EXTENDED PHASE 1 HABITAT SURVEY

HIRWAUN INDUSTRIAL ESTATE

A Report to Envisage

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CONTENTS

1. INTRODUCTION 4
1.1 BACKGROUND 4
1.2 SITE DESCRIPTION 4
2. METHODOLOGY 6
2.1 DESK STUDY 6
2.2 EXTENDED PHASE 1 HABITAT SURVEY 6
3. DESK STUDY RESULTS 7
3.1 NATURE CONSERVATION SITES 7
3.2 PROTECTED SPECIES 8
4. EXTENDED PHASE 1 HABITAT SURVEY 11
4.1 INTRODUCTION 11
4.2 HABITATS 11
4.3 FAUNA 23
5. DISCUSSION AND CONCLUSIONS 24
5.1 NATURE CONSERVATION SITES 24
5.2 HABITATS 24
5.3 PROTECTED SPECIES 27
6. RECOMMENDATIONS 32
6.1 NATURE CONSERVATION SITES 32
6.2 HABITATS 32
6.3 PROTECTED SPECIES 32
REFERENCES AND BIBLIOGRAPHY 34
APPENDICES 35
APPENDIX 1 36
APPENDIX 2 40
APPENDIX 3 42

1. INTRODUCTION

1.1 BACKGROUND

Envisage commissioned Middlemarch Environmental Ltd to undertake an Extended Phase 1 Habitat Survey of a site off Fifth Avenue, in Hirwaun Industrial Estate, Mid Glamorgan. It is understood that a recycling and waste recovery plant is planned for the site.

To fulfil the above brief to assess the existing ecological interest of the site, a desk study and an Extended Phase 1 Habitat Survey were undertaken.

The initial Extended Phase 1 Habitat Survey was performed on 20th May 2008. Additional information was gathered during protected species visited undertaken between May and August 2008.

This report details and provides the following information:

- Desk Study
- Extended Phase 1 Habitat Survey.

1.2 SITE DESCRIPTION

The survey area is located on Fifth Avenue in Hirwaun Industrial Estate (central National Grid Reference SN 938 068). The site is situated at the northern edge of the industrial estate, with industrial buildings located to the south and east. Penderyn Reservoir forms the northern site boundary, with early-mature sessile oak *Quercus petraea* lining the boundary and over-shading much of the track. A pumping station and an area of pasture with scattered trees forms the western site boundary. Fifth Avenue forms the southern site boundary and Ninth Avenue forms the majority of the eastern site boundary, with the remainder marked by a water treatment works.

The site is dominated by an area of flat, made ground, with incorporated drainage channels. It is understood that area was previously been built upon (within the last 100 years). This central area of the site is dominated by marshy grassland, however occasional gorse and planted scattered trees are present towards the edges of this habitat. This area was grazed by horses and thus subjected to a high level of poaching. Fenced off areas were present along the eastern and western site boundaries, protected areas of young broad-leaved plantation woodland and scattered trees in marshy grassland.

A grassy track runs along the northern site boundary, bound between lines of trees (northern side of track) and broad-leaved woodland (southern side of track). A small stream runs along the western

edge of the site, with a second shallower brook flowing into this stream forming a triangular area of willow carr, scattered trees and marshy grassland separate from the main area of the site (the third side was formed by a dry ditch which separated this area from the grassy track).

2. METHODOLOGY

2.1 DESK STUDY

A desk study was undertaken to determine the nature conservation designations and protected species that have been recorded within 2 km of the edge of the site. This involved contacting statutory and non-statutory organisations. Middlemarch Environmental Ltd assimilated and reviewed the desk study data provided by these organisations.

The consultees for the Desk Study were:

- CCW Web site for Protected Sites and Landscapes map
- Biodiversity Information Service for Powys and Brecon Beacons National Park
- South East Wales Biodiversity Records Centre
- National Biodiversity Network (NBN) Gateway website

The data collected from these consultees is discussed in Section 3.

2.2 EXTENDED PHASE 1 HABITAT SURVEY

To fulfill the brief of undertaking an ecological assessment of the site, an Extended Phase 1 Habitat Survey was conducted (JNCC, 1993). This is a standard technique for classifying and mapping British habitats. The aim is to provide a record of habitats that are likely to be ecologically important. During the Extended Phase 1 Habitat Survey, the presence, or potential presence, of protected species was also recorded.

The data collected during the field survey is discussed in Section 4.

3. DESK STUDY RESULTS

From the details provided by the consultees, relevant ecological data have been reviewed and are summarised below. Details are provided in Appendix 1.

3.1 NATURE CONSERVATION SITES

Records of all nature conservation sites within a 2 km radius of the perimeter of the site are provided below. Further information regarding sites within a 10 km radius of the perimeter of the site are provided in Appendix 1.

Statutorily Protected Nature Conservation Sites

A number of statutorily protected nature conservation sites are present within a 2 km radius of the site perimeter:

European Level

- Coedydd Nedd a Mellte Special Area of Conservation (SAC)
- Blaen Cynon SAC

National Level

- Dyffrynoedd Nedd a Mellte a Moel Penderyn Site of Special Scientific Interest (SSSI)
- Woodlands Park and Pontpren SSSI
- Cors Bryn-y-Gaer SSSI

Details of these sites are summarised in Table 3.1.

In addition, the Brecon Beacons National Park (a Landscape Protected Area) falls within the northern half of the survey area.

Site	Designation	Summary of Site	Approximate Proximity to the Site Boundary
Blaen Cynon	SAC	This site is considered to be one of the best areas in the United Kingdom for marsh fritillary *Euphydryas aurinia*. This site comprises five geographically separate areas which are also designated as SSSIs.	100 m east
Cors Bryn-y-Gaer	SSSI	Part of Blaen Cynon SAC, this site comprises two geographically separate areas.	100 m east
Woodlands Park and Pontpren	SSSI	Part of Blaen Cynon SAC, this site comprises three geographically separate areas.	700 m north-east
Coedydd Nedd a Mellte	SAC, SSSI	This site is considered to be one of the old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. It also contains a significant presence of *Tilio-Acerion* forests of slopes, screes and ravines.	1100 m west
Dyffrynoedd Nedd a Mellte a Moel Penderyn)	SSSI	Parts of the SSSI (which comprises two geographically separate areas) are included within Coedydd Nedd a Mellte SAC.	1100 m west
Key SAC: Special Area of Conservation SSSI: Site of Species Scientific Interest			

Table 3.1: Statutorily Protected Nature Conservation Sites within 1 km of the site

Non-Statutorily Protected Nature Conservation Sites

The data search identified seven designated as Ancient Woodland, of which six of these are designated as Ancient Semi-Natural Woodland and one is defined as Ancient Replanted Woodland. The nearest of these was located approximately 350 m west of the perimeter of the survey area. No further details regarding these woodlands have been provided. The location of these sites can be found in Appendix 1.

3.2 PROTECTED SPECIES

The desk study identified a number of protected species within a 2 km radius of edge of the site. In addition, records for Annex II bat species were provided within a 10 km radius of the perimeter of the site. Records of priority species within a 10 km radius of the site are included within Appendix 2 only. These are summarised in Table 3.3. Some of these species are also listed within the Local BAP and/or as priority species within the UK BAP. Only species recorded within the last 15 years are included within the table. The full data are provided in Appendix 2.

In addition, a number of species of conservation concern including red data book species were recorded, these are summarised below:

- liverwort species: Red data book species
- moss species: Red data book species
- lichen species: Red data book species
- 1 vascular plant: Red data book species
- 1 beetle (Coleoptera) species: Red data book species
- bird species (Redstart & Woodcock): Local BAP, Welsh Amber Bird

The absence of records should not be taken as confirmation that a species is absent from the search area.

Scientific Name	Common Name	Number of records	Approximate Distance From Site Boundary of Nearest Record	Local BAP	UK BAP	Protection/ Status
Birds						
Ficedula hypoleuca	Pied flycatcher	1	2500 m north	✓	-	S42, Bonn Convention Annex II
Phylloscopus sibilatrix	Wood warbler	1	2500 m north	-	-	S42, Bonn Convention Annex II RSPB Amber Data List
Turdus philomelos	Song thrush	1	700 m east	✓	✓	S42, RSPB Amber Data List, Welsh Amber Birds
Vanellus vanellus	Lapwing	1	1100 m north	✓	✓	S42, Bonn Convention Annex II, ECB, RSPB Amber Data List, Welsh Red Bird
Herpetofauna						
Bufo bufo	Common toad	1	700 m east	✓	✓	WCA Schedule 5 (S9(5)), S42 Berne Convention Annex III
Lacerta vivipara	Viviparous lizard	1	700 m east	✓	✓	WCA Schedule 5, S42
Rana temporaria	Common frog	1	700 m east	✓	-	WCA Schedule 5 (S9(5)) Berne Convention Annex III
Invertebrates						
Eurodryas aurinia	Marsh fritillary	37	500 m north or 500 m east	✓	✓	WCA Schedule 5, S42, ECH Annex II, Berne Convention Annex II
Boloria selene	Small pearl-bordered fritillary	1	700 m east	✓	✓	S42
Coenonympha pamphilus	Small heath	1	700 m east	-	✓	S42
Mammals						
Rhinolophus hipposideros	Lesser horseshoe bat	1	11 km east*	✓	✓	WCA Schedule 5 & 6, S42 ECH Annexes II & IV, Bonn Convention Annex II Berne Convention Annex II
Martes martes	Pine marten	2	700 m north	✓	✓	WCA Schedule 5, S42 ECH Annexes V, Berne Convention Annex III
Plants						
Hyacinthoides non-scripta	Bluebell	2	700 m north-east	-	-	WCA Schedule 8

Key
WCA: Wildlife and Countryside Act 1981
ECH: European Communities Council Directive on the conservation habitats and fauna
ECB: European Communities Council Directive on the conservation of wild birds
Local BAP: Our Natural World – a biodiversity action plan for the Brecon Beacons National Park and Action for Nature: The Local Biodiversity Action Plan for Rhondda Cynon Taff
UKBAP: UK Biodiversity Action Plan
S42: NERC Act 2006 Section 42 Species (Priority Species in Wales)

RSPB Red Data List: Globally threatened species with rapid decline in breeding population in last 25 years.
RSPB Amber Data List: Species with unfavourable conservation status is Europe, historical population decline and moderate population decline in last 25 years.

*Record outside of search area but it is considered likely that the species will be utilising habitat within search area.

Table 3.3: Protected/BAP Species within 1 km of the Site

4. EXTENDED PHASE 1 HABITAT SURVEY

4.1 INTRODUCTION

The survey was completed on 20th May 2008. The weather conditions at the time of the survey are shown in Table 4.1. Additional information was gathered during protected species visited undertaken on 21st May 2008, 29th May 2008, 30th May 2008, 16th June 2008, 30th June 2008, 16th July 2008 and 26th August 2008.

Conditions	Result
Temperature (°C)	12
Cloud Cover (%)	60
Precipitation	Dry
Wind Speed (Beaufort)	F2-3

Table 4.1: Weather Conditions at Time of Survey on 20th May 2008

The results of the Extended Phase 1 Habitat Survey are presented in Section 4.2. An annotated Extended Phase 1 Habitat Survey Drawings (Middlemarch Environmental Ltd Drawing Number C101917-01) is attached in Appendix 2. These drawings illustrate the location of all the habitat types recorded at the site and notes any areas of ecological interest. Target notes discussed within the text can be found on Middlemarch Environmental Ltd Drawing C101917-01 in Appendix 2.

4.2 HABITATS

The following habitat types were recorded at the site:

- Bare ground
- Broad-leaved plantation woodland
- Broad-leaved semi-natural woodland
- Dense scrub
- Dry ditch
- Fence
- Hardstanding
- Introduced shrub
- Marshy grassland
- Running water
- Scattered broad-leaved trees
- Scattered scrub
- Semi-improved neutral grassland

These habitats are outlined below; they are ordered alphabetically, not by ecological importance. The value of each habitat is discussed in Section 5.3.

Bare ground

A small area, comprising large gravel, formed a soakaway into which all the drains on site entered. This area was predominantly clear of vegetation (Target Note 1).

Broadleaved plantation woodland

Two areas of plantation woodland were noted within the survey area. Both areas comprised young trees and scrub planting, with the trees between 4 and 6 m high, with tussocky semi-improved grassland forming the ground flora. All trees were in good condition with no cracks, crevices or hollows noted. These areas were surrounded by fencing which was in good to moderate condition.

The largest is located along the eastern boundary of the site. Occasional introduced shrub species were noted within this area, especially at the southern end of the including *Viburnum* sp. and Japanese rose *Rosa rugosa* (Target Note 6). A breach in the fencing was noted on the south-western section of the area and therefore this area was subject to heavy poaching by horses. In this opening was an area of semi-improved neutral grassland with a large number (between 70 and 100) of southern marsh orchid *Dactylorhiza praetermissa* and common spotted orchid *Dactylorhiza fuchsii* (Target Note 4).

A much smaller area of plantation woodland was located in the south-western corner of the site adjacent to the stream. The species composition of the plantation was similar to that found within the first area. A list of species noted within the habitat is provided in Table 4.2.

Common Name	Scientific Name
Tree and Shrub Species	
Alder	*Alnus glutinosa*
Ash	*Fraxinus excelsior*
Blackthorn	*Prunus spinosa*
Dogwood	*Cornus sanguinea*
Dogwood species	*Cornus* sp.
Gorse	*Ulex europaeus*
Guelder rose	*Viburnum opulus*
Hawthorn	*Crataegus monogyna*
Oak	*Quercus* sp.
Rose	*Rosa* sp.
Ground flora	
Broad-leaved dock	*Rumex obtusifolius*
Clover	*Trifolium* sp.
Common ragwort	*Senecio jacobaea*
Common vetch	*Vicia sativa*
Field horsetail	*Equisetum arvense*
Hard rush	*Juncus inflexus*
Ribwort plantain	*Plantago lanceolata*
Sedge	*Carex* spp.
Smooth meadow-grass	*Poa pratensis*
Speedwell	*Veronica* sp.
Tufted hair-grass	*Deschampsia caespitosa*
Tufted vetch	*Vicia cracca*

Table 4.2: Species Recorded Within the Broad-Leaved Plantation Habitat

Broadleaved semi-natural woodland

At the northern edge of the site is an area of willow *Salix* sp. woodland, with occasional birch *Betula* sp. present. The trees were all young to semi-mature and the area appears to have been planted. The trees were up to 6 m high and many were leggy as a result of being too closely packed. Occasional gorse forms the understorey within this area whilst the ground flora comprised semi-improved neutral grassland, with the species composition similar to that of the adjacent track.

An area of willow carr was present within the north-western corner of the site, dominated by early mature willow *Salix* sp. Marshy grassland formed the ground flora of this habitat, with a higher proportion of grass species and also male fern *Dryopteris filis-max* present. Occasional enchanter's nightshade *Circaea lutetiana* and figwort *Scrophularia* sp. were also noted. The ground within this area had been subject to high levels of poaching by horses, leaving areas of bare soil which were often damp or full of water. A list of species noted within the habitat is provided in Table 4.3.

Common Name	Scientific Name
Tree and Shrub Species	
Birch	*Betula* sp.
Gorse	*Ulex europaeus*
Willow	*Salix* sp.
Understorey	
Common valerian	*Valeriana officinalis*
Creeping bent	*Agrostis stolonifera*
Enchanter's nightshade	*Circaea lutetiana*
Figwort	*Scrophularia* sp.
Great fescue	*Festuca gigantea*
Hard rush	*Juncus inflexus*
Male fern	*Dryopteris filis-max*
Meadowsweet	*Filipendula ulmaria*
Tufted hair-grass	*Deschampsia caespitosa*
Velvet feather-moss	*Brachythecium velutinum*

Table 4.3: Species Recorded Within the Broad-Leaved Plantation Habitat

Dense scrub

A small area of dense gorse scrub, approximately 2-3 m high, was noted in the north-eastern corner of the site.

Dry ditch

A shallow, dry ditch, approximately 0.5 m wide, was present along the northern edge of the area of willow carr/marshy grassland in the north-western corner of the site. This ditch separated this area from the adjacent track and was lined by a line of early mature willow *Salix* sp. The ditch was vegetated by semi-improved neutral grassland, with the species composition similar to the adjacent woodland track. This suggests that the ditch does not regularly hold water.

A second shallow dry ditch was noted in the south-eastern corner of the site, at the junction of Ninth and Fifth Avenue. The ground slopes down from the road-side verge into the ditch, but the level of the site is lowered that the adjacent road. The ditch was vegetated by semi-improved neutral grassland, with the species composition similar to the adjacent road side verge, which suggests that this ditch does not hold water.

Fences

Post and wire fencing, approximately 1.5 m high, generally topped by barbed wire, formed the majority of the site perimeter and also separated a number of internal areas within the site. The

perimeter fencing was generally in good condition, however the internal fence lines had been breached at a number of points. Concrete posts, remnants of a defunct fence line, were noted along parts of the western and northern site boundaries.

The fencing supported minimal vegetation, however occasional lichens including *Cladonia* sp. were noted growing on the fence posts.

Hardstanding

Two small areas of hardstanding were present along the southern and eastern edges of the site, and provided provisional vehicular access points onto the site from the Fifth Avenue and Ninth Avenue respectively.

The area off Ninth Avenue was a continuation of the road and was therefore regularly used as a parking area and turning point. The tarmac was predominantly clear of vegetation. The area of hardstanding off Fifth Avneue was blocked by large boulders to prevent vehicular access to the site. Consequently this area was subject to less disturbance and approximately 15 % of the surface was covered by a mixture of moss species (*Syntrichia ruralis* ssp *ruraliformis* and *Homalothecium lutescens*) (Target Note 2). Occasional red fescue *Festuca rubra*, Yorkshire fog *Holcus lanatus* and dandelion *Taraxacum officinale* agg. were also noted.

Introduced shrub

A small area of fenced shrub was present along the eastern boundary of the site, just to the north of the hardstanding area. This was dominated by sea-buckthorn *Hippophae rhamnoides*, with pyracantha *Pyracantha coccinea* and dogwood *Cornus* sp. also noted. In addition, a large buddleia *Buddleia davidii* bush was noted just to the north of the area of fenced introduced shrub area.

Marshy grassland

Marsh grassland was the dominant habitat type within the survey area, although it varied in species composition depending on grazing pressure, topography and proximity to the stream.

The central area of the site was flat in topography and comprised made-ground with concrete drainage channels. This area was subject to horse grazing and was often horse poached. The habitat was dominated by patches rushes which comprised between 50 and 80 % of the vegetation cover. Hard rush and soft rush were the dominant species of rush present. In between the rush patches the sward was generally short (< 5 cm) with only occasional and small tussocks of tufted hair-grass

Deschampsia caespitosa. Grass species, including Yorkshire fog *Holcus lanatus*, crested dog's-tail *Cynosurus cristatus* and sweet vernal grass *Anthoxanthum odoratum*, were infrequent within the sward. Occasional patches of glaucous sedge *Carex flacca* and common cottongrass *Eriophorum angustifolium* was also noted throughout the area. Greater bird's-foot-trefoil *Lotus pedunculatus* often formed a dominant part of the vegetation cover.

After heavy rain, occasional pools of ephemeral standing water were noted within this area, with round-leaved crowfoot *Ranunculus omiophyllus* and lesser spearwort *Ranunculus flammula* noted within these areas (Target note 5). Moss species *Calliergonella cuspidata* formed a dominant part of the vegetation cover within these areas. A further small area of land was noted to be seasonally damp with frequent common spike rush *Eleocharis palustris* present (Target note 13). Whilst many of the concrete drainage channels were clear of vegetation, others were being encroached upon by the surrounding vegetation, with species noted including hard rush *Juncus inflexus*, lesser spearwort and marsh thistle *Cirsium palustre* (Target Note 3). An area dominated by sweet-grass *Glyceria* sp. was noted in the south-western corner of the site where a drainage system outflow point was noted (Target note 14).

To the east of the main area was a raised area of marshy grassland along the eastern edge of the site, which graded down gradually into the central area. This area was drier than the central section of the site and rushes only comprised approximately 25 to 50 % of the vegetation cover. Glaucous sedge, grass species and marsh thistle were more frequent within this area, where grazing kept the average sward length to approximately 5 cm.

Along the western and northern edges of the site were areas of fenced off marshy grassland. Whilst the fences were not completely livestock-proof the marshy grassland within these areas was dominated by rushes, comprising generally over 80 % of the vegetation cover. Fewer sedges and grasses were noted within these areas although occasional tufted hair-grass was present. In the western section which was located adjacent to the stream, water mint *Mentha aquatica*, common valerian *Valeriana officinalis*, marsh thistle and cuckoo flower *Cardamine pratensis* were frequent components of the sward.

In the north-western corner of the site, on the north of the small stream, there was a further area of marshy grassland. Rushes were much less frequent within this area, comprising only 0 – 25 % of the ground cover. Meadowsweet and common valerian were frequent within the sward. Occasional reed canary grass *Phalaris arundinacea*, great burnet *Sanguisorba officinalis*, and marsh woundwort

Stachys palustris and marsh ragwort *Senecio aquaticus* were noted adjacent to the stream whilst tufts of great fescue *Festuca gigantea*, was noted growing underneath the scattered trees. A list of species noted within the habitat is provided in Table 4.4.

