

Cardiff Parkway Developments Ltd

Cardiff Hendre Lakes

2017 Extended Phase 1 Habitat Survey Report

Environmental Statement Appendix 7.1

Issue | 6 March 2017

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

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

Job number 252199

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1 Introduction

1.1 Background

Ove Arup & Partners (Arup) were commissioned by Cardiff Parkway Ltd to prepare a GRIP2 Feasibility Study for the proposed new station at St. Mellons on the Bristol to South Wales railway line.

Cardiff Parkway has submitted plans to the Department for Transport to obtain funding to develop a rail station (also to be called Cardiff Parkway) to the south of St. Mellons Business Park. The South Wales Mainline runs to the south of the Business Park but there is currently no access to the railway network between Newport to the north-east and Cardiff to the south-west.

There are aspirations to grow St. Mellons Business Park and the provision of a multi-storey car park at the proposed new station would not only provide parking for the Business Park, but it would also enable the site to serve as a park and ride location for travel into Cardiff and Newport if the railway station proposal is successful.

The site, centred on National Grid Reference ST251808, and surrounding area are shown on Figure 1.

1.2 Study Area

The site currently consists of predominantly arable and pastoral farming on the western edge of St. Mellons. The site's field boundaries are formed by hedge and tree lines with reens throughout. There is a lake, recreational grassland and woodland to the west of the site.

The wider landscape comprises residential and commercial properties, and broad-leaved woodland to the north and west. To the south the land is bisected by the railway line with further neighbouring agricultural land. To the east there is agricultural land.

1.3 Objectives

The objective of the survey was to establish the baseline ecological conditions on site and within the immediate vicinity, including its potential to support important habitats and notable/protected species and to highlight any potential ecological constraints to future development.

1.4 Legislative Context

A framework of international (European), national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. The following legislation exists to protect habitats and species of nature conservation importance:

- i. The Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitat Regulations) which transposes Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) into UK law;
- ii. The Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds) (the Wild Birds Directive);
- iii. Wildlife and Countryside Act 1981 (as amended) (WCA);
- iv. Environment (Wales) Act 2016;
- v. The Countryside and Rights of Way Act 2000;
- vi. The Hedgerow Regulations 1997; and
- vii. Protection of Badgers Act 1992.

These pieces of legislation include a number of offences relating to protected species and requirements for licences to allow construction works to proceed. In addition, the Habitats Regulations set out the requirement for the consideration of the potential effects of a project on European designated sites.

Actions which are prohibited by legislation can be made lawful on the approval and granting of a licence from Natural Resources Wales (NRW), subject to conditions.

Full details of the legislation are provided in Appendix A.

2 Methods

2.1 Desk Study

A desk study was carried out to identify statutory designated sites within 2km of the site centre point. Online searches were carried out using the Multi Agency Geographic Information for the Countryside (MAGIC)¹, Natural Resources Wales website² and the Joint Nature Conservation Committee (JNCC) website³.

In addition to this, protected and notable species, Schedule 9 invasive species and non-statutory site data within 2km of the site centre point were obtained from the South East Wales Biodiversity Records Centre (SEWBRc)⁴. Records of bats were extended to 5km from the site centre point.

2.2 Field Survey

2.2.1 Habitats

An Extended Phase 1 habitat survey was carried out on the site in accordance with standard JNCC Phase 1 Habitat Survey methodology⁵ on 26th January 2017 by Arup ecologist Dr Adam Cross, assisted by Amanda Murdock. Habitat areas greater than 0.1ha were mapped and Target Notes (TN) were used to highlight any features/habitats of interest and/or provide suitable habitat for protected species. Details of Target Notes are provided in Appendix B.

2.2.2 Species

In conjunction with the habitat survey, the potential for the site to support any legally protected species and/or other species of nature conservation importance were recorded.

Relevant species included all those protected by European or UK law, and notable species including those identified as being of principal importance in Wales, under Section 7 of the Environment (Wales) Act 2016 (Appendix A).

Detailed faunal surveys were not undertaken at this time, rather the potential for the site to support each species/species groups was assessed based on the known range of each species/species group and the suitability of the habitats within the site. Any field evidence or sightings of such species was recorded as seen. The following species were considered:

¹ <http://magic.defra.gov.uk/> Accessed online 30/01/2017.

² <https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-sites-search/?lang=en> Accessed online 30/01/2017

³ <http://jncc.defra.gov.uk> Accessed online 30/01/2017

⁴ <http://www.sewbrec.org.uk/home.page>

⁵ Joint Nature Conservation Committee, 2010. Handbook for Phase 1 habitat survey – a technique for environmental audit. <http://jncc.defra.gov.uk/page-2468>

Reptiles

The site was appraised for its suitability to support reptiles. The assessment was based on guidance outlined in the Joint Nature Conservation Committees' published Herpetofauna Workers' Manual⁶.

Amphibians

The site was appraised for its suitability to support amphibians, both protected species and species of conservation concern. If permanent ponds or reens were present on the site they were subjected to a Habitat Suitability Appraisal⁷ to assess their potential to support great crested newt *Triturus cristatus*.

Birds

The site was surveyed for habitat suitable to support bird species of conservation significance. Any bird species seen at the site were recorded and any further evidence of species such as old nests or owl pellets was noted.

Badger *Meles meles*

Any evidence of badger setts or other badger activity such as paths, latrines or signs of foraging found during the walk over was target noted and mapped. Survey methodology used and any setts recorded were classified according to published criteria⁸.

Bats

Any buildings/trees within the boundary were appraised for their suitability to support breeding, resting and hibernating bats using survey methods based on those outlined in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines⁹.

Otter *Lutra lutra*

Water bodies, if present on the site were assessed for their suitability to support otters. This assessment was based on guidance outlined from English Nature¹⁰.

Water Vole *Arvicola amphibius*

If present, water bodies on site were assessed for the suitability for water vole using published guidance¹¹.

Other Species

The site was also appraised for its suitability to support other protected or notable fauna including mammals and invertebrates.

⁶ Gent, T. and Gibson, S. (2003). *Herpetofauna Workers Manual*. JNCC, Peterborough

⁷ Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M., 2000. Evaluating the suitability for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10(4), 143-155.

⁸ Harris, S., Cresswell, P. and Jefferies, D., 1989. Surveying Badgers. Mammal Society.

⁹ Hundt, L. 2012. Bat Surveys: Good Practice Guidelines, 2nd Edition. Bat Conservation Trust.

¹⁰ Chanin, P., 2003. Monitoring the Otter, *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10., English Nature, Peterborough.

¹¹ Strachan, R. and Moorhouse, T., 2006. Water Vole Conservation Handbook, 2nd Edition. Wildlife Conservation Research Unit (WildCRU), Oxford University.

Invasive Plant Species

The site was searched for evidence of invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981, such as Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandulifera* and giant hogweed *Heracleum mantegazzianum*.

Whilst not a full protected species or botanical survey, the extended Phase 1 habitat survey methodology enables an experienced ecologist to obtain a sufficient understanding of the ecology of a site in order to either confirm the conservation importance of the site, and assess the potential for impacts on habitats/species likely to represent a material consideration in planning terms, or to ascertain that further surveys will be required before such confirmation can be made.

2.3 Limitations

Some areas of the survey area were inaccessible due to dense vegetation and health and safety concerns, e.g. cattle, railway line and waterbodies. In these areas surveying was not possible and the detectability of some species may decrease, e.g. badgers. It is assumed however that a representative assessment of the land was able to be undertaken in order to fulfil this report's objectives.

Although the habitat survey was conducted outside of the optimal period for botanical survey (April to October) the survey still provides an indicative assessment of the habitats on site.

It should be stressed that the findings presented in this study represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys are limited by factors which affect the presence of species, such as temporal weather conditions, migration patterns and behaviour.

The weather is not considered to be a limitation, as all surveys were undertaken during optimal weather conditions. Every effort has been made to ensure that the findings of the study present as accurate an interpretation as possible of the species and habitats within the study area.

