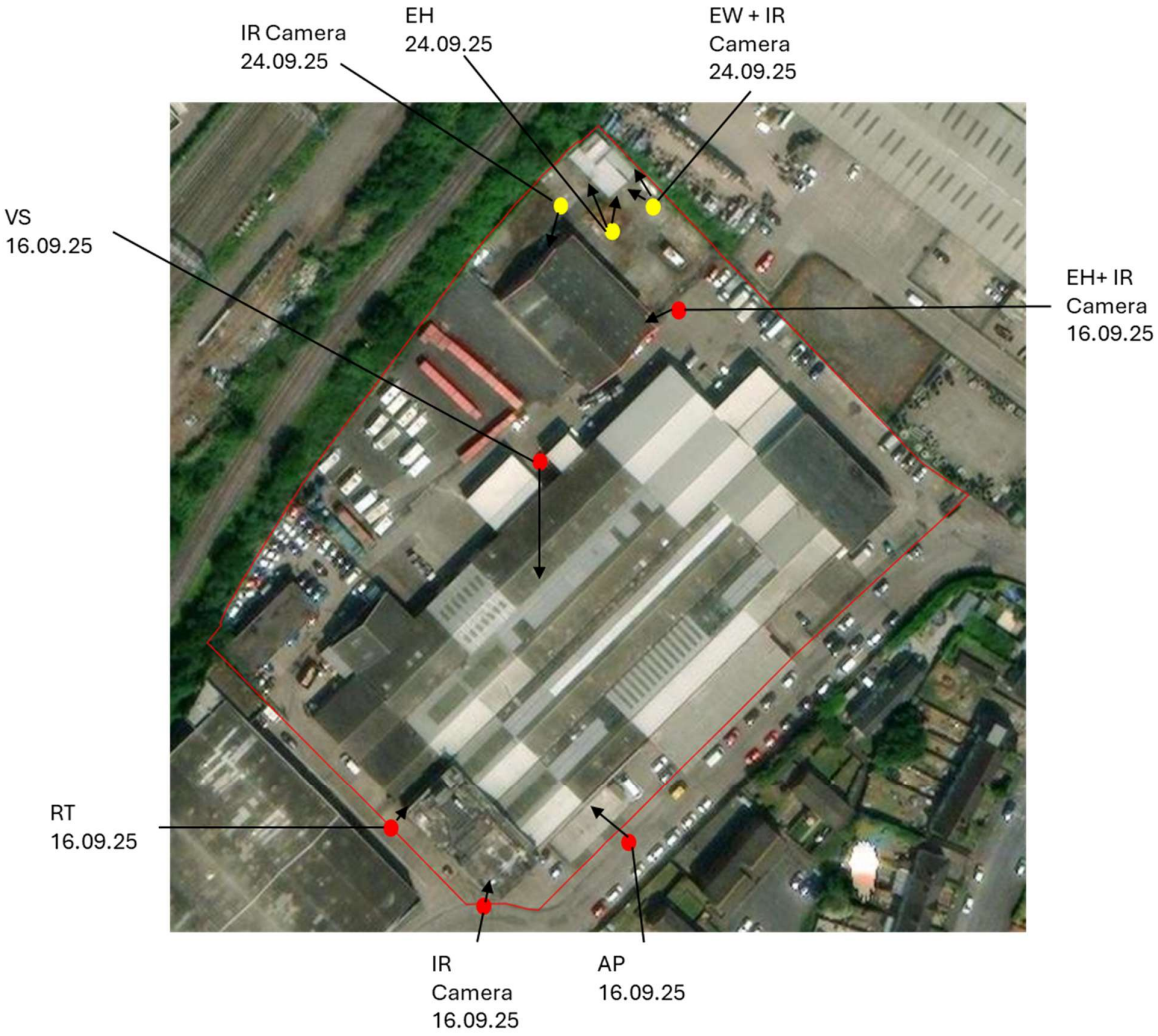


Figure 2 Location of surveyors during bat emergence surveys.

Table 2 Weather conditions during bat emergence survey.

Weather Conditions	16 September 2025		24 September 2025	
	Start of Survey (19:09)	End of Survey (20:54)	Start of Survey (18:50)	End of Survey (20:35)
Sunset Time	19:24	-	19:05	-
Temperature	18°C	17°C	18°C	14°C
Precipitation	None	Light shower	None	None
Cloud Cover	7/8	6/8	1/8	1/8
Wind	Light breeze	Light breeze	Calm	Calm

No further survey effort was completed on buildings with a negligible suitability. Surveyors recorded all bat activity but particularly focussed on whether bats emerged from or re-entered buildings. Emergence surveys commenced 15 minutes before sunset and continued for 90 minutes after sunset. Equipment included Infrared Cameras and Bat Logger M bat detectors.

2.3 Limitations

The survey data and recommendations provided in this report are valid for two years from the date of survey.

The protected species assessment provides a preliminary view of the likelihood of protected species occurring within the site. This is based on the suitability of the habitat, known distribution of the species in the local area and any direct evidence within the survey area. It should not be taken as providing a full and definitive survey of any protected species group. It is only representative of the time the survey was carried out. Additional surveys may be recommended if, based on the preliminary assessment or during subsequent surveys, it is considered reasonably likely that protected species may be present.

Access was not possible to the interior of the Building 1 marked on Figure 3, due to the building being full of furniture and rubbish.

Figure 3 Red circle indicating building that could not be accessed during surveys.

The Bat Survey Guidelines [6] recommend that emergence surveys on low suitability structures are conducted between May and August. Due to poor weather, the emergence surveys were conducted outside of the recommended survey season on 16 September 2025 and 24 September 2025. The weather was considered to be mild (temperature for both surveys was 18°C) to not impact results despite being outside the recommended survey season. Due to technical error, the video data for the emergence survey on 16 September 2025 was lost, therefore the results are based on audio recordings and surveyor observations only. This is not considered to impact results as so few bats were present it is unlikely an emergence was inadvertently missed.

3 Results

The results of the desk study and extended Phase 1 habitat survey are described below, with sites or features of particular nature conservation interest detailed as appropriate.

Supporting documents to be read in conjunction with the results and subsequent discussion are as follows.

- A summary of relevant legislation and policy presented in Appendix A.
- Appendix B details the results of the local record centre data search.
- The Phase 1 habitat survey plan is presented on Drawing 30295735-ARC-EBD-ZZ-DR-ZZ-00001 (Appendix C), whilst the associated building photographs can be seen in Table 5.

3.1 Statutory Designated Sites

There are six ecologically statutory designated sites within 2km of the proposed development site, as listed in Table 3 below. A further three geological statutory designated sites are not described. There are no SACs designated for bats within 10km of the site.

Table 3 Statutory Designated Sites

Site Name	Reasons for Designation	Location in relation to the proposed development
Howardian Local Nature Reserve (LNR)	A 13-hectare site with woodland, meadow, wetland and ponds.	783m north
Severn Estuary (Wales) Wetland of International Importance	Due to immense tidal range, this affects both the physical environment and biological communities. Habitats of interest include sandbanks which are slightly covered by sea water at all times, estuaries, mudflats and sandflats not covered by seawater at low tide and Atlantic salt meadows. This site is important for the run of migratory fish between sea and river via estuary. Species include salmon (*Salmo salar*), sea trout (*S. trutta*), sea lamprey (*Petromyzon marin*us), river lamprey (*Lampetra fluviatilis*), allis shad (*Alosa alosa*), twaite shad (*A. fallax*), and eel (*Anguilla anguilla*). It is also of particular importance for migratory birds during spring and autumn.	1133m south-east
Severn Estuary (Wales) Special Area of Conservation (SAC)	Habitats of importance include sandbanks which are slightly covered by sea water all the time, estuaries, mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows. Species of importance include sea lamprey, river lamprey, and twaite shad.	1133m south-east
Severn Estuary (Wales) Special Protection Area (SPA)	Over winter the area regularly supports: Bewick's Swan (*Cygnus columbianus bewickii*), Gadwall (*Anas strepera*), Greater white-fronted goose (*Anser albifrons albifrons*), Dunlin (*Calidris alpina alpina*), Common Shelduck	1133m south-east

	(*Tadorna tadorna*), and Common redshank (*Tringa tetanus*).	
Severn Estuary Site of Special Scientific Interest (SSSI)	The intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain. The estuarine fauna includes: internationally important populations of waterfowl; invertebrate populations of considerable interest; and large populations of migratory fish, including the nationally rare and endangered Allis Shad.	1133m south-east
Gwent Levels – Rumney and Peterstone SSSI	The Rumney and Peterstone area supports a number of important plant species including the nationally rare brackish water-crowfoot (*Ranunculus baudotii*) and several regional rarities including the pondweeds *Potamogeton obtusifolius* and *Potamogeton berchtoldii*. The northern section of this SSSI is a stronghold on the Gwent Levels for the flowering rush *Butomus umbellatus*. The area also supports a rich and important invertebrate fauna with a number of nationally notable species largely confined to this sub-unit including the marsh-flies *Pherbellia brunnipes* and *Lamprochromus elegans*, the water-beetle *Plateumaris braccata* and the variable damselfly *(Coenagrion pulchellum)*.	1606m south-east

3.2 Non-Statutory Designated Sites

There are 12 non-statutory designated sites within 2km of the site, including 11 Local Wildlife Sites / SINCs and one B-Line, as listed in Table 4 below.