Common Name	Scientific Name
-	*Calliergonella cuspidata*
Black knapweed ±	*Centaurea nigra*
Bluebell	*Hyacinthoides non-scripta*
Bristle club-rush	*Isolepis setacae*
Broad-leaved dock	*Rumex obtusifolius*
Bugle	*Ajuga reptans*
Cinquefoil	*Potentilla* sp.
Common centaury	*Centaurium erythraea*
Common cottongrass	*Eriophorum angustifolium*
Common fleabane	*Pulicaria dysenterica*
Common hawkbit	*Leontodon hispidus*
Common marsh bedstraw	*Galium palustre*
Common spike rush	*Eleocharis palustris*
Common spotted orchid	*Dactylorhiza fuchsii*
Common valerian	*Valeriana officinalis*
Compact rush	*Juncus conglomeratus*
Creeping thistle	*Cirsium arvense*
Crested dog's-tail	*Cynosurus cristatus*
Cuckoo-flower	*Cardamine pratensis*
Curled dock	*Rumex crispus*
Daisy	*Bellis perennis*
Figwort	*Scrophularia* sp.
Forget-me-not	*Myosotis* sp.
Foxglove	*Digitalis purpurea*
Giant fescue	*Festuca gigantea*
Glaucous sedge	*Carex flacca*
Great burnet §	*Sanguisorba officinalis*
Greater bird's-foot-trefoil	*Lotus pedunculatus*
Hard rush	*Juncus inflexus*
Hedge woundwort	*Stachys sylvatica*
Hemp-agrimony	*Eupatorium cannabinum*
Jointed rush	*Juncus articulatus*
Lesser celandine	*Ranunculus ficaria*
Lesser spearwort	*Ranunculus flammula*
Male fern	*Dyopteris filis-max*
Marsh ragwort	*Senecio aquaticus*
Marsh thistle	*Cirsium palustre*
Key ± LBAP Species § Locally Important Species in Powys and Brecon Beacons	

Table 4.4 (continues): Species Within the Marshy Grassland

Common Name	Scientific Name
Marsh woundwort	*Stachys palustris*
Meadow buttercup	*Ranunculus acris*
Meadow vetchling	*Lathyrus pratensis*
Meadowsweet	*Filipendula ulmaria*
Nettle	*Urtica dioica*
Nipplewort	*Lapsana communis*
Pendulous sedge	*Carex pendula*
Ragged robin	*Lychnis flos-cuculi*
Red clover	*Trifolium pratense*
Reed canary-grass	*Phalaris arundinacea*
Remote sedge	*Carex remota*
Round-leaved crowfoot	*Ranunculus omiophyllus*
Self heal	*Prunella vulgaris*
Slender rush	*Juncus tenuis*
Sneezewort	*Achillea ptarmica*
Soft rush	*Juncus effusus*
Southern marsh orchid	*Dactylorhiza praetermissa*
St. John's wort	*Hypericum* sp.
Sweet-grass	*Glyceria* sp.
Sweet vernal grass	*Anthoxanthum odoratum*
Teasel	*Dipsacus fullonum*
Toadrush	*Juncus bufonius*
Tufted hair-grass	*Deschampsia caespitosa*
Upright hedge parsley	*Torilis japonica*
Water mint	*Mentha aquatica*
Wavy bittercress	*Cardamine flexuosa*
Wild angelica	*Angelica sylvestris*
Willowherb	*Epilobium* sp.
Yorkshire fog	*Holcus lanatus*
Key ± LBAP Species § Locally Important Species in Powys and Brecon Beacons	

Table 4.4 (continued): Species Within the Marshy Grassland

Running water

A small stream ran through the site, flowing from north to south. This stream varied in depth from less than 0.1 m (where the stream ran wider over some rocks) to approximately 1 m deep (at a number of meanders in the stream where the stream almost forms a pool). The banks of the stream were between 0.5 and 1 m deep and between 60° and 90° steep. At the northern extent of the stream it was shaded by the adjacent willow trees. At the southern extent the stream was shaded by trees and scrub on both the eastern bank (within the site) and the western bank (outside of the survey area). Species present included young goat willow, ash and rowan trees and saplings, hawthorn and rose. The ground flora in this area included marsh thistle, meadowsweet, soft rush, lesser celandine,

cuckoo flower, germander speedwell *Veronica chamaedrys*, yellow pimpernel *Lysimachia nemorum* and occasional bluebell *Hyacinthoides non-scripta* and common dog violet *Viola riviniana*. The central section of the stream was not shaded. The banks were quite eroded here with a number of sections where the stream was undercutting the banks. At these points the banks were generally devoid of vegetation with bare earth forming the banks.

A further shallower stream flowed from the north-western corner of the site and into the main stream. This stream was approximately 0.4 m wide and less than 0.1 m deep and with a very slow flow, with occasional stagnant areas. The bed of this stream was rusty in colour and a scum was noted on top of the water. This section of stream was shaded by the surrounding willow carr along its full length.

Both streams were predominantly clear of marginal, emergent and floating vegetation. A small patch of bur-reed *Sparganium* sp. was noted at the northern end of the main stream, Target Note 10. A more diverse patch of emergent vegetation was noted at the point where the two streams met (Target Note 11). Species present within the small stream included bur-reed, marsh-marigold *Caltha palustris*, water horsetail *Equisetum fluviatile* and water mint, whilst only bur-reed was present within the main stream.

Scattered broad-leaved trees

The majority of the trees on the site were planted and many were still attached the the tree stakes. The trees varied in height from 1 to 4 m with many in poor condition. Evidence of horse damage was also noted on a number of trees especially those within the central area of the site. A large number of additional tree stakes indicated that many more trees had been planted at the same time, but had already failed.

A number of young trees, incluing ash and goat willow were noted on the eastern bank of the stream, at the south-western corner of the site. Scattered early mature willow *Salix* sp. were also noted within the area of marshy grassland in the north-western corner of the site.

All trees within the site were in good condition with no cracks, crevices or holes noted within the bark or trunks. Tree species noted on site are listed in Table 4.5.

Common Name	Scientific Name
Alder	*Alnus glutinosa*
Ash	*Fraxinus excelsior*
Rowan	*Sorbus aucuparia*
Whitebeam	*Sorbus* sp.
Goat willow	*Salix caprea*

Table 4.5: Species of Scattered Trees Recorded on Site

Scattered scrub

Areas of scattered scrub were present around the edges of the site. Gorse was the most frequent species present, with occasional hawthorn, rose and bramble *Rubus fruticosus* agg. also noted.

Scattered gorse was noted along much of the site's southern boundary and was also frequent in the north-eastern corner of the site, where occasional hawthorn was also noted. This scrub became quite dense in patches, however grassy tracks were present in between bushes. Occasional young and straggly rose bushes were noted within a fenced off area along the eastern boundary of the site. Hawthorn was noted within the large fenced area on the western site boundary and a small patch of bramble was noted adjacent to the area of hard standing on Ninth Avenue. In addition, low bramble was noted growing within the semi-improved neutral grassland (Target Note 9) and a further patch of bramble was noted within the north-western corner of the site (Target Note 12).

Semi-improved neutral grassland

The road verges along Ninth Avenue and Fifth Avenue comprised semi-improved neutral grassland. The verges were un-mown and the average sward length was approximately 40 cm. The sward was dominated by grass species with comprised approximately 75 % of the cover. Tufted hair-grass and cock's-foot *Dactylis glomerata* were most frequent, with false oat-grass *Arrhenatherum elatius*, timothy. Black knapweed *Centaurea nigra*, tufted vetch *Vicia cracca*, common vetch *Vicia sativa* and common bird's-foot-trefoil *Lotus corniculatus* were amongst the more common forb species within this sward.

A larger area of semi-improved grassland was noted at the south-eastern corner of the site, located between the perimeter fencing and broadleaved plantation woodland. Teasel *Dipsacus fullonum* and occasional rosebay willowherb *Chamerion angustifolium* were frequent along the northern edge of this area (Target Note 7). Scattered common spotted and southern marsh orchids (c. 25 plants) were also present. A single patch of five devil's bit scabious plants was noted on the eastern edge of this area (Target Note 8). Species recorded within this table are recorded in Table 4.6.

Common Name	Scientific Name
Black knapweed ±	*Centaurea nigra*
Bristly ox-tongue	*Picris echioides*
Broad-leaved dock	*Rumex obtusifolius*
Cock's-foot	*Dactylis glomerata*
Common bent	*Agrostis capillaris*
Common bird's-foot trefoil	*Lotus corniculatus*
Common chickweed	*Stellaria media*
Common couch	*Elytrigia repens*
Common hawkbit	*Leontodon hispidus*
Common marsh bedstraw	*Galium palustre*
Common ragwort	*Senecio jacobaea*
Common sorrel	*Rumex acetosa*
Common spotted orchid	*Dactylorhiza fuchsii*
Common vetch	*Vicia sativa*
Crested dog's-tail	*Cynosurus cristatus*
Cuckoo flower	*Cardamine pratensis*
Cut-leaved crane's-bill	*Geranium dissectum*
Devil's bit scabious	*Succisa pratensis*
False oat-grass	*Arrhenatherum elatius*
Field horsetail	*Equisetum arvense*
Foxglove	*Digitalis purpurea*
Hard rush	*Juncus inflexus*
Heath wood-rush	*Luzula multiflora*
Meadow vetchling	*Lathyrus pratensis*
Perennial ryegrass	*Lolium perenne*
Ragged robin	*Lychnis flos-cuculi*
Red clover	*Trifolium pratense*.
Red fescue	*Festuca rubra*
Ribwort plantain	*Plantago lanceolata*
Rosebay willowherb	*Chamerion angustifolium*
Silverweed	*Potentilla anserina*
Smooth meadow-grass	*Poa pratensis*
Soft brome	*Bromus mollis*
Southern marsh orchid	*Dactylorhiza praetermissa*
Springy-turf moss	*Rhytidiadelphus squarrosus*
St John's Wort	*Hypericum* sp.
Teasel	*Dipsacus fullonum*
Timothy	*Phleum pratense*
Tormentil	*Rumex crispus*
Trefoil	*Trifolium* sp.
Tufted hair-grass	*Deschampsia caespitosa*
Tufted vetch	*Vicia cracca*
Upright hedge parsley	*Torilis japonica*
Yorkshire fog	*Holcus lanatus*
Key ± LBAP Species § Locally Important Species in Powys and Brecon Beacons	

Table 4.6: Plant Species Identified Within the Semi-Improved Neutral Verges

The grass along the track at the northern boundary of the site was generally shaded by the adjacent trees and therefore was much less diverse than the other area of semi-improved neutral grassland. This habitat was also unmown however the average sward length was shorter (5 – 20 cm) and strips of bareground were present where the track was frequently used. Creeping bent *Agrostis capillaris* was encroahing onto these areas of bare earth. Due to the shaded nature of this habitat, more ferns, including hart's-tongue fern *Phyllitis scolopendrium* and male fern *Dryopteris filix-mas*, were noted within this area. Species recorded along this track are detailed in Table 4.7.

Common Name	Scientific Name
Apiaceae species	-
Cinquefoil	*Potentilla* sp.
Cock's-foot	*Dactylis glomerata*
Creeping bent	*Agrostis stolonifera*
Cuckoo flower	*Cardamine pratensis*
Foxglove	*Digitalis purpurea*
Hard rush	*Juncus inflexus*
Hart's-tongue fern	*Phyllitis scolopendrium*
Herb Robert	*Geranium robertianum*
Knotgrass	*Polygonum aviculare*
Male fern	*Dryopteris filix-mas*
Nettle	*Urtica diocia*
Perennial ryegrass	*Lolium perenne*
Persicaria	*Persicaria* sp.
Smooth meadow-grass	*Poa pratensis*
Sweet vernal grass	*Anthoxanthum odoratum*
Trefoil	*Trifolium* sp.
Tufted hair-grass	*Deschampsia caespitosa*
Yellow archangel	*Lamiastrum galeobdolon*

Table 4.7: Plant Species Identified Within the Semi-Improved Neutral Verges

4.3 FAUNA

The season/time of year dictates the number of faunal species liable to be present. Table 4.8 lists the species observed at the site at the time of the survey.

Common Name	Scientific Name
Amphibians	
Common frog ± (adult & tadpoles)	*Rana temporaria*
Common toad+ ±	*Bufo bufo*
Smooth newt ±	*Lissotriton vulgaris*
Birds	
Blackbird	*Turdus merula*
Buzzard**	*Buteo buteo*
Carrion crow	*Corvus corone*
Goldfinch	*Carduelis carduelis*
Green woodpecker**	*Picus viridis*
Greenfinch	*Carduelis chloris*
Jackdaw	*Corvus monedula*
Magpie	*Pica pica*
Meadow pipit**	*Anthus pratensis*
Robin	*Erithacus rubecula*
Pied wagtail	*Motacilla alba*
Song thrush*+ ±	*Turdus philomelos*
Starling +	*Sturnus vulgaris*
Swallow**	*Hirundo rustica*
Invertebrates	
Beautiful demoiselle	*Calopteryx virgo*
Broad-bodied chaser	*Libellula depressa*
Caddisfly larvae	*Trichoptera* sp.
Cardinal beetle	*Pyrochroa serraticornis*
Cinnabar moth caterpillar +	*Tyria jacobaeae*
Common blue	*Polyommatus icarus*
Four spotted chaser §	*Libellula quadrimaculata*
Large red damselfly§	*Pyrrhosoma nymphula*
Orange tip	*Anthocharis cardamines*
Speckled wood	*Pararge aegeria*
Wood white+	*Leptidea sinapis*
Key ***RSPB Red Data List (Birds) ** RSPB Amber Data List (Birds) + UK BAP Species ± LBAP Species § Locally Important Species in Powys and Brecon Beacons	

Table 4.8: Faunal Species Recorded During the Field Survey

5. DISCUSSION AND CONCLUSIONS

This section provides conclusions drawn from the desk study and field survey.

5.1 NATURE CONSERVATION SITES

A review of the desk study data revealed that the northern part of the site falls into the Brecon Beacons National Park, designated for its landscape quality value rather than for its nature conservation value.

Blaen Cynon Special Area of Conservation (SAC) is located approximately 100 m east of the development site (including Cors Bryn-y-Gaer SSSI, 100 m east and Woodlands Park and Pontpren SSSI, 700 m north east). Due to the close proximity of the site to the development it is possible that this will impact upon this SAC.

Coedydd Nedd a Mellte SAC approximately 1100 m west (including parts of Dyffrynoedd Nedd a Mellte a Moel Penderyn SSSI, 1100 m west).

A number of non-statutorily protected nature conservation sites (replanted and semi-natural ancient woodland) were present within a 2 km radius of the survey area. It is not anticipated that the proposed development works would have any significant impact to the integrity of these sites.

5.2 HABITATS

This section provides a summary of the ecological value of the habitats recorded on site in local and national context. Table 5.1 summarises the habitats recorded on site in relation to Local and National BAPs.

Habitat code	Habitat	Local BAP	National BAP
J4	Bare ground	-	-
A1.1.2	Broad-leaved plantation woodland		-
A1.1.1	Broad-leaved semi-natural woodland	1: Woodlands	-
A2.1	Dense scrub		-
J2.6	Dry ditch		-
J2.4	Fence	-	-
-	Hardstanding	-	-
J1.4	Introduced shrub	-	-
B5	Marshy grassland	1: Rhos Pastures	-
G2	Running water	1 & 2: Rivers and Streams	-
A1.3.1	Scattered broad-leaved trees	-	-
A2.2	Scattered scrub	-	-
B2.2	Semi-improved neutral grassland	1: Neutral Grassland	-
Local BAPS 1. Our Natural World - A Local Biodiversity Action Plan for the Brecon Beacons National Park 2. Action for Nature: The Local Biodiversity Action Plan for Rhondda Cynon Taff			

Table 5.1: Habitats Recorded Within the Site in Relation to Local and National BAPs

Table 5.2 summarises the overall ecological values of the habitats on this site. Overall the habitats range from low to moderate/high ecological value. The values have taken the following into consideration:

- Frequency of the habitat at Local and National level
- Spatial extent of the habitat at Local and National level
- Conservation designations of the habitats at Local and National level
- Species diversity within the site and habitat
- Presence of Local and National BAP species
- Presence of other notable species.

For example if the habitats are uncommon and/or small in spatial extent at a local level it is likely to have a higher ecological value than a habitat that is common and covers a greater spatial area within the local landscape. The habitat ecological value also takes the range of species likely to be supported by the habitat and the ease at which it can be recreated into account. For example scattered scrub and introduced shrub generally support a lower range of species than, for example, mosaic habitats, and are also more readily recreated so therefore have lower ecological value.

Habitat code	Habitat	Habitat value	Local value	National value
J4	Bare ground	Low	Low	Low
A1.1.2	Broad-leaved plantation woodland	Moderate-High	Low	Low
A1.1.1	Broad-leaved semi-natural woodland	Moderate-High	Low	Low
A2.1	Dense scrub	Moderate	Low	Low
J2.6	Dry ditch	Low	Low	Low
J2.4	Fence	Low	Low	Low
-	Hardstanding	Low	Low	Low
J1.4	Introduced shrub	Moderate	Low	Low
B5	Marshy grassland	Moderate	Moderate	Low
G2	Running water	Moderate - High	Moderate	Low
A1.3.1	Scattered broad-leaved trees	Low - Moderate	Low	Low
A2.2	Scattered scrub	Low	Low	Low
B2.2	Semi-improved neutral grassland	Low - Moderate	Low - Moderate	Low

Table 5.2: Ecological Value of Habitats Identified Within the Site

None of the habitats recorded are considered to be of high value at national scale, however if the marshy grassland habitat is found to support a population of marsh fritillary then it will be considered to be of high national and local value, however the absence of Devil's bit scabious means that the site is likely to be only utilised as a transitory site for the dispersal of adults.

Within the local context the broad-leaved semi-natural and plantation woodland habitats are considered to be of low value due to their small size and the young age of these habitats which means they do not fulfil the criteria of the habitat description.

Marshy grassland and running water are both local habitat on the local BAPs (Rhos Pasture and Rivers and Streams respectively) and are therefore considered to be of moderate value as it has the potential to support a variety of protected and BAP species. The marshy grassland is considered to be of moderate value as areas of higher quality Rhos Pasture is located within close proximity to the site.

Semi-improved neutral grassland also features on the local BAPs (Neutral Grassland), however due to the limited extent of this habitat this habitat is only considered to be of low to moderate value, even though it does have the ability to support some BAP species including butterflies and other invertebrates.

Several of the habitats (woodland and running water) are considered to be of moderate-high value as they provide important wildlife corridors within the site and to adjacent habitats. However, due to

the young age and limited extent of the majority habitats on site none are considered to be of high quality. The value of many of these habitats will however increase with time.

As individual examples, and within the context of the site, the habitats identified cover the whole ecological value spectrum. It is understood that the development will predominantly result in the loss of the marshy grassland habitat within the centre of the site. This habitat is listed on the local BAPs for the Brecon Beacons National Park. None of the habitats within the site, including marshy grassland, are considered to be locally uncommon and where the habitats represented within the site are considered to be important locally, those present are site are either limited in extent or are considered to be poor quality examples of the habitat type.

It is not anticipated their loss as a result of this area to the proposed development will represent a significant detrimental ecological impact. With appropriate development design and habitat enhancement, a proposed development has the potential to enhance the ecological value of the immediate area.

5.3 PROTECTED SPECIES

The desk study identified records of protected species within 1 km of the survey area. The field survey identified potential presence and/or suitable habitat of several protected species. Where the site provides potential habitat for a particular species then the relevant legislation is included in Appendix 3.

Birds

The desk study identified four species of bird within 2 km of the site, all of which feature on Section 42 of the NERC act and three of which are considered to be species of conservation concern. No records of Schedule 1 birds were provided. Several bird species were recorded during the field survey including two Red Data List species, (starling and song thrush also UK BAP species) and four Amber Data List species (buzzard, green woodpecker, meadow pipit and swallow).

This site provides suitable nesting habitat for song thrush, meadow pipit, willow warbler and potentially lapwing. Swallows were observed utilising the adjacent warehouses for nesting.

The loss of marshy grassland will adversely impact upon ground nesting birds within the locality by reducing the area of suitable nesting locations. In addition, this loss of habitat will reduce the available foraging habitat within the area.

A breeding bird survey was undertaken to help determine the impact of this development of the local bird population, see Middlemarch Environmental Ltd Report Number RT-MME-102676.

Herpetofauna

Great crested newts

No records of great crested newts were identified within the desk study within a 2 km radius of the site. Nine records within 10 km, the closest of which was made 8.5 km west of the survey area, where provided by Biodiversity Information Service for Powys and Brecon Beacons National Park.

Records from the NBN gateway provided the following records of great crested newts made within the last 15 years within a 10 km radius of the site:

- 11 records from grid square SO 00, the closest of which were made 7.5 km west of the site.
- 1 record from grid square SS 99, made 7.5 km south of the survey area.
- No records from grid squares SN 90, SN 91, SN 80, SN 81 and ST 09.

The site provides little suitable aquatic breeding habitat for great crested newts as all standing water noted on site was ephemeral. The scrub and marshy grassland on site however provides suitable foraging habitat for this species.

Great crested newts generally occupy a terrestrial range over an area of approximately 500 m radius from a breeding pond. Assessment of an ordnance survey map (1:25,000) revealed that there appear to be no ponds within a 500 m radius of the site. Penderyn Reservoir is located approximately 50 m north of the site boundary, however this water body is known to contain a fishery which would reduce its suitability for use by breeding great crested newts. A great crested newt habitat assessment was undertaken to assess the impact of this development upon this species (see Middlemarch Environmental Ltd Report Number RT-MME-102676).

Other Amphibians

Records of common frog (Local BAP species) and common toad (Local and UK BAP) were provided within a 2 km radius of the site. Common frog, common toad and smooth newt (Local BAP species) were recorded on site during the site. The site contained a number of ephemeral water bodies, however these were in areas which were subject to high levels of poaching by horses which reduced their suitability for breeding amphibians. The site, especially the marshy grassland,

provides optimal foraging habitat for these species and the loss of this area will reduce the foraging area available to these species.

Reptiles

The desk study identified one record of viviparous lizard within 2 km of the site. Scrub provides suitable refugia for reptile species, whilst the areas of hard standing and bare ground would provide suitable basking habitat. Marshy grassland provides suitable foraging habitat for reptiles and the presence of running water and ephemeral pools provide suitable foraging habitats for grass snakes. A reptile survey was undertaken to determine the presence/absence of these species on the site.

Invertebrates

Butterflies

Three species of butterfly (marsh fritillary, small heath and small pearl-bordered fritillary) were identified within the desk study. Whilst the site appears to offer sub-optimal habitat for marsh fritillary (only one small patch of Devil's bit scabious, the larval food plant, was noted), this site may provide suitable transitory habitat for this species due to the close proximity of the survey area to Blaen Cynon SAC. Wood white (a UK BAP species) was recorded during the field survey. The wide variety of plants present on site provide both a source of nectar and also larval food plants for small heath, small pearl-bordered fritillaries and wood white, amongst other species. A survey for butterflies on site (in particular marsh fritillary) was undertaken to help determine the impact of this development upon the local butterfly population (see Middlemarch Environmental Ltd Report Number RT-MME-102676).

Moths

No records of moths were provided by the local record centres within a 2 km radius of the site. Cinnabar moth caterpillars (a UK BAP species) were recorded on site during the field surveys and the loss of the marshy grassland habitat may reduce the foraging habitat for this species, however suitable habitat for this species is common within the surrounding area and therefore it is considered that this development will have a minimal impact upon this species.

Odonata

No records of odonata were provided by the local records centre. Four species of odonata, including two considered to be Locally Important Species in Brecon and Powys (four-spotted chaser and large red damselfly) were recorded during the field survey. It is understood that the streams will not be impacted upon by the development however the loss of the marshy grassland habitat will reduce the

available foraging habitat for these species within the area, however suitable habitat is common within the local area and therefore it is considered that this development will have a minimal impact upon these species.

Mammals

Badger

No records of badgers *Meles meles* were provided within the desk study. During the field survey no evidence of badgers such as latrines, tracks or setts was identified. Due to the damp nature and flat topography of much of the site, it provides few opportunities for badgers to build setts. The site would provide suitable foraging habitat for this species. A badger survey was undertaken to determine the impact of the proposed development on this species.

Bats

No records of bats were provided within a 2 km radius of the site. Records of one Annex II bat species (lesser horseshoe bat) was identified 11 km east of the survey area perimeter. Whilst this record is outside of the 10 km search radius, it is considered likely that the species will be utilising habitat within search area. The trees within the woodland and the scattered trees were in good condition with no obvious cracks or crevices suitable for roosting bats. The site offers no suitable roosting locations for bat species, but it provides suitable foraging habitat including scattered trees, broadleaved woodland, dense scrub and running water. The running water and woodland habitats also provide suitable commuting features for bats. A bat survey was undertaken to determine the usage of the site by bat species within the local area and any potential impact of the works on this species (see Middlemarch Environmental Ltd Report Number RT-MME-102676).

