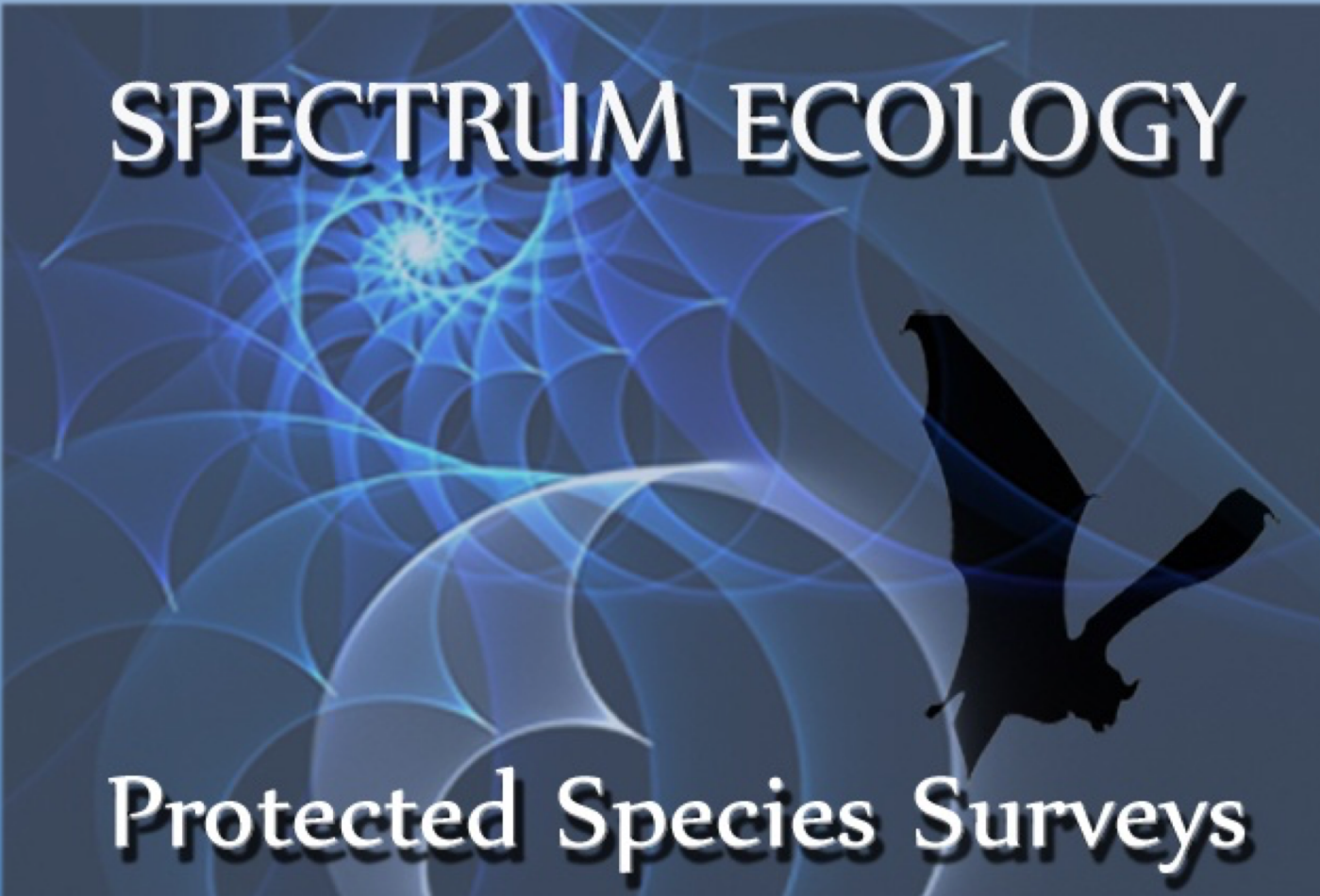


SPECTRUM ECOLOGY



Protected Species Surveys

Preliminary Ecological Appraisal

Land Adjacent to Bryngelli Industrial Estate

Report Prepared for:

Meadow Road (Hirwaun) Ltd

February 2021

Survey & report completed by J Pilkington

Checked by L Tuck

Version 1.0 – 8th Feb 2021

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SPECTRUM ECOLOGY

Ecological Consultancy

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Executive Summary

Spectrum Ecology were commissioned by Meadow Lane (Hirwaun) Ltd to undertake a preliminary ecological survey (PEA) and assessments of a site being considered for development through the planning process.

The appraisal has been undertaken in accordance with the CIEEM 'Guidelines for Preliminary Ecological Appraisals 2013'.

The Guidelines State -

'Preliminary ecological surveys have a range of purposes; one key use is in the site development process to gather data on existing conditions, often with the intention of conducting a preliminary assessment of likely impacts of development schemes or establishing the baseline for future monitoring. As a precursor to a proposed project, some evaluation is usually made within these appraisals of the ecological features present, as well as scoping for notable species or habitats, identification of potential constraints to proposed development schemes and recommendations for mitigation'.

The conclusions of the report indicate that due to the modification of the site, its historic ecological status can only be surmised from aerial imagery. It should be noted that the last aerial imagery showing the site modification was in May 2020 and the client took possession of the site in August 2020, therefore the client was not able to provide any additional information on the vegetation that previously existed.

As the site has now been mechanically cleared of the hardcore that was tipped on the site by the previous occupants, it is considered that there are no overriding ecological concerns or features that would preclude development of the site. However, if the site is left to re-vegetate and succeed then additional surveys will be required to ensure that protected species or habitats have not formed in the interim.

Notwithstanding the above, there are remnants of ecological features along the southern boundary which can be retained and continue to provide the ecological service as the current situation, or mitigated through the sensitive development of the site. This will also ensure the development meet the requirement of Section 6 of the Environment Act (Wales) 2016 which requires that public authorities:

"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".

This requirement is further consolidated in Planning Policy Wales 10 (Dec 2018)

As a result, the sensitive mitigation designed by Spectrum Ecology, found on page 12, will address the requirements of the above legislation whilst improving the connectivity through and around the site to the wider habitats.

Initial Instruction

To inform the planning process by completing:

- Desk study – detailing presence of protected species, priority habitats and designated areas
- Phase 1 Habitat survey – detailing the habitats within the PDS and potential of these habitats to support protected species.
- Mitigations and recommendations of additional works required.

Desk Study

Site Description

The Proposed Development Site (PDS) is located to the west of the Bryngelli Industrial Estate, off Meadow Lane in Hirwaun. It measures approximately 3.25 acres and is divided 50:50 between brown-field site and previously grazed pasture. The site slopes gently from the south to the north and has undergone significant improvement/modification in the distant and recent past. From recent aerial imagery it was expected that the area of land to the south of the historic foundations would have consisted of a species poor, semi-improved wet grassland, which had been historically grazed. However, on the day of inspection that the site had been subjected to ground clearance works.

The centre of the site grid reference is SN 95278 05473 and a Local Environmental Records Check was performed over a 2km radius from this point. The site is bordered to the north by a road and domestic urban development; to the east by the Bryngelli Industrial Estate; the south by a narrow strip of woodland and the A465; and to the west is a relatively small equine paddock and associated infrastructure before additional housing developments.

There is a drainage ditch running through part of the southern and the entire western boundaries which were found to be wet on the day of the survey. This ditch was culverted at least twice, once to pass under a land bridge in the south linking the PDS to the neighbouring paddock and once in the south to pass under the private land associated with the house in the north. The ditch has several considerable deposits of anthropogenic waste dumped into it and appears to have been suffering from sedimentation from surface run-off for a considerable period of time. The bed of the ditch is highly silted with little to no in-stream vegetation evident. The water depth was less than approx. 15cm at any point along most of the ditch. The flow was moderately wide and slow with the exception of one small section, close to the northern culvert opening, where the flow became significantly faster and narrower for a length of a couple of metres.

Three large mounds (1 hardcore/spoil and 2 vegetated mounds of topsoil) and a berm made from topsoil were found on site on the day of the visit.



Figure 1: Survey Site and Updated Proposed Development Site Location and Extent

Historic Use

Inspection of the 1847 tithe maps of the area suggests that at this time the land was mostly unmodified with some indication that the road/track network was being expanded west from the main settlement of Hirwaun presumably developed to service the Hirwaun iron works to the north, now known as the SSSI Cors Bryn-y-gaer.



Plate 1: Left- 1847 Tithe map, Right – 1913 OS Map (National Library of Wales, 2021)

By 1913, further development had occurred to the east, but the area encompassing the PDS, neighbouring paddock and Bryngelli industrial estate still appear to be used as pasture/garden land with three associated buildings. The map shows boundaries of enclosures which are likely to have been marked by hedgerows, suggesting the line of trees along the western boundary of the PDS has been in-situ in some form from this period.



Plate 2: Aerial Imagery captured in 1945 (WG Tile Server, 2021a)

The next record available was aerial imagery captured in 1945, which despite its poor quality seems to indicate development of the Bryngelli estate and the northern section of the PDS. It is not clear what development had occurred at this time, due to the poor resolution of the imagery, but there is a clear difference in colour in the areas discussed above, which appear to match the appearance of other developed areas or associated infrastructure. However, the south of the site appears to have remained undeveloped. In addition to this, the imagery appears to show relatively clearly that the western boundary is indeed defined by a hedgerow and that there is a small line of trees developing along the current southern boundary of the site.



Plate 3: Aerial Imagery captured in 1969 (WG Tile Server, 2021b)

In a 1969 photograph the resolution of the imagery is still not great, but industrial/warehouse style building, presumably the main bakery, can clearly be made out within the Bryngelli estate. The northern section of the PDS still appears to be developed whilst the paddock to the west and the southern section of the PDS appears to show a vegetated land-use type. The northern section of the PDS appears to show the development of a structure in the SE corner of the plateau, which although not clear, does match up with imagery taken from Google Earth as being a warehouse structure present on the plateau until 2018.