Table 4 Non-Statutory Designated Sites

Site Name	Reasons for Designation	Location in relation to the proposed development
B – Line	B-Lines are 'insect pathways' running through countryside and towns which link existing wildlife areas together.	Through development
Wildlife Site / SINC		
Roath Brook	Designated as a small watercourse which is comparatively unmodified, supports good aquatic, emergent or bankside plant communities, and where the water is not grossly polluted by long-term sources. Eels, Trout and Kingfishers (*Alcedo atthis*) have all been recorded in and along the Roath Brook SINC.	413m north
River Rhymney	The river is important for migratory fish, Otter (*Lutra lutra*), wildfowl and bankside vegetation and acts as a major wildlife corridor. Bats, Dormice (*Muscardinus avellanarius*), Grass	682m north to north-east

Site Name	Reasons for Designation	Location in relation to the proposed development
	Snakes (*Natrix helvetica*), Eel and Trout have been recorded in and around the River Rhymney	
Pengam Moors	The site is made up of grassland habitats surrounded by scrub and areas of bare ground of former industrial use. The site is important for many rare maritime plants including Sea Clover (*Trifolium squamosum*), Brackish Water Crowfoot (*Ranunculus baudotii*) and Water Whorl-grass (*Catabrosa aquatica*) and for roosting and breeding rare waterfowl and wintering birds of prey.	767m south-east
Lamby North	An inland saltmarsh on the eastern bank of the River Rhymney at its tidal section. Characteristic saltmarsh species include Sea Milkwort (*Glaux maritima*), English Scurvy-grass (*Cochlearia anglica*), Sea Beet (*Beta vulgaris subsp. maritima*), Common Sea-lavender (*Limonium vulgare*) and Sea Plantain (*Plantago maritima*). Birds noted on the site include Lapwing (*Vanellus vanellus*), Redshank and Common Sandpiper (*Actitis hypoleucos*).	847m north-east
Rhymney Grassland East	Bee Orchids (*Ophrys apifera)* are noted in two parts of the site in the ground flora of some of the older scrub woodland. Scrub in general provides cover for nesting birds, reptiles and mammals, as well as supporting rare plants, forming habitat linkages between areas of higher quality habitat, and maintaining the general biodiversity of urban areas.	879m north-east
Rhymney River Valley Complex	A small area of diverse grassland located between two woodland stands within the central section of this part of the site and includes species such as Barren Strawberry (*Waldsteinia fragarioides)*, Common Knapweed (*Centaurea nigra*), Lesser Stitchwort (*Stellaria graminea*), Velvet Bent (*Agrostis canina*) and Glaucous Sedge (*Carex flacca*). Grassland adjacent to the estuary supports the most diverse flora including Sea Aster (*Aster tripolium*), Sea Plantain (*Plantago maritima*), Sea Milkwort (*Glaux maritima*), Buck's-horn Plantain (*Plantago coronopus*), Stiff Salt-marsh Grass (*Puccinellia rupestris*), Sea Clover and Sea Barley (*Hordeum marinum*).	1022m north to north-east
Lamby Salt Marsh	The site is important for rare salt-marsh and coastal plants such as Annual Sea-blite (*Suaeda linearis*) and Glasswort (*Salicornia europaea*) and as a rest place and breeding site for birds frequenting the Rhymney Estuary for feeding.	1163m east
Lamby Way	The site comprises damp, semi-improved neutral grassland. Locally notable plants included Sea Club-rush (*Bolboschoenus maritimus*) and Celery-leaved Buttercup (*Ranunculus*	1522m north-east

Site Name	Reasons for Designation	Location in relation to the proposed development
	sceleratus). Several typical ditch species are present in the grassland on the bank, including Greater Pond-sedge (*Carex riparia*), Common Reed (*Phragmites australis*), Gypsywort (*Lycopus europaeus*) and Tufted Forget-me-not (*Myosotis laxa*). The area is relatively undisturbed and supports fauna such as Cetti's Warbler (*Cettia cetti*) and Grass Snakes.	
Llanedeyrn Woodlands Complex	The site consists of 12 sections of ancient semi-natural woodland. Ground flora present is characteristic of ancient semi-natural woodland such as Bluebell (*Hyacinthoides non-scripta*), Wood Anemone (*Anemone nemorosa*) and Yellow Pimpernel (*Lysimachia nemorum*). Some of the sections within this complex contain streams leading to the presence of wet woodland species. Bat species have been recorded in the SINC.	1613m north
Tidal Sidings	Calcareous grassland with a number of locally rare plant species Meadow Cranes-bill (*Geranium pratense*) and Bee orchid. Grassland species indicative of both neutral and calcareous grassland have been recorded. Neutral grassland species include Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Orchid (*Dactylorhiza fuchsii*), Meadow Vetchling (*Lathyrus pratensis*) and Red Clover (*Trifolium pratense*). Calcareous grassland species recorded include Bee Orchid, Black Medick (*Medicago lupulina*), Wild Parsnip (*Pastinaca sativa*) and Yellow-wort (*Blackstonia perfoliata*).	1828m south
Ocean Park South	The site contains immature calcareous grassland and scrub important for many rare plants, lichens and birds, including Autumn Lady's-tresses (*Spiranthes spiralis*), Bee Orchid, Small Thyme-leaved Sandwort (*Arenaria serpyllifolia*), Skylark (*Alauda arvensis*) and Linnet (*Linaria cannabina*).	1958m south

3.3 Important Habitats

There are five ancient semi-natural woodland sites within 2km of the proposed development, the closest area is located 1940m north-west of the site. There is also two Natural Resources Wales (NRW) Priority Areas (Coastal Saltmarsh and Lowland Wetland) within 2km of the site. The Coastal Saltmarsh priority habitat area is throughout the site. Although the site sits within the coastal saltmarsh priority habitat, there is no saltmarsh on site. The Lowland Wetland priority habitat area is 848m east of the site.

3.4 Records of Protected and Notable Species

Desk study results for protected and notable species are discussed in Section 3.5.2 and Section 3.5.3 below.

3.5 Field Survey

3.5.1 Site Description

The site was hardstanding with industrial building units throughout. There was a small section of ephemeral/tall ruderal vegetation in the northern corner of the site (image provided in Table 5, surrounding Building 1). A railway line runs adjacent to the north-west boundary of the site, and scattered trees and scrub were noted along the embankment (Figure 4).

Figure 4 Railway embankment behind fence at the back of car park.

3.5.1.1 Buildings

Four distinct buildings were located within the site. The buildings are further discussed in Section 3.5.3.5, for their potential to support roosting bats and are shown in Figure 5 and described in Table 5.

3.5.2 Protected and Notable Species

A full range of protected species were considered at an initial stage in planning the current work. Some have been discounted on the grounds that there was no likelihood of their occurrence on site (for example, due to an absence of suitable habitat). Only those species with ranges within the geographical area of the site and where suitable habitats were present within or adjacent to the site are included below. Where confirmed presence was established or a likelihood of presence was anticipated, the relevant legislation is included in Appendix A.

3.5.2.1 Protected and Notable Plant Species

The desk study returned records of 37 species of flowering plants within 2km of the site. Key notable species include Bee Orchid and Bluebell. The closest record was of Small-flowered Crane's-bill (*Geranium pusillum*), 602m from the site. The natural habitats recorded within the site were very limited and not suitable to support any of the recorded notable species.

3.5.2.2 Algae

The desk study returned records of no species of algae. The habitats recorded within the site were not suitable to support any notable species.

3.5.2.3 Bryophytes

The desk study returned records of six species of bryophytes within 2km of the site. The closest record is for Heim's Pottia (*Hennediella heimii)* 828m from the site. There were no habitats suitable to support any rare or protected bryophyte species within the survey boundary.

3.5.3 Protected Fauna and / or Species of Conservation Concern

3.5.3.1 Terrestrial Invertebrates

The desk study returned records of 62 terrestrial invertebrate species within 2km of the site. The closest record is for a Cinnabar (*Tyria jacobaeae*), located 174m from the site. There were no habitats suitable to support any rare or protected invertebrate species within the survey boundary.

3.5.3.2 Amphibians

The desk study returned records of three species of amphibians, including slow-worm (*Anguis fragilis*), common frog (*Rana temporaria*) and common toad (*Bufo bufo*). The closest record is for common frog, located 371m from the site.

There were no waterbodies within the site boundary, therefore the site was not suitable for breeding amphibians. There were no suitable habitats for amphibian terrestrial phases on site.