Pine marten

Two records of pine marten were provided by the local records centre within a 2 km radius of the site. No individuals were seen during the survey and no evidence of pine martin (e.g. scats, footprints, fur) was recorded during the survey. None of the trees within the survey area provide a suitable location for pine martins to build their dens. The woodland areas around the edges of the site provides some suitable habitat for this species and the site may therefore form a part of larger pine marten territory (males usually require 10-25 km^2 whilst females require 5-15 km^2). It is understood that the woodland areas will not be removed and therefore no suitable habitat for this species will be lost to this development. It is therefore considered unlikely that this species will be adversely impacted upon by the development.

Otter

No records of otter were provided within a 2 km radius of the site, however the streams which run through the site would provide suitable foraging habitat for bats and otters are also known to utilise marshy grassland especially during spring when they feed upon amphibians. An otter survey was undertaken to determine the usage of the site by otters (see Middlemarch Environmental Ltd Report Number RT-MME-102676).

Water vole

No records of water vole were provided within a 2 km radius of the site. Whilst the streams which run through the site are predominantly shaded with little emergent vegetation, they may provide suitable habitat for this species. A water vole survey was undertaken to determine the usage of the site by this species (see Middlemarch Environmental Ltd Report Number RT-MME-102676).

Plants

Bluebell

Records of bluebells were made within a 2 km radius of the site perimeter, and occasional bluebells were recorded along the western edge of the site. It is understood that the development will only impact upon the central area of the site and therefore it is considered that the development is unlikely to impact upon this species.

Other Species

Black knapweed (Local BAP species) and great burnet (Locally Important Species within Brecon and Powys) were recorded on site during the field survey. Black knapweed was common and recorded around the edges of the site which are mostly remaining. Great burnet was only recorded within the marshy grassland habitat in the north-western corner of the site. It is understood that this area will not be impacted by the development.

6. RECOMMENDATIONS

6.1 NATURE CONSERVATION SITES

The site is located on the edge of the Brecon Beacons National Park and therefore it is recommended that discussions be undertaken with Brecon Beacons National Park Authority.

Due to the proximity of the sites to a number of Species Areas of Conservation and Sites of Special Scientific Interest, it is recommended that discussions be undertaken with the local council and Countryside Council for Wales.

6.2 HABITATS

Stream Protection

Two streams were present on site. These should be protected during any works by bunds, cut off ditches and site drainage. This will prevent run off to the natural water course which may cause pollution, silting or erosion.

Tree Protection

All early-mature mature trees and areas of woodland (both semi-natural and plantation) which are not to be removed should be protected during the proposed works through the erection of fencing in accordance with BS5837 (2005) 'Guide for Trees in Relation to Construction' prior to bringing any equipment, machinery or materials onto site. This fencing should be maintained until all equipment, machinery and surplus materials have been removed from site. No storage of machinery or materials is to take place within the fenced area.

Site Enhancement

In accordance with the provision of National and Local Planning Policy, a habitat/species enhancement scheme should be drawn up to offset habitat losses. The new planting should include suitable native species or those attractive to wildlife.

6.3 PROTECTED SPECIES

Assessment of the habitat suitability on site and surveys for the presence of following species have been undertaken, and the results can be found in Middlemarch Environmental Ltd Report RT-MME-102676:

- Breeding bird survey.
- Great crested newt habitat assessment.

- Reptile survey.
- Marsh fritillary and butterfly survey.
- Badger survey.
- Bat activity survey.
- Otter survey.
- Water vole survey.

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APPENDICES

APPENDIX 1 Desk Study Data

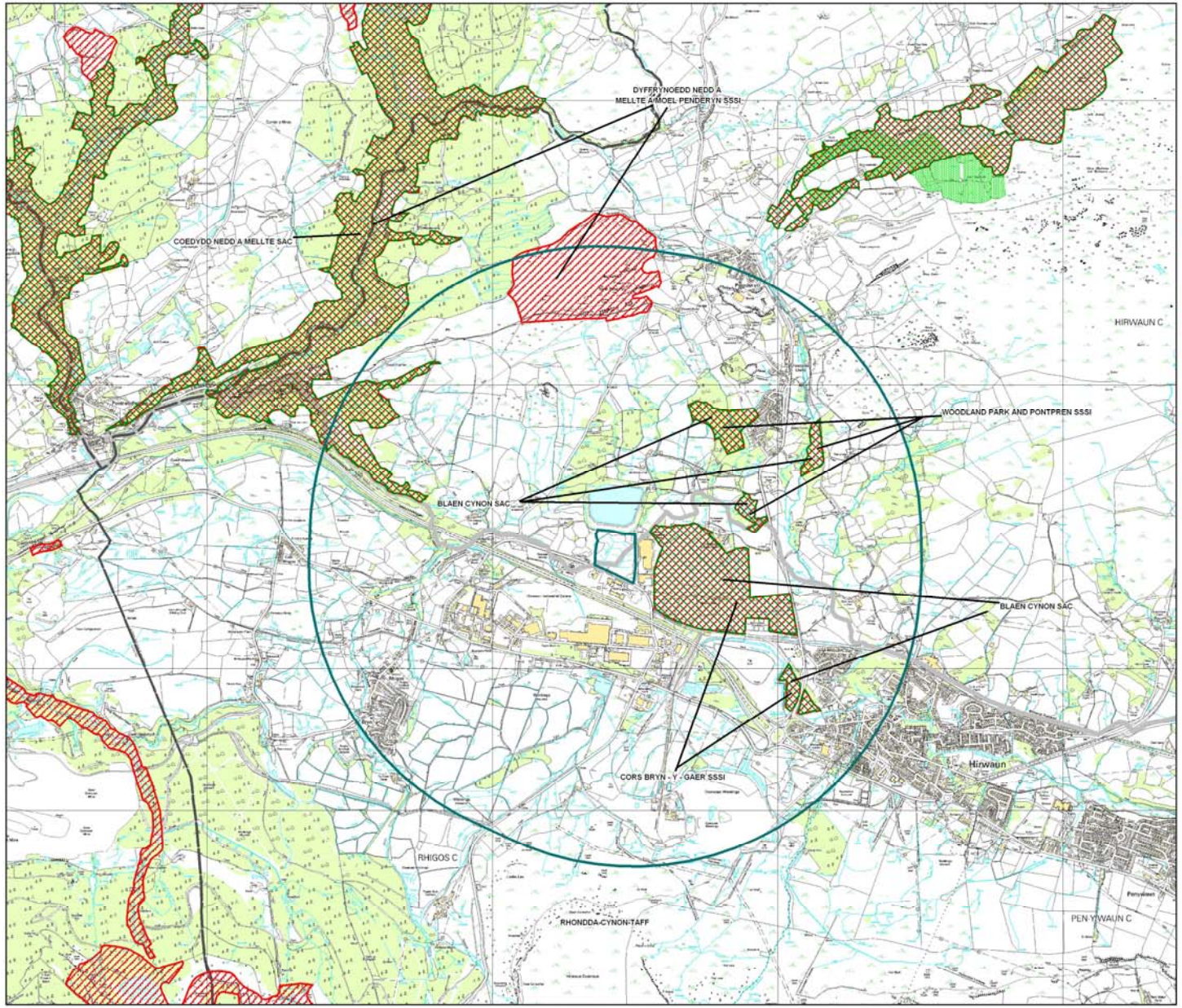
APPENDIX 2 Extended Phase 1 Habitat Survey Drawing
Middlemarch Environmental Ltd Drawing: C101917-01

APPENDIX 3 Relevant Protected Species Legislation

APPENDIX 1

Desk Study

Note – The lists of protected species records are not included in this copy of the report given the extensive list of species and the confidential nature of the some of the records (e.g. badgers).



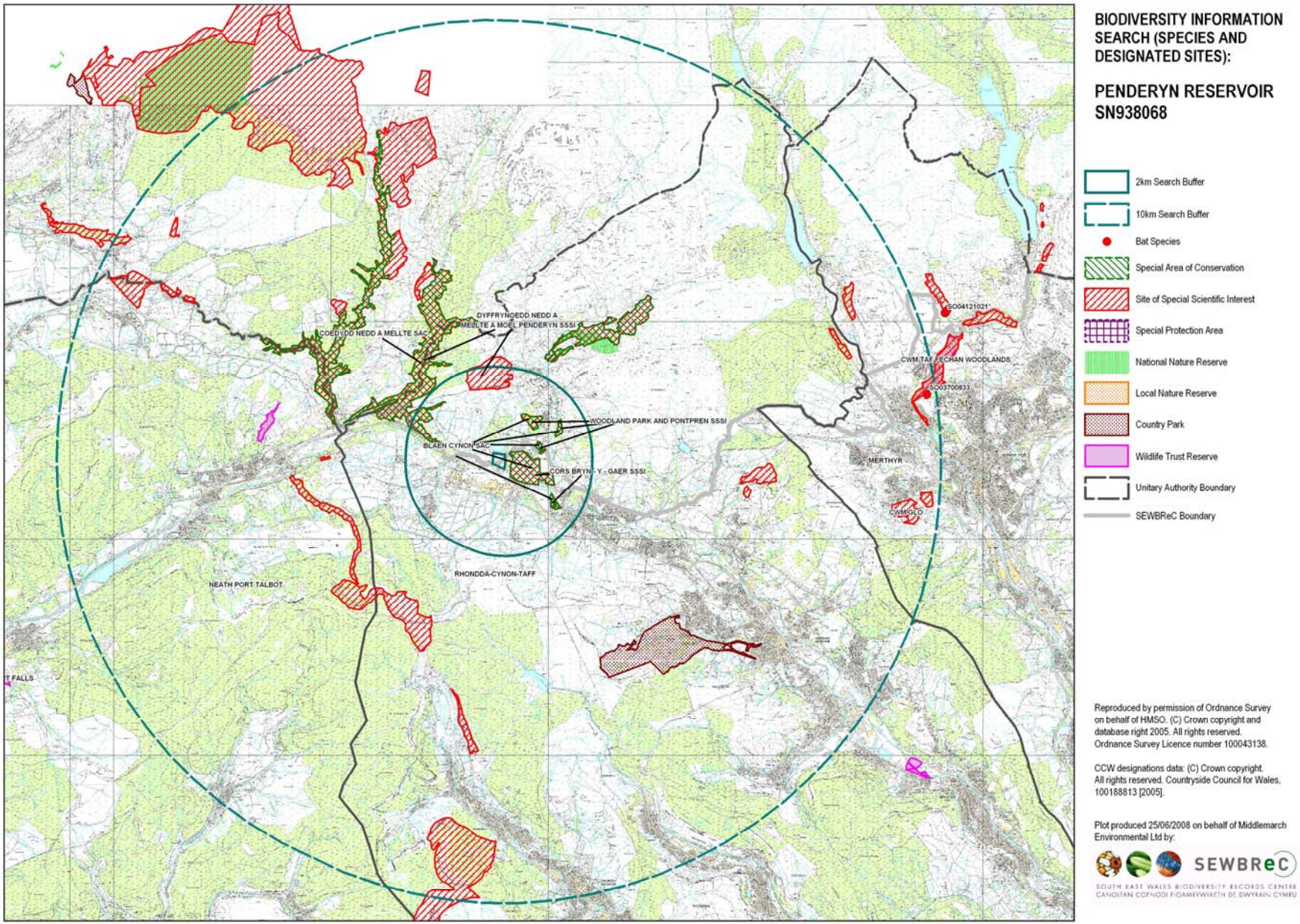
BIODIVERSITY INFORMATION SEARCH (SPECIES AND DESIGNATED SITES):

PENDERYN RESERVOIR
SN938068
(2km VIEW)

- 2km Search Buffer
- 10km Search Buffer
- Bat Species
- Special Area of Conservation
- Site of Special Scientific Interest
- Special Protection Area
- National Nature Reserve
- Local Nature Reserve
- Country Park
- Wildlife Trust Reserve
- Unitary Authority Boundary
- SEWBReC Boundary

Plot produced 25/06/2008 on behalf of Middlemarch Environmental Ltd by:

SEWBReC
SOUTH EAST WALES BIODIVERSITY RECORDS CENTRE
CANOLFAN COFNODI FIOAMRYWIAETH DE DWYRAIN CYMRU


BIODIVERSITY INFORMATION SEARCH (SPECIES AND DESIGNATED SITES):
PENDERYN RESERVOIR
SN938068
2km Search Buffer
10km Search Buffer
Bat Species
Special Area of Conservation
Site of Special Scientific Interest
Special Protection Area
National Nature Reserve
Local Nature Reserve
Country Park
Wildlife Trust Reserve
Unitary Authority Boundary
SEWBReC Boundary
DYFFRYNOEDD NEDD A MELLTE A MOEL PENDERYN SSSI
COEDYDD NEDD A MELLTE SAC
WOODLAND PARK AND PONTPREN SSSI
BLAEN CYNON SAC
CORS BRYN-Y-GAER SSSI
SO04121021
CWM TAF FECHAN WOODLANDS
SO03700833
MERTHYR
CWMGLO
RHONDDA-CYNON-TAFF
NEATH PORT TALBOT
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SEWBReC
SOUTH EAST WALES BIODIVERSITY RECORDS CENTRE
CANOLFAN COFNODI FIOAMRYWIAETH DE DWYRAIN CYMRU

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type B

1.2 Site code UK0030092

1.3 Compilation date 200012

1.4 Update 200301

1.5 Relationship with other Natura 2000 sites

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Blaen Cynon**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	200012
date confirmed as SCI	200412
date site classified as SPA	
date site designated as SAC	200412

2. Site location:

2.1 Site centre location

longitude	**latitude**
03 31 41 W	51 44 54 N

2.2 Site area (ha) 66.83

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK922	Mid Glamorgan	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment
Northern Atlantic wet heaths with *Erica tetralix*	4	D			

Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	1.9	D			
Alkaline fens	0.3	D			
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	3.7	D			

3.2 Annex II species

	Population				Site assessment			
	Resident	Migratory						
Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
Euphydryas (Eurodryas, Hypodryas) aurinia	501-1000	-	-	-	B	B	B	**B**

4. Site description

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	27.6
Heath. Scrub. Maquis and garrigue. Phygrana	8.3
Dry grassland. Steppes	11.7
Humid grassland. Mesophile grassland	41.3
Alpine and sub-alpine grassland	
Improved grassland	5.5
Other arable land	
Broad-leaved deciduous woodland	3.9
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	1.7
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Acidic, Basic, Clay, Neutral, Nutrient-poor, Nutrient-rich, Peat, Sandstone, Sedimentary

Geomorphology & landscape:

Hilly, Lowland

4.2 Quality and importance

Euphydryas (*Eurodryas, Hypodryas*) *aurinia*

- for which this is considered to be one of the best areas in the United Kingdom.

4.3 Vulnerability

The plant communities of Blaen Cynon are dependent on maintenance of the hydrological regime and the continuation of traditional agricultural management.

The marsh fritillary butterfly population is threatened in some parts of the site by a lack of grazing, leading to scrub encroachment, and by inappropriate tree planting. Burning for agricultural purposes is also a major threat.

Appropriate agricultural management could be achieved over the majority of the site through management agreements with the owners and occupiers.

The site lies within the South Wales Coalfield on the fringes of an urban area, designated as cSAC, which will help control threats from housing, opencast or other industrial development and pollution arising from such development in the immediate vicinity.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK04 (SSSI/ASSI)	100.0

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type B

1.2 Site code UK0030141

1.3 Compilation date 200012

1.4 Update 200303

1.5 Relationship with other Natura 2000 sites

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Coedydd Nedd a Mellte**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	200012
date confirmed as SCI	200412
date site classified as SPA	
date site designated as SAC	200412

2. Site location:

2.1 Site centre location

longitude	**latitude**
03 34 02 W	51 46 20 N

2.2 Site area (ha) 378.18

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK922	Mid Glamorgan	25.29%
UK914	Powys	65.05%
UK924	West Glamorgan	9.66%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment
Northern Atlantic wet heaths with *Erica tetralix*	0.2	D			
European dry heaths	1.1	D			
Calcareous rocky slopes with chasmophytic vegetation	0.9	D			
Tilio-Acerion forests of slopes, screes and ravines	4.8	C	C	B	**C**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	46.4	B	C	B	**B**

3.2 Annex II species

	Population				Site assessment			
	Resident	Migratory						
Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
Salmo salar	Present	-	-	-	D			
Cottus gobio	Present	-	-	-	D			

4. Site description

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	2.6
Bogs. Marshes. Water fringed vegetation. Fens	
Heath. Scrub. Maquis and garrigue. Phygrana	8.5
Dry grassland. Steppes	7.4
Humid grassland. Mesophile grassland	1.0
Alpine and sub-alpine grassland	
Improved grassland	0.2
Other arable land	
Broad-leaved deciduous woodland	76.9
Coniferous woodland	2.1
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	0.9
Other land (including towns, villages, roads, waste places, mines, industrial sites)	0.4
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Acidic, Alluvium, Basic, Clay, Limestone, Neutral, Nutrient-poor, Nutrient-rich, Peat, Sandstone, Sedimentary

Geomorphology & landscape:

Caves, Crags/ledges, Floodplain, Lowland, Slope, Valley

4.2 Quality and importance

Tilio-Acerion forests of slopes, screes and ravines

- for which the area is considered to support a significant presence.

Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

- for which this is considered to be one of the best areas in the United Kingdom.

4.3 Vulnerability

The majority of the woodland is owned by the Forestry Commission and is ungrazed. However, stray livestock still gain access in places and could pose a threat to tree and shrub regeneration. Fencing against livestock would certainly be desirable in the areas currently subject to agricultural use. A combination of agri-environment schemes and management agreements offer the best mechanism for securing favourable management in these areas.

Stands of planted conifers, beech and sycamore within and adjacent to the site are seeding into semi-natural woodland communities in places. The Forestry Commission has agreed to remove most of these species from the site itself, but seedlings may still invade from other areas and an ongoing control programme should be considered.

The area contains waterfalls which are a great attraction to the public and significant erosion damage has been caused by pedestrians, horses and bicycles. An ongoing path repair programme has only been partially successful in addressing this problem and further restrictions on public access should be considered. Given the level of access to the site and surrounding plantations, there could be significant fire risk in prolonged dry periods.

Airborne acid and nutrient deposition may also be a problem, particularly for epiphytic lichens.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK04 (SSSI/ASSI)	100.0

APPENDIX 2

Middlemarch Environmental Ltd Drawing C101917-01 – Extended Phase 1 Habitat Survey

C101917-01

Legend

- Scattered introduced shrub
- Scattered scrub
- Scattered broad-leaved trees
- Target note
- Ditch, dry
- Fence
- Site boundary
- Bare ground
- Broad-leaved plantation
- Broad-leaved woodland
- Dense scrub
- Hard standing
- Introduced shrub
- Marshy grassland
- SI — Semi-improved neutral grassland

Client: Envisage	Project: Hirwaun Industrial Estate
Drawing: Extended Phase 1 Habitat Survey	Drawing Number: C101917-01
Revision: 00	Date: September 2008
Scale at A3: 1:1,500	Drawn By: SKS
Approved By: AD	Notes: -

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APPENDIX 3

Relevant Legislation

This section provides a summary of the legislation protecting species which may be present on site. The reader is referred to the original legislation for the definitive interpretation.

Birds

Nesting and Nest Building Birds

Nesting and nest building birds are protected under the Wildlife and Countryside Act WCA 1981 (as amended). Some species (listed in Schedule 1 of the WCA) are protected by special penalties- these species include barn owl.

Subject to the provisions of the act, if any person intentionally –

(a) kills, injures or takes any wild bird;

(b) takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or

(c) takes or destroys an egg of any wild bird,

he shall be guilty of an offence.

'Reckless' offences with regard to the disturbance of nesting wild birds included in Schedule 1 of the Wildlife and Countryside Act were added by the Countryside and Rights of Way Act 2000.

Herpetofauna

Great Crested Newt

Great Crested Newt *Triturus cristatus* are protected under Schedule 5 of the 1981 Wildlife and Countryside Act. and Schedule 2 of the Conservation (Natural Habitats etc) Regulations 1994 (Regulation 38) and because of their rarity they are also protected under Annexes IIa and IVa of the Habitats and Species Directive and under the Berne Convention. Habitat used by great crested newts is also protected under the 1981 Wildlife and Countryside Act. It is therefore illegal to kill, injure, capture, obstruct access or disturb any site that these species use.

Other amphibians

Common frog, common toad and smooth newt receive protection under Schedule 5 of the Wildlife and Countryside Act 1981 as amended. (S9(5)), S42

Reptiles

All species of reptile found in the British Isles are afforded some level of statutory protection under the Wildlife and Countryside Act, 1981 and common lizard, grass snake, adders and slowworm are

included under Schedules 5 of the act for intentional killing or injury. Smooth snake and sand lizard are fully protected under the Wildlife and Countryside Act, 1981 as well as European legislation covering internationally protected species. This means that such species have additional protection from disturbance, capture, and damage to a place used for protection or shelter and even obstructing such a place.

Invertebrates

Marsh Fritillary

The butterfly is listed on Annex II of the EC Habitats Directive and Appendix II of the Bern Convention. It is also protected under Schedule 5 of the WCA 1981, making it illegal to kill, disturb, injure, capture or possess a marsh fritillary, and its place of shelter or protection is protected against intentional and reckless acts of damage, destruction or obstruction. It is also listed on Section 42 (Priority Species in Wales) of the NERC Act (2006).

Other Butterfly Species

The small heath and small pearl bordered fritillary are both listed on Section 42 (Priority Species in Wales) of the NERC Act (2006).

Mammals

Bats

In England, Scotland and Wales all bat species are fully protected under the Wildlife and Countryside Act 1981 (as amended), through inclusion in Schedule 5. All bats are also included in Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994, which defines 'European Protected Species of animals'.

The following account represents a simplified summary of the legislation provided by Mitchell-Jones and Robertson (1999). *Taken together, the Act, Order and Regulations make it illegal to:*

intentionally or deliberately kill, injure or capture (take) bats;
deliberately disturb bats (whether in a roost or not);
damage, destroy or obstruct access to bat roosts;
possess or transport a bat or any part of a bat, unless acquired legally;
sell, barter or exchange bats, or parts of bats.

In this interpretation, a bat roost is 'any structure or place which any wild animal…uses for shelter or protection.'. Because bats tend to reuse the same roosts, legal opinion is that the roost is protected whether or not the bats are present at the time. Reckless offences were added by the Countryside and Rights of Way Act 2000, which applies only to England and Wales.

Badgers

Badgers are also included within Wildlife and Countryside Act, 1981 as an amendment to the Badgers Act, 1973 but more recent legislation has strengthen the protection afforded to badgers. The Protection of Badgers Act, 1992 is the most recent legislation and deals with all aspects of welfare issues including excavation within the vicinity of a sett and/or obstructing access in some way. The badger is also listed in Appendix III of the Berne Convention.

Otter

The otter receives legal protection through its inclusion in Schedule 5 (Animals which are Protected) of the Wildlife and Countryside Act 1981 (as amended). This level of protection makes the following actions illegal:

- intentional killing, injuring or taking
- possession or control (live or dead animal, part or derivative)
- damage to, destruction of, obstruction of access to any structure or place used by a scheduled animal for shelter or protection
- disturbance of animal occupying such a structure or place
- selling, offering for sale, possessing or transporting for the purpose of sale (live or dead animal, part or derivative)
- advertising for buying or selling such things

'Reckless' offences with regard to the disturbance of Schedule 5 animal species and their places of shelter were added by the Countryside and Rights of Way Act 2000.