3 Results

3.1 Desk Study

SEWBRc provided details of protected habitats and species on 31st January 2017. The search was carried out up to 2km from the site boundary with 5km for records of bats and European protected sites. Data were limited to the last 10 years.

3.1.1 Statutory Sites

The search using MAGIC highlighted three European sites and three national statutory designated sites within 5 and 2km of the site boundary, respectively. All designated sites are detailed in Table 1 below. Figure 1 details the locations of the designated sites.

Table 1. Statutory designated sites within 5 and 2km of the site boundary, for European and national sites, respectively. Designated features are taken from NRW's website and the corresponding citation.

Site Name	Features	Approximate Distance from Proposed Development
European sites		
Severn Estuary Ramsar	<p>Designated for:</p> <p>Habitats Directive Annex I features: sandbanks, which area slightly covered by sea water all the time, estuaries, mudflats and sandflats not covered by seawater at low tide and Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) (Ramsar criterion 1).</p> <p>Unusual estuarine communities, reduced diversity and high productivity (Ramsar criterion 3).</p> <p>This site is important for the run of migratory fish between sea and river via estuary. Species include salmon <i>Salmo salar</i>, sea trout <i>S. trutta</i>, sea lamprey <i>Petromyzon marinus</i>, river lamprey <i>Lampetra fluviatilis</i>, allis shad <i>Alosa alosa</i>, twaite shad <i>A. fallax</i>, and eel <i>Anguilla anguilla</i>. It is also of particular importance for migratory birds during spring and autumn (Ramsar criterion 4)</p> <p>The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon, sea trout, sea lamprey, river lamprey, allis shad, twaite shad, and eel use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad and twaite shad which feed on mysid shrimps in the salt wedge (Ramsar criterion 8).</p> <p>Assemblages of international importance:</p>	1.1km south

Site Name	Features	Approximate Distance from Proposed Development
	<p>- Species with peak counts in winter (waterfowl) (Ramsar criterion 5).</p> <p>- Species/populations occurring at levels of international importance (Ramsar criterion 6).</p> <p>Tundra swan <i>Cygnus columbianus bewickii</i>, greater white-fronted goose <i>Anser albifrons albifrons</i>, common shelduck <i>Tadorna tadorna</i>, gadwall <i>Anas strepera strepera</i>, dunlin <i>Calidris alpina alpina</i>, common redshank <i>Tringa totanus</i>.</p> <p>- Future species for consideration:</p> <p>During the breeding species: lesser black-backed gull <i>Larus fuscus graelsii</i></p> <p>With peak counts in spring/autumn: ringed plover <i>Charadrius hiaticula</i></p> <p>With peak counts in winter: teal <i>Anas crecca</i>, Northern pintail <i>Anas acuta</i>.</p>	
Severn Estuary Special Area of Conservation (SAC)	<p>Annex I habitats that are a primary reason for selection of this site:</p> <p>Estuaries</p> <p>Mudflats and sandflats not covered by seawater at low tide</p> <p>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <p>Sandbanks which are slightly covered by sea water all the time</p> <p>Reefs</p> <p>Annex II species that are a primary reason for selection of this site:</p> <p>Sea lamprey, river lamprey and twaite shad</p>	1.1km south
Severn Estuary Special Protection Area (SPA)	<p>This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:</p> <p>Over winter Bewick's swan</p> <p>This site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:</p> <p>On passage ringed plover</p> <p>Over winter: curlew <i>Numenius arquata</i>, dunlin, pintail, redshank, shelduck.</p> <p>The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl, including gadwall, shelduck, pintail, dunlin, curlew, redshank, Bewick's swan, wigeon <i>Anas penelope</i>, lapwing <i>Vanellus vanellus</i>, teal, mallard <i>Anas platyrhynchos</i>, shoveler <i>Anas clypea</i>, pochard <i>Aythya farina</i>, tufted duck, <i>Aythya fuligula</i>, grey plover <i>Pluvialis</i></p>	1.1km south

Site Name	Features	Approximate Distance from Proposed Development
	<i>squatarola</i> , white-fronted goose and whimbrel <i>Numenius phaeopus</i> .	
National sites		
Gwent Levels – Rumney and Peterstone Site of Special Scientific Interest (SSSI)	<p>The Gwent Levels constitute the lowlands between Cardiff and Chepstow and are drained by an ordered network of drainage ditches. They are an example of one of the most extensive areas of reclaimed wet pasture in Great Britain.</p> <p>The Gwent Levels reens are rich in plant species and communities, many of which are rare or absent in other Levels systems. This is due to the variety of reen types and their management regimes and the timing of the management which results in a staggered programme across the Levels. The regular maintenance of some reens provides conditions for submerged plant species such as hairlike pondweed <i>Potamogeton trichoides</i> and openwater emergents such as arrowhead <i>Sagittaria sagittifolia</i> an opportunity to flourish. Others are less intensively managed and some have become completely overgrown by weeds and hedges.</p> <p>The aquatic invertebrate fauna is very diverse and the Gwent Levels compares well with similar areas in Britain. Many nationally rare or notable species are present such as <i>Haliphus mucronatus</i> and <i>Hydrophilus piceus</i>. The area is important in the Welsh context for its snails and dragonflies and includes the species <i>Physa heterostrophia</i> and <i>Brachytron pratense</i> respectively. The larger number of hedgerows add to the diversity of the area and, together with the main reen banks, provide a habitat for nationally important assemblages of terrestrial invertebrates such as <i>Pipunculus fonssecai</i> and <i>Tomosvaryella minima</i>.</p> <p>The Rumney and Peterstone area supports a number of important plant species including the nationally rare brackish water-crowfoot <i>Ranunculus baudotii</i> and several regional rarities including the pondweeds <i>Potamogeton obtusifolius</i> and <i>Potamogeton berchtoldii</i>. The northern section of this SSSI is a stronghold on the Gwent Levels for the flowering rush <i>Butomus umbellatus</i>.</p> <p>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 <i>Pherbellia brunnipes</i> and <i>Lamprochromus elegans</i>, the water-beetle <i>Plateumaris braccata</i> and the variable damselfly <i>Coenagrion pulchellum</i>.</p>	Within site boundary
Severn Estuary SSSI	The Severn Estuary lies on the south west coast of Britain at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers. The immense tidal range (the second highest in the world) and classic funnel shape make the Severn Estuary unique in Britain and very rare worldwide. The intertidal zone of	1.1km south

Site Name	Features	Approximate Distance from Proposed Development
	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. The SSSI forms the major part of a larger area of estuarine habitat, which includes the Upper Severn Estuary, the Taf/Ely Estuary and Bridgwater Bay.	
Gwent Levels – St. Brides SSSI	<p>The information above (for the Gwent Levels – Rumney and Peterstone SSSI) is applicable here with regards to the general ecology of the Gwent Levels SSSI. In addition the following information is specific to the St Brides area:</p> <p>The reens in the St Brides area support a number of interesting plant species most notably thread-leaved water-crowfoot (<i>Ranunculus trichophyllus</i>) and small pondweed (<i>Potamogeton berchtoldii</i>). Reen bank and green lane habitats in this area are also important for relict meadow plant species such as the regionally notable grass vetchling <i>Lathyrus nissolia</i> and common meadow-rue <i>Thalictrum flavum</i>. The St Brides area also supports rich invertebrate communities with a number of nationally notable and notable marshland species, e.g. the true fly <i>Chrysogaster macquarti</i> and the beetle <i>Hydaticus transversalis</i>. It is the only area on the Gwent Levels where the rare fly <i>Stenomicroa cogani</i> has been recorded.</p>	1.3km east

3.1.2 Non-Statutory Sites

Within 2km of the site boundary there are 13 non-statutory Sites of Importance for Nature Conservation (SINCs) and one Wildlife Trust Reserve (Peterstone Wentlooge). These are detailed in Table 2.

Of the 13 SINCs, there are two within the site boundary: Hendre Lake SINC and Marshfield SINC. An additional non-statutory site, Hendre Lake West SINC, is nearby to the western extent of the site boundary but outside of the site boundary. Figure 1 details the locations of the designated sites.