3.5.3.3 Reptiles

The desk study returned nine records of slow worm (*Anguis fragilis*) within 2km of the site. The closest record is 371m from the site. There is anecdotal evidence of slow-worm along the railway corridor adjacent to the site (reported by County Ecologist, 18 September 2025), however no suitable habitat for reptiles was recorded within the site boundary.

3.5.3.4 Birds

The desk study returned records of 94 bird species within 2km of the site, including 27 species receiving full protection under the Wildlife and Countryside Act Schedule 1 Part 1 [7]. The closest records of bird species are Greenfinch (*Chloris chloris*), Swift (*Apus apus*), Herring Gull (*Larus argentatus*), Nightjar (*Caprimulgus europaeus*), and Swallow (*Hirundo rustica*) 174m from the site.

The scattered trees and scrub adjacent to the site, along the railway embankment, was suitable to support nesting birds. The site was considered to be unsuitable for ground nesting birds.

3.5.3.5 Bats

The desk study returned records of five species of bats, including Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*P. pygmaeus*), Noctule (*Nyctalus noctule*), Lesser Horseshoe (*Rhinolophus hipposideros*) and Myotis (*Myotis sp.*). The closest record was for a Common Pipistrelle, located 552m from the site. The closest roost was recorded 1580m from the site for Common Pipistrelle.

The buildings within site contained features suitable to support small numbers/individual crevice dwelling roosting bats (Figure 5, Table 5). Scattered trees and scrub along the railway embankment adjacent to the site (outside of the site boundary) provide suitable habitat to support commuting and foraging bat species.

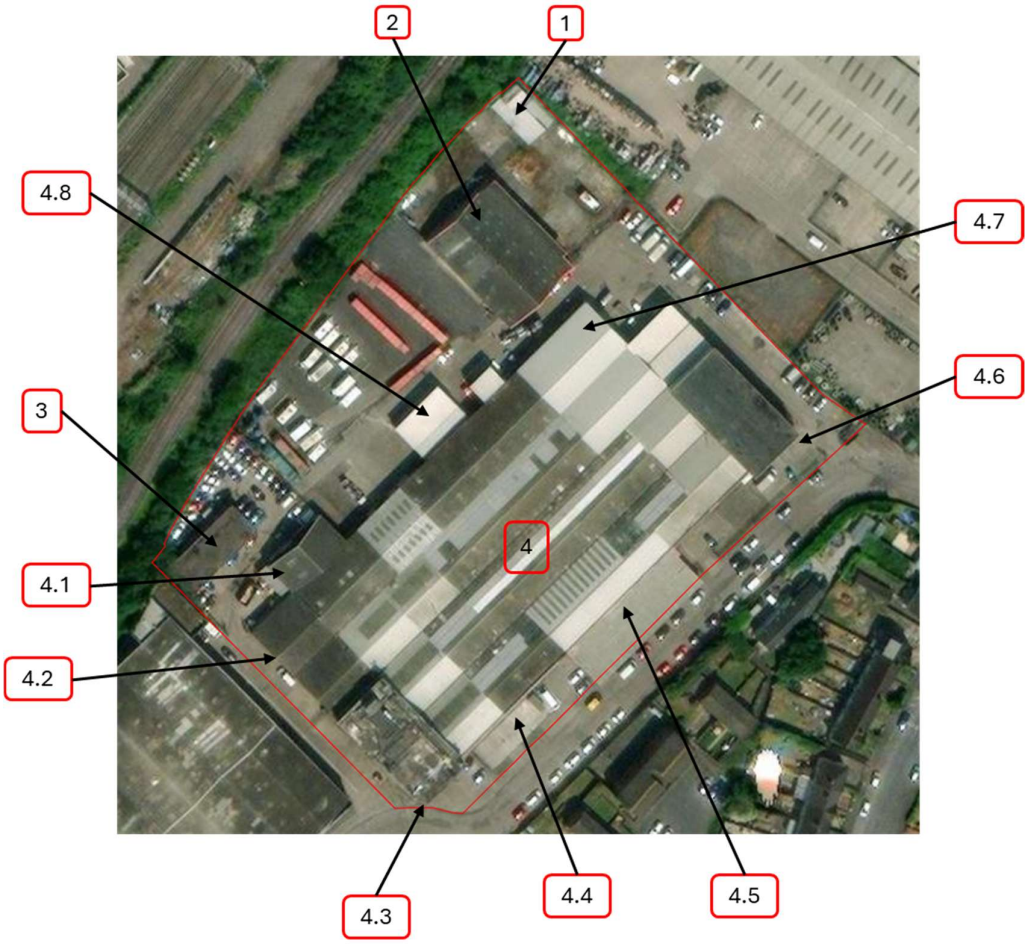


Figure 5 Buildings present on the site.

Table 5 Building descriptions and photographs.

Building Reference	Description	Photograph
1	Rendered breezeblock and lifted corrugated roof. Top section raised roof has gaps behind MDF boarding and under facia into open building with wooden beams seen from doorway. Vent bricks and entrance under corrugated roofing sheet. Gap above garage door. Hole into building. Low potential for bats.	

		    
2	Pitched roof with some Perspex windows. Gaps between brickwork either side and between asbestos sheet and corrugated metal sheet upwards. Holes in wall. Low potential for bats.	     

3		Flat roof, single story, brick, felt covering, some thin ivy that can be seen through. Tight all around. Negligible suitability for bats.	 
4 – Main warehouse complex	4.1	Negligible suitability for bats. Clear Perspex windows, constantly lit.	
	4.2	Single story, brick with pitched roof. Potential asbestos roof. Crevice on gable end fascia board, does not enter building, potential for an individual bat.	 
	4.3	Double story, brick building. Windows boarded up. Some crevices where concrete crumbling around drainage pipes. Low potential for bats.	  

	4.4	Auction house. Gaps at ridge tile suitable for crevice dwellers – low potential. Hole in roof od auction house big enough for crevice dwellers, with some potential crevices to land in. Whole auction house connected internally – building low potential for bats.	  
	4.5	ABM Building – unable to access interior. Negligible potential for bats on exterior.	
	4.6	Breezeblock, corrugated flat roof. Metal sheeting and felt combination. Negligible potential for bats.	
	4.7	Steel frame. No access to interior.	No photos available.
	4.8	Negligible potential for bats.	

Results of Emergence Surveys

During the emergence surveys, Common Pipistrelle (*Pipistrellus pipistrellus*), Nathusius' Pipistrelle (*P. nathusii*) and Common Noctule (*Nyctalus noctula)* were found utilising the wider site for foraging and/or commuting.

The earliest echolocation time for common pipistrelle was 19:30, recorded on the south-east side of Building 4. This echolocation time is earlier than average roost emergence times for common pipistrelle, which is typically 20 minutes after sunset [6]. The earliest echolocation time recorded for common noctule was 20:38, recorded at building 2. This is significantly later than the typical emergence time for the species, approximately 10 minutes after sunset [6], indicating that the individuals recorded came from a roost outside of the site boundary. The echolocation time recorded for Nathusius' pipistrelle was 19:47, which is in line with average roost emergence time for the species, approximately 30 minutes after sunset [6].

The site was lit throughout, with streetlamps present near to all recording locations. Foraging bats may therefore utilise the area due to an increased presence of invertebrates which are attracted to the lighting.

During the emergence surveys, the weather was dry and warm (Table 2).

No bat emergences were observed from any of the features during the survey. No further bat emergence surveys are required to support the proposed development.

3.5.3.6 Hazel Dormouse

The desk study returned 24 records of hazel dormouse within 2km of the site. The closest record was 780m from the site. There were no suitable habitats for hazel dormouse within the site.

3.5.3.7 Water Vole

The desk study returned no records of water vole (*Arvicola amphibius*) within 2km of the site. There were no suitable habitats for water vole within the site.

3.5.3.8 Otter

The desk study returned four records of otter (*Lutra lutra*) within 2km of the site. The closest record was 1596m from the site. There were no suitable habitats for otter within the site.

3.5.3.9 Badger

The desk study returned two records of badger (*Meles meles*) within 2km of the site. The closest record was 1173m from the site. There were no suitable habitats for badger within the site.

3.5.3.10 Other Mammals

The desk study returned records for Hedgehog (*Erinaceus europaeus*), Hare (*Lepus europaeus*) and Common Porpoise (*Phocoena phocoena*) within 2km of the site. The closest record was for Hedgehog 265m from the site. There were no suitable habitats for hedgehog, hare, or common porpoise within the site.