An extensive online literature search only rendered anecdotal evidence of development which suggested that the Ferrari's brand of bakeries started as a single café in 1912 and had expanded into a local chain by 1925. There is no definitive evidence of the construction of the bakery at this site, but it is suggested that a new 'factory/bakery' was deemed necessary in the 1960s. This would support the change in development noted between the 1945 and 1969 imagery, although it does not shed any light on the development of an apparent anthropogenic plateau from 1945. The Ferrari's brand bakery went into administration in December of 2006, and the bakery was closed in 2008. In 2013, planning permission was granted to erect a large supermarket and fuel station on the site, but the development never materialised and there is anecdotal evidence in online pictures of the dilapidated bakery and associated building showing it was unused in 2017 and potentially being prepared for demolition. However, inspection of imagery provided by Google Earth shows that the warehouses appear to have been repaired and repurposed to accommodate other industrial users within the estate at some point between June 2018 and May 2020. During this time, the warehouse on the plateau in the northern section of the PDS was also demolished although the plateau appears to have remained intact.

Upon more detailed inspection of the aerial imagery showing the portion of land in the south of the PDS, now documented as bare earth, it can be clearly seen that both the paddock to the west and the southern area of the PDS were being jointly managed as hay meadow and pastureland between 2001 and 2013.



Plate 4: Aerial Imagery of the PDS 2001-2013 (Clockwise – 2001, 2006, 2010, 2013) (Google Earth, 2021)

In fact, the southern area of the PDS at this time was actually two enclosures separated by a gappy tree line. The southern enclosure appears to have been more intensively managed than the more northern enclosure that is showing signs of reduced grazing and the influx of rushes.

In 2016, the management of both of the enclosures within the PDS appears to have been reduced, and the areas of rush-dominated sward have increased to cover approximately half of the more northern enclosure, with the southern enclosure resembling a much taller, ranker sward.



Plate 5: Aerial Imagery of the PDS (Left – 2016, Right – 2018) (Google Earth, 2021)

By 2018, despite the addition of what appears to be a small livestock related structure (i.e. feeder, water tank, small shelter) in the southern enclosure, the entirety of the southern section of the PDS appears to be moderately neglected with a rush sward having developed across more than 75% of the area. The treeline separating the enclosures within the PDS also appears to be failing, consisting only a couple of trees instead of a gappy line, despite the canopy density increasing to obscure the view of the Ferrari's sign still present in the SW corner of the site between 2006 and 2018.



Plate 6: Aerial Imagery of the PDS 28/05/2020 (Google Earth, 2021)

The imagery captured in May 2020 shows that the tree line dividing the 2 historic enclosures within the PDS has been removed. The state of the sward also appears to have dramatically worsened in the intervening 2 years, with large areas of dead/dying vegetation and a number of deposits that appear to be fly tipped within the site. The degradation in the sward does not appear to be confined to any specific location or extent of the site, but rather appears to have occurred more severely around the edges of the entire site, with the section that borders a largely intact and natural habitat affected as badly or worse than those areas bordering the industrial estate, the plateau or the road.

Proposed development



Plate 7: Plan of the Proposed Development (Life Properties Group, 2021)

Legislation and Planning Policy Context

The following is a summary of the legislation relevant to the site being assessed; for full wording, please see the original documents as referenced.

EU Directive 92/43/EEC – Part II - The Habitats Directive 1992

This European legislation has now been superseded by The Conservation of Habitats and Species (amendment) (EU Exit) Regulations 2019. The legislation continues to

recognise the network of internationally important sites (Natura 2000 (N2K) sites) which are designated for their ecological status. However, those sites previously designated under the N2K banner are now part of the creation of a national site network (NSN) within the UK territory comprising the protected sites already designated under the Nature Directives, and any further sites designated under these Regulations

These sites include:

- Special Protection Areas (SPAs) – designated on the basis of conservation of wild birds under the Birds Directive 79/409/EEC (**Eur-Lex, 2007**)
- Special Area of Conservation (SACs) including candidate SACs (cSAC) - designated on the basis of conservation of habitats by the Habitats Directive (**Eur-Lex, 1992**)
 - Potential SPAs (pSPA)
 - Ramsar sites – designated on the basis of conservation of wetlands by the Convention on Wetlands of International Importance, 1971 (UNSECO, 2020)
 - Offshore Marine Sites (OMS)

Articles 6(3) and 6(4) require an Appropriate Assessment to be completed on any plans/projects, which are likely to have a significant effect on one or more N2K site, that are not necessary for the management of the site. They also state that the potential impacts should be analysed in combination with any other plans that may have a cumulative effect on the protected site.

Conservation (Natural Habitats & c.) Regulations 1994 (Legislation.gov.uk, 2020)

The Conservation Regulations implement the Habitat Directive which lists a number of species which are designated as European Protected Species (EPS) and makes it an offence to deliberately kill, capture or disturb individuals or to damage or destroy the breeding or resting places used by them.

The Habitats and Species Regulations 1994, amended in 2010 and amended in 2017 has now been superseded as the UK has now left the EU. The legislation post January 1st 2021 is The Conservation of Habitats and Species (amendment) (EU Exit) Regulations 2019.

Wildlife and Countryside Act 1981 (Legislation.gov.uk, 2019a)

The Wildlife and Countryside Act 1981 makes it an offence to intentionally kill, injure or take any wild bird or animal listed on Schedules 1 and 5 respectively. It is also an offence to take, damage or destroy; the nests of wild birds either whilst they are being built or used, the eggs of wild birds or the places of shelter/protection for wild animals including disturbance of animals using these places. Schedule 8 prohibits the intentional picking, uprooting or destruction of any species listed. Finally, Schedule 9 prohibits the release of animals or dispersal of plants detailed within it as they pose a significant detrimental risk to native wildlife.

Convention of the Conservation of European Wildlife and Natural Habitats 1982 (Bern Convention) (COE.INT, 2020)

The Convention imposes legal obligations on contracting parties, throughout the continent of Europe and some African states, to ensure protection and conservation of both wild animal and plant species and their natural habitats (listed in Appendices I and II of the Convention), to increase co-operation between contracting parties, and to regulate the exploitation of migratory species listed in Appendix III of the Convention.

Protection of Badgers Act 1992 (Legislation.gov.uk, 2019b)

Badgers are protected in England and Wales under the Protection of Badgers Act 1992. This makes it an offence to:

- Make an attempt or succeed in wilfully killing, injuring or taking a badger
- Intentionally or recklessly damage, destroy or obstruct access to a badger sett
- Cruelly ill-treat a badger
- Dig for badgers
- Cause a dog to enter a badger sett
- Disturb a badger in its sett

A sett is defined by the Act as any structure or place showing signs of current or recent occupation by badger. Under the current interpretation of the Act, a licence is required for the following operations:

- Use of hand-tools within 10m of a sett
- Use of light machinery within 20m of a sett
- Use of heavy machinery within 30m of a sett
- Closure of a sett

The penalties for breaching this legislation include a fine and/or incarceration depending on the severity and number of offences.

Environment (Wales) Act 2016 Section 7 (Wales Biodiversity Partnership, 2019)

This act replaced the duty previously described in Section 42 of the NERC Act 2006 in Wales as of 2016. It documents the species and habitats deemed of key significance to improve and sustain Welsh biodiversity, to ensure all reasonable steps are taken to maintain and enhance those species and habitats.

Designations

DEFRA's MagicMap application was interrogated to find any sites with statutory designations located within 2km and 15km of the proposed development site; the results can be found in Figures 2 and 3 respectively.

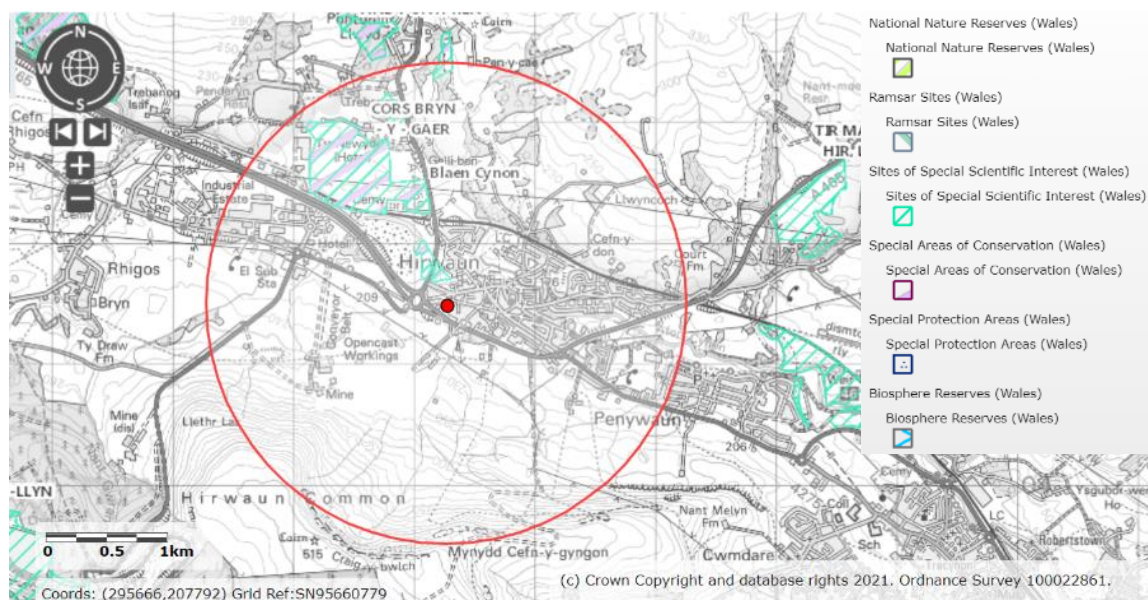


Figure 2: Statutory designated areas within 2km of the PDS

Figure 2 shows that there is one European site, Blaen Cynon SAC and 2 SSSIs, Cors Bryn-y-Gaer and Woodland Park and Pontpren, within 2 km of the centre of the PDS.