The European otter also has European protection under the Habitats Directive 43/93; being listed in Annex 2a and 4a, the Bern Convention, in Appendix III, and world-wide protection under CITES. Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994 (the Habitats Regulations) defines 'European protected species of animals' and makes it an offence deliberately to kill, capture, or disturb a European Protected Species, or to damage or destroy the breeding site or resting place of such an animal.

Water vole

The Wildlife and Countryside Act 1981 (as amended) was updated on April 6th 2008 and the protection which water vole receive was increased to make it an offence to:

Intentionally kill, injure or take water vole from the wild;
Possess or control live or dead water voles or derivatives;
Intentionally or recklessly damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection;
Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose; or
Sell water voles or offer or offer or expose for sale or transport for sale.

Plants

Bluebell

Bluebell receives protection under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) against sale only.

MIDDLEMARCH ENVIRONMENTAL LTD

QUALITY ASSURANCE

TITLE: EXTENDED PHASE 1 HABITAT SURVEY

HIRWAUN INDUSTRIAL ESTATE

A Report to Envisage

Contract Number: C101917

Report Number: RT-MME-101917

Revision Number: 0

Description: Final

Date: September 2008

Checked by:

James Calow
Principal Consultant

Approved by:

Dr. Philip Fermor
Managing Director

PROTECTED SPECIES SURVEYS

HIRWAUN INDUSTRIAL ESTATE

A Report Submitted to Envisage

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Report Number: RT-MME-102676

September 2008

PROTECTED SPECIES SURVEYS

HIRWAUN INDUSTRIAL ESTATE

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01 OF 02

01 ENVISAGE
02 MIDDLEMARCH ENVIRONMENTAL LTD

This report was conducted and compiled by

Anna Dudley AIEEM, Lucy Philpott AIEEM,

Dr Helen Markland and Dr Katy Read

Contract Number C102676

September 2008

CONTENTS

1. INTRODUCTION 4
1.1 BACKGROUND 4
1.2 SITE DESCRIPTION 4
1.3 LEGISLATION 5
2. METHODOLOGY 9
2.1 BADGER SURVEY 9
2.2 BAT SURVEY 9
2.3 BREEDING BIRDS SURVEY 9
2.4 GREAT CRESTED NEWT HABITAT ASSESSMENT 10
2.5 MARSH FRITILLARY SURVEY 11
2.6 OTTER SURVEY 12
2.7 REPTILE SURVEY 12
2.8 WATER VOLE SURVEY 13
3. RESULTS 14
3.1 BADGER SURVEY 14
3.2 BAT SURVEY 15
3.3 BREEDING BIRD SURVEY 18
3.4 GREAT CRESTED NEWT HABITAT ASSESSMENT 20
3.5 MARSH FRITILLARY SURVEY 23
3.6 OTTER SURVEY 26
3.7 REPTILE SURVEY 28
3.8 WATER VOLE SURVEY 31
4. DISCUSSION AND CONCLUSIONS 34
4.1 BADGER 34
4.2 BATS 34
4.3 BREEDING BIRDS 35
4.4 GREAT CRESTED NEWT 36
4.5 MARSH FRITILLARY 38
4.6 OTTER 38
4.7 REPTILE 39
4.8 WATER VOLE 39
5. SUMMARY 41
6. RECOMMENDATIONS 42
REFERENCES AND BIBLIOGRAPHY 45
APPENDICES 47
APPENDIX 1 48
APPENDIX 2 49
APPENDIX 3 52
APPENDIX 4 54
APPENDIX 5 62
APPENDIX 6 66

1. INTRODUCTION

1.1 BACKGROUND

On 16th May 2008, Envisage commissioned Middlemarch Environmental Ltd to undertake a series of protected species surveys at a site in Hirwaun Industrial Estate, in Mid Glamorgan.

The protected species included within the survey criteria include:

- Badger
- Bat species
- Breeding birds
- Great crested newt
- Marsh fritillary
- Otter
- Reptile species
- Water vole

1.2 SITE DESCRIPTION

- The centred Ordnance Survey Map Reference for the site is SN 938 067. The surveyed area consisted of an extensive section of land in the industrial part of the welsh village of Hirwaun, to the south of the Penderyn reservoir and the north of Fifth Avenue. The site covers approximately 8.85 ha in extent.

- The majority of the site is covered with marshy grassland, while woodland is present around the northern and western edges and scrub along the southern and eastern boundaries. A small stream runs through the woodland, cutting across the north western corner of the site.

- Directly to the north is the Penderyn Reservoir and to the west an area of scattered woodland. To the east of the site is an industrial unit adjacent to which is Blaen Cynon Special Area of Conservation (SAC). This SAC is 67 hectares in size and is designated due to the presence of a large population of marsh fritillary *Euphydras aurinia* butterflies. To the south of the site are more industrial units.

- The location of the site is shown on Middlemarch Environmental Ltd Drawing C102676-01 in Appendix 1.

1.3 LEGISLATION

This section provides a summary of the legislation protecting the species for which surveys were undertaken. The reader is referred to the original legislation for the definitive interpretation.

1.3.1 Badger

Badgers and their setts are protected under the Protection of Badgers Act 1992.
All the following are criminal offences: to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as 'any structure or place which displays signs indicating current use by a badger'. Badger setts can be disturbed by a multitude of operations which include excavation and coring. (English Nature, 2002).

1.3.2 Bat

In England, Scotland and Wales all bat species are fully protected under the Wildlife and Countryside Act 1981 (WCA) (as amended), through inclusion in Schedule 5. In England and Wales, this Act has been amended by the Countryside and Rights of Way Act 2000 (CroW), which adds an extra offence, makes species offences arrestable, increases the time limits for some prosecutions and increases penalties.

All bats are also included in Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994, (or Northern Ireland, 1995) (the Habitats Regulations), which defines 'European protected species of animals'. Taken together, the Act, Order and Regulations make it illegal to:

Intentionally or deliberately kill, injure or capture (or take) bats;
Deliberately disturb bats (whether in a roost or not);
Recklessly disturb roosting bats or obstruct access to their roosts (England & Wales only; proposed for Scotland in 2004);
Damage or destroy bat roosts;
Possess or transport a bat or any part of a bat, unless acquired legally;
Sell (or offer for sale) or exchange bats, or parts of bats.

1.3.3 Breeding Birds

Nesting and nest building birds are protected under the Wildlife and Countryside Act WCA 1981 (as amended). Some species (listed in Schedule 1 of the WCA) are protected by special penalties. Subject to the provisions of the act, if any person intentionally:

Kills, injures or takes any wild bird;
Takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or
Takes or destroys an egg of any wild bird,

he shall be guilty of an offence.

'Reckless' offences with regard to the disturbance of nesting wild birds included in Schedule 1 of the Wildlife and Countryside Act were added by the Countryside and Rights of Way Act 2000.

1.3.4 Great Crested Newt

The wording in the Wildlife and Countryside Act 1981 (as amended) and The Conservation (Natural Habitats, &c.) Regulations 1994 is slightly different. Langton *et alia* (2001) make the point that taken together, the Act and the Regulations (following the CROW Act 2000) make it illegal to:

Intentionally or deliberately capture or kill, or intentionally injure great crested newts.
*Deliberately disturb great crested newts or intentionally or recklessly * disturb them in a place used for shelter or protection.*
Damage or destroy a breeding site or resting place.
Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection.
Possess a great crested newt, or any part of it, unless acquired lawfully.
Sell, barter, exchange or transport or offer for sale great crested newts or parts of them.

*Reckless offences were added by the Countryside and Rights of Way Act 2000, which applies only to England and Wales.

1.3.5 Marsh Fritillary

This butterfly is listed on Annex II of the EC Habitats Directive and Appendix II of the Bern Convention. It is also protected under Schedule 5 of the WCA 1981, making it illegal to kill, disturb, injure, capture or possess a marsh fritillary, and its place of shelter or protection is protected against intentional and reckless acts of damage, destruction or obstruction. It is also listed on Section 42 (Priority Species in Wales) of the NERC Act (2006).

1.3.6 Otter

The otter is listed on Appendix I of CITES, Appendix II of the Berne Convention and Annexes II and IV of the Habitats Directive. They are protected under Schedule 5 of the Wildlife and Countryside Act 1981 and Schedule 2 of the Conservation (Natural Habitats, *etc*) Regulations 1994 (Regulation 38). It is therefore illegal to attempt to kill, injure or take an otter, and attempt to destroy, damage, obstruct access or disturb any site that they use.

1.3.7 Reptile

All of the UK's native reptiles are protected by law. The two rarest species – sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*) benefit from the greatest protection.

Common lizard (*Lacerta vivipar*a), slow-worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix natrix*) are protected under the Wildlife and Countryside Act 1981 as amended from intentional killing or injuring.

Sand lizard and smooth snake are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, & c.) Regulations 1994 which together make it illegal to kill, injure, capture, handle or disturb these animals. Places they use for breeding, resting, shelter and protection are protected from being damaged or destroyed. It is also illegal to obstruct these animals from using such areas.

1.3.8 Water Vole

The Wildlife and Countryside Act 1981 (as amended) was updated on April 6th 2008 and the protection which water vole receives was increased to make it an offence to:

Intentionally kill, injure or take water vole from the wild;
Possess or control live or dead water voles or derivatives;

Intentionally or recklessly damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection;

Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose; or

Sell water voles or offer or offer or expose for sale or transport for sale.

2. METHODOLOGY

2.1 BADGER SURVEY

The survey consists of a visual inspection of the site for signs of badger presence, including setts, latrines, foraging signs and tracks.

These works were undertaken in May 2008.

2.2 BAT SURVEY

In line with the specifications detailed by English Nature (2004a), a daytime (pre-dusk) walkover survey of the site was conducted. A visual assessment was undertaken of the site for activity and signs of possible bat presence. All likely roosting areas were visually assessed. Any accessible holes/cracks and crevices that may have allowed bat access into potential roosting areas were inspected using an endoscope.

In addition, a series of targeted nocturnal surveys were conducted (continuing until 1.5 hours after sunset) to determine whether bats are using those areas of the site deemed to exhibit greatest potential. The nocturnal survey was conducted using electronic bat detectors (Bat Box Duet & Patterson D240x). Computer analysis of bat detector recordings collected identified all species recorded on the site, which are utilising different frequencies simultaneously.

These works were undertaken in May, July and August 2008.

2.3 BREEDING BIRDS SURVEY

The methodology used for the breeding bird survey follows the Common Bird Census (CBC) as utilised by the Royal Society for the Protection of Birds (RSPB) and the British Trust for Ornithology (BTO) detailed in Gilbert *et al* (Bird Monitoring Methods, 1998).

The CBC methodology involves walking the entire survey site and passing within 50 m of every point. All bird data is recorded onto maps and a final species list is compiled. Particular note is made of any Schedule 1 Species, National and Local BAP Priority Species and those listed as being of Conservation Concern (Red and Amber Listed).

These works were undertaken in May and June 2008.

2.4 GREAT CRESTED NEWT HABITAT ASSESSMENT

The great crested newt habitat assessment is undertaken in two stages.

Stage 1

As part of the Extended Phase 1 Habitat Survey undertaken for this site a desk study was undertaken to determine any protected species that have been recorded within a 1 km radius of the site. This included consulting the local biological records centres and the NBN Gateway regarding any records held for great crested newts.

Relevant data collected from the consultees is discussed in Section 3.

Stage 2

A habitat assessment of the land surrounding the development area (up to 500 m from the site) for suitable breeding and terrestrial habitat was undertaken. In order to assess the habitat suitability for amphibians in the development area, including great crested newts, the following criteria were considered:

- Presence of suitable breeding habitats in the vicinity of the site.
- Presence of suitable terrestrial habitats within the development site.
- Presence of habitat corridors allowing newts to commute into the site.

An Ordnance Survey Map (Scale 1:25,000) was consulted to identify any waterbodies within 500 m of the proposed development area.

Any water bodies were then assessed for habitat suitability for great crested newts, utilising the modified Great Crested Newt Habitat Suitability Index (Oldham *et al*., 2000). The habitat suitability index provides a means of evaluating habitat quality. The Habitat Suitability Index (HSI) is a numerical index between 0 and 1, where 0 indicates suitable habitat and 1 represents optimal habitat. The HSI score is then utilised to define the suitability of the pond on a categorical scale (Table 2.1). The system is not precise enough to allow the conclusion that a pond with a high score will support great crested newts whilst those with a low score will not. See Appendix 4 for further details of the Great Crested Newt Habitat Suitability Index (HSI).

HSI Score	Pond Suitability
< 0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

Table 2.1: HSI scoring for Pond Suitability

2.5 MARSH FRITILLARY SURVEY

The field survey was undertaken in three stages to determine the presence of marsh fritillary *Euphydryas aurinia* on site.

Stage 1: Habitat & Food Plants

An initial habitat and food plant survey of the site and the surrounding area will provide an assessment of the breeding potential within the site itself and whether there is any potential for dispersal into surrounding habitats. The marsh fritillary *Euphydryas aurinia* is associated with two main habitat types, damp neutral or acidic grasslands (Rhos pastures) and dry chalk and limestone grasslands. The main larval foodplant is devil's-bit scabious *Succisa pratensis*, with field scabious *Knautia arvensis* and small scabious *Scabiosa columbaria* occasionally used.

Stage 2: Adult Survey

Using the Butterfly Monitoring Scheme methodology, a series of counts will be undertaken along a fixed route across the site between 10:15 and 15:45 (British Summer Time) and only when the temperature is between 13 °C and 17 °C and there is a maximum of 40 % cloud cover (Hill et al, 2005). Adults seen within 5 metres of each side of the transect route will be recorded. Netting may be required to examine the butterfly in detail to confirm its identity. Multiple visits will be required to prove absence (Hill *et al*., 2005) and it is proposed to undertake three survey visits to this site for this stage. This stage of the survey will be undertaken during May to July when the adults are most prevalent/ active.

Stage 3: Larval and Egg Survey

Depending on the quantity of food plant across the site, these will be surveyed using quadrats or by examination of the individual plants for the larval form and eggs of the marsh fritillary *Euphydryas aurinia*. Larvae hatch from eggs laid in June and July and go into hibernation in August and

emerge in the spring to resume feeding and enter pupation in May. An egg search will be undertaken in late June and larval search in July or August.

2.6 OTTER SURVEY

The field survey consisted of an initial walkover survey assessing the site for habitat suitability, complemented by a detailed search for otter signs, paying particular attention to all watercourses and water features within the site.

The survey consists of:

- Assessment of immediate watercourses
- Field signs of tracks, spraint, holts and other evidence of otter activity noted within 500m
- A brief description of the surrounding habitat

2.7 REPTILE SURVEY

On the initial visit on 20th May 2008, survey transects were identified on site to ensure that habitats within the survey area with the potential to support reptiles were sampled. Any important reptile features such as vegetation piles, sunny aspects, log piles; abundant food supply (invertebrates etc) was also noted. The initial survey also identified areas, which would be suitable for the placement of artificial refugia.

The identification of survey transects facilitated the installation of 80 temporary survey refuges within the site on 20th May 2008. Refuges were made from 500 mm x 500 mm sections of roof felt. Survey transects are marked on the survey map (see Middlemarch Environmental Ltd Drawing No. C102676-09, Appendix 6).

Reptiles are ectotherms, deriving their body heat from the external environment. Therefore the timing of the survey visits was dictated by weather conditions. Surveys were undertaken on warm sunny days with low cloud cover and little wind to maximise the probability of recording any reptiles present within the site. Six survey visits (including 5 inspection visits) were completed in May, June and July. Suitable weather conditions for these works, as detailed in Gent & Gibson (1998), are summarised in Table 2.2.

Parameter	Value
Temperature	9 - 17° C
Sunshine	Preferable
Cloud	Little or None
Wind	Low/None

Table 2.2: Weather Conditions for Reptile Surveys
(adapted from Gent & Gibson, 1998)

Generally reptile survey visits were undertaken between 08:30 to 11:00 and 16:00 to 18:30, when temperatures were between 9 °C and 17 °C, and during or following periods of direct sunlight.

2.8 WATER VOLE SURVEY

The methodology involves an assessment of water features running through and around the site, with regard to the presence of, and suitability for water voles. This extended 500m upstream and 500m downstream of the proposed works, where it was possible to access the riverbanks.

An assessment will be made of the suitability of the habitat, and, where appropriate, a search made for possible burrows. Signs of water vole activity become evident from the start of the water vole breeding season in March until October (Strachan 1998). These include:

- Droppings
- Latrine sites
- Feeding stations and “lawns”
- Footprints and tracks or “runs”
- Burrows

3. RESULTS

3.1 BADGER SURVEY

3.1.1 Introduction

A badger survey was completed on 21st May 2008. The weather conditions during the survey are shown in Table 3.1.

Parameter	Condition
Temperature (°C)	13
Cloud Cover (%)	70
Precipitation	None
Wind Speed (Beaufort)	2-3

Table 3.1: Weather Conditions During the Badger Survey

No records of badgers within a 2 km radius of the survey area were provided by the local record centres (see Middlemarch Environmental Ltd Report Number RT-MME-101917 for desk study results).

3.1.2 Survey Results

The field survey, which comprised an extensive search of all suitable habitat types within the proposed area of development, identified no signs that the site is currently being used by badgers. Such signs commonly include badger setts, latrines, evidence of foraging activity and appropriate runs or tracks, all of which were recorded as being absent from the survey area.

As the majority of the site consists of damp and marshy ground this would make it unsuitable for badgers to utilise for building setts. The drier areas in the north-eastern corner of the site may provide suitable areas for badgers to build setts, however these could be thoroughly searched and no setts or evidence of badger activity was noted within this area of the site.

Where acccess was possible, a strip of land approximately 30 m wide was searched beyond the site boundary. Two push-throughs in the fence of the pumping station were noted to the south-west of the site. Closer inspection of these push-throughs revealed large amounts of sheep wool was caught upon the fence of the larger hole in the fence. The second hole under the fencing was smaller and no evidence of usage by any mammal (such as hairs, prints or odour) was noted. This push through

led to a trail down to the edge of the stream. No prints, claw marks, hairs or other evidence of usage by mammals was noted along this trail.

3.2 BAT SURVEY

3.2.1 Introduction

The initial assessment of the site for bats was undertaken on 20th May 2008. The weather conditions during the survey are presented in Table 3.2.

Parameter	20/05/08
Temperature (°C)	12
Cloud Cover (%)	60
Precipitation	Dry
Wind Speed (Beaufort)	F2-3

Table 3.2: Weather Conditions During the Initial Bat Survey

Nocturnal bat surveys were undertaken on 15th July 2008 and 26th August 2008. The weather conditions during the surveys are shown in Table 3.3.

Parameter	15/07/08		26/08/2008	
	Start	End	Start	End
Temperature (°C)	18	16	17	16
Cloud Cover (%)	100	100%	100	100
Precipitation	None	None	Light Drizzle	Light Drizzle
Wind Speed (Beaufort)	2-3	2	1-2	1-2
Sunset	21:29		20:17	

Table 3.3: Weather Conditions During the Nocturnal Bat Surveys

No records of bats were provided by the local record centres within a 2 km radius of the site. Records of one Annex II bat species (lesser horseshoe bat) was identified 11 km east of the site perimeter.

3.2.2 Initial Survey Results

An initial walkover study of the site revealed that the trees within the woodland and the scattered trees were young to early mature and most were in good condition or had no cracks or crevices suitable for use by roosting bats. No other features suitable for use by roosting bats were noted within the survey area.

Whilst the site offers no suitable roosting locations for bat species, it provides suitable foraging habitat including scattered trees, broadleaved woodland, dense scrub and running water. The running water and woodland habitats also provide suitable commuting features for bats. The northern and western boundaries of the site were predominantly unlit, however the southern and eastern boundaries of the site were lit by regularly spaced street lights (spaced at approximately 20 m intervals). In addition, bright lights were also located within the water treatment works at the north-eastern corner of the site. This may reduce the suitability of the adjacent habitats for use by commuting and foraging bats.

Further to the results of the initial survey, two activity surveys were undertaken on the site to determine how the survey area is utilised by bats.

3.2.3 Nocturnal Survey Results

First Nocturnal Survey

The first nocturnal emergence survey was undertaken on 15th July 2008. Surveyors concentrated on the woodland bordering the south-western and north-eastern corners of the site. Sunset on 15th July 2008 was at 21:29 (BBC Weather Centre Data).

Two species of bats were recorded during the first survey. Results of the nocturnal survey can be found illustrated on Middlemarch Environmental Drawing Number C102676-02, in Appendix 2.

Spot Point 1: North-eastern corner

The first bat recorded was a common pipistrelle *Pipistrellus pipistrellus* at 21:59, 30 minutes after sunset. The bat was briefly detected but not seen foraging along the woodland track along the northern edge of the site. It was not seen which way the bat entered or exited the survey area.

The second bat, a soprano pipistrelle *Pipistrellus pigmaeus*, detected was observed foraging along the woodland along the northern boundary of the site at 22:19 (40 minutes after sunset). This individual was recorded making three passes passed the surveyor over a period of approximately three minutes.

The third bat, also a soprano pipistrelle, was detected at 22:29, briefly foraging along the woodland along the northern boundary.

Spot Point 2: South-western corner

The first bat recorded was a common pipistrelle at 22:04, 35 minutes after sunset. This bat was observed commuting across the site, entering from the south-western corner and flying northward along the stream. Due to the length of this side of the site, it was not possible to determine whether the bat exited the site or whether it remained foraging within the survey area.

The second bat, also a common pipistrelle, was detected foraging along the edge of the plantation woodland and scattered trees adjacent to the stream. A number of passes were detected by this individual during the survey.

A further individual common pipistrelle was detected briefly foraging along the southern edge of site, along the edge of Fifth Avenue. This individual was recorded at 22:22, 52 minutes after sunset.

No other bat species were recorded by the surveyor positioned at this spot point.

General Activity within the site

Common pipistrelles were recorded regularly foraging along the stream/ plantation woodland/ scattered trees along the western site boundary. In addition, regular foraging was detected along the edge of the plantation woodland and Ninth Avenue along eastern site boundary and along the edge of the woodland along the track at the northern end of the site.

No bats were recorded foraging within the central area of the site.

No further bat species were recorded during the activity survey.

Analysis of the sound recordings made during this survey did not detect any further species of bat.

Second Nocturnal Survey

Spot Point 3: North-eastern Corner

A second nocturnal survey was undertaken on 26th August 2008. This survey concentrated upon the woodland area in the north-western corner of the site and the plantation woodland in the south-eastern part of the site. Sunset on 26th August 2008 was at 20:17 (BBC Weather Centre).

One species of bats were recorded during the second survey. Results of the nocturnal survey can be found illustrated on Middlemarch Environmental Drawing Number C102676-03, in Appendix 2.

The first bat, a common pipistrelle *Pipistrellus pipistrellus* was detected at approximately 20:46, 29 minutes after sunset. This bat was observed foraging around the trees adjacent to this spot point for approximately two minutes before moving beyond the range of the bat detector in an unknown direction.

Three further common pipistrelle were detected at 21:53, 21:09 and 21:13 again foraging around trees at the woodland edge in the northwest corner of the site for between 1 and 2 minutes.
No other bat species were recorded by the surveyor positioned at this spot point.