3.5.4 Invasive Species

The desk study recorded 25 invasive species present within 2km of the site. These include Butterfly-bush (*Buddleja davidii*), Montbretia (*Crocosmia aurea x pottsii = C. x crocosmiiflora*), Greater Periwinkle (*Vinca major*), Wall Cotoneaster (*Cotoneaster horizontalis*), Spanish Bluebell (*Hyacinthoides hispanica*), Canadian Waterweed (*Elodea canadensis*), Least Duckweed (*Lemna minuta*), Nuttall's Waterweed (*Elodea nuttallii*), Himalayan Honeysuckle (*Leycesteria formosa*), Entire-leaved Cotoneaster (*Cotoneaster integrifolius*), Cherry Laurel (*Prunus laurocerasus*), Pampas-grass (*Cortaderia selloana*), Japanese Rose (*Rosa rugosa*), Common Cord-grass (*Spartina anglica*), Small-leaved Cotoneaster (*Cotoneaster microphyllus*), White Stonecrop (*Sedum album*), Pink Purslane (*Claytonia sibirica*), Sea-buckthorn (*Hippophae rhamnoides*), Harlequin Ladybird (*Harmonia axyridis*), Red-crested Pochard (*Netta rufina*), Canada Goose (*Branta canadensis*), Ring-necked Parakeet (*Psittacula krameri*), Night-heron (Nycticorax nycticorax), Egyptian Goose (*Alopochen aegyptiaca*), and Grey Squirrel (*Sciurus carolinensis*).

No invasive species were noted during the survey.

4 Discussion

4.1 Potential Ecological Constraints

4.1.1 Ecological Features Scoped Out

The following ecological features have been scoped out as not requiring further consideration with regard to the proposed development on site (no significant impacts are anticipated).

- Statutory Designated Sites: All works will be localised, affecting only the site and immediately adjacent habitats. The works to change from industrial to residential use is not considered likely to have an impact on designating features of the statutory designated sites as they are sufficiently distant from the site, with no impact pathways identified.
- Non-Statutory Designated Sites (excluding B-Line): All non-statutory designated sites (excluding B-Line) are sufficiently distanced from the site with no impact pathways identified.
- Habitats: All works will be localised, affecting only the site and immediately adjacent habitats. All priority habitats are sufficiently distanced from the site with no impact pathways identified.
- Protected and Notable Plant Species, Bryophytes, Algae, Invertebrates, Amphibians, Reptiles, Birds, Hazel Dormouse, Water Vole, Otter, Badger, Other Mammals: There were no habitats within the site suitable to support these species. No significant impacts are predicted.

4.1.2 Ecological Features Scoped In

- B-Line: A B-Line runs throughout the site and has potential to be impacted by the proposed development.
- Bats: There were multiple records for bat species within 2km of the site. Commuting and foraging bats were recorded using the site during emergence surveys. Buildings within the site have potential to be roosts for individuals of crevice dwelling species. Although no roosts were identified, in the absence of mitigation, if bats do later roost in the building, they may be negatively impacted by the proposed development through the loss of roosting sites.

5 Recommendations for Further Surveys, Mitigation and Possible Enhancement

5.1 Further Surveys

No further surveys are recommended.

5.2 Recommended Mitigation

Removal of buildings on site has the potential to damage and remove bat roosting habitat. The potential for bats in the features identified was low, and suitable for individuals only. The emergence surveys did not identify any individuals using the features and no features were considered to be suitable for a maternity or hibernation roost.

Therefore, in the context of the wider landscape, the loss of habitat is not considered significant. Mitigation will be required to ensure that individuals are not harmed during construction. Buildings should be demolished in

winter during bat hibernation (late November – March) or buildings should be removed under a precautionary working method statement.

Bat boxes should be incorporated into new landscaping and buildings, as described in Section 5.3.2. A sensitive lighting scheme should be used on site, maintaining a dark corridor along the northern boundary adjacent to the railway track. The landscape planting that forms part of the proposed development will ensure that commuting routes will be maintained and feeding/roosting reestablished. The removal of existing buildings is not considered to have a significant impact to bats if enhancement and mitigation recommendations are followed.

5.3 Possible Enhancements

Measures to be considered within the design are detailed below and will help ensure the proposals meet legislation relating to net benefit to biodiversity and Cardiff Local Policy (Appendix A).

5.3.1 Native Planting

It is recommended that an ecologist contributes to the evolution of the development and landscaping design to maximise biodiversity gain and advise upon the provision of appropriate green infrastructure. The ecologist should ensure that wildlife corridors are created and that any new planting is designed to be beneficial to wildlife. Suitable planting will ensure that the site provides opportunities for pollinators and supporting the B-Line running through the site.

5.3.2 Bat and Bird Boxes

Bat boxes should be installed on the houses on site. This would provide enhancement/replacement for the loss of potential roost features within existing buildings, which would potentially be removed. The bat boxes that are suitable are detailed below, but other similar makes of boxes would be suitable:

- Schwegler 1FR Bat Tube or similar woodcrete boxes that can be installed in building facades or in concrete structures during construction.
- Schwegler 2F Bat Box or similar woodcrete boxes that are suitable for small species such as pipistrelle.
- Schwegler 2FN Bat Box or similar woodcrete boxes that are suitable for both larger and smaller bat species. The box has 2 entrances.

Woodcrete boxes have been recommended as they are constructed from a material which is long lasting, and the design of the boxes means that they require no maintenance; however, other materials have similar thermal properties and could be considered. Care should be taken to avoid using boxes that are not long lasting or require cleaning. All boxes require annual inspections to ensure they remain in situ and are fit for purpose.

Bird boxes could be installed within trees that are planted on site or attached to buildings. This will provide additional nesting opportunities. The bird boxes that are recommended are detailed below:

- Schwegler 1B Bird Box or similar woodcrete boxes that are suitable for small species of bird.
- Swift boxes.

5.3.3 Biodiverse Roofs

Green or red roofs could be installed on bicycle sheds and bin stores on the site. This would significantly enhance opportunities for wildlife by providing valuable habitat in an otherwise urban environment. An ecologist should be consulted to ensure that species included on green roofs are native and suitable to support local invertebrate (and the B-Line) and bird species.

5.3.4 Green infrastructure

A green buffer should be included at the northern boundary of the site, not only to provide an opportunity for wildlife but to help with visual and noise screening. This vegetation could link to new gardens and provide links to the wider area. Hedgerows, parcels of grassland or scattered trees could be incorporated around the perimeter of the site and help with linkages. Native species should be used to plant all green linkages.

Barriers between houses should be permeable to allow movement of wildlife – either hedgerows or fences should have gaps at the base to allow hedgehogs and other wildlife to pass between gardens.

5.3.5 Rain Garden

Drainage in the new development should be sustainable in design and could include a rain garden, to capture and filter rainwater runoff, reducing the risk of localised flooding and improving water quality. Native species should be used to plant rain gardens.

6 Conclusions

6.1 Overview

The site is located in Tremorfa, Cardiff and contains hardstanding habitat with industrial building units throughout. There is a small unmanaged area with ephemeral/tall ruderal vegetation in the northern corner of the site. There are no statutory designated sites located within the site boundary, and no statutory designated sites will be impacted by the proposed development, due to the localised scale and their proximity to the site. A non-statutory designated site (B-Line) runs throughout the site.

Natural habitats on site were limited and provide limited opportunities for priority and protected species. The railway embankment to the north was of more ecological interest with potential to support slow worm, hedgehog and was considered a likely foraging and commuting habitat for bats.

A bat roost assessment of buildings identified three buildings with several features with low suitability to support individual crevice dwelling bat-species. A dusk emergence survey on each of the low suitability features identified common pipistrelle, Nathusius' pipistrelle and common noctule foraging and commuting on site but no emergences were observed, and no roost was confirmed. Demolition of existing buildings has a residual risk for potential to damage and remove bat roosting habitat for a low number of individuals that may later inhabit the buildings.

6.2 Recommendations

No further surveys are required. The following mitigation is recommended:

- Buildings should be demolished in winter during bat hibernation season (late November – March) OR the features could be removed under a precautionary working method statement with a licenced bat ecologist outside hibernation season.
- Any lighting required to undertake the works and during the operational phase of the proposed development should be task focussed to minimise impacts to nocturnal wildlife. In any areas where lighting is not already present and is to be installed, a sensitive lighting strategy should be developed to minimise impacts of the proposed development on wildlife (i.e. along the northern boundary)
- Bat boxes should be incorporated into new landscaping and buildings.
- Landscape proposals should include native planting to maximise biodiversity opportunities throughout the site and enhance the B-Line throughout the site.

Additional enhancements that should be considered for incorporation into the design to ensure a net benefit to biodiversity in line with legislation include:

- Bird boxes on buildings and new landscaping.
- Green or red roofs with native plant species on any bicycle sheds or bin stores planned for the development.
- Wildlife piles to support reptiles and hedgehog in the vicinity of the railway.
- Bee bricks and bug boxes.
- Permeable barriers to create hedgehog highways.

Once the design is finalised it is recommended that this report is updated to include a statement in relation to green infrastructure and net benefit to biodiversity to help inform planning.

7 References

[1] CIEEM, “Advice Note on the Lifespan of Ecological Reports and Surveys,” 2019.