Hendre Lake SINC is an artificial fishing lake with a small central island. In 2010 0.3ha of reedbeds were present, although they are grazed on by coot *Fulica atra* and Canada geese *Branta canadensis*. The site is used for wintering bittern *Botaurus stellaris* little egret *Egretta garzetta* and Cetti's warbler *Cettia cetti* are present, although breeding has not been proved yet. Otter and water vole have the potential to use the site.

Marshfield SINC is an area of damp semi-improved neutral grassland, divided by ditches and hedges. The main plant species are creeping bent *Agrostis stolonifera* and timothy *Phleum pratense* with rushes, e.g. soft rush *Juncus effusus*, and a moderate diversity of flowering herbs.

Hendre Lake West SINC is approximately 66m west of the site boundary at Hendre Lake and is designated for its grassland habitat, which is distinct from the reed features of the Gwent Levels SSSI. The eastern area encompasses a mix of damp semi-improved grassland, dominated by creeping bent, hairy sedge *Carex hirta* and greater bird's foot trefoil *Lotus pedunculatus* with a number of herb species. More westwards the habitat is dominated by grasses, e.g. Yorkshire fog *Holcus lanatus*, creeping bent, timothy, false oat-grass *Arrhenatherum elatius* and perennial rye-grass *Lolium perenne*, including a greater diversity of flowers, e.g. yellow rattle *Rhinanthus minor*. Redshank and bittern have both been recorded here, in this lowland meadow and purple moor grass and rush pasture priority habitats.

Table 2. Locally designated non-statutory sites within 2km from the site boundary.

Site Name	Approximate Distance from the Site Boundary
Hendre Lake SINC	Within site boundary
Marshfield SINC	Within site boundary
Hendre Lake West SINC	0.7km west
Hendre Road SINC	0.7km west
Rumney Great Wharf SINC	1.0km south-west
Tyla Farm Wood SINC	1.1km north
Cath Cobb Wood SINC	1.1km west
Sandy Lane Farm Field SINC	1.1km north-east
The Homestead SINC	1.1km north
Wentloog Industrial Park SINC	1.6km south-west
Peterstone Wentlooge Wildlife Trust Reserve	1.6km south-east
Druidstone Road SINC	1.7km north-west
Pant-Rhiw-Goch Wood SINC	1.8km north
Coal Pit Lane Pond SINC	1.9km north

3.1.3 Protected and Notable Species

SEWBRc provided data on protected and notable species within 2km of the site boundary. Reptiles, amphibians and mammals are detailed in Table 3.

Table 3. Summary of protected reptile, amphibian and mammal records within 2km of the site boundary. Data are from within the last 10 years (post-2007). Distances are approximate.

Species / Group	Scientific Name	Status ¹²	Summary of Records	Year of nearest record
Reptiles and Amphibians				

¹² EPS = European Protected Species as listed under Schedule 2 of the Conservation of Habitats and Species Regulations (2010)

Species / Group	Scientific Name	Status ¹²	Summary of Records	Year of nearest record
Great crested newt	<i>Triturus cristatus</i>	EPS, WCA	One record from 950m away north-east.	2008
Palmate newt	<i>Lissotriton helveticus</i>	WCA	Ten records from Cath Cobb Woodlands, Marshfield and Trowbirdge, Cardiff. The closest record is 1100m north-east.	2009
Smooth newt	<i>Lissotriton vulgaris</i>	WCA	One record from Trowbridge, Cardiff (1370m west).	2009
Common frog	<i>Rana temporaria</i>	WCA	16 records, with one record on site.	2009
Common toad	<i>Bufo bufo</i>	WCA	19 records with two on site, both from Hendre Lake.	2016
Slow worm	<i>Anguis fragilis</i>	WCA	12 records with the closest record from 750m north-east. Records area also from 2014 950m west.	2008
Common lizard	<i>Zootoca vivipara</i>	WCA	Five records with the closest from 750m away.	2008
Grass snake	<i>Natrix natrix</i>	WCA	Six records with the closest from 500m away.	2016
Bats				
Unidentified bat	<i>Chiroptera</i>	EPS, WCA	43 records with the closest from 115m away.	2008
Myotis bat	<i>Myotis</i> spp.	EPS, WCA	12 records with the closest from 880m north-west.	2013
Natterer's bat	<i>Myotis nattereri</i>	EPS, WCA	Two records with the closest from 1000m away.	2014
Whiskered bat	<i>Myotis mystacinus</i>	EPS, WCA	Three records, including roosts; closest roost is approximately 650m away.	2015
Brown long-eared bat	<i>Plecotus auritus</i>	EPS, WCA	10 records including roosts; closest roost is approximately 930m away.	2015
Common pipistrelle	<i>Pipistrellus pipistrellus sensu stricto</i>	EPS, WCA	87 records with the closest from 170m away. Records include roosts from within 1km; confidential.	2015
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	EPS, WCA	Three records with the closest from 900m away	2014
Greater horseshoe bat	<i>Rhinolophus ferrumequinum</i>	EPS, WCA	7 records with the closest from 4100m away; confidential.	2015
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	EPS, WCA	Three records with the closest from 5800m away; confidential.	2010

WCA = Species protected under Schedule 5 (animals) or Schedule 8 (plants) of the Wildlife and Countryside Act (1981) as amended

Species / Group	Scientific Name	Status ¹²	Summary of Records	Year of nearest record
Pipistrelle species	<i>Pipistrellus</i> spp.	EPS, WCA	113 records, including roosts. Closest known roost is approximately 750m away from the site.	2009
Serotine	<i>Eptesicus serotinus</i>	EPS, WCA	Six records with the closest from 1000m.	2014
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	EPS, WCA	36 records with the closest from 170m away. Closest known roost is approximately 1km away from the site.	2015
Daubenton's bat	<i>Myotis daubentonii</i>	EPS, WCA	Eight records with the closest from 900m away.	2014
Leisler's bat	<i>Nyctalus leisleri</i>	EPS, WCA	One record from 1800m away.	2010
Riparian Mammals				
Otter	<i>Lutra lutra</i>	EPS, WCA	Four records of otter with the closest on site of a spraint.	2010
Water vole	<i>Arvicola amphibius</i>	WCA	One record on site from Hendre Lake.	2010
Other mammals				
Badger ¹³	<i>Meles meles</i>	BA	Five records with the closest from 1000m away north.	2014
Brown hare	<i>Lepus europaeus</i>	WCA	One record from 1700m away.	2008
Hedgehog	<i>Erinaceus europaeus</i>	WCA	22 records with the closest on site near Hendre Lake.	2013
Hazel dormouse	<i>Muscardinus avellanarius</i>	EPS, WCA	11 records with the closest from 880m away.	2015

3.1.3.1 Birds

31 birds designated under Schedule 1 of the Wildlife and Countryside Act 1981 were found within the 2km search area from the last 10 years. Of these 31 Schedule 1 species (listed in Appendix C in full) only three species are considered to have the potential to breed on site. These species are the barn owl *Tyto alba*, kingfisher *Alcedo atthis* and Cetti's warbler, which could nest in old trees on site, bankside habitat or reedbeds/scrub at Hendre Lake, respectively. The other 28 Schedule 1 birds are unlikely to breed on site given a lack of suitable breeding habitat or that they are winter/passage bird species, e.g. redwing *Turdus iliacus*.

¹³ BA = Protection of Badgers Act (1992)

SEWBReC also provided numerous records of Section 7¹⁴ birds. These are listed in full in Appendix C.

3.1.3.2 Section 7 Invertebrates and Plants

SEWBReC returned data on Section 7 species within the 2km search area. These included brown-banded carder-bee *Bombus humilis* (three records; two on site from 2016), shrill carder-bee *B. sylvorum* (10 records with two on site from 2016), dingy skipper *Erynnis tages* (six records from approximately 20m off site in 2011), large wainscot *Rhizodra lutosus* (one record from 600m off site in 2011), tubular water-dropwort *Oenanthe fistulosa* (three records from >1000m off site from 2009 - 2014), sea barley *Hordeum marinum* (seven records from approximately 1400m and beyond from 2010 to 2015). All the above species are also listed on the UK Biodiversity Action Plan.