At its closest point, the boundary of the PDS is within 170m of the southern extent of the overlapping designations of Blaen Cynon and Cors-bryn-y-Gaer. Blaen Cynon supports the largest metapopulation of Marsh fritillary (*E. aurinia*) on the southern edge of the Brecon Beacons (JNCC 2015), whilst the SSSI is of special interest for its lowland bog, areas of soligenous flush, marshy, dry neutral and lowland acid grassland.

Whilst a brief discussion of the potential negative impacts that may be caused by the proposed development is included later in this report, the LPA must decide if this proposal requires an Ecological Impacts Assessment (EclA) considering the sites previous industrial uses.

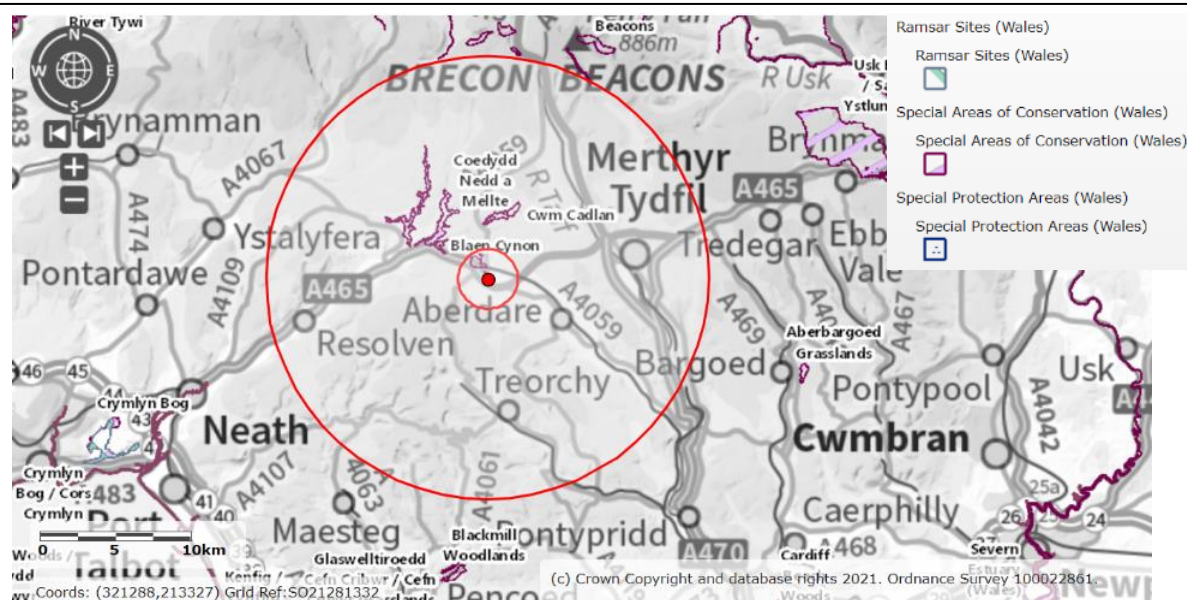
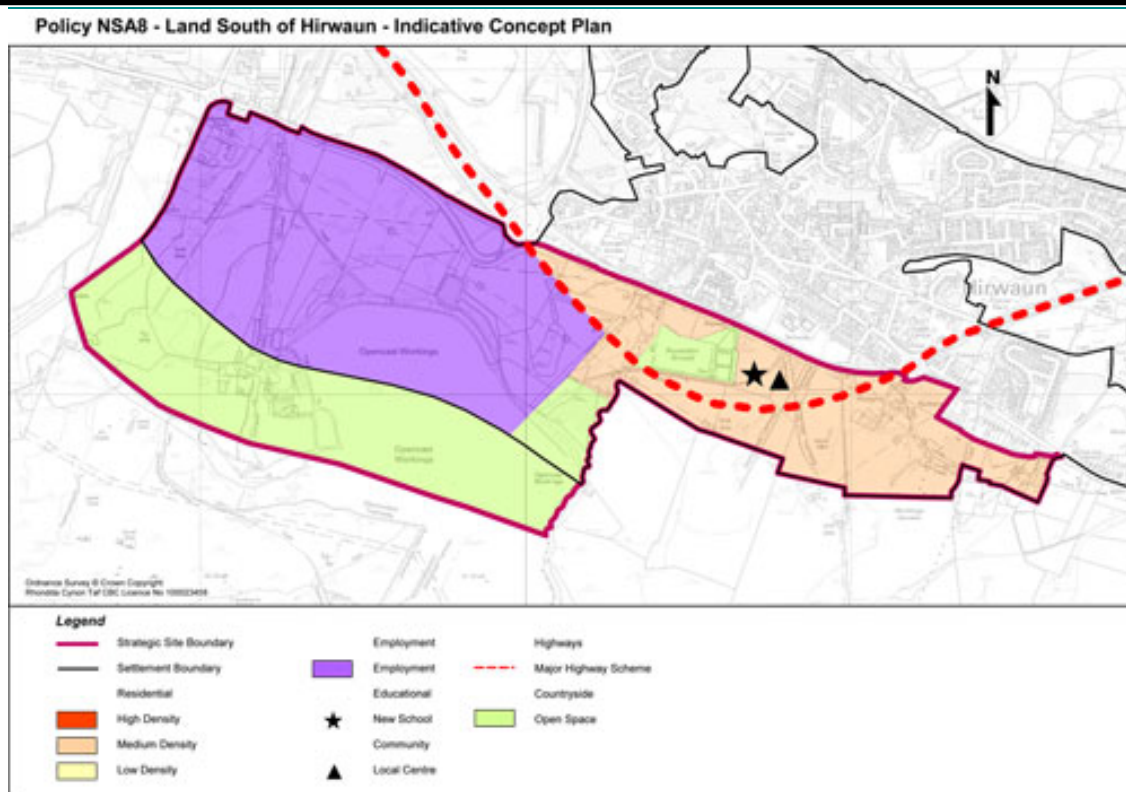


Figure 3: National Site Network within 15km of the PDS

In addition to Blaen Cynon, there are two further European sites, Cwm Cadlan and Coedydd Nedd a Mellte within 15km of the centre of the PDS. Due to the proximity of 3 European sites to the PDS, the LPA as the competent authority would need to decide if a Habitat Regulations Assessment (HRA) will be required as part of any future development on this site and if other developments adjacent to this site required an HRA to proceed. With that in mind, an Indicative Concept Plan was found for land south of Hirwaun within very close proximity of the PDS (Fig 4) was found during interrogation of the Rhondda Cynon Taff Council's planning portal. This shows that the area had already been designated for development under the local policies and that it is assumed the Local Authority have already undertaken an Appropriate Assessment of the allocation into policy.



Policy NSA 8 – Land South of Hirwaun

In accordance with Policy CS 3 land is allocated South of Hirwaun for the construction of 400 dwellings, 36 hectares of employment, a new primary school, a retail store of 2000m² net floor space, medical /community centre and informal recreation contained in a landscape setting. Development on the Strategic Site will be subject to a large-scale reclamation scheme.

Figure 4: Indicative Concept Plan for land south of Hirwaun (RCT 2021)

Interrogation of the RCT LDP mapping application shows that there are numerous SINCS within 2km of the PDS and 5 SINCS (AW 8.9-8.13) within 1km (Fig 5), indicating the land surrounding the PDS is ecologically rich and supports a high number of priority species. Whilst there are no statutory protections offered to these sites by their designation, they often contain nationally rare, threatened or priority species and habitats, therefore playing a critical role in conservation of the UK's natural heritage.

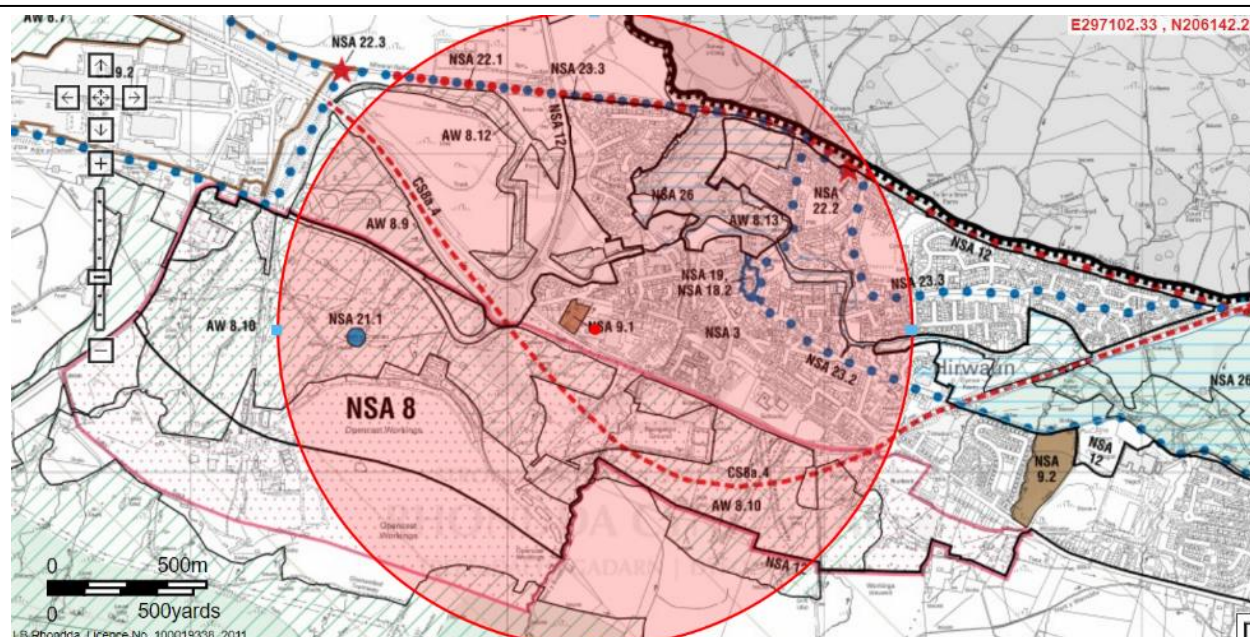


Figure 5: RCT LDP map showing locations of SINCs (RCT 2021)

Habitats

Examination of the LERC shows there are a number of Priority habitats as listed on S7 of the EWA 2016 which will need to be considered within the EcIA (see Table 2 below).