[2] Natural England, “MAGIC,” 2024. [Online]. Available: https://magic.defra.gov.uk/MagicMap.aspx.

[3] HM Government, “The Environment (Wales) Act,” 2016.

[4] Joint Nature Conservation Committee, Handbook for Phase 1 habitat survey: a technique for environmental audit, Peterborough, 2010.

[5] C. Stace, New Flora of the British Isles, Third Edition, Cambridge: Cambridge University Press, 2010.

[6] J. Collins, “Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition),” The Bat Conservation Trust, London, 2023.

[7] HM Government, “Wildlife and Countryside Act (as amended),” London, 1981.

[8] HM Government, “The Conservation of Habitats and Species Regulations,” 2017. [Online]. Available: https://www.legislation.gov.uk/uksi/2017/1012/contents/made.

[9] HM Government, “Environmental Protection Act,” 1990.

[10] Cardiff Government, “Cardiff Green Infrastructure SPG Ecology and Biodiversity Technical Guidance Note (TGN),” Cardiff, 2017.

Appendix A

Legislation and Policy

Ecological Constraint	Rationale
European Designated sites (Special Areas of Conservation, Special Protection Areas and Ramsar Sites)	Under the Conservation of Habitats and Species Regulations 2017, as amended [8], an assessment is required where a plan or project may give rise to significant effects upon 'European Sites' including SACs, SPAs, and Ramsar sites. The process of assessing the implications of development on European Sites is known as Habitats Regulations Assessment (HRA).
Nationally Designated Sites (Sites of Special Scientific Interest)	It is a legal requirement to apply for 'assent' from Natural Resources Wales for any works which could potentially damage the flora, fauna or features for which a SSSI is designated (under the Wildlife and Countryside Act (1981) (as amended) [7].
Non-native invasive Plants (as listed in Appendix B)	It is an offence under Section 14 of Wildlife and Countryside Act 1981 (as amended) [7] to cause plants listed in Schedule 9 to grow in the wild. Material contaminated with these species is classified as controlled waste under the Environmental Protection Act 1990 [9] and should therefore be disposed of in an appropriately licensed landfill site.
European protected species (great crested newts, natterjack toad, sand lizard, smooth snake, bats, dormice, otters)	It is an offence under the Conservation of Habitats and Species Regulations 2017 [8] to deliberately kill or injure a European protected species, to destroy breeding/ resting sites, or to deliberately disturb these species and affect their ability to survive, rear young, breed or hibernate.
Nationally protected species - those listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (Allis shade, twaite shad, great crested newt, natterjack toad, bats, dormice, otter)	It is an offence under the Wildlife and Countryside Act 1981, as amended [7] to intentionally or recklessly disturb a species listed on Schedule 5 whilst it is in a place of shelter, or to obstruct access to a place of shelter.

Policies	Rationale
Achieving a Net Benefit for Biodiversity Section 6 of the Environment (Wales) Act	A public authority must seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions
Planning Policy for Wales	The Welsh Government has prepared new guidance on green infrastructure and its delivery within the planning system, as an update to the National Planning Policy for Chapter 6 of Planning Policy Wales, published in October 2023 which advocates a more proactive approach to Green Infrastructure setting out how in particular, planning authorities must demonstrate that they have sought to fulfil the duties and requirements of Section 6 of the Environment (Wales) Act by taking all reasonable steps to maintain and enhance biodiversity in the exercise of their functions including a broad framework for delivery called DECCA, Diversity, Extent, Condition Connectivity and Adaptation attributes of ecosystem resilience (adaptability, recovery and resistance). New development proposals will be required to conserve and where appropriate enhance biodiversity interests unless it can be demonstrated that: 1) the need for the development clearly outweighs the biodiversity value of the proposed development; and 2) the impacts of the development can be satisfactorily mitigated and acceptably managed through appropriate future management regimes. When considering Net Benefit to Biodiversity (NBB) in Wales, a whole system approach is encouraged with an understanding of the following required: • The biodiversity value of the site, • Its ecosystem resilience (using DECCA), • The ecosystem services or benefits provided, • Its existing and potential linkages with the wider green infrastructure network pre- and post- development proposals. In order for a planning proposal to be accepted, the application must demonstrate it has maintained and enhanced biodiversity as well as built resilient ecological networks. A stepwise approach needs to be implemented which comprises: • Avoidance • Minimising • Mitigating (as a last resort)

Policies	Rationale
	• Compensating for any adverse impacts as a result of the development • In the event of adverse effects outweighing other material considerations then the application would be refused. For the proposed development, the following has been considered in relation to NBB: • Evaluation of the current ecosystem resilience, achieved through the undertaking of the walkover survey and habitat mapping as well as the consideration of suitability for protected species. • Consideration of the value of the site for biodiversity. • Review of existing linkages with surrounding green infrastructure. • Review of the masterplan of the proposed Development and application of the “Stepwise” approach.
Cardiff Supplementary Planning Guidance – Protected Species	Bats (all species), Otter, Great Crested Newt, Dormouse, Water Vole, Badger, Adder, Grass Snake, Slow-Worm, Common Lizard (*Zootoca vivipara*), Barn Owl (*Tyto alba*), Peregrine (*Falco peregrinus*), Kingfisher (*Alcedo atthis*), Cetti’s Warbler (*Cettia cetti*), Childing Pink (*Petrohagia nanteuilii*). [10]
Cardiff Local Development Plan Policy EN5 – Designated Sites	Development will not be permitted that would cause unacceptable harm to sites of international or national nature conservation importance. Development proposals that would affect locally designated sites of nature conservation and geological importance should maintain or enhance the nature conservation and/or geological importance of the designation. Where this is not the case and the need for the development outweighs the nature conservation importance of the site, it should be demonstrated that there is no satisfactory alternative location for the development which avoids nature conservation impacts, and compensation measures designed to ensure that there is no reduction in the overall nature conservation value of the area or feature [10].
Cardiff Local Development Plan Policy EN6 – Ecological Networks and Features of Importance for Biodiversity	Development will only be permitted if it does not cause unacceptable harm to: (i) Landscape features of importance for wild flora and fauna, including wildlife corridors and ‘stepping stones’ which enable the dispersal and functioning of protected and priority species; (ii) Networks of importance for landscape or nature conservation. Particular priority will be given to the protection, enlargement, connectivity and management of the overall nature of semi natural habitats. Where this is not the case and the need for the development outweighs the nature conservation importance of the site, it should be demonstrated

Policies	Rationale
	that there is no satisfactory alternative location for the development and compensatory provision will be made of comparable ecological value to that lost as a result of the development [10].
Cardiff Local Development Plan Policy EN7	Development proposals that would have a significant adverse effect on the continued viability of habitats and species which are legally protected, or which are identified as priorities in the UK or Local Biodiversity Action Plan will only be permitted where: i. The need for development outweighs the nature conservation importance of the site; ii. The developer demonstrates that there is no satisfactory alternative location for the development which avoids nature conservation impacts; and iii. Effective mitigation measures are provided by the developer. Where harm is unavoidable it should be minimised by effective mitigation to ensure that there is no reduction in the overall nature conservation value of the area. Where this is not possible, compensation measures designed to conserve, enhance, manage and, where appropriate, restore natural habitats and species should be provided [10].
Cardiff Local Development Plan Policy EN8 – Trees, Woodlands, and Hedgerows	Development will not be permitted that would cause unacceptable harm to trees, woodlands and hedgerows of significant public amenity, natural or cultural heritage value, or that contribute significantly to mitigating the effects of climate change [10].