3.1.3.3 Invasive species

SEWBReC provided data on invasive species within 2km of the site boundary. The only species recorded on site were the American mink *Neovison vison* (two records on site in 2009), Canada goose (99 records from 2008 - present), zebra mussel *Dreissena polymorpha* (one record from 2015) and red-eared terrapin *Trachemys scripta* (one record from 2016 in Hendre Lake). Cherry laurel *Prunus laurocerasus* (two records in 2016) and harlequin ladybird *Harmonia axyridis* (two records from 2013 and 2016) were recorded from within 150m of the site boundary. Of the invasive species recorded within the search area only American mink and Canada goose are recorded on Schedule 9 of the Wildlife and Countryside Act 1981, where these species are illegal to release or allow to escape into the wild.

3.2 Field Survey

3.2.1 Habitats

A total of 15 habitats were identified within the site boundary. These are shown in Figure 2.

1. Standing water
2. Intact hedge
3. Defunct hedge
4. Hedge with trees
5. Dry ditch
6. Semi-natural broadleaved woodland
7. Dense scrub
8. Semi-improved neutral grassland

¹⁴ Species listed on Section 7 of the Environment (Wales) Act 2016. These species

9. Improved grassland
10. Marshy grassland
11. Poor semi-improved grassland
12. Tall ruderal
13. Arable
14. Buildings
15. Tarmac

3.2.1.1 Hendre Lake

Hendre Lake in the west of the site comprises the largest body of standing water on site. The lake supports fish and has marginal vegetation around the boundary, consisting of, in part, reed *Phragmites australis*, bulrush *Typha latifolia*, *Carex* spp. and soft rush. Dense scrub was recorded around part of the lake margin. This habitat comprised in part, the species hawthorn, immature oaks and elder *Sambucus nigra*. Ivy encompassed some of the trees. Managed grassland surrounding the lake was classed as poor semi-improved grassland, given noticeable diversity, e.g. rushes *Juncus* spp. and docks *Rumex* spp..

Semi-natural broadleaved woodland was found on an island in the centre of the lake, and to the south of Hendre Lake with ash *Fraxinus excelsior* dominating. To the east of the lake Scots pine *Pinus sylvestris* was noted amongst willow and oak, with a bramble understory.

A large, recently reprofiled reën, enters the eastern side of the lake. One dry ditch was identified on site to the south of Hendre Lake, which supported in part *Carex* spp. This is likely to flood with varying water levels.

An area of tall ruderal habitat south of the lake comprised predominantly rosebay willowherb *Epilobium angustifolium*, with encroaching *Rubus* spp. and reed in wetter areas.

3.2.1.2 Woodland and western habitat

Across the western extent of the site lies semi-natural broadleaved woodland. To the east of Hendre Lake and west of the fields the strip of woodland consists of mature oaks, alder *Alnus glutinosa*, ash, and hawthorn.

Dense scrub fringed the woodland and marshy grassland. This habitat comprised in part of the species hawthorn, immature oaks and elder. Ivy encompassed some of the trees.

A section of unmanaged semi-improved and marshy grassland was recorded in this western extent of the site between two patches of broadleaved woodland. The marshy grassland was dominated by grasses, e.g. Yorkshire fog and timothy, with extensive areas of *Juncus* spp. and reed, with creeping buttercup *Ranunculus repens* and broadleaved dock *Rumex obtusifolius* observed. Scattered willows were across the area.

3.2.1.3 Northern fields

Some fields, predominately in the north of the site, had been managed as arable land and improved grassland. Some improved grassland fields were heavily grazed by sheep and the sward had little botanical diversity, besides grass, e.g. *Agrostis* spp.

Other fields across the northern part of the site had intermediary botanical diversity between semi-improved and improved grassland, and were recorded as poor semi-improved neutral grassland accordingly. These fields were in some areas heavily grazed but were of sufficient diversity in places to not be classed as improved, e.g. containing *Juncus* spp. and reed.

To the north there is a small building on tarmac hard standing.

3.2.1.4 Southern fields (north of railway)

Diversity varied with the western section of this semi-improved neutral grassland area where it became wetter with *Juncus* spp., reed and scattered willow creating a mosaic habitat, approaching swamp habitat (TN7, Figure 2). The eastern fields were dominated by grassland species, e.g. creeping bent, with other species recorded, e.g. Yorkshire fog, red clover *Trifolium pratense* and soft rush. The north-east section of this habitat forms the Marshfield SINC.

To the east there is an electrical sub-station adjacent to the road.

3.2.1.5 Southern fields (south of railway)

The semi-natural broadleaved woodland south of the railway was predominantly willow, forming a wet woodland of willow carr. Ivy *Hedera helix* encompassed some of the trees.

As for the northern fields, some fields were of limited botanical diversity but more diverse than improved grasslands. Accordingly, these fields were classed as poor semi-improved neutral grasslands. Other fields were heavily grazed by cattle and sheep and were classed as improved grassland.

An area along the railway comprised semi-improved neutral grassland where diversity increased with *Juncus* spp. and reeds.

3.2.1.6 Field boundaries

Across the entire site the field boundaries are often bounded by intact hedges, both species-rich and species-poor. Typical species within the hedges include hawthorn *Craetagus monogyna*, willow *Salix* spp., oak *Quercus* spp. and bramble. Both intact hedges, defunct hedges and hedges with trees support a varied understory in places, e.g. male fern *Dryopteris filix-mas* and hart's-tongue *Asplenium scolopendrium* were present. Defunct hedges although less continuous in their cover support a similar diversity of flora as for intact hedges. Across the site are hedges with mature trees present, e.g. oak *Quercus* spp. (*Quercus robur* identified on site) and willow.

Most field boundaries are bounded also by reens, with a variable extent of aquatic macrophyte cover, in particular reed, *Carex* spp. and *Juncus* spp.. Some reens are also shaded in part by hedges and trees. Some reens were noted to be managed with the banks reprofiled and possibly dredged. The excavated material was noted to contain a diversity of dead freshwater molluscs with *Physa* spp., *Planorbium* *corneus*, *Lymnaea stagnalis*, *Lymnaea auricularia* and *Sphaerium corneum* (see Appendix D for further detail).

3.2.2 Species

3.2.2.1 Invertebrates

As detailed in Appendix D, a variety of freshwater molluscs were found from dredged material from reens. Some of these species recorded, e.g. *Physa* spp. may be a SSSI feature of the Gwent Levels, which the proposed development site is within.

The site has the potential to support notable species of invertebrates as a result of the variety of habitats present, as previously described.

3.2.2.2 Amphibians

Hendre Lake and the associated reens across the site provide suitable habitat for amphibians, e.g. common frog *Rana temporaria* and common toad *Bufo bufo*. There is also potential for all three newt species (palmate, smooth and great crested) to be on site.

Habitat Suitability Indices (HSI) were created for each waterbody on site. The details of the HSI scores are reported in Table 4. The results suggest that the majority of the waterbodies on site are of below-average or average suitability for great crested newts, although some waterbodies are of good quality. Hendre Lake is of poor quality.

Table 4. Habitat Suitability Indices for waterbodies on site.

Waterbody Number	HSI Score	Categorisation of HSI Score
1	0.32	Poor
2	0.63	Average
3	0.58	Below Average
4	0.63	Average
5	0.69	Average
6	0.69	Average
7	0.63	Average
8	0.71	Good
9	0.57	Below Average

Waterbody Number	HSI Score	Categorisation of HSI Score
10	0.48	Poor
11	0.63	Average
12	0.41	Poor
13	0.53	Below Average
14	0.45	Poor
15	0.60	Average
16	0.68	Average
17	0.62	Average
18	0.62	Average
19	0.53	Below Average
20	0.53	Below Average
21	0.62	Average

3.2.2.3 Reptiles

The presence of wetter areas, such as reens, marshy grassland and a lake, with scrub and open areas of semi-improved grassland provide suitable habitat for reptiles. The site has the potential to support reptile populations.