Table 2: Priority habitats within 2km of the PDS

Category	Description	%	Count
Woodland	Semi-natural broadleaved woodland	1.77	4444
Grassland	Unimproved acid grassland	5.1	82
	Marshy grassland	2.03	788
	Semi-improved acid grassland	0.53	111
	Semi-improved neutral grassland	0.29	50
Heath	Dry acid heath	0.64	7
Wetland	Fen	0.66	125
	Blanket bog	0.11	6
	Acid/neutral flush	<0.01	15
	Swamp	<0.01	36
	Standing water	0.46	385
Hedge	Intact hedge	0.59	1826

According to the mapping feature provided within the LERC report, the PDS' historic sward was classified as "poor semi-improved grassland" which is not deemed to be a priority habitat. However, the date of the survey that this mapping is based on is unknown, and so it is not possible to determine whether the noted colonisation of *Juncus sp.*, presumably due to lower levels or withdrawal of management effort, has been considered within this classification or whether the diversity of the sward had potentially improved since the classification was made.

Species

Analysis of the Local Ecological Records Check (SEWBReC) shows a number of protected species are present within 2km of the PDS (Table3).

Table 3: Analysis of LERC for protected species within 2km of PDS

Superorder	Common Name	Latin Name	Protection(s)
Amphibians	Common toad	<i>Bufo bufo</i>	WCA 1981
	Common frog	<i>Rana temporaria</i>	
Birds	Lesser redpoll	<i>Acanthus cabaret</i>	S7
	Skylark	<i>Alauda arvensis</i>	
	Tree pipit	<i>Anthus trivialis</i>	
	Black-headed gull	<i>Chiroicocephalus ridibund</i>	
	Cuckoo	<i>Cuculus canorus</i>	
	Yellow hammer	<i>Emberiza citronella</i>	
	Reed bunting	<i>Emberiza schoeniculus</i>	
	Kestrel	<i>Falco tinnunculus</i>	
	Pied flycatcher	<i>Ficedula hypoleuca</i>	
	Herring gull	<i>Larus argentatus</i>	
	Linnet	<i>Linaria cannabina</i>	
	Grasshopper warbler	<i>Locustella naevia</i>	
	Yellow wagtail	<i>Motacilla flava</i>	
	Spotted flycatcher	<i>Muscicapa striata</i>	
	Curlew	<i>Numenius arquata</i>	
	House sparrow	<i>Passer domesticus</i>	
	Grey partridge	<i>Perdix perdix</i>	
	Wood warbler	<i>Phylloscopus sibilatrix</i>	
	Black-necked grebe	<i>Podiceps nigricollis</i>	
	Willow tit	<i>Poecile montana</i>	
	Marsh tit	<i>Poecile palustris</i>	
	Dunnock	<i>Prunella modularis</i>	
	Bullfinch	<i>Pyrrhula pyrrhula</i>	
	Turtle dove	<i>Streptopelia turtur</i>	
	Starling	<i>Sturnus vulgaris</i>	
	Black Grouse	<i>Tetrao tetrix</i>	
	Song thrush	<i>Turdus philomelos</i>	
	Ring ouzel	<i>Turdus torquatus</i>	
	Lapwing	<i>Vanellus vanellus</i>	
	Goshawk	<i>Accipiter gentilis</i>	WCA 1981
	Hen harrier	<i>Circus cyaneus</i>	
	Merlin	<i>Falco columbaris</i>	
	Peregrine falcon	<i>Falco peregrinus</i>	
	Brambling	<i>Fringilla montifringilla</i>	
	Crossbill	<i>Loxia curvirostra</i>	
	Red kite	<i>Milvus milvus</i>	
	Osprey	<i>Pandion haliaetus</i>	

	Redwing	<i>Turdus iliacus</i>	
	Fieldfare	<i>Turdus pilaris</i>	
	Barn owl	<i>Tyto alba</i>	
Fish	Eel	<i>Anguilla Anguilla</i>	WCA 1981
	Brown/sea trout	<i>Salmo trutta</i>	
Invertebrates	Small pearl-bordered fritillary	<i>Boloria selene</i>	S7
	Small heath	<i>Coenonympha pamphilus</i>	
	Dingy skipper	<i>Eynnis tages</i>	
	Ghost moth	<i>Hepialus humuli</i>	
	Shoulder-striped wainscoat	<i>Leucania comma</i>	
	Dot moth	<i>Melanchra persicariae</i>	
	Oblique carpet	<i>Orthonama vittata</i>	
	Shaded broad-bar	<i>Scotopteryx chenopodiata</i>	
	Buff ermine	<i>Spilosoma lutea</i>	
	Feathered gothic	<i>Tholera decimalis</i>	
	Cinnabar	<i>Tyria jacobaeae</i>	
	Dark-barred twin-spot carpet	<i>Xanthorhoe ferrugata</i>	
	Pearl-bordered fritillary	<i>Boloria euphrosyne</i>	WCA 1981
	Marsh fritillary	<i>Euphydryas aurinia</i>	
Plants	Eyebright	<i>Euphrasia officinalis pratensis</i>	S7
	Fragrant orchid	<i>Gymnadenia conopsea</i>	
	Globe flower	<i>Trollius europaeus</i>	
	Bluebell	<i>Hyacinthoides non-scripta</i>	WCA 1981
	Rough marsh mallow	<i>Malva setigera</i>	
Mammals	Hedgehog	<i>Erinaceus europaeus</i>	S7
	Hare	<i>Lepus europaeus</i>	
	Polecat	<i>Mustel putorius</i>	
	Pipistrelle	<i>Pipistrellus pipistrellus</i>	WCA 1981
	Lesser horse-shoe bat	<i>Rhinolophus hipposideros</i>	
	Badger	<i>Meles meles</i>	PBA
Reptiles	Slow worm	<i>Anguis fragilis</i>	WCA 1981
	Common Lizard	<i>Zootoca vivipara</i>	

Phase 1 Habitat Survey

The PDS and the adjoining areas were subjected to a Phase 1 Habitat Survey to determine which habitats were present within the boundary of, and in close proximity to, the PDS. This survey will establish whether there are important or protected habitats present within the PDS and indicate the potential of the site to support any protected or important species. In combination with the previously completed desk study, it will also allow a preliminary assessment of the ecological risks that the proposed development may pose and guide further survey effort if it is known or suspected that important/protected habitats or species may be present within the PDS.

Methodology

A thorough walk-over survey was completed within the habitat section mapped, during which the diversity of all floral species was noted including their relative abundance, using the DACFOR scale. All faunal sightings were noted for the site as a whole.

The site was visited on 17/01/2021 between 10:00 and 15:00. On arrival, it was a cold (approx. 7°C), overcast (approx. 8 octas), moderately still with light drizzle through the later afternoon.

Survey Results

A map of the habitats found during the survey can be found in Figure 5, and the floral and faunal assemblage documented during the survey can be found in Tables 4 and 5 respectively.

On inspection of aerial imagery of the site prior to the site visit, it was expected that the northern most section would be covered by a large concrete slab which formed the foundations of the previous bakery; the north east of the site would have a number of buildings and infrastructure associated with access to the foundations and the land to the south of that would be unmanaged, overgrown/scrubby grassland with wetter/marshy areas dispersed towards the southern end. Notes from the developer indicated that there was a wet ditch running along the tree-lined boundary to the west. The southern boundary also appeared to hold potential to support an ecologically important habitat from the desktop survey, despite its proximity to the A465.

However, during the site visit it was found that the site had undergone significant modification since the last available aerial imagery was taken.

Highly modified/defunct habitats

Hardcore and hardstanding

Much of the area previously identified to be a solid platform had been subjected to breaking since May 2020 and on the day of the visit was witnessed to be made up of rubble predominantly made-up from broken concrete. Whilst it can clearly be seen from the aerial imagery that there is a patchwork of seams across the surface of the foundations which could easily have become exploited by the pioneer species typical of Open Mosaic Habitat on Previously Developed Land, the hard-core covered section

of land was entirely devoid of any living or dead vegetation, so few assumptions can be made in regard to the likelihood of this area having previously supported the Section 7 Priority habitat Open Mosaic Habitat on Previously Developed Land (OMHPDL). No large/mature vegetation can be clearly identified from the available imagery, however there are several examples of species that would be associated with OMHPDL (Rosebay willow herb, mosses and liverworts) across the wider site, and evidence of floral colonisation on the areas of remaining intact hardstanding bordering this area, suggesting that the historic foundation platform could have had small areas that might have qualified as early stages of succession from bare substrate to OMHPDL.



Plate 8: Vegetation found on areas or remaining hardcore

However, as previously noted, this area has undergone modification with all but the peripheries cleared and can no longer be counted as OMHPDL.