Spot Point 4: South-western Corner

No bat species were recorded by the surveyor positioned at this spot point during the survey.

General Activity within the site

Single foraging common pipistrelles were regularly recorded along the entire length of the site's western boundary. In addition, a foraging common pipistrelle was briefly recorded in the north-eastern corner of the site.

No bats were recorded foraging within the central area of the site.

No further bat species were recorded during the activity survey.

Analysis of the sound recordings made during this survey did not detect any further species of bat.

3.3 BREEDING BIRD SURVEY

3.3.1 Introduction

Breeding bird survey visits were completed on 21st May and 30th June 2008. The weather conditions during the survey are shown in Table 3.4.

Parameter	21/05/08	30/06/08
Temperature (^{o}C)	13	13
Cloud Cover (%)	70	40
Precipitation	None	None
Wind Speed (Beaufort)	2-3	1

Table 3.4: Weather Conditions During the Breeding Bird Surveys

The desk study identified four species of bird within 2 km of the site, all of which feature on Section 42 of the NERC act and three of which are considered to be species of conservation concern. No records of Schedule 1 birds were provided.

3.3.2 Survey Results

Table 3.5 details the breeding birds (including number of territories) recorded within the survey area in March – July 2008.

Common Name	Scientific Name	Status	No. of Territories
Blackbird	*Turdus merula*	-	3
Meadow pipit	*Anthus pratensis*	Amber Listed Species.	2
Robin	*Erithacus rubecula*	-	4
Skylark	*Alauda arvensis*	National BAP Species, Rhondda Cynon Taff BAP Species, Red Listed Species, S42.	
Song thrush	*Turdus philomelos*	National BAP Species, Rhondda Cynon Taff BAP Species, Red Listed Species, S42.	1
Treecreeper	*Certhia familiaris*	-	1
Willow warbler	*Phylloscopus trochilus*	Amber Listed Species.	5
Wren	*Troglodytes troglodytes*	-	2

Key
RSPB Red Species included on RSPB Red List of Conservation Concern (see below)
RSPB Amber Species included on RSPB Amber List of Conservation Concern (see below)
Rhondda Cynon Taff BAP Species listed on The Local Biodiversity Action Plan for Rhondda Cynon Taff
UK BAP Species listed as UK Biodiversity Action Plan Priority Species
S42 NERC Act 2006 Section 42 Species (Priority Species in Wales)
Notes for RSPB Red-listing Criteria
BDp: Rapid (>50%) decline in UK breeding population over the last 25years
HD: Historic population decline in UK during 1800-1995
Additional Amber-listing Criteria
SPEC 2 or 3: Species with unfavourable conservation status in Europe (SPEC = Species of European Conservation Concern)
Notes for RSPB Amber List Criteria
BDMp: Moderate (25-49%) decline in UK breeding range over last 25 years
BDMr: Moderate (25-49%) contraction in UK breeding range over last 25 years
SPEC 2 or 3: Species with unfavourable conservation status in Europe (SPEC = Species of European Conservation Concern)

Table 3.5: Breeding Bird Survey Data, May-June 2008

In addition to the species listed in Table 3.5, a number of other species were identified using the site for foraging purposes including blue tit *Cyanistes caeruleus*, carrion crow *Corvus corone*, common starling *Sturnus vulgaris*, great tit *Parus major*, green woodpecker *Picus viridis*, greenfinch *Carduelis chloris*, goldfinch *Carduelis carduelis*, magpie *Pica pica*, pied wagtail *Motacilla alba*, swallow *Hirundo rustica* and woodpigeon *Columba palumbus*.

Several of these additionally recorded species are of Conservation Concern: -

- Common starling – National BAP Species, Red Listed Species, NERC Act 2006 Section 42 Species.
- Swallow – Amber Status.

Swallows were observed to be utilising the warehouse buildings to the east of the site for breeding.

3.4 GREAT CRESTED NEWT HABITAT ASSESSMENT

3.4.1 Introduction

A great crested newt habitat assessment was completed on 21st May 2008. The weather conditions during the survey are shown in Table 3.6.

Parameter	Condition
Temperature (°C)	13
Cloud Cover (%)	70
Precipitation	None
Wind Speed (Beaufort)	2-3

Table 3.6: Weather Conditions During the Great Crested Newt Habitat Assessment

No records of great crested newts were identified within the desk study within a 2 km radius of the site. Nine records within 10 km, the closest of which was made 8.5 km west of the survey area, where provided by Biodiversity Information Service for Powys and Brecon Beacons National Park.

Records from the NBN gateway provided the following records of great crested newts made within the last 15 years within a 10 km radius of the site:

- 11 records from grid square SO 00, the closest of which were made 7.5 km west of the site.
- 1 record from grid square SS 99, made 7.5 km south of the survey area.
- No records from grid squares SN 90, SN 91, SN 80, SN 81 and ST 09.

3.4.2 Survey Results

Habitat Assessment

Site

Great crested newts require both aquatic and terrestrial habitats during their life cycle. Open water, especially with marginal and submerged vegetation provides suitable habitat for breeding great crested newts. Areas of scrub, tall ruderal vegetation and hedgerow provide suitable sites for hibernacula and foraging. Grassland and scrub also provide terrestrial foraging areas.

This site had no areas of permanent standing water, and ephemeral pools of water within the site were less than 0.1 m deep. Two streams, one which had a moderate flow speed and another with a slow flow ran through the western edge of the site. The main stream has a moderate flow speed and small fish were noted within the channel. Limited amounts of marginal vegetation (bur-reed *Sparangium* sp.) are also present within this stream.

The shorter length of stream which flows into the main stream had a slower flow, with a few more patches of marginal and emergent vegetation within the channel (bur-reed, marsh-marigold *Caltha palustris*, water horsetail *Equisetum fluviatile* and water mint *Mentha aquatica*) and provide suitable egg laying habitat for great crested newts. The water within the channel was generally shallow (less than 0.1 m deep) and was highly turbid and therefore visibility was seriously impaired.

The marshy grassland and semi-improved grassland habitats which dominate the site provide suitable foraging habitats for great crested newts, and the areas of scrub and woodland may provide suitable foraging habitat and areas of refugia.

Surrounding Area

Reference to the Ordnance Survey map revealed a single water body, Penderyn Reservoir, within a 500 m radius of the development site. Please refer to Appendix 4 (Middlemarch Environmental Ltd Drawing Number C102676-05) for the exact location of this water body in relation to the development site.

Penderyn Reservoir, located approximately 50 m north of the site perimeter, is a man-made feature with no aquatic, emergent or marginal vegetation present (Plate 3.1). It is approximately 10 ha in size (approximately 400 m x 250 m), supports a brown trout and rainbow trout fishery. It could not

be determined how deep the reservoir was. The reservoir was raised in comparison to the surrounding area, with regularly mown grassland on the steep banks. The suitability of the reservoir for great crested newts is assessed below, however the grassy banks would provide suitable foraging habitat for this species.

No other standing water bodies were noted within a 500 m radius of the site, however the marshy grassland, pasture with surrounding hedgerows and trees provide optimal habitat for great crested newts to utilise for foraging, refuge and hibernation.

Plate 3.1: Penderyn Reservoir

Great Crested Newt Habitat Suitability Index (HSI)

Table 3.7 provides the calculated HSI for the reservoir. The full criteria for the HSI are provided in Appendix 4.

The HSI score for the reservoir was 0.39, which equates to a 'Poor' suitability rating.

Factor	Score
Geographic Location	Marginal geographic location for GCN (HI 0.5)
Water body Area	10,000 m^2 (HI 0.01*)
Water body Permanence	Never dries (HI 0.9)
Water Quality	Poor (HI 0.33)
Pond Shading	0 % of pond perimeter shaded (HI 1.0)
No. Water Fowl	Minor (HI 0.67)
Occurrence of Fish	Major (HI 0.01)
Water body Density	2 ponds present within 1 km of survey water body (HI 0.27)
Quality of terrestrial (foraging) habitat	Moderate (HI 1.0)
Macrophyte Cover	0 % cover (HI 0.3)
HSI Score	**0.39**
* NB: The size of the waterbody is beyond the range of the graph provided within the HSI guidance so this figure has been estimated by extrapolating from the provided graph.	

Table 3.7: Great Crested Newt Habitat Suitability Index

3.5 MARSH FRITILLARY SURVEY

3.5.1 Introduction

The habitat and food plant assessment was undertaken on 30th May 2008. Surveys for adult marsh fritillaries were conducted on the 30th May 2008, 30th June 2008 and 16th July 2008. An egg search was undertaken on 16th June 2008 and a larval search was carried out on August 27th 2008. The weather conditions during the surveys are shown in Table 3.8.

Parameter	30/05/08	16/06/08	30/06/08	16/07/08	27/08/08
Temperature (°C)	17	19	13	18	16
Cloud Cover (%)	40	70	40	10-30	100
Precipitation	None	Sunny Spells	None	None	Light rain
Wind Speed (Beaufort)	1	2	1	1	2

Table 3.8: Weather Conditions During the Marsh Fritillary Surveys

The local record centre provided 37 records of marsh fritillary within a 2 km radius of the site perimeter, the closest of which were made approximately 500 m north and east of the site. In addition, Blaen Cynon Special Area of Conservation (considered to be one of the best areas in the United Kingdom for marsh fritillary) is located approximately 100 m east of the survey area.

3.5.2 Survey Results

Stage 1: Habitat & Food Plants

An initial habitat and food plant survey was undertaken of the site and the surrounding area to provide an assessment of the breeding potential within the site itself and whether there is any potential for dispersal into surrounding habitats.

A search for devil's-bit scabious (the larval food plant) revealed only a single patch of five individual plants within the south-eastern corner of the site within the semi-improved neutral grassland habitat. The location of this patch of devil's-bit scabious is shown on Middlemarch Environmental Ltd Drawing Number C102676-04. No field scabious *Knautia arvensis* or small scabious *Scabiosa columbaria* were identified within the survey site.

The majority of survey area covered in rush dominated marshy grassland. The site was subject to heavy grazing and therefore the sward was short in between rush patches (generally less than 5 cm) with occasional sparse tussocks of tufted hair-grass *Deschampsia caespitosa*. The semi-improved neutral grassland which was present along the southern and eastern site boundaries was unmown and the average sward length was approximately 40 cm.

Within the surrounding area, it was not possible to access the land to the west of the site to undertake a survey for Devil's bit scabious, however the grounds within the pumping station consisted of regularly mown amenity grassland. Penderyn Reservoir is located to the north of the site. The grassy slopes of the reservoir were regularly mown, and no devil's-bit scabious was recorded on the slopes. It was not possible to gain access to land within the water treatment works (to the north-east of the site), however when viewed through the fence the grassland within this habitat appeared to comprise regularly mown amenity grassland with few forb species present. Industrial units and hard standing formed the remainder of the eastern boundary. The land to the south of the site was occupied by further industrial units, surrounded by regularly maintained amenity planting. These habitats surrounding the site are therefore considered to provide unsuitable habitat for marsh fritillary.

Stage 2: Adult Survey

The location of the transect and the butterflies observed along the transects are recorded on Middlemarch Environmental Ltd Drawing Numbers C102676-06 to 08. The butterflies recorded during each of the surveys are listed in Tables 3.9 to 3.11.

Species	Scientific Name	Status
Common blue	*Polyommatus icarus*	-
Orange tip	*Anthocharis cardamines*	-
Speckled wood	*Pararge aegeria*	-
Wood white	*Leptidea sinapis*	UK BAP
Key UK BAP Listed on UK Biodiversity Action Plan		

Table 3.9: Results of Adult Marsh Fritillary Surveys Recorded on 30th May 2008

Species	Scientific Name	Status
Common blue	*Polyommatus icarus*	-
Meadow brown	*Maniola jurtina*	-
Ringlet	*Aphantopus hyperantus*	-
Small heath	*Coenonympha pamphilus*	UK BAP
Small pearl-bordered fritillary	*Bolorie selene*	UK BAP
Speckled wood	*Pararge aegeria*	-
Key UK BAP Listed on UK Biodiversity Action Plan		

Table 3.10: Results of Adult Marsh Fritillary Surveys Recorded on 30th June 2008

Species	Scientific Name	Status
Common blue	*Polyommatus icarus*	-
Large skipper	*Ochlodes sylvanus*	-
Meadow brown	*Maniola jurtina*	-
Ringlet	*Aphantopus hyperantus*	-
Small heath	*Coenonympha pamphilus*	UK BAP
Small skipper	*Thymelicus sylvestris*	-
Small white	*Pieris rapae*	-
Speckled wood	*Pararge aegeria*	-
Key UK BAP Listed on UK Biodiversity Action Plan		

Table 3.11: Results of Adult Marsh Fritillary Surveys Recorded on 16th July 2008

No marsh fritillary butterflies were recorded during any of the survey visits, or during any of the other visits to the site.

Stage 3: Larval and Egg Survey

The five devil's-bit scabious plants in the south-eastern corner of the site were searched for the presence of eggs on 16th June 2008. No marsh fritillary eggs were found.

The plants were searched for the presence of larvae on August 27th 2008 and no marsh fritillary larvae were found.

3.6 OTTER SURVEY

3.6.1 Introduction

Otter surveys were completed on 21st May 2008. The weather conditions during the survey are shown in Table 3.12.

Parameter	Condition
Temperature (°C)	13
Cloud Cover (%)	70
Precipitation	None
Wind Speed (Beaufort)	2-3

Table 3.12: Weather Conditions During the Otter Survey

No records of otter were provided by the local record centres within a 2 km radius of the site.

3.6.2 Survey Results

Constraints

Access to the full 500 m up and downstream of the proposed works site was not possible. It was therefore only possible to survey approximately 25 m downstream of the site and approximately 100 m upstream of the perimeter of the site.

Survey Results

A small stream ran through the site, flowing from north to south. This stream varied in depth from less than 0.1 m (where the stream ran wider over some rocks) to approximately 1 m deep (at a number of meanders in the stream where the stream almost forms a pool). The banks of the stream were between 0.5 and 1 m deep and between 60° and 90° steep. At the northern extent of the stream it was shaded by the adjacent willow trees. At the southern extent the stream was shaded by trees and scattered scrub on both the eastern bank (within the site) and the western bank (outside of the survey area). The central section of the stream was not shaded and here the banks were quite eroded with a number of areas where the stream was undercutting the banks. At these points the

banks were generally devoid of vegetation with bare earth forming the banks. The scrub along the banks was generally sparse and offered no suitable locations for otters to lay up in. The trees along the bank were all reasonably young and therefore were in good condition and also provided no suitable locations for otters to rest. Stones on the bed of the stream provided a number of sprainting points for otters, but no spraints were noted.

A further shallower stream flowed from the north-western corner of the site and into the main stream. This stream was approximately 0.4 m wide and less than 0.1 m deep and with a very slow flow, with occasional stagnant areas. The bed of this stream was rusty in colour and a scum was noted on top of the water. This section of stream was shaded by the surrounding early mature willow carr along its full length (all trees were in good condition). This section of stream offered no suitable sprainting points for otter.

Both streams were predominantly clear of marginal, emergent and floating vegetation, with only occasional sparse patches noted.

At the northern end of the site a small concrete bridge crosses the stream. There were no suitable ledges beneath this stream to provide a suitable sprainting point for otters, however there was a large number of stones on the bed of the stream which would be suitable, however no spraints were noted. Beyond the northern boundary of the site the stream limited amounts of marginal vegetation were present within the channel. The channel narrowed to approximately 1 m wide and the banks were generally shallow (approximately 20°-45°) and the banks were covered in grassland species and bracken *Pteridium aquilinum*. The banks were generally not shaded. Few suitable sprainting points were noted.

At the southern extent of the site the stream flowed into two concrete pipes, which extended for approximately 20 m underneath the Fifth Avenue, before emerging out of the pipe above ground. At the time of the survey the stream only really flowed through the left-hand tunnel (looking downstream). No spraints were noted around the entrances to these pipes.

To the south of Fifth Avenue, the river, now 2 to 3 m wide, flows out of three pipes and then bends around to the west. The river is partly culverted here and whilst some of the banks are natural, parts of the banks were formed by vertical concrete. The banks varied between 1 and 2 m high and were between 2 and 4 m wide.

The banks were covered in dense scrub and trees which almost completed shaded the channel, and no marginal, emergent or aquatic vegetation was noted within the channel. The dense bramble and scrub may provide suitable locations for otters to utilise as lay-ups during the day.
After approximately 25 m the stream flows under a fence into a sewage treatment works. It was not possible to access this section of the stream.

Small fish were noted within the stream, and numerous amphibians were present on site. These would both provide a suitable food source for otters utilising the site.

No signs attributable to otter (i.e. tracks, spraint, holts) were noted during the survey.

3.7 REPTILE SURVEY

3.7.1 Introduction

Reptile surveys were completed on 29th May, 30th May, 16th June, 30th June and 16th July 2008. The weather conditions during the survey are shown in Table 3.13.

Parameter	29/05/08	30/02/08	16/06/08	30/06/08	16/07/08
Temperature (°C)	17	17	19	13	18
Cloud Cover (%)	10	40	70	40	10-30
Sunshine	Sunny	Sunny spells	Sunny spells	Sunny spells	Sunny
Wind Force (Beaufort)	1-2	1	2	1	1
Precipitation	None	None	None	None	None
Preceding weather conditions	No rain	No rain	Rain showers prior to survey	Dry	Dry

Table 3.13: Weather Conditions During the Reptile Surveys

3.7.2 Survey Results

Habitat Assessment

The survey area is dominated by marshy grassland, with areas of scrub and woodland around the perimeters of the site. Two small streams run along the western edge of the site.

The surrounding habitat consisted of Penderyn Reservoir to the north, a pumping station (surrounded by amenity grassland) and pasture with trees were located to the west. A water treatment works was located to the north-east of the site with industrial units and hard standing forming the remainder of the eastern boundary. The land to the south of the site was occupied by further industrial units, surrounded by regularly maintained amenity planting.

The key habitats associated with reptiles within the survey area are summarised below.

Bare ground

A small area, comprising large gravel, formed a soakaway into which all the drains on site entered. This soakaway was located in close proximity to the stream and scrub and therefore may provide a suitable refuge or basking area for reptiles.

Dense and scattered scrub

A small area of dense gorse scrub was noted in the north-eastern corner of the site. In addition, areas of scattered scrub were located around the site, especially in the north-eastern corner of the site. This may provide suitable refuge and hibernation opportunities for reptiles. The margins are also suitable migration corridors and provide additional foraging habitat.

Hardstanding

Two areas of hardstanding were noted at the edge of the site. The area of hardstanding off Ninth Avenue was regularly used and therefore subject to high levels of disturbance making it unsuitable for use by basking reptiles. The second area of hardstanding (off Fifth Avenue) was undisturbed and therefore may provide a suitable basking habitat for reptiles.

Marshy grassland

Marshy grassland, dominated by rush species, with areas of ephemeral standing water dominated much of the site. This habitat was generally of a flat topography, however the land sloped downwards from Ninth Avenue, steeply to the main area of the site. This slope had a westerly aspect and would have provide basking opportunities for reptiles in the evening, however this area was heavily poached by horses and this would reduce its suitability for use. This habitat provided suitable habitat for a variety of amphibian species (which were regularly recorded during the survey visits) and therefore this habitat provides optimal foraging habitat for grass snake. This habitat also provided suitable foraging opportunities for slow worm and common lizard. The dense tussocks of rush may also provide reptiles with areas of shelter and refuge.

Running water

The two streams which ran through the site. The main stream ran through the site, flowing from north to south. This stream varied in depth from less than 0.1 m (where the stream ran wider over some rocks) to approximately 1 m deep (at a number of meanders in the stream where the stream almost forms a pool) and varied between 1 and 2 m wide. A further shallower stream flowed from the north-western corner of the site and into the main stream. This stream was approximately 0.4 m wide and less than 0.1 m deep and with a very slow flow, with occasional stagnant areas. These streams provide suitable foraging opportunities for grass snakes.

Semi-improved neutral grassland

The road verges along Ninth Avenue and Fifth Avenue comprised semi-improved neutral grassland. The verges were unmown and the average sward length was approximately 40 cm. The sward was dominated by grass species with comprised approximately 75 % of the cover. This unmanaged area which contains long and tussocky grass provides reptiles with shelter and foraging habitat.

In addition, further areas of semi-improved neutral grassland was present along the woodland track at the northern edge of the site. The majority of this area was shaded and the sward length was much shorter. This habitat may however provide some foraging opportunities for reptiles.

Field Survey Results

Temporary refugia were installed along five transects which incorporated all the different habitats within the site. The locations of these transects are shown on Middlemarch Environmental Ltd Drawing Number C102676-09, Appendix 6.

The results from the reptile survey are presented in Table 3.14. One juvenile slow worm was recorded using temporary refugia on 16th June 2008. This slow worm was recorded on the western transect (T2), adjacent to the soakaway area. No reptiles were recorded during an inspection of the existing refugia on site. Numerous adult and juvenile toads and two juvenile smooth newts were recorded under the temporary and existing refugia during the surveys.

Date	Survey Results
29-05-08	None
30-05-08	None
16-06-08	1 juvenile slow worm
30-06-08	None
16-07-08	None

Table 3.14: Reptile Survey Results

3.8 WATER VOLE SURVEY

3.8.1 Introduction

The water vole survey was completed on 21st May 2008. The weather conditions during the survey are shown in Table 3.15.

Parameter	Condition
Temperature (^{o}C)	13
Cloud Cover (%)	70
Precipitation	None
Wind Speed (Beaufort)	2-3

Table 3.15: Weather Conditions During the Water Vole Survey

No records of water vole were provided by the local record centres within a 2 km radius of the site.

3.8.2 Survey Results

Constraints

Access to the full 500 m up and downstream of the proposed works site was not possible. It was therefore only possible to survey approximately 25 m downstream of the site and approximately 100 m upstream of the perimeter of the site.

Water Vole Habitat Survey

The two streams within the site were assessed for their suitability for use by water voles.

The main stream runs through the site, flowing approximately from north to south. This stream varied in depth from less than 0.1 m (where the stream ran wider and over rocks) to approximately 1 m deep (at a number of meanders in the stream where the stream almost forms a small pool). The stream varies from 1 to 2 m wide. The banks of the stream were between 0.5 and 1 m deep and between 60° and 90° steep. The banks were generally soil, however a small length of concrete

reinforcement was present on the left bank (looking downstream) where the water flowed out of the soakaway (into which all the site's drainage flowed). At the northern end of the site the banks were shallower (approximately 25°) and here the banks had been subject to high levels of horse poaching.

At the northern extent of the stream it was shaded by the adjacent willow trees. At the southern extent the stream was shaded by trees and scrub on both the eastern bank (within the site) and the western bank (outside of the survey area). The ground flora in this area included marsh thistle *Cirsium palustre*, meadowsweet *Filipendula ulmaria*, soft rush *Juncus effusus*, lesser celandine *Ranunculus ficaria*, cuckoo flower *Cardamine pratensis*, germander speedwell *Veronica chamaedrys*, yellow pimpernel *Lysimachia nemorum* and occasional bluebell *Hyacinthoides non-scripta* and common dog violet *Viola riviniana*. The central section of the stream (approximately 100 m long) was not shaded. The banks were quite eroded with a number of sections where the stream was undercutting the banks. At these points the banks were generally devoid of vegetation with bare earth forming the banks. Two patches of bur-reed *Sparganium* sp. were noted within the channel, one at the northern end of the site and another at the point where the smaller stream flows into this stream. Occasional water horsetail *Equisetum fluviatile* and bistort *Persicaria* sp. were also noted.