3.2.2.4 Birds

23 bird species were observed on site, with one Schedule 1 species (kingfisher) observed, which has the potential to breed on site. There is a variety of habitat on site to support a range of breeding birds, including ground nesting birds in more unmanaged grasslands to woodland species in trees.

3.2.2.5 Bats

The mosaic of habitats identified on site have the potential to support foraging, commuting and roosting bats due to the presence of buildings, marshy grassland, treelines, railway lines, hedges, woodland, and waterbodies. A number of mature oaks provide potential roost features across the site along field boundaries. The presence of these habitats provides a moderate/high quality habitat for bats, according to the Bat Conservation Trust (BCT) guidelines¹⁵. As the site is bordered to the west by residential developments, there is an increased likelihood that bats such as pipistrelle species that roost in surrounding houses utilise the site to forage, as the habitats on site could support a large population of invertebrates. Buildings on site (in electrical sub-stations) were not assessed for their suitability to support bats given health and safety concerns.

¹⁵ Hundt, L., 2012. Good Practice Guidelines, 2nd Edition. London: Bat Conservation Trust.

3.2.2.6 Dormice

The brambles, scrub, woodland and hedgerows on site provide suitable foraging and nesting habitats for dormice. However, due to barriers such as roads, reens and rail, connectivity to other habitats such as woodland and hedgerow has been fragmented.

3.2.2.7 Badgers

No signs of badger were observed on site during the survey and the fields offered little habitat for sett creation, given the relatively high water table. There is suitable habitat on site, such as the woodland to the west, where badger setts may be present. The site offers the potential for foraging opportunities for badgers.

3.2.2.8 Otters and water vole

No sign of water vole or otter were observed during the survey. The site however has potential to support both species from the range of waterbodies on site and from past records. These waterbodies including the connecting habitat and forage for water voles provides high quality habitat for both species.

3.2.2.9 Other mammals

A path, thought to be fox *Vulpes vulpes*, was found to the north of the site. Due to the habitats on site species including rabbit and hedgehogs may also be present.

3.2.2.10 Invasive plants

The site was searched for evidence of invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981. No invasive species were recorded; however the Extended Phase 1 habitat survey methodology was undertaken outside of the optimal season where plants can be readily identified.

4 Summary and Conclusions

The site currently supports a range of habitats which are of value to both flora and fauna. A range of additional studies are likely to be required prior to development. These are outlined below, and it is recommended that these be discussed and agreed in advance with the Local Planning Authority (LPA) and Natural Resources Wales (NRW), as appropriate.

4.1 Designated Sites

The site currently is within the boundary of the Gwent Levels – Rumney and Peterstone SSSI. The site boundary also contains two SINCs: Marshfield and Hendre Lake. Consultation with the LPA and NRW is advised prior to any planning application being submitted.

4.2 Habitats

As reported, a range of habitats are present on site. The Extended Phase 1 habitat survey was carried out before the start of the peak season for botanical survey; the need for additional botanical surveys (optimal survey period April to October) should be discussed with the LPA ahead of the site development.

4.3 Species

4.3.1 Invertebrates

The site lies within the Gwent Levels – Rumney and Peterstone SSSI, which is designated in part for its important invertebrate communities, including aquatic species. The scope for further invertebrate work should be discussed with the LPA ahead of the site development. Survey work could involve a range of survey methods carried out by a suitably qualified specialist in invertebrate identification, throughout the main survey period (May – September).

4.3.2 Amphibians

Given the possible presence of great crested newt and amphibians on site surveys should be undertaken to identify the presence/likely absence of great crested newt, during the appropriate time of year (likely March to June). A licence may be required in order for works to progress, if great crested newts are present on site.

4.3.3 Reptiles

As described above, it is likely that populations of reptiles could be present on site and a reptile survey is recommended. This can be carried out between April and October.

4.3.4 Breeding Birds

Given the size of the site and the varied nature of the habitats on site a breeding bird survey should be considered, in discussion with the LPA. This will allow the value of the site to breeding birds to be effectively assessed.

4.3.5 Bats

Under BCT guidelines the site is considered large and is of medium/high quality habitat for bats; as such further bat surveys are recommended. It is recommended that transect surveys should be carried out up to twice per month between April and September/October, in accordance with guidance. In addition the guidance recommends static bat detectors are deployed at up to three locations, with data collected on five consecutive nights each month.

Any trees or buildings which are to be cleared should be surveyed ahead of works, as they may contain a potential bat roost. The surveys should be devised in consultation with the LPA and NRW. If bats were found to be roosting on site, in a tree for example, a NRW issued European Protected Species Licence would be needed before it could be removed.

4.3.6 Dormice

Habitats on site have the potential to support dormice. Although the habitat is fragmented with roads, rail and reens there is some connectivity with adjacent habitat and the wider landscape where dormice have been recorded. Surveys should therefore be undertaken for dormice, in consultation with the LPA and NRW. A licence may be required for works to progress if dormice are to be potentially affected by the proposed development.

4.3.7 Badger

Signs of badger were not found on site although suitable habitat exists for badgers on site, e.g. woodland to the west. A survey for badgers is recommended to be undertaken on site to determine if setts are present, their status, and the value of the site to badgers. The survey can be carried out at any time of year but sett detection is easiest during the winter months when vegetation has died back.

4.3.8 Otter and water vole

Suitable habitat of high quality was identified on site for both otter and water vole. It is therefore recommended to undertake a survey for both species. Given the similarity in habitat and survey technique, these surveys can be undertaken at the same time for these riparian mammals. A licence may be required, if otters are found on site and potentially affected, in order for works to progress.

4.3.9 Other mammals

The site has the potential to support foraging and commuting hedgehog. The need for further surveys should be scoped with the LPA. European hedgehog is listed as a priority species listed under Section 7 of the Environment (Wales) Act 2016.