It has also been noted that from the 2020 aerial imagery provided by Google Earth that there were several accumulations of the crushed remnants of concrete slab which are being stored on site, which will be used for road construction what looked to be hard-core/building waste which are likely to have potential to have provided refuge and hibernation habitat for reptiles. Therefore, a clearance methodology will be required and adhered to when time comes to utilise the crushed stone.

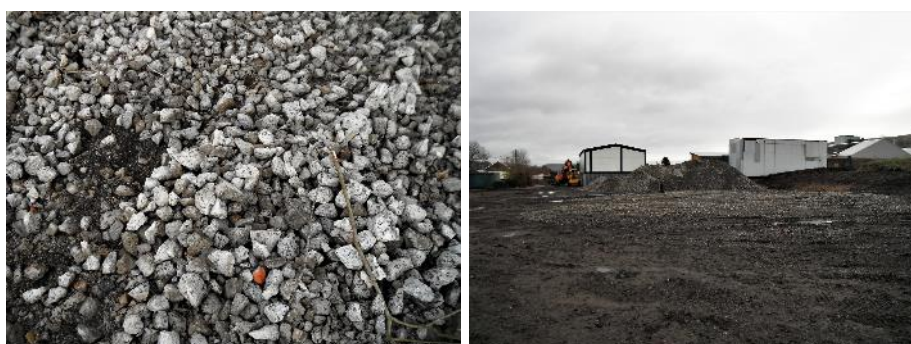


Plate 9: Hard-core covered area and spoil mound

The areas of solid hardstanding remaining on site were restricted to the edges of the historic plateau, the access roads, the area to the north to the dilapidated building and 2 small patches in the southwest, one of which was the foundations of the Ferrari's sign.

The access track through the eastern boundary was being used to store heavy machinery. The surface of the hard substrate was clear of vegetation with the exception of the raised border on the northern side which had been colonised by birch, grasses and mosses, specific identification of which was not possible due to desiccation.



Plate 10: Eastern Access point

The much shorter northern access point was also clear of vegetation cover.

The areas around the margin of the historic plateau had been subjected to a degree of mechanical scraping or heavy plant movement indicated by the scuff marks and disturbance in Plate 11. Whilst there is some less disturbed habitat in these areas, it is very limited in both size and connectivity to the wider environment as well as highly constrained by abiotic conditions and its positioning at least a metre higher than the surrounding land along most of its length.



Plate 11: Remaining areas of hard-core

The hardstanding surrounding the dilapidated building was either covered in decaying leaf litter from a large pollarded Ash to the north of the building, smaller ash trees growing through the chain link to the western extent or the birch growing to the south of the building or clear due to shading from the building and its sunken position compared to that of the plateau or trees. Considerable amounts of litter, glass from the

smashed windows and other debris that had fallen from the building were also moderately abundant in this area.

The area of hard-core and the areas of remaining hard standing in the north are no longer deemed to have any conservation interest or importance.

The two small patches of hardstanding in the southern section of the PDS fall within 5m of the boundary of the southern border strip and therefore could potentially remain intact, although the sign and its supports may be removed, as they will preserve islands of basking habitat if the rest of the buffer recovers and succeeds.



Plate 12: Areas of hardstanding in the south of the PDS

Building

There is one building standing in the north east corner of the PDS. The building is severely dilapidated, appears unoccupied and has evidence of warning tape installed by the rescue services implying it has been condemned. Therefore, no attempt was made to access the building due to safety concerns. However, the building was inspected from all external aspects to assess it for areas that could be accessed by bat species and barn owl. Numerous access points were easily identified on each aspect of the building and therefore the building holds potential to support roosts of both species. However, the significant access points also create an environment which is sub-optimal for roosting nesting due to exposure to the elements and in predatory terms, due to access by domestic cats for example. The corrugated tin roof also means that the building is subject to huge variances in temperature which indicate a low probability of use, especially for bats. Therefore, a demolition method statement for protected species will be required to ensure compliance with best practice prior to modification or demolition.



Plate 13: Building in the north-east of the PDS

Bare Earth

The area to the south of the hard-core had also undergone modification in its very recent history, having had the top, vegetative and hardcore layer scraped due to a previous occupant importing significant fill material which also was confirmed by the Site Investigation report. Very little of the original vegetation was left in situ, and what was visible had been damaged over the years, to the point that very few species-level identifications could be achieved. It was estimated that 95-98% of the surface of this area had been scraped with the exception of the two vegetated mounds that were visible on the aerial imagery again this is imported material by previous occupants. The excavation of soil in this area appeared to vary from scraping just the top fill material and vegetative layer off (darker areas) to scraping all the way back to subsoil (lighter orangey areas). There was no distinct difference in level between the soil types other than compaction suggesting the whole area had been subjected to similar levels of importation/fill of material, prior to our client taking possession of the site.



Plate 14: Bare earth and areas of compact soil

Moderately new berms of the previously imported material, which were just over a metre tall and approx. 1.5m wide, had been installed to the northern section of the eastern boundary, so it is assumed that these have been created using at least some of the material scraped back to enable the recent site investigation process and infiltration tests.



Plate 15: Soil berm

There is a small section of moderately intact, rank, scrubby, wet grassland remaining in the south-west corner of the PDS and two large, vegetated soil mounds in the eastern section of the bare earth area. As both of these areas have been subjected to considerably less modification, they could be deemed intact habitats and will be dealt with in a separate section.

Vegetated mounds

There are two large soil mounds within the southern section of the PDS. They are well vegetated with a creeping buttercup dominated sward and an abundance of species typical of both agriculturally improved grassland (i.e. curled and broadleaved docks, sorrel, ribwort plantain) and neglected waste land (i.e. bramble, rosebay willowherb and birch regen) with frequent patches of both broad and fine leaved grasses and occasional rush.



Plate 16: Vegetated mound looking south from the top of the northern mound

Neither mounds were present on aerial imagery before June 2018 but both mounds are visible on the imagery captured in May 2020, suggesting they were imported and created in the intervening period and this was confirmed by the client, that the material was imported before they took possession of the site. Plate 18 shows imagery captured from the LERC report which appears to show the construction of the southern mound with the clear indication of the northern mound already present and vegetated. It is not possible to find the date on which this imagery was taken, but the conversion of the land to the south of the warehouse on the Bryngelli estate to concrete plateau from grassland visible on the imagery is known to have been taken place in 2018 and thus links it to the same period.



Plate 16: Imagery captured on an unknown date between June 2018 and May 2020 (LERC, 2021)

Plate 18 clearly shows the importation of material covering the vegetative sward and topsoil from the southern section of the PDS, it is assumed that the line of trees indicating the boundary of the historic smaller enclosure was also removed at this time. Although there is no available imagery to confirm it, the presence of a 2nd year birch sapling on the northern mound suggests that the mounds were created shortly after the 2018 imagery was captured by Google Earth. These importation works will have been a major factor in the decline in the health and possible failure of the sward across the southern section of the PDS between 2018 and 2020.



Plate 17: Areas of excavation on the tops of the vegetated mounds (Target notes 3&4)

Intact habitats – Boundary strip

The southern and western boundary strips should be considered as comprising woodland and scrub, grassland and wet ditches covered in the following sections. Despite the significant amount of historic modification this combination of habitats should be considered the only intact habitats left within the site and therefore retained. To ensure the success of these habitats and their continued ability to support local wildlife, a permanent, 5m wide, unmodified, unmanaged green buffer strip should be retained between the existing boundary strips and the boundary of the new development (including the gardens or green spaces).

Woodland and scrub

The areas of woodland in the south and western boundaries of the PDS are believed to have originated from a pair of hedgerows on either side of the wet ditches installed to delineate the historic boundaries of field enclosures. In the years since their installation they have been allowed to succeed to become a pair of out-grown hedges/gappy line of trees and then to strips of woodland, due to a moderate amount of sapling regeneration from the mature trees.

The southern woodland has a very gappy canopy and hence has a dense understory of bramble dominated scrub along most of its length.



Plate 18: Panoramic of southern boundary strip

The high frequency of multi-dominant stems along the western boundary (presumably due to historic grazing damage and hedge maintenance) has allowed a greater extent of canopy closure significantly reducing the density of the understory along most of its length.



Plate 19: Multi-dominate growth form of trees in western boundary strip

Semi-improved wet grassland border strip

There was found to be a margin of no deeper than 1.5m between the bare earth and the woodland along the western and southern boundaries. This strip showed influence from both the grassland sward predicted to have occurred within the bare earth area prior to clearance and the bramble dominated scrub within the neighbouring woodland.

The recent disturbance and season of the survey made it harder to assess the quality and diversity of the sward, but the very small area of the remnant habitat automatically reduces the conservation value of the habitat.



Plate 20: Semi-improved wet grassland border strip

It should be assumed that the area found to be bare earth in this survey would have resembled the above habitat back in 2013, having succeeded from improved grassland (similar to the paddock to the west – Plate 23) after a period of management neglect.



Plate 21: Paddock adjoining to the West

Wet ditches

The wet ditch running along the western boundary was easily accessible and was therefore subjected to a thorough walk over survey. This ditch appears to be fed from another ditch running part of the way along the southern boundary. Due to the dense vegetation within the southern boundary strip, it was not possible to ascertain the start point of the ditch within this habitat, but an access point through the strip to the A465 can be seen to the east of the PDS on the 2016 and 2018 aerial imagery suggesting the start of the ditch to be within the southern boundary strip of the PDS.