A further shallower stream flowed from the north-western corner of the site and into the main stream. This stream was approximately 0.4 m wide and less than 0.1 m deep and with a very slow flow, with occasional stagnant areas. The bed of this stream was rusty in colour and a scum was noted on top of the water. This section of stream was shaded by the surrounding willow carr along its full length. The banks of this section of stream were very shallow (at most 10°) and were generally devoid of vegetation, as the stream was heavily horse poached in a number of places. Species noted within the small stream included bur-reed, marsh-marigold *Caltha palustris*, water horsetail *Equisetum fluviatile*, lesser spearwort *Ranunculus flammula* and water mint *Mentha aquatica*, with the vegetation concentrated at the point where the two streams met.

At the northern end of the site a small concrete bridge crosses the stream. Beyond the northern boundary of the site the stream limited amounts of marginal vegetation were present within the channel. The channel narrowed to approximately 1 m wide and the banks were generally shallow (approximately 20°-45°) and the banks were covered in grassland species and bracken *Pteridium aquilinum*. The banks were generally not shaded.

At the southern extent of the site the stream flowed into two concrete pipes, which extended for approximately 20 m underneath the Fifth Avenue, before emerging out of the pipe above ground. At the time of the survey the stream only really flowed through the left-hand tunnel (looking downstream).

To the south of Fifth Avenue, the river, now 2 to 3 m wide, flows out of three pipes and then bends around to the west. The river is partly culverted here and whilst some of the banks are natural, parts of the banks were formed by vertical concrete. The banks varied between 1 and 2 m high and were between 2 and 4 m wide.

The banks were covered in dense scrub and trees which almost completed shaded the channel, with species noted on the banks included ash *Fraxinus excelsior* dogwood *Cornus sanguinea*, birch *Betula* sp., bramble *Rubus fruticosus* agg., cherry laurel *Prunus laurocerasus*, willow *Salix* sp.. Ground flora included garlic mustard *Alliaria petiolata*, herb Robert *Geranium robertianum*, brome *Bromus* sp. and lesser celandine *Ranunculus ficaria*. No marginal, emergent or aquatic vegetation were noted within this section of stream.

After approximately 25 m the stream flows under a fence into a sewage treatment works. It was not possible to access this section of the stream.

Water Vole Species Survey

A number of burrows were noted within the banks of the main stream, generally just above the water level, however no evidence of water vole (prints, latrines etc) was noted within or around them. Where these holes were noted the banks of the stream were bare of vegetation and eroding. Water voles generally prefer areas of bank which are densely vegetated and therefore it is considered likely that these holes are not water vole.

No evidence of the presence of water voles was identified within either watercourse present on, or adjacent to, the site i.e. no latrines, burrows, grazed lawns, etc.

4. DISCUSSION AND CONCLUSIONS

4.1 BADGER

No evidence of badger presence on site was identified during the field surveys, and a single mammal track was noted just beyond the south-western corner of the site leading down to the stream. No evidence was noted along this track (hairs, prints, claw marks etc) which would allow it to be attributed to badgers or another mammal species.

The desk study, undertaken as part of the original Extended Phase 1 Habitat Survey (Middlemarch Environmental Report Number RT-MME-101917, 2008) identified no records of badgers within a 2 km radius of the site.

The lack of existing records for this species with the local area, together with the absence of evidence of badgers on site, mean that it is considered unlikely that the proposed development will adversely impact upon this species.

4.2 BATS

Initial bat surveys identified that there were no suitable roosting locations for bats within the site however the survey area provides suitable foraging habitat and commuting features.

Two separate nocturnal surveys were undertaken, each concentrating on different corners of the site to determine where the bats were entering the site and how the habitats within the site wee utilised by bats. A single common pipistrelle was detected commuting along the western boundary of the site on only one of the two nocturnal surveys. The limited commuting activity recorded indicates that the site does not contain important commuting features for the local bat populations.

Common and soprano pipistrelles were recorded foraging along the edges of the site during the survey period, with the western boundary being most frequently utilised. Whilst well lit by street lights, the eastern and southern boundaries were both utilised by foraging bats. As bats were recorded foraging on site during both survey visits, this indicates that the site is a regularly utilised foraging area for bats within the local area. No bats were recorded utilising the central area of the site which is due to be developed as a part of the proposals.

During the surveys, the first bats were detected approximately 30 minutes after sunset, just at the end of the emergence time for pipistrelle species (usual emergence time between 20 and 30 minutes

after sunset, but occasionally emerge before sunset, Jones & Walsh (2006)). This indicates that the bats were not roosting in close proximity to the site. The only bat detected commuting across the site, a common pipistrelle, was detected at 35 minutes after sunset, outside of the emergence time for this species. The results suggest that the bats which utilise the site do not roost within close proximity to the site. Pipistrelle species are known to have a feeding area of 3 to 4 km from their roost (Bat Conservation Trust, 2007).

Common and soprano pipistrelle bats were recorded regularly foraging within the site, which indicates that the site is a regularly utilised foraging ground for common and soprano pipistrelles in the locality.

4.3 BREEDING BIRDS

Of the 19 species of bird noted using the site during the survey visits, eight species were recorded to be breeding on the site including sky lark a declining farmland bird species.

The site is of value for a range of National and Local Biodiversity Action Plan Priority Species and RSPB Red and Amber Listed Species of Conservation Concern including:

- Three National BAP Species – sky lark and song thrush
- Two local BAP Species – sky lark and song thrush
- Three RSPB Red Listed Species – sky lark, song thrush & starling
- Eight RSPB Amber Listed Species – green woodpecker, lesser black backed gull, swallow, tree pipit and willow warbler.

The most valuable features/habitats recorded on site for breeding birds are the areas of marshy grassland within the centre of the site. This area supported one pair of sky lark and two pairs of meadow pipit. The presence of sky lark is of significance in a local, county and national context.

The woodland and scattered trees which form the site's boundary features are also deemed to be valuable for species such as willow warbler, song thrush, blackbird, robin and wren. The presence of song thrush is of significance in a local, county and national context. Concentrations of breeding birds were consistently noted along these boundary features.

It is understood that the development will result in the loss of the marshy grassland area within the central area of the site; this will result in the loss of suitable nesting habitat for sky lark and meadow

pipit within the survey area. Due to the small size of the site it will not be possible to retain these species within the site. It is understood that the habitats around the edges of the development will be retained, and therefore the site will still provide suitable nesting habitat for a variety of species including song thrush. The loss of the marshy grassland will however result in the loss of foraging habitat.

4.4 GREAT CRESTED NEWT

Reference to Biodiversity Information Service for Powys and Brecon Beacons National Park and the NBN Gateway identified no records of great crested newt within 2 km of the survey area. The closest records provided were made approximately 7.5 km from the perimeter of the site.

The land within the site was considered to provide optimal foraging habitat for great crested newts but the site contains had no areas of permanent standing water, and ephemeral pools of water within the site were less than 0.1 m deep, with no areas of open water suitable for great crested newts to undertake breeding displays. The larger stream on site was considered to be sub-optimal for use by great crested newts as it has a significant flow, limited egg laying habitat and numerous small fish were present. The smaller stream had a slower flow and no fish were noted and more marginal and emergent vegetation provided suitable egg laying habitat. The water was however highly turbid which seriously impaired visibility and makes it sub-optimal for use by displaying great crested newts.

The marshy grassland and semi-improved grassland habitats which dominate the site provide suitable foraging habitats for great crested newts, and the areas of scrub and woodland may provide suitable foraging habitat and areas of refugia.

A single water body, Penderyn Reservoir, was identified within a 500 m radius of the development area. The reservoir is located approximately 50 m north of the site with suitable terrestrial habitat connecting the survey area and the reservoir. In addition, the habitat to the north, west and north-east of the site is considered to provide optimal foraging habitat with good connectivity for this species.

Penderyn Reservoir, approximately 50 m north of the site, is approximately 10 ha in size, far exceeding the preferred size range for ponds (50-250 m^2) which support great crested newt breeding activities (Langton *et al*., 2001). This water body contains no aquatic vegetation and therefore lacks suitable egg laying habitat and the water clarity was low which would make it sub-optimal for great

crested newt mating displays. The presence of trout within the reservoir further decreases the suitability of this water body. The suitability of the water bodies within 500 m of the proposed development site is summarised in Table 4.1.

Water body	Distance from nearest edge of the survey site	HSI Score	Brief description of key features
Penderyn Reservoir	50 m north	0.39 (Poor suitability)	Deep reservoir with no marginal or emergent vegetation. No other ponds present within a 500 m radius, two ponds within a 1 km radius of the reservoir.

Table 4.1: Summary of Breeding Potential of Ponds for Great Crested Newts within 500m of the Development Site

A total of eight ponds were located within a 1 km radius of the development site, the closest of which was located approximately 600 m west (Ordnance Survey, 2008). Due to the distance of these ponds from the development site they were not included within this assessment and it is not known whether they have potential to support breeding amphibians, including great crested newts. Whilst great crested newts are known to travel up to 1 km from their breeding ponds during the terrestrial phase of their life cycle, they generally only travel between 250 to 500 m when the surrounding foraging habitat is optimal.

Only one of these ponds, located 800 m to the north-east of the site, was connected to the site by continuous suitable terrestrial habitat. The rest of the ponds were separated from the site by at least one road. Whilst these roads are not main roads and therefore are not considered to form impermeable barriers to newts, the lack of habitat connectivity together with the distance would decrease the likelihood of any great crested newts within these ponds utilising the development site.

The lack of records for great crested newts within a 2 km radius of the site, and the presence of only one sub-optimal water body within a 500 m radius of the proposed development area mean that it is considered unlikely that great crested newts would be present within the vicinity of the development. It is therefore concluded that any works undertaken on the development site would not impact upon great crested newts.

4.5 MARSH FRITILLARY

No marsh fritillaries (adults, larvae or eggs) were recorded during the surveys.

The site provided sub-optimal habitat for marsh fritillary, with only a single small patch of devil's-bit scabious (the larval food plant) noted. The majority of the site comprised rush dominated marshy grassland, which did however provide a good source of nectar for adult butterflies, including buttercup species *Ranunculus* sp. and marsh thistle *Cirsium palustre*.

The site was subject to heavy grazing and therefore the sward was short in between rush patches (generally less than 5 cm) with occasional sparse tufts of tufted hair-grass *Deschampsia caespitosa*. In contrast, the semi-improved neutral grassland (where the small patch of devil's-bit scabious was noted) along the southern and eastern edge of the site were ungrazed and unmown, with an average sward length of approximately 40 cm. This makes the site sub-optimal for marsh fritillary, who generally prefer intermediate length swards (8-25 cm) or shorter swards (5-15 cm) if the food plants are readily available (Butterfly Conservation, no date). With a change in management however it is considered likely that this site could provide suitable habitat for this species.

Eleven species of butterfly were recorded during the survey, including three species of conservation concern listed on the UK Biodiversity Action Plan: small heath, small pearl bordered fritillary and wood white, which have undergone population decreases of 52 %, 70 % and 64 % respectively over the last 20 to 30 years (UK Butterflies, 2008). This indicates that the site provides an important habitat for these species.

4.6 OTTER

The streams and marshy grassland on site provide otters with suitable foraging habitat. The dense scrub at the southern end of the survey area (outside of the site boundary) may provide a suitable resting area for otters, but the banks within the site were relatively open and provide little opportunities for otters to hide.

No evidence of otter usage was noted during the survey (spraints, anal jelly, hairs, prints or feeding remains). Otters do not always leave evidence of their presence, especially if the population density within an area is low (Woodroffe, 2007) however the lack of evidence suggests that this length of watercourse within the site is not regularly utilised by this species.

The desk study, undertaken as part of the original Extended Phase 1 Habitat Survey (Middlemarch Environmental Report Number RT-MME-101917, 2008) identified no records of otter within a 2 km radius of the site.

The lack of existing records for this species with the local area, together with the absence of evidence of otters on site, mean that it is unlikely that the proposed development will adversely impact upon this species.

4.7 REPTILE

The site provides suitable resources for reptiles:

- Woodland and scrub– provide commuting, foraging and hibernation sites
- Grassland habitats – provide foraging and commuting sites.
- Hard standing – provides basking areas for reptiles.
- Running water – provides foraging habitat for grass snake.

A single juvenile slow worm was recorded at a single point on the western edge of the marshy grassland habitat. No other reptiles were identified during the survey visits. Whilst no reptiles including slow worms were identified utilising the centre of the site, which is where the proposed development will be located, it is considered likely that they will be utilising this habitat for foraging. It is therefore considered that this development will impact upon this species without the implication of a mitigation strategy.

4.8 WATER VOLE

Water voles are closely associated with fresh water habitats, generally slow-flowing, less than 3 m wide and approximately 1 m deep, including rivers, ditches, lakes and canals. They favour steep banks, which need to be suitable for burrowing and well vegetated. Their diet is almost exclusively vegetarian, including grasses, reeds and other herbaceous vegetation. The streams within the survey area are considered to provide sub-optimal water vole habitat owing to the frequently shaded nature of the channel provided by adjacent scrub and woodland. The streams only contained occasional patches of marginal and emergent vegetation and therefore provide limited food resources for water voles. In addition, the banks were generally either sparsely vegetated where they were shaded by scrub and trees, or were bare where they were eroding away and therefore do not provide sufficient cover for water voles.

No evidence of water vole presence i.e. burrows, latrines, grazed vegetation was detected along the surveyed watercourses within, and adjacent to, the surveyed area.

The desk study, undertaken as part of the original Extended Phase 1 Habitat Survey (Middlemarch Environmental Report Number RT-MME-101917) identified no records of water vole within a 2 km radius of the site.

The lack of existing records for this species with the local area, together with the absence of evidence of water vole on site, mean that it is unlikely that the proposed development will adversely impact upon this species.

5. SUMMARY

The issues associated with the protected species on site are summarised in Table 5.1.

SPECIES	ISSUES
Badger	No evidence of this species was found within the survey area.
Bats	No suitable roosting locations were present on site. The woodland features around the edges of the site provided suitable commuting and foraging areas for bats. Only two common species of bats, and no Annex II bat species, were recorded utilising these features during the activity surveys.
Breeding Bird	Optimal habitat for ground-nesting birds such as meadow pipit and skylark and hedgerow species such as song thrush.
Great Crested Newt	Habitat within the local area generally considered to be unsuitable for great crested newts.
Marsh Fritillary	No evidence. However, site provides suitable habitat for a variety of other butterfly species including three species of conservation concern: small heath, small pearl-bordered fritillary and wood white.
Otter	No evidence.
Reptile	Small population of slow worm present on site and therefore a mitigation strategy will be required for the site.
Water Vole	No evidence.

Table 5.1: Summary of Species Issues on Site

6. RECOMMENDATIONS

6.1 Badger

No recommendations are made regarding this species, however if any new setts or excavations attributable to badgers are discovered prior to the commencement of the development then works should cease and a suitably qualified ecologist consulted for advice.

6.2 Bat

The habitats along the perimeters of the site were identified as regularly utilised foraging areas for common and soprano pipistrelles. The new development must therefore have no additional lighting should situated along the boundaries of the site to ensure that dark commuting and foraging routes are maintained for the local population of bats to utilise.

If lighting is required within the development, then down lighting is recommended to prevent fragmentation of the bat connectivity of the site and to ensure dark areas remain for bats to utilise for foraging and commuting.

6.3 Breeding Birds

Middlemarch Environmental Ltd understands that extensive areas of vegetation in the centre of the site will be lost as a result of the proposed development. It is therefore recommended that any vegetation removal should not be carried out while birds are nesting. Ideally any removal works should take place outside of the bird breeding season (i.e. between October – February inclusive). However selective removal of grassland, trees and scrub may be permitted within the bird breeding season on the provision that a nesting bird survey is carried out immediately prior to the removal and all works are carried out under guidance of a suitably qualified Ecological Clerk of Works.

If any active nests are discovered during clearance works, then works must cease and a suitable 'buffer zone' be maintained around the nest to prevent disturbance that may contravene the Wildlife and Countryside Act WCA 1981 (as amended). The 'buffer zone' will be determined by the Ecological Clerk of Works and will depend upon the requirements of the species involved.

Any vegetation removed should be flattened, chipped or removed from site within 48 hours of removal to prevent further use by nesting bird species.

It will not be possible to retain a sufficient sized area of marshy grassland habitat to provide a suitable nesting location for sky lark and meadow pipit within the survey area. However the boundary features should be retained (with adjacent buffer strips of grassland) where possible to provide habitat for breeding birds such as song thrush.

A mitigation strategy is required for the site as important nesting features and foraging habitats will be lost as a result of this development. A mitigation strategy should be implemented to ensure that the site still provides suitable habitat for a range of breeding bird species.

6.4 Great Crested Newt

Limited suitable breeding habitat was present on site. No recommendations are made regarding this species.

6.5 Marsh Fritillary

No marsh fritillaries were identified on site during the survey and the site was found to offer limited suitable habitat for this species at present. The site is located within 100 m of suitable marsh fritillary habitat and therefore if no works are undertaken on site within two years of this survey, then further surveys should be undertaken to ensure that marsh fritillaries have not colonised this site is the interim.

The site provides suitable habitat for a variety of butterfly species, including three species of conservation concern. A mitigation strategy should be drawn up and implemented for the site to ensure that this site continues to provide suitable habitat for these species.

6.6 Otter

No evidence of otter activity was identified along the streams within the site. It is understood that the streams and a buffer zone of vegetation along the banks will be retained as a part of the development. No recommendations are therefore made regarding this species.

6.7 Reptiles

As a small population of slow worm has been identified on site, a reptile mitigation strategy will be required for the site in order for the proposed development to proceed.

English Nature (2004b) identifies two aims that need to be achieved where reptiles are present on proposed development sites:

- To protect reptiles from any harm that might arise during the development work; and,
- To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.

6.8 Water Vole

No evidence of water vole activity was identified along the streams within the site. It is understood that the streams and a buffer zone of vegetation along the banks will be retained as a part of the development. No recommendations are therefore made regarding this species.

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APPENDICES

Appendix 1: Middlemarch Environmental Ltd Drawing C102676-01: Site Location

Appendix 2: Nocturnal Bat Survey Results
Middlemarch Environmental Ltd Drawing Number C102676-02: Results of nocturnal bat survey on 15th July 2008.
Middlemarch Environmental Ltd Drawing Number C102676-03: Results of nocturnal bat survey on 26th August 2008.

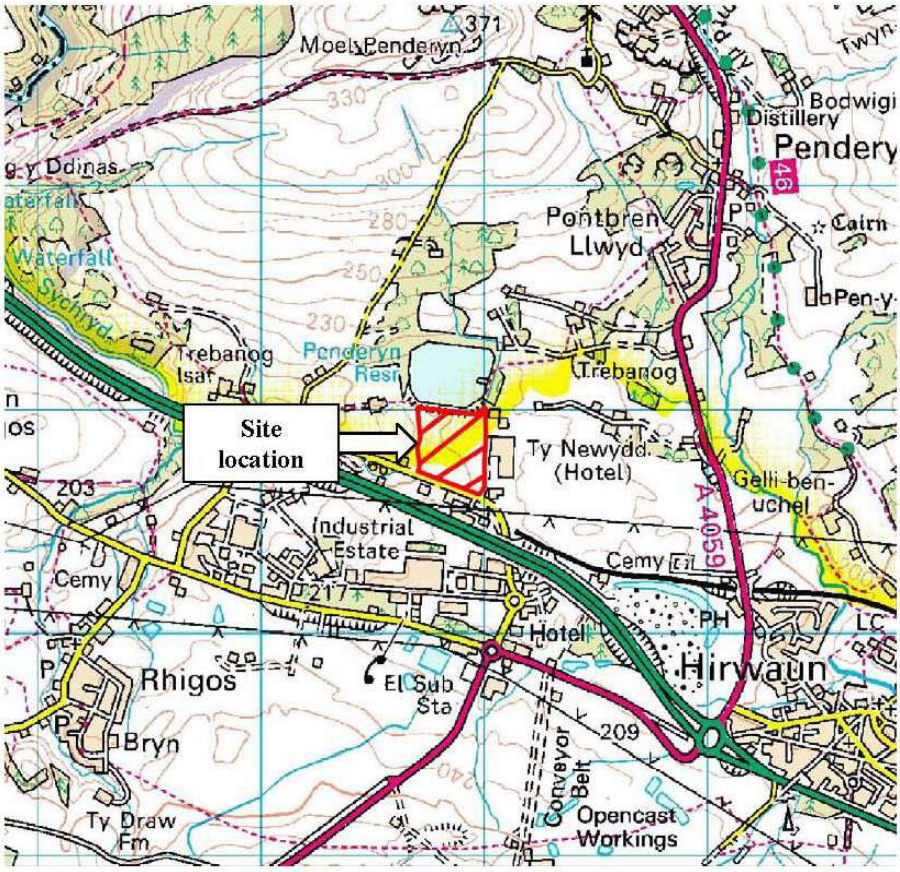
Appendix 3: Breeding Bird Surveys
Middlemarch Environmental Ltd Drawing Number C102676-04: Approximate locations of the breeding bird territories within the site.

Appendix 4: Great Crested Newt Habitat Assessment
Location of water bodies within a 500 m radius of the site
Great crested newt habitat suitability index

Appendix 5: Marsh Fritillary Transect Results
Middlemarch Environmental Ltd Drawing Number C102676-06: Visit 1 30th May 2008
Middlemarch Environmental Ltd Drawing Number C102676-07: Visit 2 30th June 2008
Middlemarch Environmental Ltd Drawing Number C102676-08: Visit 3 16th July 2008

Appendix 6: Reptile Surveys
Middlemarch Environmental Ltd Drawing Number C102676-09: Location of Reptile Transects.

APPENDIX 1



N

MIDDLEMARCH ENVIRONMENTAL

Site Location Plan	
Client:	Envisage
Site:	Hirwaun Industrial Estate
Drawing N°:	C102676-01
Scale:	Not to Scale
Date:	September 2008
Drawn by:	AD
Checked by:	KR

APPENDIX 2

Middlemarch Environmental Ltd Drawing Number C102676-02: Results of nocturnal bat survey on 15th July 2008.

Middlemarch Environmental Ltd Drawing Number C102676-03: Results of nocturnal bat survey on 26th August 2008.