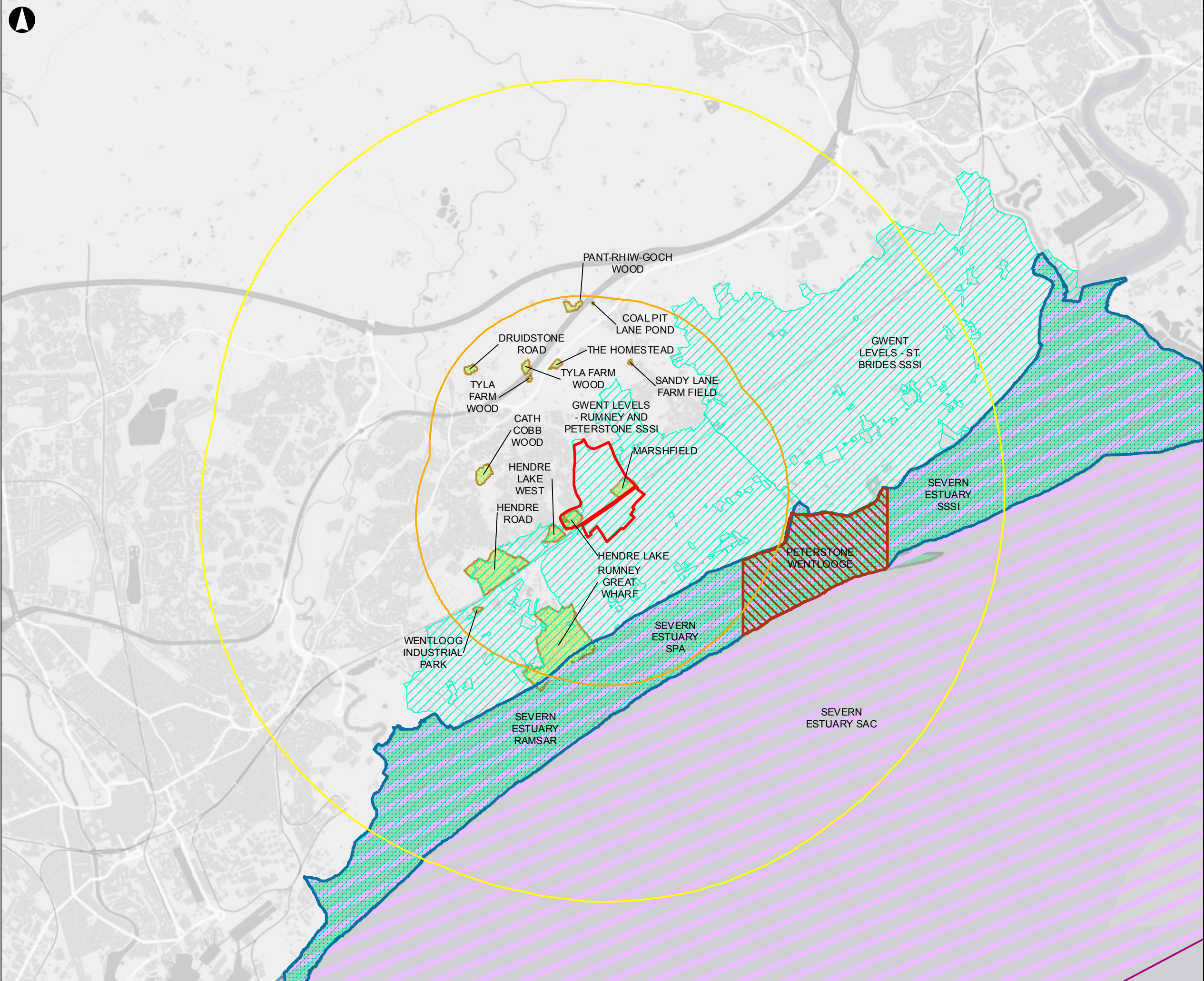
4.3.10 Invasive Plants

No invasive plants were recorded on site during the Extended Phase 1 habitat survey. However, the survey was undertaken outside of the optimal period for botanical surveys it is therefore recommended that a survey for invasive plants is undertaken during the optimal months of April – October.

Figures

Figure 1. Statutory and Non-Statutory Designated Sites

Figure 2. Extended Phase 1 Habitat Survey Results

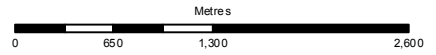


- Legend**
- Red Line Boundary
 - Red Line Boundary - 2km Buffer
 - Red Line Boundary - 5km Buffer
- Statutory Sites**
- Special Protection Areas (SPA)
 - Sites of Special Scientific Interest (SSSI)
 - Special Areas of Conservation (SAC)
 - Ramsar
- Non-Statutory Sites**
- Sites of Importance for Nature Conservation (SINC)
 - Wildlife Trust Reserve

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P2	2017-01-30	EB	PW	PC
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Issue	Date	By	Chkd	Appd
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ARUP

Client
Cardiff Parkway Developments Ltd

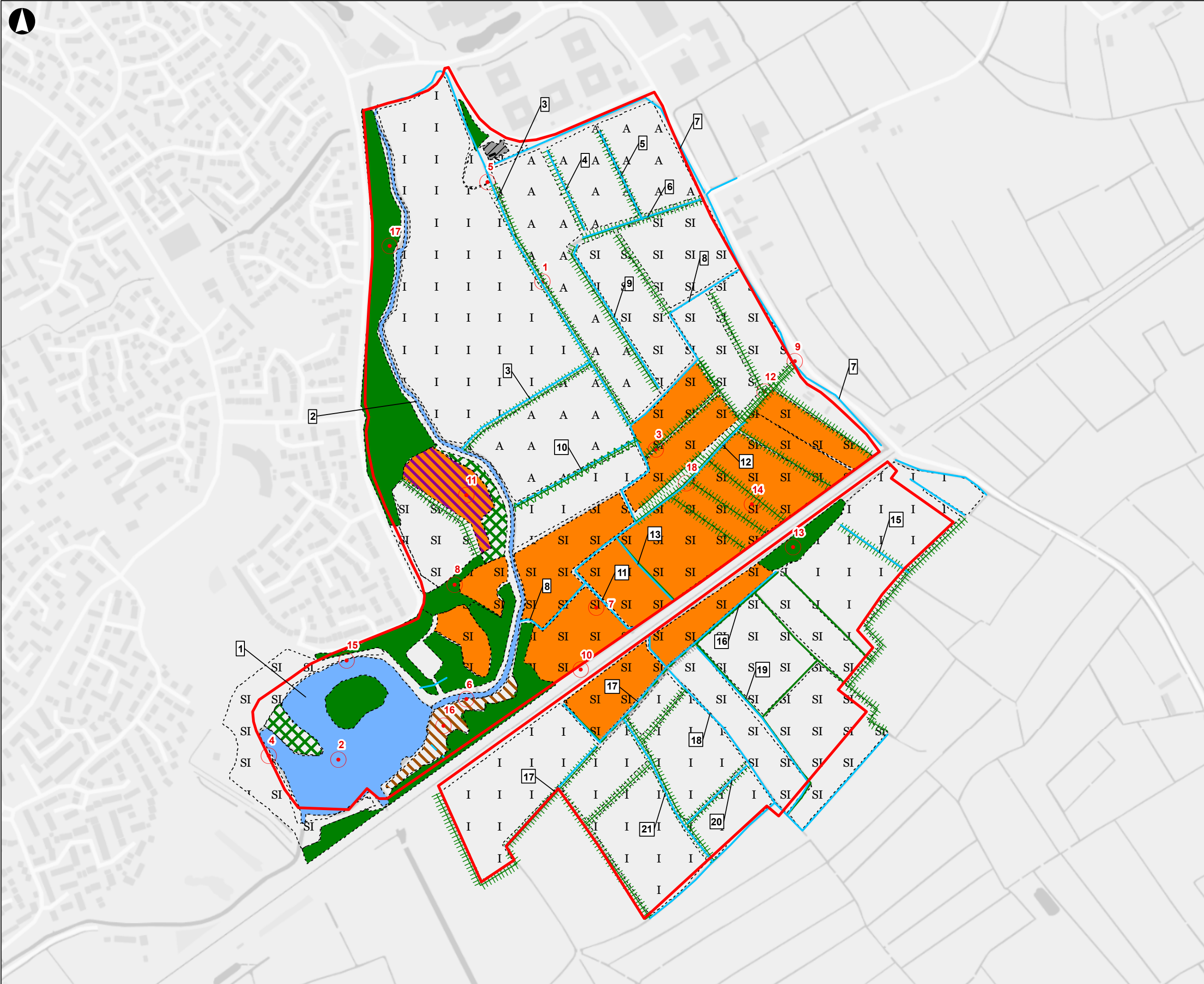
Job Title
Cardiff Hendre Lakes

Environmental Designations

Scale at A3
1:50,000

Job No 252199	Drawing Status For Issue
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Drawing No 002	Issue F1
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Legend

Red Line Boundary

Target note

Standing water

Species-rich intact hedge

Species-poor intact hedge

Species poor defunct hedge with fence

Species-poor hedge with trees

Dry ditch

Semi-natural broadleaved woodland

Dense scrub

SI SI

Semi-improved neutral grassland

I I

Improved grassland

Marshy grassland

SI SI

Poor semi-improved grassland

Tall ruderal

Standing water

A A

Arable

Buildings

Tarmac

Waterbody number

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P3	2017-01-30	EB	PW	PC
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Issue	Date	By	Chkd	Appd
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Metres

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ARUP

Client

Cardiff Parkway Developments Ltd

Job Title

Cardiff Hendre Lakes

Extended Phase 1
Habitat Survey

Scale at A3

1:6,000

Job No

252199

Drawing Status

For Issue

Drawing No

001

Issue

F1

Appendix A

Legislative Context

A1 Legislative Context

A framework of international, European, national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. This is described in the following sections. The reader should refer to the original legislation for the definitive interpretation.

A1.1 Statutory Designated Sites

A network of nationally designated sites has been established through the designation of Sites of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act 1981 (as amended). The protection afforded by the Act means it is an offence to carry out or permit to be carried out any operation listed within the notification without the consent of the Statutory Nature Conservation Organisation¹⁶ (Natural Resources Wales).