The section of ditch in the far south travels through the aforementioned very small area of intact rank, scrubby, grassland prior to being culverted to travel under a land bridge connecting the PDS to the pasture and stables area to the west. As it travels north, the channel varies in width from between approx. 2m to less than a metre and becomes deeper before it is again culverted to travel through the private property associated with the house to the NW for approximately 25m before descending into a gravity fed drain, presumably to join the local waste-water system. The water level along the visible length was less than 15cm at any point and no connection to another water body or water course was detected during the site inspection or inspection of maps of the local area.





Plate 22: Western wet ditch (Clockwise – Southern extreme prior to culvert, channel in mid-south, northern extreme prior to culvert, channel in mid-north)

There are several accumulations of anthropogenic waste within the channel which is highly silted in the south with a highly modified eastern bank in the north. The water depth, high levels of silting and non-navigable sections of the ditch mean it is not capable of supporting fish species or crayfish.



Plate 23: Evidence of channel modification of western wet ditch

Whilst the ditch is deemed to be highly modified, it holds potential to support both breeding and hibernating habitat for amphibians. Despite their low suitability to support mammals due to a lack of forbs in the field layer (water vole) or fish (otter), the banks were also inspected for field signs of otter and water vole, none were found.

Whilst this ditch does not currently appear to hold a great deal of conservation interest, it preserves connectivity and with simple improvements (i.e. removal of debris, prevention of sediment laden run-off entering from the PDS) its value will be dramatically increased whilst also creating a buffer between the PDS and the neighbouring paddock.

Phase 1 Habitat Map of the Land adjoining the Bryngelli Estate, Hirwaun, South Wales.



1:900

0 10 20 m

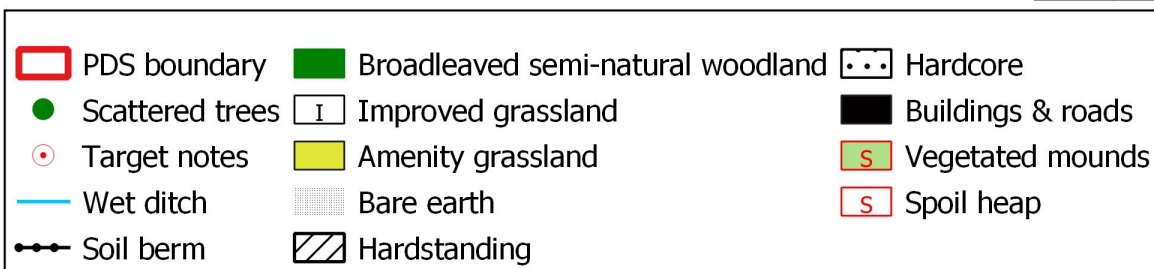


Figure 5: Phase 1 Habitat Map

Table 4: Target notes

Target note	
1	Tree with potential to hold a bat roost
2	Plant suspected to be Bluebell
3&4	Areas of excavation
5	Pollarded Ash outside PDs with potential to hold a bat roost

Table 5: Floral Species List

Common Name	Latin Name	Bare earth	Vegetated mounds	Grassland strip	Woodland
Agrostis	<i>Agrostis sp.</i>	P	O	F	
Ash	<i>Fraxinus excelsior</i>				F
Bramble	<i>Rubus fruticosus</i>		R	O /LA	A
Broadleaf dock	<i>Rumex obtusifolius</i>	P	A	F	O
Cotoneaster	<i>Cotoneaster horizontalis</i>	P			
Cocksfoot	<i>Dactylis glomerata</i>	P	O	O	O
Common sorrel	<i>Rumex acetosa</i>	P	R		
Creeping buttercup	<i>Ranunculus repens</i>	P	D	O	O
Curled dock	<i>Rumex crispus</i>	P	A	O	
Dandelion	<i>Taraxacum officinale</i>	P	O	R	
Elder	<i>Sambucus nigra</i>				R
False oat grass	<i>Arrhenatherum elatius</i>			F	O
Fescue	<i>Festuca sp.</i>	P	O		
Foxglove	<i>Digitalis purpurea</i>			F/LA	O
Hard rush	<i>Juncus inflexus</i>	P	R	O	O
Hazel	<i>Corylus avellane</i>				O
Herb robert	<i>Geranium robertum</i>			R	R
Holly	<i>Ilex aquifolium</i>				O
Knapweed	<i>Centaurea nigra</i>		R		
Marsh thistle	<i>Cirsium palustre</i>		F	O	
Meadow buttercup	<i>Ranunculus acris</i>	P	R	R	
Oak	<i>Quercus sp</i>				A
Pine	<i>Pinus sp</i>				O
Ribwort plantain	<i>Plantago lanceolata</i>		F	R	
Rosebay willowherb	<i>Chamerion angustifolium</i>		O/LF	F/LA	F
Silver birch	<i>Betula pendula</i>		R	R	A
Soft rush	<i>Juncus effusus</i>	P	R	O	O
Willow	<i>Salix sps</i>				A
Yorkshire fog	<i>Holcus lanatus</i>	P	O		

P = present (not possible to estimate relative abundance), D – dominant, A – abundant, F – frequent, O – occasional, R – rare, LA/LF – Locally abundant/frequent

Table 6: Faunal Species List

Common Name	Latin Name	Number
Magpie	<i>Pica pica</i>	1

Species

Amphibians

The wet ditches bordering the PDS hold a small amount of sub-optimal breeding habitat for amphibians, and the surrounding scrub and woodland also has potential to support hibernation habitat for a small number of individuals. In addition to this, it is likely that, prior to its covering from imported in 2018, the vegetative sward across the southern section of the site would have held a moderate resource for foraging and hibernation habitats. Both common toad (4 records within 2km, nearest 470m E) and common frog (7 records within 2km, nearest 528m NW) have been noted on the LERC within 2km of the centre of the PDS. Both species are protected by Sections 9(1) and 9(5) of the WCA 1981 preventing their intentional killing, injury and trade.

Examination of the site aerial imagery and maps suggests there is no clear waterway connectively between the PDS and record sites of either the common toad or common frog, reducing the likelihood that these species would be present within the PDS. However, a risk avoidance strategy should be adopted for all further vegetation clearance works to ensure no harm comes to any hibernating, aestivating or breeding amphibians. In addition to this, if any field signs (spawn) or individuals are found within the PDS or bordering wet ditches prior to, or during the completion of, any clearance activities works should cease until an ecologist has inspected the site and declared works are fit to resume.

Birds

There are no reed bed or open water habitats, and the wet ditches on the south and west boundaries of the PDS are not capable of supporting riparian or wetland bird populations (e.g. kingfisher and yellow wagtail).

There are also insufficient cone-producing conifers suitable to support crossbill within the PDS. There two areas of scrubby woodland, that are suitable to support populations of smaller passerines, and prior to its destruction there would have been, large areas of grassland, that are likely to have been suitable for ground-nesting farmland/grassland specialists, e.g. skylark and lapwing, and foraging habitat for birds of prey.

It is also considered unlikely but possible that Barn owl could exploit the dilapidated building on site to nest, especially as the nearest records of Barn owl are 739m to the west-south-west of the centre of the PDS within the open cast workings, and there are an additional 6 records in the local area.

A single magpie was witnessed briefly foraging in the bare earth section of the site before it left and didn't return for the remainder of the visit. No pellets or feeding remains were found during the site visit, and no birds were seen or heard during site visits.

All birds, nests and eggs are protected by the WCA 1981 during bird-nesting season (Feb-Aug); hence no clearance of areas or grassland that might be utilised by skylark, or scrub or trees, should be undertaken during this period. In addition to this, the

dilapidated building in the NE should be inspected for signs of use by nesting Barn owl as part of any future development proposals.

Fish

Whilst there are several lengths of wet ditch connected via relatively short culverts to the south and west of the site, they are very shallow, highly silted and physically blocked by anthropogenic deposits of large waste in several locations, significantly reducing navigability and suitability for use as a spawning ground. In addition to this, there does not appear to be any waterway linkages to the stream from any natural watercourses or bodies, as after forming to the south presumably gathering water from the neighbouring land and the A465, they drain into a large, gravity fed anthropogenic drain presumably into the wastewater system in front of the house in the NW. It can therefore be deemed that there is no suitable habitat within the PDS that is capable of supporting a population of eel or trout.

Invertebrates

The two species protected by the WCA 1981 noted on the records check were the Pearl-bordered and the Marsh Fritillary. Theoretically the PDS supports very small areas of sub-optimal habitat for the Marsh fritillary, but it has been deemed highly unlikely that the PDS could have supported a population or portion of a meta-population of Pearl-bordered fritillary.

However, for previously noted reasons it was not possible to determine if any of the larval food plants for any of the butterflies and moths noted in Table 3 were present in the seedbank throughout the PDS during the Phase 1 habitat survey.

M. fritillary is a notoriously poor disperser, but there are 84 records of the Marsh fritillary within 3km of the PDS, with the closest being noted 223m east-north-east in Cors Bryn-y-Gaer/Blaen Cynon designated areas which is known to support a large metapopulation of M. Fritillary. In addition to this a further 7 species of butterfly and moth listed as a priority species by Section 7 of the Environment (Wales) Act 2016 have been historically noted within 2km of the centre of the PDS.

No invertebrate interest was noted in the site during the visit due to the both the lack of natural habitat and the season of the survey. However, it has been deemed that the PDS currently holds no potential to support a population due to severe habitat modification or clearance that has already been undertaken. However, if the vegetative sward regenerates for any reason prior to the completion of the development activity should be halted and the habitats inspected to ascertain their value to invertebrate populations.

Plants

Bluebell (*Hyacinthoides non-scripta*) is protected by the WCA 1981 and has been noted within 413m of the centre of the PDS with 6 additional records within the local area. In addition to this, it was recorded as potentially being present within the SE of the PDS; one very weak specimen was potentially identified close to the eastern extent

of the southern boundary fence. The possible specimen was moderately damaged reducing the ability to provide a confirmation of identification to species level; in addition, the neighbouring area had moderately recently been disturbed/excavated to differing extents, so it was also not possible to determine the original extent of the distribution.