Appendix B

Local Record Centre Data

Common Name	Scientific Name	Legislation
Bryophyte		
Heim's Pottia	*Hennediella heimii*	RDB1(Wales) - LC
Common Pocket-moss	*Fissidens taxifolius*	RDB1(Wales) - LC
Marchantia polymorpha subsp. polymorpha	*Marchantia polymorpha subsp. polymorpha*	RDB1(Wales) - LC
Wall Screw-moss	*Tortula muralis*	RDB1(Wales) - LC
Tiny Pocket-moss	*Fissidens viridulus*	RDB1(Wales) - LC
Blunt-fruited Pottia	*Tortula caucasica*	RDB1(Wales) - LC
Vascular Plants		
Small-flowered Crane's-bill	*Geranium pusillum*	LI(SEWBReC), WS_C
Bee Orchid	*Ophrys apifera*	LI(SEWBReC), WS_C
Grass Vetchling	*Lathyrus nissolia*	LI(SEWBReC), WS_C
Pale Flax	*Linum bienne*	LI(SEWBReC), WS_C
Pyramidal Orchid	*Anacamptis pyramidalis*	LI(SEWBReC), WS_C
Stone Parsley	*Sison amomum*	LI(SEWBReC), WS_C
Spiked Water-milfoil	*Myriophyllum spicatum*	LI(SEWBReC), WS_C
Buckthorn	*Rhamnus cathartica*	LI(SEWBReC)
Ivy-leaved Duckweed	*Lemna trisulca*	LI(SEWBReC), WS_C
Fat Duckweed	*Lemna gibba*	LI(SEWBReC), WS_C
White Water-lily	*Nymphaea alba*	LI(SEWBReC), WS_C
Rigid Hornwort	*Ceratophyllum demersum*	LI(SEWBReC), WS_C
Bluebell	*Hyacinthoides non-scripta*	WCA8
Narrow-leaved Bird's-foot-trefoil	*Lotus tenuis*	RDB1(Wales) - NT, LI(SEWBReC)
Yellow-wort	*Blackstonia perfoliata*	LI(SEWBReC), WS_C
Corn Mint	*Mentha arvensis*	RDB1(Wales) - VU
Dittander	*Lepidium latifolium*	RDB2 (UK) - S
Hairy St John's-wort	*Hypericum hirsutum*	LI(SEWBReC), WS_C
Alder Buckthorn	*Frangula alnus*	LI(SEWBReC), WS_C
Common Sea-lavender	*Limonium vulgare*	LI(SEWBReC), WS_C
Wild Celery	*Apium graveolens*	LI(SEWBReC), WS_C
Lesser Sea-spurrey	*Spergularia marina*	LI(SEWBReC), WS_C
Spotted Medick	*Medicago arabica*	LI(SEWBReC)
Fritillary	*Fritillaria meleagris*	RDB2 (UK) - S
Parsley Water-dropwort	*Oenanthe lachenalii*	LI(SEWBReC), WS_C

Long-bracted Sedge	*Carex extensa*	LI(SEWBReC), WS_C
Greater Sea-spurrey	*Spergularia media*	LI(SEWBReC), WS_C
Hard-grass	*Parapholis strigosa*	LI(SEWBReC), WS_C
Autumn Lady's-tresses	*Spiranthes spiralis*	RDB1(UK) - NT, LI(SEWBReC), WS_C
Smooth Cat's-ear	*Hypochaeris glabra*	RDB1(UK) - VU
Dwarf Mallow	*Malva neglecta*	RDB1(Wales) - NT, LI(SEWBReC), WS_C
Common Broomrape	*Orobanche minor*	LI(SEWBReC), WS_C
Weasel's-snout	*Misopates orontium*	RDB1(UK) - VU
Spiny Restharrow	*Ononis spinosa*	LI(SEWBReC), WS_C
Snow Pearlwort	*Sagina nivalis*	RDB1(UK) - VU, RDB2(UK) - R
Burnet Rose	*Rosa spinosissima*	LI(SEWBReC)
Early Forget-me-not	*Myosotis ramosissima*	LI(SEWBReC), WS_C
Invertebrates		
Cinnabar	*Tyria jacobaeae*	S7
Mottled Rustic	*Caradrina morpheus*	S7
Lackey	*Malacosoma neustria*	S7
Knot Grass	*Acronicta rumicis*	S7
Brindled Beauty	*Lycia hirtaria*	S7
Banded Demoiselle	*Calopteryx splendens*	LI(SEWBReC), WS_C
Adonis' Ladybird	*Hippodamia variegata*	RDB2 (UK) - NB
Speckled Bush-cricket	*Leptophyes punctatissima*	LI(SEWBReC), WS_C
Buff Ermine	*Spilosoma lutea*	S7
Grey Dagger	*Acronicta psi*	S7
Rosy Rustic	*Hydraecia micacea*	S7
White Ermine	*Spilosoma lubricipeda*	S7
Polydrusus formosus	*Polydrusus formosus*	RDB2 (UK) - NA
Dark-barred Twin-spot Carpet	*Xanthorhoe ferrugata*	S7
Ghost Moth	*Hepialus humuli*	S7
Rustic	*Hoplodrina blanda*	S7
Small Emerald	*Hemistola chrysoprasaria*	S7
Shaded Broad-bar	*Scotopteryx chenopodiata*	S7
Purple Hairstreak	*Favonius quercus*	LBAP(CDF)
Long-horned Bee	*Eucera longicornis*	S7, RDB2(UK) - NA
Long-winged Cone-head	*Conocephalus fuscus*	LI(SEWBReC), WS_P
Beautiful Demoiselle	*Calopteryx virgo*	LI(SEWBReC), WS_C
Shrill Carder Bee	*Bombus sylvarum*	S7, RDB2(UK) - NB
Red-tailed Mason Bee	*Osmia bicolor*	RDB2 (UK) - NB

Pentastiridius leporinus	*Pentastiridius leporinus*	RDB2 (UK) - NB
Garden Tiger	*Arctia caja*	S7
Swallowtail	*Papilio machaon*	WCA5, RDB1(UK) - NT
Brown-banded Carder Bee	*Bombus humilis*	S7
Stag Beetle	*Lucanus cervus*	HDir, WCA5, S7, RDB2(UK) - NB
Broom Moth	*Ceramica pisi*	S7
Dark Brocade	*Mniotype adusta*	S7
Latticed Heath	*Chiasmia clathrata*	S7
Black-tailed Skimmer	*Orthetrum cancellatum*	LI(SEWBReC), WS_C
Painted Nomad Bee	*Nomada fucata*	RDB2 (UK) - NA
Dusky Thorn	*Ennomos fuscantaria*	S7
Small Square-spot	*Diarsia rubi*	S7
Hairy Dragonfly	*Brachytron pratense*	LI(SEWBReC), WS_P
Hill Cuckoo Bee	*Bombus rupestris*	RDB2 (UK) - NB
Dolichovespula media	*Dolichovespula media*	RDB2 (UK) - NA
Donacia clavipes	*Donacia clavipes*	RDB2 (UK) - NB
Marsh Fritillary	*Euphydryas aurinia*	HDir, WCA5, RDB1(UK) - VU, LI(SEWBReC), WS_P
Moss Carder Bee	*Bombus muscorum*	S7
Cantharis fusca	*Cantharis fusca*	RDB2 (UK) - S
Wall	*Lasiommata megera*	S7, RDB1(UK) - NT, WS_C
Small Heath	*Coenonympha pamphilus*	S7, RDB1(UK) - NT, WS_C
Ptinus sexpunctatus	*Ptinus sexpunctatus*	RDB2 (UK) - NB
Silvery Leafcutter Bee	*Megachile leachella*	RDB2 (UK) - NB
Emerald Damselfly	*Lestes sponsa*	LI(SEWBReC), WS_C
August Thorn	*Ennomos quercinaria*	S7
Mouse Moth	*Amphipyra tragopoginis*	S7
Dot Moth	*Melanchra persicariae*	S7
Dusky Brocade	*Apamea remissa*	S7
Rosy Minor	*Litoligia literosa*	S7
Blood-vein	*Timandra comae*	S7
Small Phoenix	*Ecliptopera silaceata*	S7
Shoulder-striped Wainscot	*Leucania comma*	S7
Sallow	*Cirrhia icteritia*	S7
Centre-barred Sallow	*Atethmia centrago*	S7
Spindle Knot-horn	*Nephopterix angustella*	RDB2 (UK) - NB
Grass Rivulet	*Perizoma albulata*	S7
Beet Moth	*Scrobipalpa ocellatella*	RDB2 (UK) - N
Mullein Wave	*Scopula marginepunctata*	S7

Amphibians		
Common Frog	*Rana temporaria*	HDir, WCA5, WS_C
Palmate Newt	*Lissotriton helveticus*	WCA5, WS_C
Common Toad	*Bufo bufo*	WCA5, S7, WS_C
Reptiles		
Slow-worm	*Anguis fragilis*	WCA5, S7, WS_C
Birds		
Swift	*Apus apus*	WBAm(RSPB)
Herring Gull	*Larus argentatus*	BDir22, S7, WBR(RSPB), UKBR(RSPB), WS_C
Nightjar	*Caprimulgus europaeus*	BDir1, S7, WBAm(RSPB), WS_P
Swallow	*Hirundo rustica*	WBAm(RSPB)
Starling	*Sturnus vulgaris*	BDir22, S7, WBR(RSPB), UKBR(RSPB), WS_C
House Sparrow	*Passer domesticus*	S7, WBAm(RSPB), UKBR(RSPB), WS_C
Lesser Black-backed Gull	*Larus fuscus*	BDir22, WBAm(RSPB), WS_C
Redwing	*Turdus iliacus*	BDir22, WCA1, WBAm(RSPB), UKBR(RSPB)
Great Black-backed Gull	*Larus marinus*	BDir22, WBR(RSPB), WS_C
Black-headed Gull	*Chroicocephalus ridibundus*	BDir22, S7, WBR(RSPB)
Kingfisher	*Alcedo atthis*	BDir1, WCA1, WBAm(RSPB), WS_C
Grey Wagtail	*Motacilla cinerea*	WBAm(RSPB), UKBR(RSPB)
Common Sandpiper	*Actitis hypoleucos*	WBR(RSPB)
Willow Warbler	*Phylloscopus trochilus*	WBR(RSPB)
Goldcrest	*Regulus regulus*	WBAm(RSPB)
Mistle Thrush	*Turdus viscivorus*	BDir22, WBAm(RSPB), UKBR(RSPB)
Grey Heron	*Ardea cinerea*	WBAm(RSPB)
Long-tailed Tit	*Aegithalos caudatus*	WBAm(RSPB)
Common Gull	*Larus canus*	BDir22, WBR(RSPB)
Mallard	*Anas platyrhynchos*	BDir21, WBAm(RSPB)
Fieldfare	*Turdus pilaris*	BDir22, WCA1, WBAm(RSPB), UKBR(RSPB)
Song Thrush	*Turdus philomelos*	BDir22, S7, WBAm(RSPB), UKBR(RSPB), WS_C
Dunnock	*Prunella modularis*	S7
Curlew	*Numenius arquata*	BDir22, S7, WBR(RSPB), UKBR(RSPB), WS_C
Shelduck	*Tadorna tadorna*	WBAm(RSPB)
Short-eared Owl	*Asio flammeus*	BDir1, WBR(RSPB), WS_P