C102676-02

Legend

- Surveyor position
- Common pipistrelle, commuting
- Common pipistrelle, foraging
- Soprano pipistrelle, foraging
- Site boundary

N

Client: Envisage	Project: Hirwaun Industrial Estate
Drawing: Nocturnal Bat Survey No 1	Drawing Number: C102676-02
Revision: 00	Date: September 2008
Scale at A3: 1:1,500	Drawn By: SKS
Approved By: AD	Notes: -

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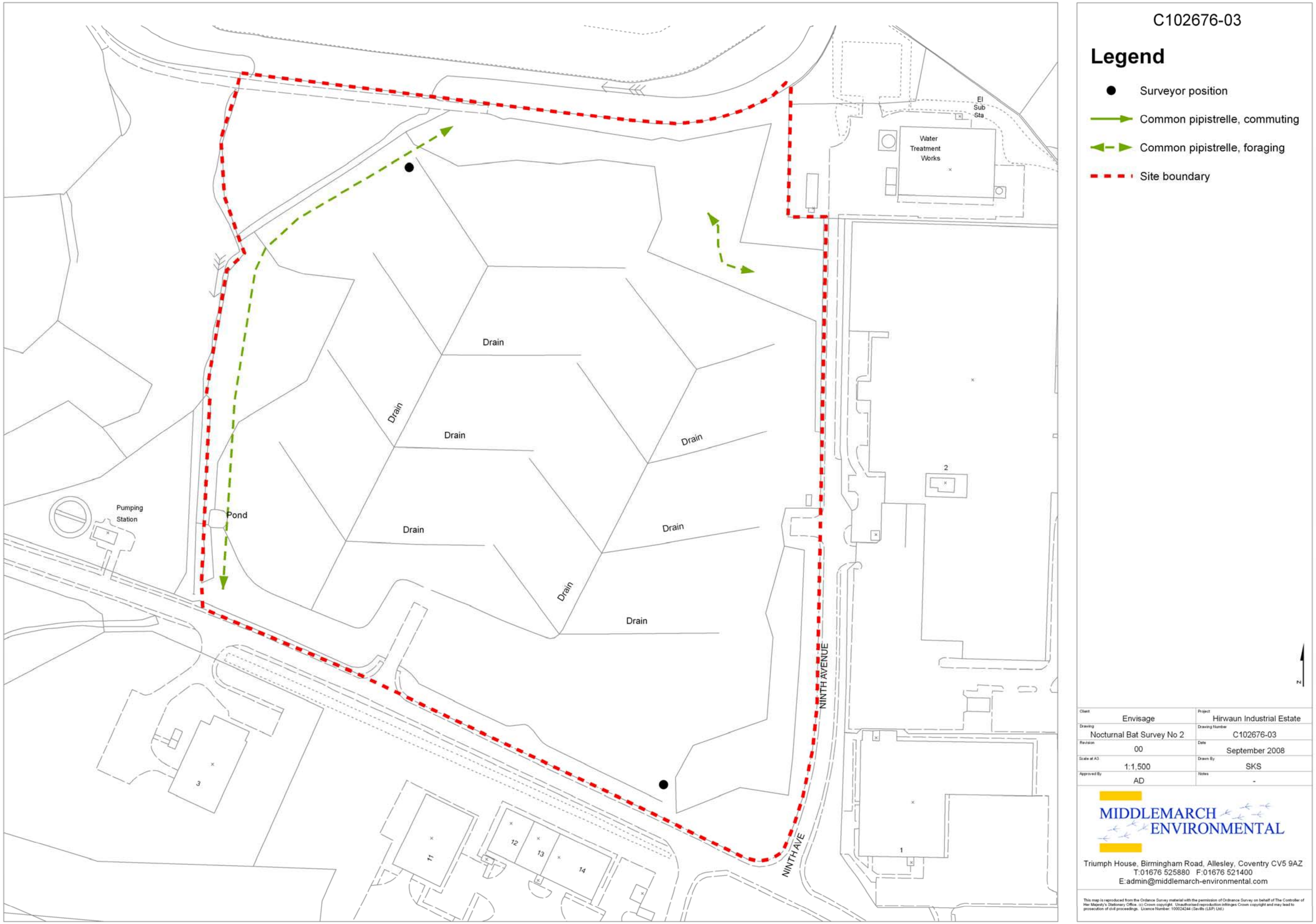
C102676-03
Legend
Surveyor position
Common pipistrelle, commuting
Common pipistrelle, foraging
Site boundary
Drain
Drain
Drain
Drain
Drain
Drain
Drain
Drain
Drain
Pond
Pumping Station
Water Treatment Works
El Sub Sta
NINTH AVENUE
NINTH AVE
N
Client
Envisage
Project
Hirwaun Industrial Estate
Drawing
Nocturnal Bat Survey No 2
Drawing Number
C102676-03
Revision
00
Date
September 2008
Scale at A3
1:1,500
Drawn By
SKS
Approved By
AD
Notes
-
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APPENDIX 3

Middlemarch Environmental Ltd Drawing Number C102676-04: Approximate locations of the breeding bird territories within the site.

C102676-04

Legend

Site boundary

Key:

B. - Blackbird
MP - Meadow pipit
R. - Robin
S. - Skylark
ST - Song thrush
TC - Tree creeper
WR - Wren
WW - Willow warbler

N

Client: Envisage	Project: Hirwaun Industrial Estate
Drawing: Breeding Bird Survey	Drawing Number: C102676-04
Revision: 00	Date: September 2008
Scale at A3: 1:1,500	Drawn By: SKS
Approved By: AD	Notes: -

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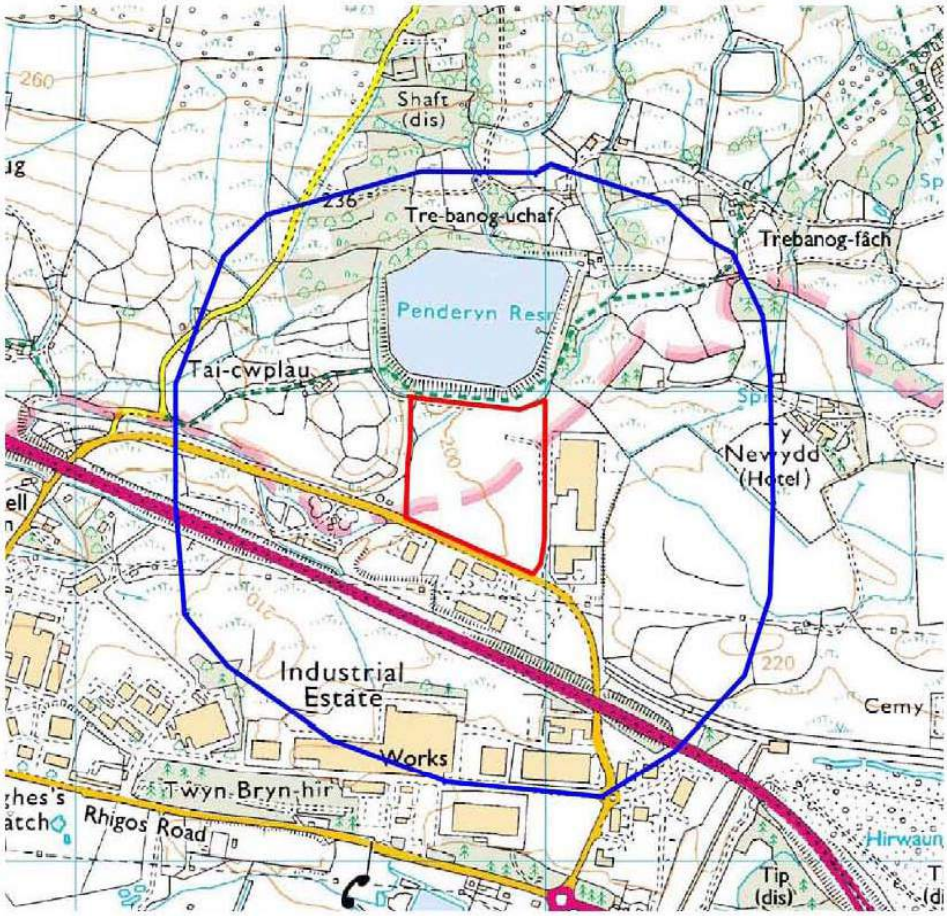
APPENDIX 4



Key	
	Site boundary
	Approximate 500 m radius from site boundary

MIDDLEMARCH ENVIRONMENTAL

Location of water bodies within a 500 m radius of the site boundary

Client:	Envisage
Site:	Hirwaun Industrial Estate
Drawing N°:	C102676-05
Scale:	Not to Scale
Date:	September 2008
Drawn by:	AD
Checked by:	KR

Great Crested Newt Habitat Suitability Index

Background

The Habitat Suitability Index (HSI) for the great crested newt was developed by Oldham *et al.* (2000). HSI scoring systems were originally developed by the US Fish and Wildlife Service as a means of evaluating habitat quality and quantity. An HSI is a numerical index, between 0 and 1. 0 indicates unsuitable habitat, 1 represents optimal habitat. The HSI for the great crested newt incorporates ten suitability indices, all of which are factors thought to affect great crested newts. These ten suitability indices are retained in this current Guidance Note.

The HSI system proposed by Oldham *et al.* (2000) is fairly easy to use. However, one suitability index (SI_9, terrestrial) involves a more lengthy measurement and calculation than the other factors. In using the HSI system with volunteer surveyors in Kent, Lee Brady substituted a simpler evaluation of terrestrial habitat quality, a four-point scale. Volunteers have found this modified HSI relatively easy to use.

Several other, local, surveys have utilised the HSI, but utilised their own variations on the original system. In 2007, a workshop was held at the Herpetofauna Workers' Meeting to evaluate the use of the HSI for the great crested newt, with the aims of:

- identifying components of the system that may need clarification or refinement
- agreeing on a standard that can be easily used by volunteers and professionals alike.

A conservative approach has been adopted in modifying the use of the original HSI suitability indices.

Use and limitations of HSI

The HSI for great crested newts is a measure of habitat suitability. It is not a substitute for newt surveys. In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to allow the conclusion that any particular pond with a high score will support newts, or that any pond with a low score will not do so.

There is also a positive correlation between HSI scores and the numbers of great crested newts observed in ponds. So, in general, high HSI scores are likely to be associated with greater numbers of great crested newts. However, the relationship is not sufficiently strong to allow predictions to be made about the numbers of newts in any particular pond.

HSI scoring can be useful in:

- Evaluating the general suitability of a sample of ponds for great crested newts
- Comparing general suitability of ponds across different areas
- Evaluating the suitability of receptor ponds in a proposed mitigation scheme.

How to collect data and calculate HSI

The HSI is a geometric mean of ten suitability indices:

$$HSI = (SI_1 \times SI_2 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/10}$$

- The ten Suitability Indices are scored for a pond, in the field and from map work.
- The ten field scores are then converted to SI scores, on a scale from 0.01 to 1 (0.01 is used as the bottom end of the range in stead of 0, because multiplying by 0 reduces all other SI scores to 0).
- The ten SI scores are then multiplied together.
- The tenth root of this number is then calculated $(X)^{1/10}$

The calculated HSI for a pond should score between 0 and 1.

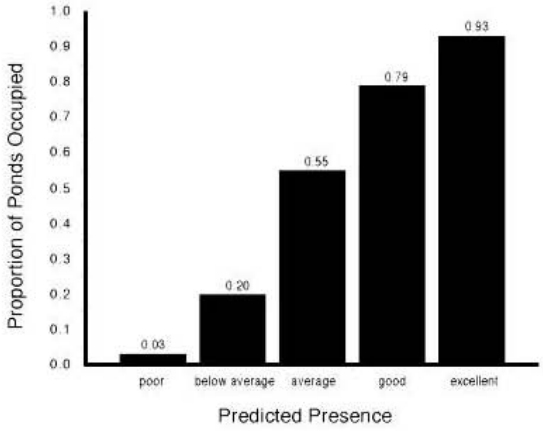
Some of the field scores are categorical, some are numerical. The numerical field scores are converted to SI scores by reading off the values from graphs produced by Oldham *et al.* (2000) reproduced in this Guidance Note.

The field scores are the data that should be collected by a surveyor. A summary of data to collect is given in *Summary of scoring system* below. More full details of the scoring system, including descriptions of the criteria used in the categorical scores are given in *Details of Suitability Indices and Definitions of Categories*. Two of the SI sores (SI_1 and SI_8) can be carried out as desktop/map exercises and so do not have to be completed in the field. The remaining SI scores should be recorded as field scores, and later converted to suitability indices, in some cases reading SI scores from the graphs provided in *Details of Suitability Indices and Definitions of Categories*.

Categorisation of HSI scores

Lee Brady has developed a system for using HSI scores to define pond suitability for great crested newts on a categorical scale:

HSI		Pond suitability
<0.5	=	poor
0.5 – 0.59	=	below average
0.6 – 0.69	=	average
0.7 – 0.79	=	good
> 0.8	=	excellent



2

Summary of scoring system

SI_1 Location

Field score	SI
A (optimal)	1
B (marginal)	0.5
C (unsuitable)	0.01

SI_2 Pond area

Field score	SI
Measure pond surface area (m^2) and round to nearest 50 m^2	Read off graph.

SI_3 Pond drying

Field score	SI	Criteria
Never	0.9	Never dries
Rarely	1.0	Dries no more than two years in ten or only in drought.
Sometimes	0.5	Dries between three years in ten to most years
Annually	0.1	Dries annually

SI_4 Water quality

Field score	SI	Criteria
Good	1.0	Abundant and diverse invertebrate community.
Moderate	0.67	Moderate invertebrate diversity
Poor	0.33	Low invertebrate diversity, few submerged plants
Bad	0.01	Clearly polluted, only pollution-tolerant invertebrates, no submerged plants.

SI_5 Shade

Field score	SI
Estimate percentage perimeter shaded to a least 1 m from shore.	Read off graph.

SI_6 Fowl

Field score	SI	Criteria
Absent	1	No evidence of water fowl (although moorhen may be present)
Minor	0.67	Waterfowl present, but little sign of impacts
Major	0.01	Severe impact of waterfowl

SI_7 Fish

Category	SI	Criteria
Absent	1	No records of fish stocking and no fish revealed during survey.
Possible	0.67	No evidence of fish, but local conditions suggest that they may be present.
Minor	0.33	Small numbers of crucian carp, goldfish or stickleback known to be present.
Major	0.01	Dense populations of fish known to be present.

SI_8 Ponds

Field score	SI
Count the number of ponds within 1 km of survey pond, not separated by major barriers, and divide by 3.14. This can be done from maps rather than in the field.	Read off graph.

SI_9 Terrestrial habitat

Field score	SI
Good	1
Moderate	0.67
Poor	0.33
None	0.01

SI_{10} Macrophytes

Field score	SI
Estimate the percentage of the pond surface area occupied by macrophyte cover (between May and the end of September)	Read off graph.

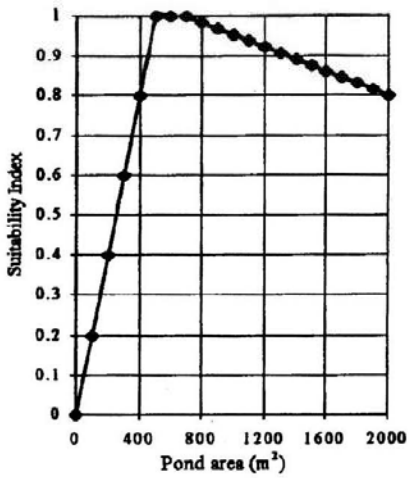
Details of Suitability Indices and Definitions of Categories

Factor 1. Geographic location (SI_1)

Sites should be scored according to the zone in which they occur. This scoring can be carried out either in the field, or as part of a desktop exercise.
Zone A, location is optimal, SI = 1
Zone B, location is marginal, SI = 0.5
Zone C, location is unsuitable, SI = 0.01.

Some sites will fall on boundary lines between zones. In such cases, select medium-value scores i.e. Zone B.

Factor 2. Pond area



Pond area is the surface area of the pond when water is at its highest level (excluding flooding events). This is usually in the spring. If the pond is being measured at another time of year, the springtime area should still be evident from vegetation types and evidence of a draw down zone around the pond.

Pond area should be measured as accurately as possible. There are several ways of doing this, for example by measuring axes of regularly shaped ponds, either by pacing out in the field, or using a map. Irregularly shaped ponds may have to be treated as a series of geometrical shapes, calculating the area for each and adding together.

Since it can be difficult reading off SI scores from graph, pond area should be rounded to nearest 50 m.

It can be particularly difficult to read off SI scores for very small ponds. For ponds smaller than 50 m^2 a score of 0.05 should be used.

Factor 3. Permanence

Pond permanence should be deduced from local knowledge and on personal judgement. A landowner may know how often a pond dries. However, if not, the surveyor should make a judgement based on water level at the time of the survey, and taking seasonality into consideration. For example, a pond that is already dry by late spring is likely to dry out every year, etc.

Category	SI	Criteria
Never dries	0.9	Never dries.
Rarely dries	1.0	Dries no more than two years in ten or only in drought.
Sometimes dries	0.5	Dries between three years in ten to most years.
Dries annually	0.1	Dries annually.

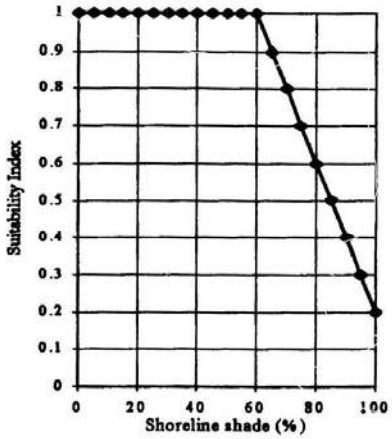
Factor 4. Water quality.

The assessment of water quality is subjective and should be based primarily on invertebrate diversity. Hence, water quality should not be confused with water clarity. Sometimes clear water can be devoid of invertebrates, and turbid ponds can support a wealth of invertebrates. There is no quick and simple invertebrate index of water quality. However, some species are indicators of water quality.

Category	SI	Criteria
Good	1.0	Water supports an abundant and diverse invertebrate community. Netting reveals handfuls of diverse invertebrates, including groups such as mayfly larvae and water shrimps.
Moderate	0.67	Moderate invertebrate diversity
Poor	0.33	Low invertebrate diversity (e.g. species such as midge and mosquito larvae. Few submerged plants.
Bad	0.01	Clearly polluted, only pollution-tolerant invertebrates (such as rat-tailed maggots), no submerged plants.

Other cues may also provide information about water quality. For example, ponds subject to agricultural inputs are likely to have poor water quality.

Factor 5. Shade



Estimate percentage pond perimeter shaded, to at least 1m from the shore. Shading is usually from trees, but can include buildings but should not include emergent pond vegetation. Estimate should be made during the period from May to the end of September.

Factor 6. Fowl

This factor is concerned with the impact of waterfowl upon a pond. At high densities, as created when waterfowl are encouraged to use a pond, by provision of food, the birds can remove all aquatic vegetation, pollute water and persistently stir sediments. Score as one of three categories.

Category	SI	Criteria
Absent	1	No evidence of waterfowl impact (moorhens may be present).
Minor	0.67	Waterfowl present, but little indication of impact on pond vegetation. Pond still supports submerged plants and banks are not denuded of vegetation.
Major	0.01	Severe impact of waterfowl. Little or no evidence of submerged plants, water turbid, pond banks showing patches where vegetation removed, evidence of provisioning waterfowl.

'Waterfowl' includes most water birds, such as ducks, geese and swans. Moorhens should be ignored because almost every pond has at least one or two.

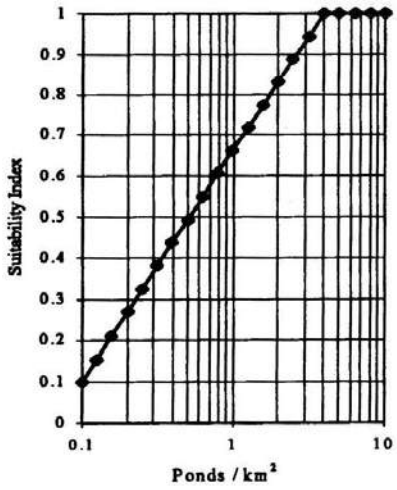
Factor 7. Fish

Information on fish should be gleaned from local knowledge and the surveyor's own observations. Pond owners will usually be aware of stocking with fish for commercial or aesthetic reasons. However, stickleback (which can be significant predators of great crested newt larvae, when present in large numbers) are unlikely to be

deliberately introduced to a pond, but may arrive through other means. Netting is useful in detecting smaller fish, such as sticklebacks, or the fry of larger species.

Category	SI	Criteria
Absent	1	No records of fish stocking and no fish revealed by netting or observed with torchlight.
Possible	0.67	No evidence of fish, but local conditions suggest that they may be present.
Minor	0.33	Small numbers of crucian carp, goldfish or stickleback known to be present.
Major	0.01	Dense populations of fish known to be present.

Factor 8. Pond count



This is the number of ponds occurring within 1 km of survey pond. Do not count the survey pond itself. Ponds on the far side of major barriers, such as main roads, should not be counted. Use 1:25,000 scale O.S. data, such as Explorer maps, GIS or web-based mapping sources. Pond counts can be carried out a by a survey coordinator and so do not necessarily have to be performed by surveyors.

Getamap	www.ordnancesurvey.co.uk/oswebsite/getamap/
Magic	www.magic.gov.uk/site_map.html
Digimap	edina.ac.uk/digimap/

Divide the number of ponds by Pi (3.14) to calculate the density of ponds per km^2, and read off graph.

Factor 9. Terrestrial

Scoring terrestrial habitat depends on the surveyor's understanding of newt habitat quality. Good terrestrial habitat offers cover and foraging opportunities and includes meadow, rough grassland, hedges, scrub and woodland. Terrestrial habitat should be considered only on the near side of any major barriers to dispersal (e.g. main roads or large expanses of bare habitat).

Category	SI	Criteria
Good	1	Extensive area of habitat that offers good opportunities for foraging and shelter completely surrounds pond (e.g. rough grassland, scrub or woodland).
Moderate	0.67	Habitat that offers opportunities for foraging and shelter, but may not be extensive in area and does not completely surround pond.
Poor	0.33	Habitat with poor structure that offers limited opportunities for foraging and shelter (e.g. amenity grassland).
None	0.01	Clearly no suitable habitat around pond (e.g. centre of large expanse of bare habitat).

Great crested newts do not have specific habitat requirements. However, good quality terrestrial habitat has structure. The presence of rabbit borrows, small mammal holes, proximity to old farm buildings, stone walls, piles of loose stone/rock all contribute towards 'good' terrestrial habitat. Note that it is rare to encounter a pond with a terrestrial habitat category of 'none'.

Factor 10. Macrophytes

Estimate the percentage of the pond surface area occupied by macrophyte cover. This includes emergents, floating plants (excluding duckweed) and submerged plants reaching the surface. Make estimate during the newt breeding season (March to May). Read off SI value from graph.

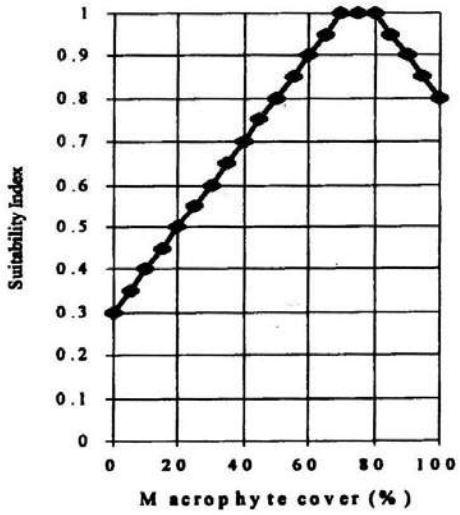
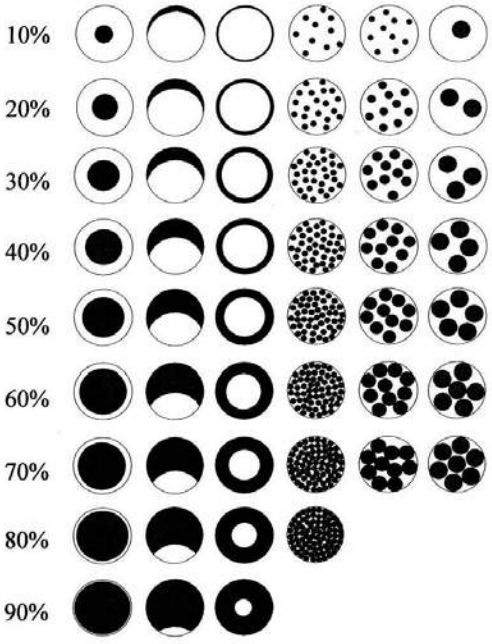


Fig. Guide for use in assessment of the proportions of vegetation cover in a pond. The areas of dark shading simulate a variety of vegetation dispersion patterns.