In addition to this, there are 4 records of rough marsh mallow (*Malva setigera*) within 223m of the centre of the PDS. However, whilst it is possible that this species may have been supported within the PDS, the habitat, even as semi-improved wet grassland, would have been suboptimal as it thrives on chalky soils. In addition to this, all records were made in 1903 and the species has not been noted in the areas since, with its distribution now thought to be mainly constrained to a small number of sites in central southern England. The species can therefore be confidently assumed to no longer be present within the PDS.

Section 7 priority species fragrant orchid, eyebright and globeflower were also detailed on the LERC at distances of over 1km from the centre of the PDS. Whilst it is possible that these species could have been supported by the original sward, it is unlikely they would have thrived within the PDS due to the suboptimal conditions and given the distance of the limited number of outdated historic records from the site.

Mammals

No field signs of any protected mammals or any individuals were encountered during the site inspection. However, the recent modifications to the area, thought to be semi-improved wet grassland, have removed all viable habitats within the central section of the site, pushing all remaining habitat out into the extreme peripheries of the site. Whilst there is potential to obtain footprints and tracks from some of the soft mud remaining within the area, recent moderate/heavy rain is deemed to have erased all but the most obvious tracks along frequently used paths. This level of modification is deemed highly likely to have displaced any commuting and foraging activity to the neighbouring paddock during and since the period of disturbance due to the resulting lack of natural habitat within the PDS. This is highly likely to have rendered a false negative in regards to the identification of any mammalian use (other than anthropogenic use) and therefore it is not possible to state with any confidence that the site was not previously used by any of the protected species noted in the records check without specific doubts mentioned below. Obliterated

Bats – All species of bats are protected by the WCA 1981. It can be assumed that the sward prior to its removal would have provided a moderate foraging resource for bats due to its damp nature. In addition to this, there are a number of linear features within the site which may be used by bats for commuting and foraging.

The woodland boundary strips may also hold potential to host seasonal roosts, and therefore, the site should be further inspected by a suitably licenced ecologist to assess the use of this part of the site if it is to be removed as part of the development.

Badger – Protected by the Protection of Badgers Act 1992, it is an offence to kill, injure or take a badger or to damage, destroy or block their setts. In addition to this, licenses are required for use of machinery within close proximity of the setts (as detailed in the legislation section). Whilst there were no obvious signs of a badger sett within the PDS

the wooded area to the south was not accessible to undertake a detailed enough survey to preclude its use. In addition to this, there are 3 active setts noted within 2km of the centre of the PDS suggesting the local area is well used by badger. Whilst there appear to be several major barriers to dispersal between these setts, noted to the north and north west, and the PDS, there are also several reports of roadkill within close proximity of the PDS and a record of badger activity to the south of the A465 (within 461m of the PDS) suggesting that the badger are navigating these barriers with unknown levels of success. The previously recorded habitat type, semi-improved wet grassland, now noted as bare earth, is likely to have afforded badgers a suboptimal foraging resource but could be a key link in a commute around a sett's normally considerable territory. Unfortunately, there was no opportunity to search for badger paths within the PDS which could have given great insight into any commuting paths from the south of the site through the holes noted in the chain-link fence along the northern boundary.

A search for badger setts should be undertaken within a minimum of 30m of the PDS boundary, by a suitably experienced ecologist, to ensure compliance with the Protection of Badgers Act 1992.

If no badger setts are found within this area, it should be possible for clearance to be undertaken with minimal restrictions, but during the construction phase minimal use should be made of night-time lighting; pipes over 120mm in diameter and steep sided excavations should have escape ramps or be covered when not in use. In addition to these measures, provision should be made in any physical linear boundaries of the potential development to allow continued access to/through the PDS to ensure commuting routes to other areas of habitat are not lost by the species.

Hedgehog – Whilst the closest record (463m WNW) is south of the A465, there are an additional 9 records of hedgehog within 2km of the PDS and several within the housing estate to the NE of the site. There is access for hedgehog to the site under the both access gates and via the land bridge in the SW. Whilst the habitat that is predicted to have existed within the PDS is not the optimal habitat for hedgehogs it is likely to have provided a reasonable foraging resource with some hibernation habitat in the scrubby woodland along the southern boundary.

Hedgehogs should be assumed to be have been using the site for foraging and commuting purposes prior to habitat modification and a risk avoidance statement should be constructed detailing specific measures to be implemented to protect them from harm during clearance and construction of any potential development. These should at a minimum include, minimal use of night-time lighting; installing escape ramps into or covering all pipes (over 120mm diameter) and steep sided excavations when not in use; and utilisation of sympathetic clearance techniques. If any vegetative sward is allowed to regenerate prior to the commencement of construction for any reason an additional walk-over survey will be required prior to the undertaking of sympathetic vegetation clearance.

Sympathetic vegetation clearance should include but not be limited to the following;

- Thorough walk-over survey directly prior to the commencement of works to check for individuals and their field signs.
- A thorough tool-box talk to inform personnel of potential presence their field signs.

- Clearance should be supervised by an appropriately qualified ecologist or ECoW and halted if field signs are discovered during works until appropriate measures can be installed to protect the population.
- If an individual or their field signs are discovered during clearance, works should immediately cease until a suitably qualified ecologist has had ample time to investigate the sighting and implemented reasonable measures to allow continuation.
- No clearance should be undertaken during vulnerable periods, in this case hibernation period (Oct-Mar inclusive).
- Employment of a 2-cut methodology where the sward is cut no lower than 150mm and left for a suitable period for faunal species to clear the area before cutting to ground level.
- All clearance should be performed uni-directionally towards an area of remaining suitable habitat that will be left intact to allow successful escape.
- Special attention should be paid to the clearance of any dense piles of vegetation and all arisings from clearance should be stacked at least 15m outside of the construction zone.

In addition to these measures, a minimum of one access hole (130x130mm) per fence/wall in any physical linear enclosure boundaries to allow hedgehogs continued access to/through the PDS post-development.

Hare –Hare have been historically recorded within 2km of the centre of the PDS (3 records - nearest 223m SSW); however, all three records have been made in and around the land to the north of the open cast workings to the south of the A465. It is deemed that the fast and busy A465 would pose a significant physical barrier and deterrent to dispersal from this site into the PDS, especially as the habitats within the PDS would be comparatively sub-optimal especially since the recent modifications.

Therefore, it should be assumed that hare are absent from the PDS, but a risk avoidance statement should be constructed to include minimal use of night-time lighting; installing escape ramps into or covering all pipes (over 120mm diameter) and steep sided excavations when not in use; and utilisation of sympathetic clearance techniques as previously described. The vulnerable period in this case is the breeding period (Mar-Sep inclusive) where young leverets may be sheltering in the tall grass. If the sward is for any reason allowed to regenerate prior to construction commencing another walk-over survey should be undertaken prior to any clearance activities begin.

Polecat – There are two historic records of polecat within 2km of the centre of the PDS. However, both are located over 1km to the north and north east, and upon inspection of the aerial imagery there are several significant barriers to their dispersal to the PDS in the form of main roads and large areas of urban development. In addition to this, the site should be considered suboptimal habitat for polecat further reducing the drive to disperse to this specific area. Whilst, it is possible that the site may have been used for commuting purposes to disperse to more suitable habitat in the wider area when the young were dispersing from their mother's territory in the autumn, it can be assumed with confidence that they are not present within to PDS year-round. Therefore, continued provision of access through/past the development via access holes (they will be able to utilise the holes provided for badger without any issue) and the installation of a green buffer to the west and south of the PDS is highly

recommended.

Reptiles

Both slow worm (1 record, 282m NE) and common lizard (4 records, nearest 320m S) have been recorded as being present within 2km of the PDS by the LERC.

Slow worm have been recorded as being present in the woodland lining a tributary of the river Cynon to the north east of the PDS as part of a planning application. The discovery of slow worm during a planning application suggests that the habitat within the local area is suitable to support slow worm and that the lack of records in wider area north of the A465 is more due to a lack of survey effort rather than a lack of wildlife. In addition to this, wooded area holds good connectivity to the scrubby woodland to the south of the site which holds moderate potential to support hibernation and breeding sites due to the unmanaged nature allowing the accumulation of rotting vegetation and it can also be confidently assumed that the sward present in the south of the PDS until recent modification would have offered reasonable foraging opportunities for a small population of slow worm.

Whilst the closest record of common lizard initially suggests a high likelihood of presence within the PDS, it can be seen that the three closest records have been made within the open cast working and the land surrounding it to the south of the A465, which would present a major barrier to dispersal for this species. The final record is 1730m to the north in Penderyn which is deemed to be far enough geographically removed from the PDS to make their dispersal through the urban area between the record site and the PDS highly unlikely. In addition to this, the topological survey which notes that the majority of the south of the PDS is 'grass' with areas of dense vegetation being restricted to the boundaries of the site suggests that the site would have been deemed suboptimal for common lizard compared to the record sites. It is also deemed likely that common lizard would have been picked up in the same survey that detected slow worm in the more local area and therefore it can be assumed to be absent with reasonable confidence.

Nevertheless, slowworm may still be utilising the scrubby woodlands for commuting, dispersal and hibernation now that the potential foraging habitat has been removed so, assuming no clearance, development or modification is to be undertaken in the southern or western boundary woodlands, a specific risk avoidance statement should be drawn up to minimise the risk to any potential populations during clearance and construction. This statement should include a thorough walk-over survey of the areas to be cleared directly prior to clearance and a thorough tool-box talk to inform personnel of potential presence their field signs. In addition to this, a permanent, 5m wide, unmodified, unmanaged green buffer must be left between the development footprint and the boundary of the southern and western boundary strips to enable commuting and basking behaviour to continue on the edges of these strips of habitat.