The protection afforded to SSSIs is used to underpin the designation of areas at a European Level. European Sites comprise:

- Special Areas of Conservation (SAC) designated under the Conservation of Habitats and Species Regulations 2010 (as amended) (known as the Habitats Regulations);
- Special Protection Areas (SPA) designated under the Wildlife and Countryside Act.

Wetlands of International Importance (Ramsar Sites) declared under the Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 are normally also notified as SSSIs but are only considered European Sites as a matter of UK and Local Government Policy.

The Habitats Regulations transpose the requirements of Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) in to law within England and Wales, while the Wildlife and Countryside Act transposes Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive) in the law within England and Wales. Equivalent legislation exists to transpose these directives in the law within Scotland and Northern Ireland.

The Habitats Regulations require that consideration is given to the implications of plans and projects (developments) on European Sites are considered. Specifically Regulation 61(1) states:

“A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which –

(a) is likely to have a significant effect on a European site or European marine site (either alone or in combination with other plans or projects), and

¹⁶ Section 28 of the Wildlife and Countryside Act 1981 (as substituted by Schedule 9 of the Countryside and Rights of Way Act 2000).

(b) is not directly connected with or necessary to the management of that site, must make an appropriate assessment of the implications for that site in view of that site's conservation objectives."

The formal consideration of effects on European Sites is therefore undertaken by the determining authority such as the Local Planning Authority.

Local Nature Reserves can be given protection against damaging operations through powers within the National Parks and Access to the Countryside Act 1949 (as amended). However this protection is usually conveyed through inclusion of protection within local planning policy relating to these sites and other non-statutory sites such as Sites of Importance for Nature Conservation.

A1.2 European Protected Species

The Habitats Regulations convey special protection to a number of species which are listed in schedule 2 of the Regulations and are referred to as European Protected Species (EPS):

- All UK resident bat species;
- All whale and dolphin species;
- Large blue butterfly (*Maculinea arion*);
- Common dormouse (*Muscardinus avellanarius*);
- Pool frog (*Rana lessonae*);
- Sand lizard (*Lacerta agilis*);
- Fisher's estuarine moth (*Gortyna borelii lunata*);
- great crested newt (*Triturus cristatus*)
- common otter (*Lutra lutra*)
- wild cat (*Felis silvestris*);
- Lesser Whirlpool Ram's-horn Snail (*Anisus vorticulus*)
- Smooth snake (*Coronella austriaca*);
- Sturgeon (*Acipenser sturio*);
- Natterjack toad (*Bufo calamita*); and
- All marine turtles.

Regulation 41 makes it an offence to:

- a) Deliberately capture, injure or kill any wild animal of a EPS;
- b) Deliberately disturb wild animals of such a species;
- c) Deliberately takes or destroys the eggs of such a species;
- d) Damages or destroys a breeding site or resting place of such an animal.

Disturbance in the context of the offences above is disturbance which is likely to impair the ability of the animals to survive, to breed or reproduce, to nurture their young, to hibernate, to migrate; or to affect significantly the local distribution of the species.

Licences can be granted by the relevant SNCO for developments (sometime referred to as EPS Licences or Derogation Licences) providing the purposes of the licence is for “preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”.

A1.3 UK Protected Species

The Wildlife and Countryside Act 1981 provide protection to both EPSs and other species including wild birds, water voles and reptiles.

All wild birds, their nests and eggs are protected with some rare species afforded extra protection from disturbance during the breeding season (these species are listed in Schedule 1 of the Act). It is illegal to take any wild bird or damage or destroy the nests and eggs of breeding birds. There are certain exceptions to this in respect of wildfowl, game birds and certain species that may cause damage.

Water vole receive protection under the Wildlife and Countryside Act 1981 which prohibits the killing, injuring or taking by any method.

All native reptile species in the UK are subject to partial protection from intentional or reckless killing or injury only.

Badger and their setts are protected under the Protection of Badgers Act 1992 which makes it an offence to kill, injure or take a badger, or interfere with a sett.

A1.4 Other Legislation Relating to Species

Section 6 of the Environment (Wales) Act 2016 includes a duty on all public authorities to “seek to maintain and enhance biodiversity” so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to “promote the resilience of ecosystems”. This duty applies to government bodies, local authorities and statutory undertakers.

To assist in complying with this duty, public authorities must have regard to relevant evidence provided in the State of Natural Resources Report and any relevant area statement for an area in which the authority exercises functions, as well as having regard to the list of living organisms and habitats published under Section 7 of the Act. Species and habitats listed on Section 7 are considered to be of Principle Importance for the conservation of biological diversity.

The Environment (Wales) Act 2016 replaces the NERC Act 2006; Section 6 replaces Section 40 of the NERC Act and Section 7 replaces the Section 42 lists.

Appendix B

Target Notes

B1 Target Notes

Target Note Reference	Notes
1	Bat roost potential in mature oaks along hedge.
2	Fish present (according to signage carp, eel and roach are present). Habitat suitable for water vole, otter, with some potential for amphibians. Many species of birds observed using this habitat, including kingfisher.
3	Row of trees, predominantly <i>Salix</i> spp.. A stand of <i>Buddleja davidii</i> present. Bat roosting potential along tree lines.
4	Poor semi-improved grassland with some scattered trees: oak (with bat roost potential), hawthorn and willow. This habitat is predominantly used as amenity grassland but does have some botanical value over amenity/improved grassland.
5	Mosaic of habitats, including grassland, hedgerows, ruderals and marginal vegetation associated with the reen. Mammal track crossing reen, likely fox.
6	Sides of reen managed and reprofiled. Stands of <i>Phragmites australis</i> and <i>Juncus</i> spp. present, however little vegetation in the channel remaining, although likely to recolonise. Potential for water vole and otter along all reens on site although habitat suitability is lowered on recently managed reens.
7	Habitat is predominantly semi-improved grassland; however where depressions are present (and the watertable becomes visible) the habitat forms a mosaic with F1 swamp, where the presence of reed dominates in seral succession. Scattered willows present. Common snipe using this field.
8	Broad leaved woodland contains some mature oaks with moderate bat roost potential.
9	Large reen bordering fields and road. Potential for otter (as with all reens). Recently managed with little aquatic vegetation although once recolonised, it will be have greater suitability for water voles.
10	Either side of the railway is a gravel matrix, wet ditch and scattered trees (<i>Salix</i> spp.) and ruderal/scrub species, such as <i>Epilobium angustifolium</i> , <i>Phragmites</i> spp., and <i>Rubus</i> spp. Limited reptile potential, although access was not possible to rail sides.
11	Marshy grassland with high proportion of <i>Juncus</i> spp. <i>Phragmites</i> spp. encroaching in places and scattered <i>Salix</i> spp. across the habitat.
12	Large willow tree with woodpecker holes and moderate bat roost potential.
13	Willow carr, with multiple ponds underneath containing aquatic plants including reed, pondweed and sedges. Some potential for invertebrates, nesting birds and bats, although the trees are not particularly large.
14	Fields adjacent to railway are of limited botanical diversity; however the presence of ditches increases the variation in species present. Grasses dominate with <i>Juncus</i> spp. and limited forbs.
15	Marginal vegetation around perimeter of pond, including <i>Typha latifolius</i> , stands of <i>Phragmites australis</i> , <i>Juncus</i> spp. and <i>Rubus</i> spp., including some scattered broad leaf trees, e.g. <i>Salix</i> spp.
16	Tall ruderal habitat, primarily <i>Epilobium angustifolium</i> , but <i>Rubus</i> spp. encroaching and turning into scrub habitat with fringing <i>Salix</i> spp. and <i>Fraxinus excelsior</i> .
17	Semi-natural broadleaved woodland with a mosaic of ruderal species and scrub habitat. Moderate potential for roosting bats, nesting birds and badgers.