Redshank	*Tringa totanus*	BDir22, WBAm(RSPB)
Teal	*Anas crecca*	BDir21, WBAm(RSPB), WS_C
Lapwing	*Vanellus vanellus*	BDir22, S7, WBR(RSPB), UKBR(RSPB), WS_C
Kestrel	*Falco tinnunculus*	S7, WBR(RSPB), WS_C
Cormorant	*Phalacrocorax carbo*	WBAm(RSPB), WS_C
Reed Bunting	*Emberiza schoeniclus*	S7, WBAm(RSPB), WS_C
Coot	*Fulica atra*	BDir21, WBAm(RSPB)
Tufted Duck	*Aythya fuligula*	BDir21, WBAm(RSPB)
Oystercatcher	*Haematopus ostralegus*	BDir22, WBAm(RSPB)
Jack Snipe	*Lymnocryptes minimus*	BDir21, WBAm(RSPB)
Peregrine	*Falco peregrinus*	BDir1, WCA1, WS_P, WS_C
Green Sandpiper	*Tringa ochropus*	WCA1, WBAm(RSPB)
Bullfinch	*Pyrrhula pyrrhula*	S7, WBR(RSPB), WS_C
Merlin	*Falco columbarius*	BDir1, WCA1, WBR(RSPB), UKBR(RSPB), WS_P, WS_C
Red Kite	*Milvus milvus*	BDir1, WCA1, WCA9, WBAm(RSPB), WS_P
Meadow Pipit	*Anthus pratensis*	WBAm(RSPB)
Whitethroat	*Curruca communis*	WBR(RSPB)
Manx Shearwater	*Puffinus puffinus*	WBAm(RSPB)
Wigeon	*Mareca penelope*	BDir21, WBAm(RSPB), WS_C
Pochard	*Aythya ferina*	BDir21, WBR(RSPB), UKBR(RSPB), WS_C
Skylark	*Alauda arvensis*	BDir22, S7, WBAm(RSPB), UKBR(RSPB), WS_C
Cetti's Warbler	*Cettia cetti*	WCA1
Linnet	*Linaria cannabina*	S7, WBR(RSPB), UKBR(RSPB), WS_C
Yellow-legged Gull	*Larus michahellis*	UKBAm(RSPB)
Garganey	*Spatula querquedula*	BDir21, WCA1, WBAm(RSPB)
Sand Martin	*Riparia riparia*	WBAm(RSPB), WS_C
Black Tern	*Chlidonias niger*	BDir1, WCA1
Redstart	*Phoenicurus phoenicurus*	WBAm(RSPB), WS_C
Hobby	*Falco subbuteo*	WCA1, WS_P
Mediterranean Gull	*Ichthyaetus melanocephalus*	BDir1, WCA1, WBAm(RSPB)
Bittern	*Botaurus stellaris*	BDir1, WCA1, S7, WBAm(RSPB), WS_P
Shoveler	*Spatula clypeata*	BDir21, WBAm(RSPB)
Common Tern	*Sterna hirundo*	BDir1, WBAm(RSPB),
Greenshank	*Tringa nebularia*	BDir22, WCA1

Green Woodpecker	*Picus viridis*	WBAm(RSPB), WS_C
Arctic Tern	*Sterna paradisaea*	BDir1, WBR(RSPB)
Scaup	*Aythya marila*	BDir22, WCA1, WBAm(RSPB), UKBR(RSPB)
Spotted Flycatcher	*Muscicapa striata*	S7, WBR(RSPB), UKBR(RSPB), WS_C
Larus argentatus argenteus	*Larus argentatus argenteus*	S7
Pintail	*Anas acuta*	BDir21, WCA1.2, WBAm(RSPB)
Snipe	*Gallinago gallinago*	BDir21, WBAm(RSPB), WS_C
Ringed Plover	*Charadrius hiaticula*	S7, WBR(RSPB), UKBR(RSPB), WS_C
Dunlin	*Calidris alpina*	WBR(RSPB)
carbo cormorant	*Phalacrocorax carbo carbo*	WBAm(RSPB)
Barn Owl	*Tyto alba*	WCA1, WCA9, WS_P
Wheatear	*Oenanthe oenanthe*	WBAm(RSPB)
Avocet	*Recurvirostra avosetta*	BDir1, WCA1, WBAm(RSPB)
Whimbrel	*Numenius phaeopus*	BDir22, WCA1, WBAm(RSPB), UKBR(RSPB)
Knot	*Calidris canutus*	BDir22, WBR(RSPB)
Turnstone	*Arenaria interpres*	WBAm(RSPB)
Bar-tailed Godwit	*Limosa lapponica*	BDir1, BDir22, S7, WBR(RSPB)
Goshawk	*Accipiter gentilis*	WCA1, WCA9, WS_P
Hawfinch	*Coccothraustes coccothraustes*	S7, Bern, WBAm(RSPB), UKBR(RSPB)
Black-tailed Godwit	*Limosa limosa*	BDir22, WCA1, WBAm(RSPB), UKBR(RSPB)
Common Scoter	*Melanitta nigra*	BDir22, WCA1, S7, WBAm(RSPB), UKBR(RSPB)
Firecrest	*Regulus ignicapilla*	WCA1, WBAm(RSPB), WS_C
Sanderling	*Calidris alba*	WBAm(RSPB)
Grey Plover	*Pluvialis squatarola*	BDir22, WBR(RSPB)
Velvet Scoter	*Melanitta fusca*	BDir22, WCA1, RDB1(UK) - EN, WBR(RSPB), UKBR(RSPB)
Tree Sparrow	*Passer montanus*	S7, WBR(RSPB), UKBR(RSPB), WS_P
Marsh Harrier	*Circus aeruginosus*	BDir1, WCA1, WBAm(RSPB), UKBR(RSPB), WS_P
Crossbill	*Loxia curvirostra*	WCA1, WS_C
Little Ringed Plover	*Charadrius dubius*	WCA1
Osprey	*Pandion haliaetus*	BDir1, WCA1, WBAm(RSPB)
Dipper	*Cinclus cinclus*	WBAm(RSPB)
Fulmar	*Fulmarus glacialis*	WBAm(RSPB)

Gannet	*Morus bassanus*	WBAm(RSPB)
Mammals		
Badger	*Meles meles*	BA, WS_P
Otter	*Lutra lutra*	EPS, HDir, WCA5, S7, RDB2(UK), WS_P
Hazel Dormouse	*Muscardinus avellanarius*	EPS, HDir, WCA5, S7, RDB2(UK), WS_P
Common Pipistrelle	*Pipistrellus pipistrellus*	EPS, HDir, WCA5, S7, RDB2(UK), WS_P
Myotis Bat species	*Myotis*	EPS, HDir, WCA5
Soprano Pipistrelle	*Pipistrellus pygmaeus*	EPS, HDir, WCA5, S7, RDB2(UK), WS_P
Noctule	*Nyctalus noctula*	EPS, HDir, WCA5, S7, RDB2(UK), WS_P
Lesser Horseshoe Bat	*Rhinolophus hipposideros*	EPS, AnII, HDir, WCA5, S7, RDB2(UK), WS_P
Hedgehog	*Erinaceus europaeus*	S7
Hare	*Lepus europaeus*	S7, WS_P
Common Porpoise	*Phocoena phocoena*	EPS, HDir, WCA5, S7, RDB2(UK)
Invasive Non-Native Species		
Butterfly-bush	*Buddleja davidii*	INNS
Montbretia	*Crocosmia aurea x pottsii = C. x crocosmiiflora*	WCA9, INNS
Greater Periwinkle	*Vinca major*	INNS
Wall Cotoneaster	*Cotoneaster horizontalis*	WCA9, INNS
Spanish Bluebell	*Hyacinthoides hispanica*	INNS
Canadian Waterweed	*Elodea canadensis*	INNS
Least Duckweed	*Lemna minuta*	INNS
Nuttall's Waterweed	*Elodea nuttallii*	INNS
Himalayan Honeysuckle	*Leycesteria formosa*	INNS
Entire-leaved Cotoneaster	*Cotoneaster integrifolius*	WCA9, INNS
Cherry Laurel	*Prunus laurocerasus*	INNS
Pampas-grass	*Cortaderia selloana*	INNS
Cotoneaster	*Cotoneaster*	WCA9, INNS
Japanese Rose	*Rosa rugosa*	WCA9, INNS
Common Cord-grass	*Spartina anglica*	INNS
Small-leaved Cotoneaster	*Cotoneaster microphyllus*	WCA9, INNS
White Stonecrop	*Sedum album*	INNS
Pink Purslane	*Claytonia sibirica*	INNS
Sea-buckthorn	*Hippophae rhamnoides*	RDB2 (UK) - S, INNS
Harlequin Ladybird	*Harmonia axyridis*	INNS