If for any reason the PDS becomes re-vegetated, any required clearance must be supervised by an appropriately qualified ecologist or ECoW and halted if field signs are discovered during works until appropriate measures can be installed to protect the population. No clearance should be undertaken during the hibernation period (Oct-Mar inclusive). In addition to this, clearance should be undertaken using a 2-cut methodology where the sward is cut no lower than 150mm and left for a suitable period

for faunal species to clear the area before cutting to ground level. Where possible all clearance should be performed uni-directionally towards an area of remaining suitable habitat that will be left intact to allow successful escape. Special attention should be paid to the clearance of any dense piles of vegetation, and all arisings from clearance should be stacked at least 15m outside of the construction zone. Once cleared, the site should be managed to keep the sward below 100mm at all times to reduce the likelihood of a population establishing itself in the cleared area between clearance and construction.

Invasive Non-native Species

Whilst no signs of plant INNS were witnessed on the site or within close proximity of the site, their current/historic presence cannot be conclusively ruled out. This is due to both the season of the survey but also the recent removal of top-soil and destruction of the vegetative sward.

Therefore, a discussion of the likelihood of the most prevalent plant INNS for SE Wales and the habitat type has been included (i.e. Japanese knotweed – *Faollopia japonica*, Himalayan balsam – *Impatiens glandulifera* and Giant hogweed - *Heracleum mantegazzianum*). Whilst there are no confirmed records of Giant hogweed in the wider area surrounding the PDS, suggesting that Giant hogweed is highly likely to be absent from the site, there are records of both Japanese knotweed and Himalayan balsam within 500m of the boundary of the site.

Japanese knotweed is currently only known to spread via rhizomes and spread of vegetative matter within the UK, and there were no obvious stands within close proximity of the site to suggest contamination of the site by this species. However, the boundary fences had clearly been broken in several places to facilitate informal/unauthorised access which could have provided an unlikely mechanism of dispersal to the PDS. It should therefore be accepted that whilst it is possible, it is unlikely that the PDS has supported Japanese knotweed in the recent past.

Himalayan balsam is fairly prolific along the northern reaches of the river Cynon and stretches of the A465 within moderately close proximity to the section that borders the PDS. The plant has an aggressive seed dispersal mechanism that can spread up to 800 seeds up to 7m from a single plant. It thrives in damp conditions, can become established from a single seed and spread rapidly without management. Seeds are known to be transported by vehicles, people, domestic and wild animals and water ways. In addition to this, the fleshy almost succulent vegetation of the plants is annual and tends to rot quickly over the winter, before germinating in Feb-March with often little evidence of presence, except for dense stands, throughout Nov-Feb. It is therefore deemed highly possible that the site may have supported small amounts of Himalayan balsam in the recent past and that the soil may still hold a viable seedbank of this species. It is therefore highly recommended that any soil, hard core or excavation machinery removed from the site be treated as contaminated and subjected to stringent biosecurity measures to ensure no accidental dispersal occurs in the wider environment.

Potential Threats and Impacts

A brief discussion of the general threats, impacts and potential mitigations has been included below to outline the main threats, but both the proximity of the PDS to highly important and designated sites and the individual nature/history of the site/development will require a more detailed and nuanced analysis of the threats and their impacts to the local and wider environment through the completion of an EclA should the LPA deem this necessary.

1. Loss of habitats and habitat fragmentation

At this stage of the sites condition, it should be deemed imperative that the connectivity to other habitats outside of the PDS is maintained. This includes at a minimum retention of the hedge and woodland network and the installation of access holes for large mammals and hedgehogs into any physical linear boundaries installed within the PDS.

2. Changes to local hydrology and groundwater levels

A detailed Sustainable Urban Drainage Scheme application should be made to ensure that changes to the water table due to the installation of considerable areas of impervious cover, necessary to install a residential development and associated infrastructure (i.e. brick concrete, asphalt etc.) within the PDS, are minimised.

During the planning process, the impacts of digging and installing foundations, pipelines and other necessary infrastructure on the hydrology of the site and how this will affect the surrounding habitats should be considered.

3. Chemical pollutions and sedimentation of surrounding habitats

Prior to construction, a detailed CEMP will be required to address and minimise the increased risks of water, airborne, noise and vibration pollution caused by the development.

Particular attention should be paid to the risks of pollution and sedimentation within the wet ditch to the west as even though it appears to drain into the waste-water system Welsh Water provide stats on the average number of releases per annum (presumably into the river Cynon) from the Merthyr Rd area of Hirwaun as 90, which is very high. This means that chemical or sediment pollutants received by the waste water system during heavy precipitation are fairly likely to be discharged to the wider environment untreated. Pollutants, both chemical and organic within the ground/surface water could also cause catastrophic changes to the sward assemblage and diversity of the surrounding habitats. All lubricant, fuel and plant storage should be confined to a specific compound within the development site. In addition to the details of measures to deal with accidental spillages on site (i.e. spill kits), the aforementioned CEMP should also ensure management of the products of dewatering activities or heavy precipitation on part-completed constructions/preparations, plant or storage facilities does not allow chemical or sediment pollution to access the protected habitats (i.e. use of bunds).

4. Noise and vibration pollution

Radford, Morley and Jones (2020) state that, whilst the effects of noise on our native terrestrial wildlife is not well understood, there is a growing body of research that has

linked noise pollution to reduced efficacy in breeding and foraging, particularly in birds and terrestrial mammals. It is widely accepted that infrequent or exceptionally loud noise and vibration can pose negative and often significant disturbance to roosts and resting sites, dispelling the residents from their refuges. This is particularly problematic when the individuals are rearing young as it can increase the risks posed to the young by abandonment (hypothermia, starvation, dehydration, predation etc.) even if the adults return to the refuge sometime later. Every effort should be made to ensure that works producing high levels of noise or vibrations avoided where possible or are completed outside of breeding seasons (Mar-Aug inclusive).

5. Increase in local air pollution

Acidification of the swards in areas surrounding the PDS, caused by increased likelihood of acid rain resulting from higher levels of local Sulphur dioxide, Nitrogen oxides and Carbon dioxide emissions, could detrimental especially to those habitats that are already deemed to be acidic due to their lack of ability to buffer the added acidic inputs. Sulphur dioxide, nitrogen oxides and carbon dioxide are components of the normal emissions produced when burning fossil fuels that dissolve in moisture in the air to form weak solutions of acid before falling as precipitation. Whilst emissions from cars or household gas boilers are not considered to be the most important sources of these gasses within the UK, the increase in these emissions within such a close proximity to a potentially vulnerable and internationally important habitat should be investigated to ensure they are not present in damaging levels.

Therefore, the emissions associated with any future development should be kept at an absolute minimum. This can be achieved by ensuring all of the residential dwellings are as energy efficient as possible with the highest rated EPCs possible. With this in mind it is recommended that at a minimum the developer ensures that the new homes are equipped high quality insulation (including consideration of the insulating properties of the windows and doors) and highly efficient boiler systems to provide heating and hot water to the properties. An investigation into how the addition of renewable power sources (e.g. PV solar panels) and electric car charging points to the dwellings or development would affect the levels of emissions produced by the proposed development would also be beneficial. In addition to this, it is recommended that a speed restriction of 20mph is implemented within the development as this is shown to support a shift use of individual cars to greener methods of transport.

Mitigation

Mitigation design should include, but by no means be limited to, the following recommendations. Please note the completion of the additional survey work required is likely to increase and refine the below recommendations.

- No modification, clearance or development should be undertaken in the southern or western habitat strips.
- Integration of permanent, 5m wide, unmodified, unmanaged green buffer strip between the boundary of the southern and western habitat strips and the boundary of the development (including the gardens or green spaces).

- It is imperative that connectivity is maintained through the development therefore, at least one hedgehog access hole into each section linear physical boundaries within the development (130x130mm ground-level hole) and; larger mammal access holes (230x230mm ground-level hole) spaced at 25m intervals into each section of linear physical external boundaries surrounding the development on any aspect.
- If vegetation regeneration occurs within the PDS for any reason prior to completion of construction, additional surveys will be required to establish use of the site by reptiles, amphibians and ground nesting birds. In addition to this no vegetation clearance is to be undertaken during the reptile hibernation period (Oct-Mar) or bird nesting season (Feb-Aug). All vegetation clearance must be supervised by an appropriately experienced ECoW and undertaken utilising sympathetic clearance techniques.
- Use of artificial night-time lighting should be avoided unless necessary and then should be directional, downward pointing and restricted to the shortest possible time period.
- Escape ramps or covers must be installed into or covering all pipes (over 120mm diameter) and steep sided excavations when not in use.
- It is understood that there will be the requirement of significantly landscaping across the site to create the amenity spaces associated with the dwellings. Under no circumstances should any non-native species be utilised in the creation of these areas (i.e. Leylandii hedging). The species installed to these areas should not only be native but appropriate to the wider environment and of local provenance. In addition to this, all green spaces not enclosed as gardens or directly associated with a dwelling should be considered as wild spaces and allowed to regenerate naturally from the seedbank.

Actions that will be required before development.

Additional faunal and floral survey effort

- Risk avoidance statements for clearance – hedgehog, hare, and reptiles if site is allowed to regenerate.
- Establishment of absence of Himalayan balsam and potential mapping of location and extent if present.

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Disclaimer

This assessment was made of the site described at a particular time. The evidence that this report contains can be used to draw conclusions as to the likely significant effect and the likely impacts of any proposed development on the site. Every effort has been taken to provide an accurate assessment of the situation pertaining to this site. No liability can be assumed for omissions or changes after the survey has taken place.