Appendix C

SEWBReC Desk Study Birds Records

C1 SEWBRReC Desk Study Bird Records

Common Name	Scientific Name	Status ¹⁷
Lesser Redpoll	<i>Acanthis cabaret</i>	S7
Skylark	<i>Alauda arvensis</i>	S7
Bittern	<i>Botaurus stellaris</i>	Sch1, BDir1, S7
Cetti's Warbler	<i>Cettia cetti</i>	Sch1, S7
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	S7
Merlin	<i>Falco columbarius</i>	Sch1, BDir1, S7
Hobby	<i>Falco subbuteo</i>	Sch1, S7
Kestrel	<i>Falco tinnunculus</i>	Sch1, S7
Mediterranean Gull	<i>Larus melanocephalus</i>	Sch1, BDir1, S7
Grasshopper Warbler	<i>Locustella naevia</i>	S7
Red Kite	<i>Milvus milvus</i>	Sch1, BDir1, S7
Yellow Wagtail	<i>Motacilla flava</i>	S7
House Sparrow	<i>Passer domesticus</i>	S7
Bullfinch	<i>Pyrrhula pyrrhula</i>	S7
Green Sandpiper	<i>Tringa ochropus</i>	Sch1
Redwing	<i>Turdus iliacus</i>	Sch1, S7
Song Thrush	<i>Turdus philomelos</i>	S7
Starling	<i>Sturnus vulgaris</i>	S7
Kingfisher	<i>Alcedo atthis</i>	Sch1, BDir1, S7
Dunnock	<i>Prunella modularis</i>	S7
Cuckoo	<i>Cuculus canorus</i>	S7
Reed Bunting	<i>Emberiza schoeniclus</i>	
Peregrine	<i>Falco peregrinus</i>	Sch1, BDir1, S7
Linnet	<i>Linaria cannabina</i>	S7
Fieldfare	<i>Turdus pilaris</i>	Sch1, S7
Barn Owl	<i>Tyto alba</i>	Sch1
Marsh Harrier	<i>Circus aeruginosus</i>	Sch1, BDir1, S7
Lapwing	<i>Vanellus vanellus</i>	S7
Corncrake	<i>Crex crex</i>	Sch1, BDir1, S7
Hen Harrier	<i>Circus cyaneus</i>	Sch1, BDir1, S7
Lesser Spotted Woodpecker	<i>Dendrocopos minor</i>	
Pintail	<i>Anas acuta</i>	S7

¹⁷ Sch1 = Designated under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).
 BDir1 = Birds listed on Annex I of the EC Birds Directive.
 S7 = Birds listed on Section 7 of the Environment (Wales) Act 2016.

Common Name	Scientific Name	Status ¹⁷
Scaup	<i>Aythya marila</i>	Sch1
Little Ringed Plover	<i>Charadrius dubius</i>	Sch1
Ringed Plover	<i>Charadrius hiaticula</i>	S7
Brambling	<i>Fringilla montifringilla</i>	Sch1, S7
Bar-tailed Godwit	<i>Limosa lapponica</i>	BDir1
Black-tailed Godwit	<i>Limosa limosa</i>	Sch1
Common Scoter	<i>Melanitta nigra</i>	S7
Curlew	<i>Numenius arquata</i>	S7
Whimbrel	<i>Numenius phaeopus</i>	Sch1, S7
Black Redstart	<i>Phoenicurus ochruros</i>	Sch1, S7
Golden Plover	<i>Pluvialis apricaria</i>	BDir1, S7
Turtle Dove	<i>Streptopelia turtur</i>	
Greenshank	<i>Tringa nebularia</i>	Sch1, S7
Garganey	<i>Anas querquedula</i>	Sch1, S7
Lapland Bunting	<i>Calcarius lapponicus</i>	Sch1, S7
Black Tern	<i>Chlidonias niger</i>	Sch1, BDir1, S7
Bewick's Swan	<i>Cygnus columbianus</i> subsp. <i>bewickii</i>	Sch1, BDir1, S7
Little Gull	<i>Hydrocoloeus minutus</i>	Sch1, BDir1, S7
Snow Bunting	<i>Plectrophenax nivalis</i>	Sch1, S7
Avocet	<i>Recurvirostra avosetta</i>	Sch1, BDir1
Firecrest	<i>Regulus ignicapilla</i>	Sch1, S7
Arctic Skua	<i>Stercorarius parasiticus</i>	S7
Ring Ouzel	<i>Turdus torquatus</i>	S7
Twite	<i>Linaria flavirostris</i>	S7
Ruff	<i>Calidris pugnax</i>	Sch1, BDir1, S7
Tree Pipit	<i>Anthus trivialis</i>	S7
Dark-bellied Brent Goose	<i>Branta bernicla</i> subsp. <i>bernicla</i>	S7
Hawfinch	<i>Coccothraustes coccothraustes</i>	S7
Yellowhammer	<i>Emberiza citrinella</i>	
Woodlark	<i>Lullula arborea</i>	Sch1, BDir1, S7
Spotted Flycatcher	<i>Muscicapa striata</i>	S7
Grey Partridge	<i>Perdix perdix</i>	S7
Honey-buzzard	<i>Pernis apivorus</i>	Sch1, BDir1, S7
Whooper Swan	<i>Cygnus cygnus</i>	Sch1, BDir1
Yellow Wagtail	<i>Motacilla flava</i> subsp. <i>flavissima</i>	
Osprey	<i>Pandion haliaetus</i>	Sch1, BDir1, S7
Nightjar	<i>Caprimulgus europaeus</i>	BDir1, S7

Appendix D

Species Observed

D1 Species Observed

Ref.	Common name	Scientific Name	Notes
Birds			
1	Kingfisher	<i>Alcedo atthis</i>	Schedule 1 under WCA 1981. Observed on the lake.
2	Little egret	<i>Egretta garzetta</i>	Five observed flying over the lake.
3	Song thrush	<i>Turdus iliacus</i>	Observed around the lake and across the site.
4	Bullfinch	<i>Pyrrhula pyrrhula</i>	Three observed around the lake.
5	Black-headed gull	<i>Chroicocephalus ridibundus</i>	Numerous on the lake.
6	Mute swan	<i>Cygnus olor</i>	Observed on lake and on the connecting reen.
7	Great crested grebe	<i>Podiceps cristatus</i>	Single individual on the lake.
8	Wren	<i>Troglodytes troglodytes</i>	Observed across the site.
9	Canada goose	<i>Branta canadensis</i>	Observed on the lake.
10	Mallard	<i>Anas platyrhynchos</i>	Observed on the lake.
11	Magpie	<i>Pica pica</i>	Observed across the site.
12	Reed bunting	<i>Emberiza schoeniclus</i>	Observed on grassland within woodland near to the lake's car park.
13	Moorhen	<i>Gallinula chloropus</i>	Observed on the lake.
14	Rook	<i>Corvus frugilegus</i>	Observed across the site.
15	Carrion crow	<i>Corvus corone</i>	Observed across the site.
16	Starling	<i>Sturnus vulgaris</i>	Observed across the site.
17	House sparrow	<i>Passer domesticus</i>	Heard in adjacent residential properties to lake.
18	Great spotted woodpecker	<i>Dendrocopus major</i>	Heard on site.
19	Blue tit	<i>Cyanistes caeruleus</i>	Heard on site.
20	Great tit	<i>Parus major</i>	Heard on site.
21	Herring gull	<i>Larus argentatus</i>	Two individuals flying across the lake.
22	Teal	<i>Anas crecca</i>	Two observed on reens in centre of site.
23	Snipe	<i>Gallinago gallinago</i>	Two observed on wet grassland to south of site, adjacent to railway.
Molluscs			
24	Great ramshorn	<i>Planorbarius corneus</i>	Numerous individuals of varying size found in dredged mud on bankside of reen.
25	<i>Physa</i> spp.	<i>Physa</i> spp.	Numerous individuals found in dredged mud on bankside of reen.

Ref.	Common name	Scientific Name	Notes
26	Great pond snail	<i>Lymnaea stagnalis</i>	Numerous individuals of varying size found in dredged mud on bankside of reen.
27	Ear pond snail	<i>Lymnea auricularia</i>	Numerous individuals of varying size found in dredged mud on bankside of reen.
28	Hairy orb mussel	<i>Sphaerium corneum</i>	Two individuals found in dredged mud on bankside of reen.