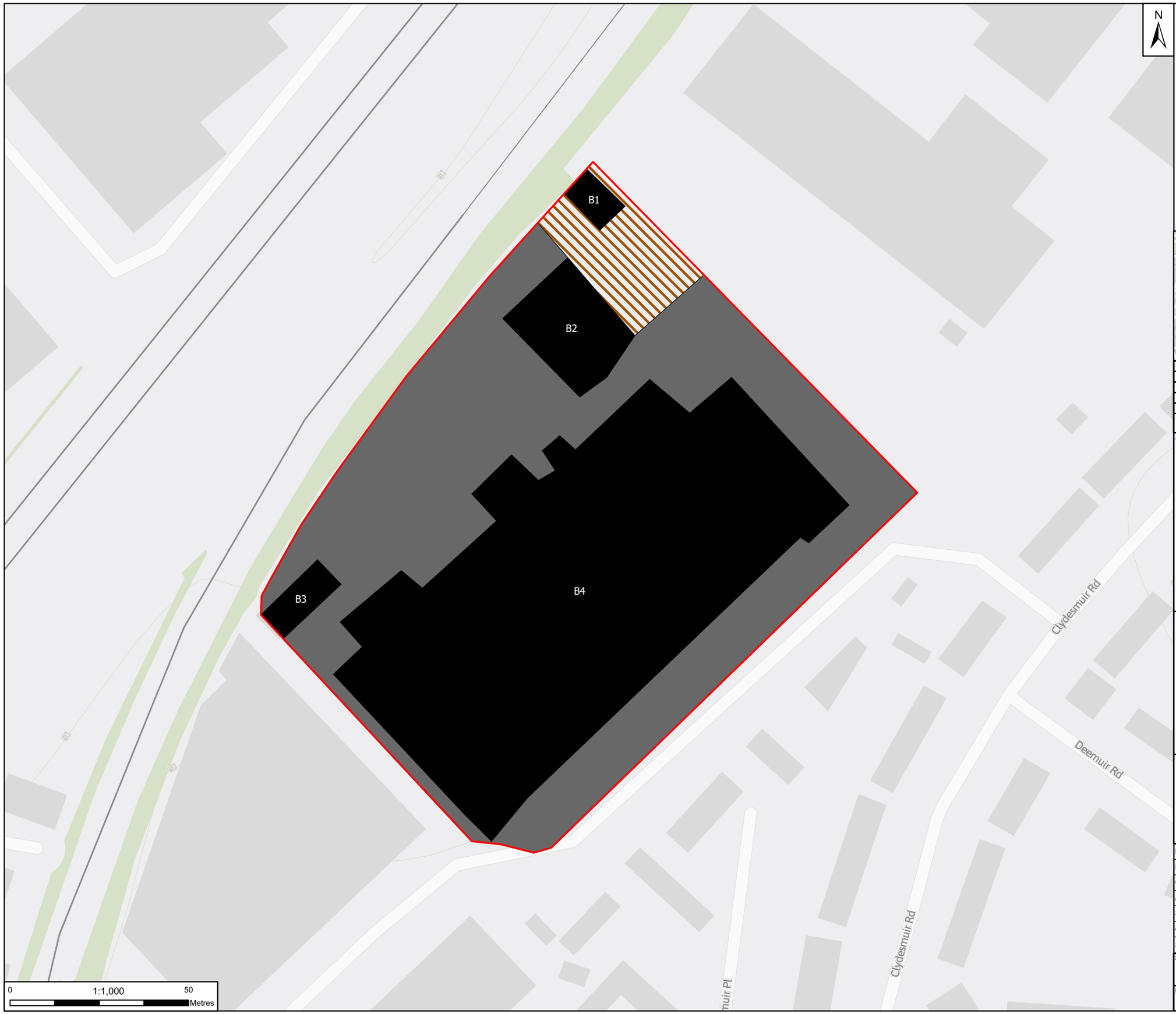
Red-crested Pochard	*Netta rufina*	BDir22, WCA9, INNS
Canada Goose	*Branta canadensis*	BDir21, WCA9, INNS
Ring-necked Parakeet	*Psittacula krameri*	WCA9, INNS
Night-heron	*Nycticorax nycticorax*	BDir1, WCA9, INNS
Egyptian Goose	*Alopochen aegyptiaca*	WCA9, INNS
Grey Squirrel	*Sciurus carolinensis*	WCA9, INNS

Abbreviations

BA = Protection of Badgers Act	WBR (RSPB) = RSPB Welsh Red listed birds (not based on IUCN criteria)	WCA5 = Wildlife and Countryside Act Schedule 5 Species
BDir1 = EC Birds Directive Annex 1 Species	WBAm (RSPB) = RSPB Welsh Amber listed birds (not based on IUCN criteria)	WCA8 = Wildlife and Countryside Act Schedule 8 Species
BDir21 = EC Birds Directive Annex 2.1 Species	UKBR (RSPB) = RSPB UK Red listed birds (not based on IUCN criteria)	WCA9 = Wildlife and Countryside Act Schedule 9 Species
BDir22 = EC Birds Directive Annex 2.2 Species	UKBAm (RSPB) = RSPB UK Amber listed birds (not based on IUCN criteria)	INNS = Invasive Non-Native Species
EPS = European Protected Species	S7 = Environment Act (Wales) Section 7 Species	LBAP (CDF) = Local Biodiversity Action Plan Species (Cardiff)
HDir = EU Habitats Directive Species	WCA1.1 = Wildlife and Countryside Act Schedule 1 Part 1 Species	LI (SEWBReC) = Locally Important Species (as identified by local specialists) in SEWBReC area

Appendix C

Phase 1 Habitat Map



N

Legend

Site Boundary

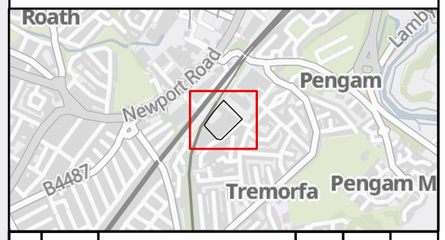
Phase 1 Habitat Types

Buildings

Developed land;sealed surface

Other tall herb and fern - ruderal

Notes: GB Background: Contains OS data © Crown Copyright and database right 2025
Contains data from OS Zoomstack
Contains public sector information licensed under the Open Government Licence v2.0



Rev	Date	Description	Drawn	Check	Approv
01	03/10/25	INITIAL ISSUE	IS	SC	HW

Client:

PROJECT:

pegasus

CLYDESMUIR INDUSTRIAL ESTATE

Site
Clydesmuir

Client
UK Power Networks
Newington House,
237 Southwark Bridge Road,
London, England,
SE16NP

ARCADIS

Registered office:
80Fen
80 Fenchurch Street
London
EC3M 4BY

Coordinating Office:
5th Floor
401 Faraday Street
Warrington
WA3 6GA

www.arcadis.com

Title:

Phase 1 Habitat Map

Designed	R. Turcan	Date: 03 Oct 25	Signed
Drawn	I. Singh	Date: 03 Oct 25	Signed
Checked	S. Carr	Date: 03 Oct 25	Signed
Approved	H. Webb	Date: 03 Oct 25	Signed
Scale:	1:1,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	S2	Project Number:	30295735

Suitability Description:

For Information

Drawing Number:
30295735-ARC-EBD-ZZ-DR-ZZ-00001

Revision:
P01

Print Date: 03-10-25 17:42:36

C:\Users\singhi0241\ARCADIS\30191766 - UKPN Environment - 01 GIS GDV\01 Aprx\UKPN Figure Request\Clydesmuir Phase 1 Habitat Map.aprx

Arcadis Consulting (UK) Limited

Suite 4D, Fourth Floor
Hodge House
114-116 St Mary Street
Cardiff CF10 1DY

T: +44 (0)29 2092 6700

arcadis.com