Reference

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

7

APPENDIX 5

Marsh Fritillary Transect Results

Middlemarch Environmental Ltd Drawing Number C102676-06: Visit 1 30th May 2008

Middlemarch Environmental Ltd Drawing Number C102676-07: Visit 2 30th June 2008

Middlemarch Environmental Ltd Drawing Number C102676-08: Visit 3 16th July 2008

C102676-06

Legend

- Location of Devil's bit scabious patch
- Survey transect
- Site boundary

Key:

CB - Common blue
WW - Wood white
OT - Orange tip
SW - Speckled wood

♂ - male

♀ - female

N

Client: Envisage	Project: Hirwaun Industrial Estate
Drawing: Marshy Fritillary Transect, Visit 1	Drawing Number: C102676-06
Revision: 00	Date: September 2008
Scale at A3: 1:1,500	Drawn By: SKS
Approved By: AD	Notes: -

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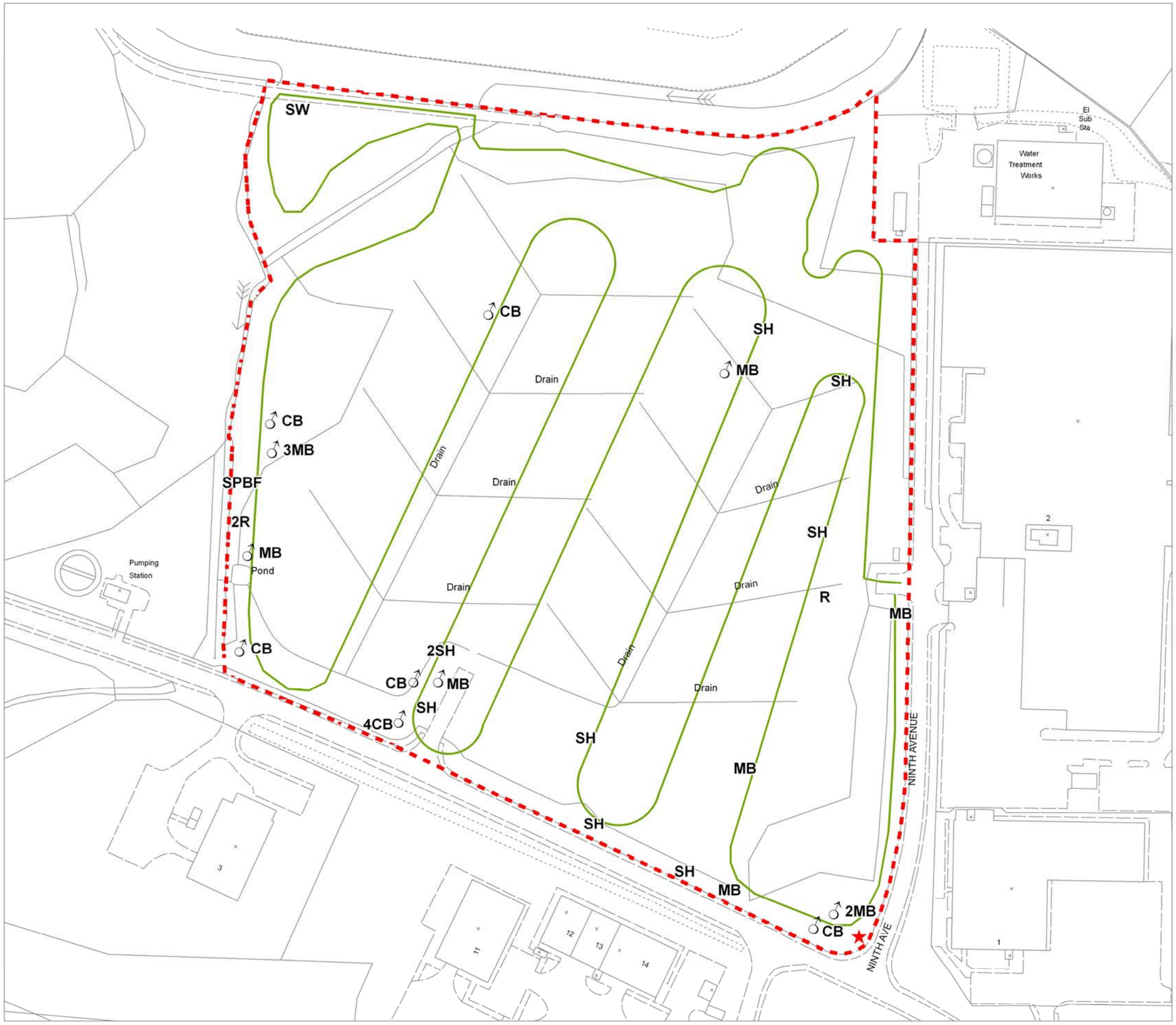

C102676-07

Legend

- Location of Devil's bit scabious patch
- Survey transect
- Site boundary

Key:

CB - Common blue
MB - Meadow brown
R - Ringlet
SH - Small heath
SPBF- Small pearl-bordered fritillary
SW - Speckled wood

♂ - male

♀ - female

N

Client: Envisage	Project: Hirwaun Industrial Estate
Drawing: Marshy Fritillary Transect, Visit 2	Drawing Number: C102676-07
Revision: 00	Date: September 2008
Scale at A3: 1:1,500	Drawn By: SKS
Approved By: AD	Notes: -

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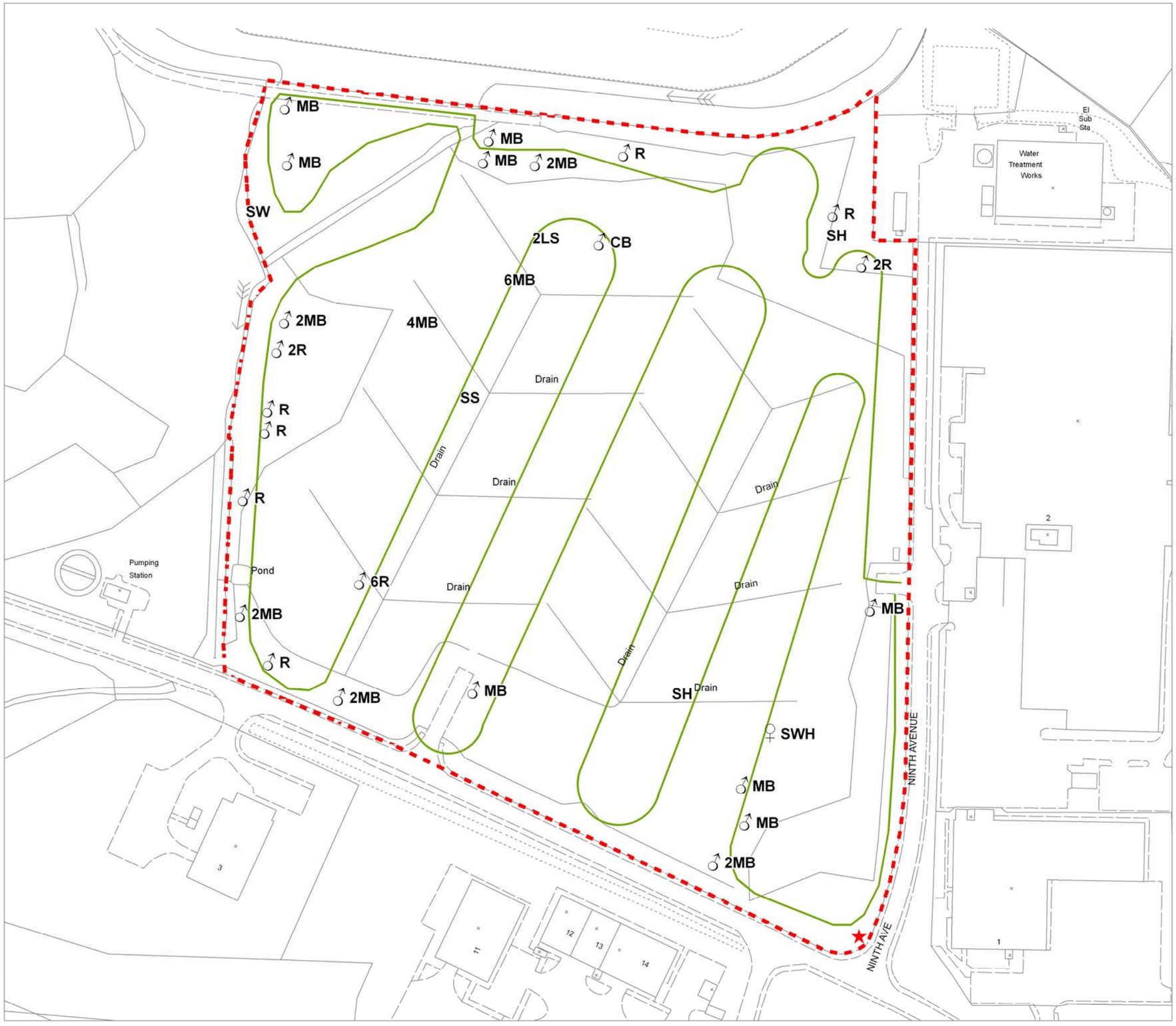

C102676-08

Legend

★ Location of Devil's bit scabious patch

Survey transect

Site boundary

Key:

CB - Common blue
LS - Large skipper
MB - Meadow brown
R - Ringlet
SH - Small heath
SS - Small skipper
SW - Speckled wood
SWH - Small white

♂ - male

♀ - female

N

Client: Envisage	Project: Hirwaun Industrial Estate
Drawing: Marshy Fritillary Transect, Visit 3	Drawing Number: C102676-08
Revision: 00	Date: September 2008
Scale at A3: 1:1,500	Drawn By: SKS
Approved By: AD	Notes: -

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APPENDIX 6

Middlemarch Environmental Ltd Drawing Number C102676-09: Location of Reptile Transects

C102676-09

Legend

Reptile transect

Site boundary

N

Client: Envisage	Project: Hirwaun Industrial Estate
Drawing: Reptile Transects	Drawing Number: C102676-09
Revision: 00	Date: September 2008
Scale at A3: 1:1,500	Drawn By: SKS
Approved By: AD	Notes: -

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MIDDLEMARCH ENVIRONMENTAL LTD

QUALITY ASSURANCE

TITLE: PROTECTED SPECIES SURVEYS
HIRWAUN INDUSTRIAL ESTATE

A Report to Envisage

Contract Number: C102676

Report Number: RT-MME-102676

Revision Number: 0

Description: Final

Date: September 2008

Checked by:

James Calow
Principal Consultant

Approved by:

Dr. Philip Fermor
Managing Director

1 BASELINE ECOLOGY

1.1 OVERVIEW

A site walkover survey was carried out on the 30th October 2007 to provide initial feedback on ecological issues. The walkover covered the site plus a 30 metre buffer and included Penderyn Reservoir to the north.

The site comprises a large open marshy grassland field intersected by a series of partially reinforced drainage ditches. Fenced areas of tree planting extend along the western and northern boundaries. A stream flows east-west along the northern site boundary and north-south along the western boundary. Penderyn Reservoir is located approximately 50 metres to the north.

1.2 NATURE CONSERVATION DESIGNATIONS

An initial desk study was undertaken involving a review of published information including Countryside Council for Wales (CCW) Protected Sites and Landscapes Map website, the Joint Nature Conservation Committee (JNCC) website.

1.2.1 *Statutory Nature Conservation Designations*

No statutory designations for nature conservation were identified within the proposed site boundary, although the following European site, a Special Area of Conservation (SAC) (1), and two national sites, Sites of Special Scientific Interest (SSSI) (2), occur within 2 km of the proposed site.

- Blaen Cynon SAC (66.8 ha), located approximately 200 m from the eastern site boundary at the nearest point, consists of areas of damp pastures and heaths which support the largest metapopulation of marsh fritillary butterfly, for which the site is designated.

- Cors Bryn-y-Gaer SSSI (52.3 ha), located approximately 200 m from the eastern site boundary. This site is of special interest for its lowland bog and for areas of soligenous flush, marshy grassland, dry neutral grassland and lowland acid grassland. These habitats occur in a complex with wet heath, swamp and semi-improved grassland. The sites are also of special interest for the marsh fritillary butterfly.

- Woodland Park and Pontpren SSSI (14.5 ha), located approximately 600 m from the north-eastern site boundary at the nearest point. This site is of

---

(1) Special Area of Conservation (SAC) is designated under the *European Directive on the Conservation of Natural Habitats and Wild Flora and Fauna (92/43/EEC)* (known as the *Habitats Directive*) to protect sites that are considered rare because of their habitats or the species contained within them. Enacted in the UK through the *Conservation (Natural Habitats &c) Regulations, 1994.*

(2) Site of Special Scientific Interest (SSSI) is a site notified by NE, under the provisions of the *WCA* as of national nature conservation or geological importance.

special interest for the marsh fritillary butterfly. Additional interest is provided by a mixture of habitat types which are suitable for the marsh fritillary butterfly, including marshy grassland, dry acid and neutral grassland, heathland and woodland.

1.3 BASELINE ECOLOGY OF THE SITE

A preliminary ecological walkover survey was undertaken within the site and surrounding areas up to 30 m by ERM in October 2007. Broad habitats across the site are classified according to *Handbook for Phase 1 Habitat Survey, JNCC, 1993.*

The site comprises a large open field occupied mostly by marshy grassland, which is intersected by a series of partially reinforced drainage ditches. Fenced areas of planted trees extend along the western and northern boundaries. A stream flows east-west along the northern site boundary and north-south along the western boundary. Mature broadleaved woodland occurs beyond the north-western site boundary, grassland pasture beyond the western site boundary, neighbouring industrial sheds to beyond the eastern site boundary and Penderyn reservoir to the north.

Penderyn reservoir is located approximately 50 m beyond the northern site boundary and falls inside the Brecon Beacons National Park Boundary. It is elevated above the site level by approximately 25 m with steep grass banks, of which the southern, eastern and western banks are reinforced and provide no shoreline. The northern bank supports semi-natural broadleaved woodland and has limited rocky shoreline which is frequently used by anglers.

1.3.1 *Protected Species*

An initial desk study to obtain available records from National Biodiversity Network (NBN) Gateway website has revealed the presence of the following protected species within the 10 km grid square incorporating the site: In addition, potential suitable habitat for a number of protected species was identified during the preliminary ecological walkover. The findings from the study and walkover are described below.

1.3.2 *European Protected Species*

Marsh fritillary butterfly [1]

Records exist approximately 200 m from the site associated with the neighbouring SAC and SSSI designations. Blaen Cynon SAC, Woodland Park

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(1) The marsh fritillary is included on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Annex IIa of the EC Habitats Directive (Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) and is a priority Biodiversity Action Plan species.

and Pontpren SSSI and Cors Bryn-y-Gaer SSSI are designated in particular for supporting marsh fritillary butterfly metapopulations.

The marshy grassland within the proposed site has some potential to support marsh fritillary butterfly. No record was made of *Succisa pratensis* (devil's-bit scabious), a flowering plant favoured by this butterfly, during the preliminary ecological walkover. It should be noted however that due to the late timing of the survey in the flowering season for this plant, this does not confirm absence. In addition, absence of this flowering plant would not necessarily imply absence of the marsh fritillary butterfly.

Otter [1]

Otter records exist for Llyn Fawr, approximately 3.5 km south-west of the proposed site.

The stream to the west and north supports suitable otter foraging habitat and otter have been recorded within the 10 km grid square and within 3.5 km of the site. Therefore it is likely further survey will be recommended for this species with mitigation developed as appropriate. Surveys for the presence of otter can be carried out at any time of year.

Water Vole [2]

No water vole records were identified during the initial desk study.

The preliminary ecological walkover noted potential water habitat along a section of the stream extending along the western site boundary, although this section is isolated to an extent due to the unsuitable nature of the banks further to the south and along the section extending along the northern site boundary.

Bats [3]

Bat records exist for *Chiroptera* species and common pipistrelle within the 10 km grid square.

No trees or structures with the potential to support bat roosts were recorded within the site or within a 10 m buffer. The adjacent mature woodland to the west may have the potential to provide bat roost habitat. The limited area of woodland associated with the stream and extending along the western and northern site boundaries offers potential foraging habitat for bats.

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(1) Protected under Annex IIa and IVa of the EC Habitats Directive (92/43/EC) and applied in the UK under Conservation (Natural Habitats &c.) (Amendment) Regulations 2007. Also a Schedule 5 species, receiving full protection under the Wildlife and Countryside Act, 1981

(2) Protected under the Wildlife and Countryside Act 1981 and amendments, Section 9 (4) only (as amended by the Nature Conservation (Scotland) Act 2004). This protects the water vole's places of shelter but does not safeguard the animal itself.

(3) Protected under the Wildlife and Countryside Act 1981 and amendments and the Conservation (Natural Habitats, & c) (Amendment) Regulations 2007.

1.3.3 *Nationally Protected Species*

Birds

Records of ring ouzel, listed as a Red List Species of Conservation Concern (RSPB, 2002 - 2007) [1], exist approximately 2 km south of the proposed site boundary. Records of lesser black-backed gull, an Amber List species, exist approximately 10 km of the site boundary. Red kite are also known to occur in the local area.

Penderyn reservoir is elevated above the site level with steep grass banks. Three of the sides to the south, east and west are reinforced and provide no shoreline. The northern bank is wooded and has limited rocky shoreline which is frequently used by anglers. The reservoir is likely to be used by passage and wintering waterfowl and breeding birds during the spring and summer.

The marshy grassland, tree scrub and woodland habitats have the potential to support nesting sites for breeding birds. A pair of buzzard was observed circling over the grassland within the site. A number of woodland species were heard or observed within the tree scrub and woodland habitat.

Badger [2]

There are records of badger within the OS 10 km grid square.

Woodland beyond the northern and western site boundaries has the potential to support badger setts, however no setts were recorded within the site or a 30 metre buffer of the site boundary.

1.4 *RECOMMENDATIONS*

Any recommendations will be subject to consultation with CCW and the local authorities and will be dependent upon the development proposals. Initial recommendations provided below are based on the initial site layout drawing *Rev 3* proposals. Discussions with CCW should be commenced as early as possible in order to confirm survey requirements and potential key impacts from the development.

1.4.2 *Statutory Nature Conservation Designations and Marsh Fritillary Butterfly*

The SAC and two SSSI are designated in particular for their special interest for supporting marsh fritillary butterfly metapopulations. The marshy grassland across the site has potential to support this species. Therefore it is advised that a survey to determine the presence or absence of this species is carried out during the optimum survey season from May to June inclusive. In addition, a

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(1) Gregory, R.D., Wilkinson, N.I., Noble, D.G., Robinson, J.A., Brown, A.F., Hughes, J., Procter, D.A., Gibbons, D.W., Galbraith, C.A. (2002) The population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 95: 410-450.

(2) Protected under the Protection of Badgers Act, 1992 and the Nature Conservation (Scotland) Act 2004.

botanical survey is recommended to determine the communities present and their likely suitability for marsh fritillary butterfly and to identify any rare or notable plant species. Given the European status of the marsh fritillary butterfly and the current unknown status of it within the site, further consultation will need to be carried out with the local invertebrate group and CCW before further recommendations can be given at this stage.

1.4.3 Penderyn Reservoir

Penderyn reservoir has no statutory designation; however falls inside the National Park Boundary and therefore the Local National Park Authority should be consulted on ecological issues. The reservoir has some potential to support wintering, breeding and passage birds. Cormorant and buzzard were recorded during the survey and red kite are known to occur in the local area. Further consultation will be needed with the local ornithological group, the local records centre, CCW and the Local National Park Authority to inform further survey work. It is likely that some wintering, breeding and passage survey effort will be recommended. Wintering surveys should be carried out between September and March. Breeding surveys, if required, should be carried out between April and July. Autumn passage surveys, if required, should be carried out between September and November and spring passage surveys between March and mid-May.

1.4.4 Otter

The stream to the west and north comprises suitable otter foraging habitat and otter have been recorded within the 10 km grid square and within 3.5 km of the site. Therefore it is likely that further survey will be recommended to determine presence and to provide recommendations for appropriate mitigation. Surveys for the presence of otter can be carried out at any time. Mitigation would depend on the precise nature of the proposed disturbance activities affecting the watercourse but given the proposal for the access road along the western boundary this could potentially involve the implementation of a precautionary stand off zone of no disturbance from the watercourse. Mitigation measures would need to be agreed in advance with CCW.

1.4.5 Water Vole

A section of the stream extending along the western site boundary has the potential to support water voles however the preliminary desk study did not find any records of water vole within the 10 km grid square. The results of consultation with the Mammal Society and Local Records Centre would need to be considered and a further survey to determine presence should be carried out from March to October inclusive. Mitigation would again depend on the precise nature of the proposed disturbance activities affecting the watercourse but could potentially involve the implementation of a precautionary stand off zone of no disturbance from the watercourse. Mitigation measures would need to be agreed in advance with CCW.

1.4.6 ***Bats***

No trees or structures with the potential to support bat roosts were recorded within the site or within a 10 m buffer. The adjacent mature woodland to the west has the potential to provide bat roost habitat. The limited area of woodland associated with the stream and extending along the western and northern site boundaries offers potential foraging habitat for bats. It is likely that a bat activity survey will be required if the trees are to be disturbed throughout development. Alternatively a precautionary working methodology should be agreed with CCW involving supervised felling by a licensed bat worker. Bat activity surveys can be carried out from May to September.

1.4.7 ***Birds***

There is potential for nest sites within the, tree scrub and mature trees across the site. There is some potential for wintering and ground nesting birds within the marshy grassland. Any vegetation clearance should be limited to outside the bird breeding season which extends from March to August inclusive to prevent disturbance to breeding birds.

In addition, it is recommended that a wintering bird survey is carried out between November and February to determine the presence of wintering birds within the grassland. Precautionary working measures could then be put in place in advance of on site disturbance activities to discourage use by wintering birds. Such deterrence measures could include a grid of flags planted across the site.

1.4.8 ***Badgers***

A further badger survey of the woodland to the north and west of the site should be carried out between November and June to determine the presence of setts. If active badger setts are found to be present within 30 m of the disturbance works, it is likely that appropriate precautionary methods of working could be agreed in advance with CCW. These could include appropriate stand offs for heaving and light machinery. If setts are found that are likely to be directly disturbed then it may become necessary to obtain a disturbance licence from CCW.