

PROPOSED COMMERCIAL DEVELOPMENT:
LAND AT PANT INDUSTRIAL ESTATE, DOWLAIS, MERTHYR
TYDFIL

ECOLOGICAL ASSESSMENT

JANUARY 2020

MKR Property Ltd

BE Ecological Ltd
2, Park View House,
Heolgerrig,
Merthyr Tydfil,
info@beecological.co.uk
www.beecological.co.uk

Page intentionally left blank

Pant Industrial Estate, Dowlais, Merthyr Tydfil

Proposed Commercial Development: Pant Industrial Estate

Ecological Assessment

Document control

Issue	Stage	Author	Checked	Approved	Date
1	DRAFT FOR COMMENT	Beth Evans	Hugh Dixon	Hugh Dixon	14.02.20

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Approved by	Date
1	VA	Minor Amendments	Hugh Dixon	16.03.20

Disclaimer

No part of this report may be copied or reproduced by any means without prior written permission from BE Ecological Ltd. If you have received this report in error, please destroy all copies in your possession or control.

This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by BE Ecological Ltd, no other party may use, make use of or rely on the contents of the report. No liability is accepted by BE Ecological Ltd for any use of this report, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in the report are on the basis of BE Ecological Ltd using due skill, care and diligence in the preparation of the same and no explicit warranty is provided as to their accuracy.

All documents remain the property of BE Ecological Ltd and may not be used for any purpose whatsoever until full payment has been received for them unless written permission has been sought and obtained from BE Ecological Ltd.

CONTENTS

NON-TECHNICAL SUMMARY	1
1 INTRODUCTION	2
1.1 OBJECTIVE	2
1.2 METHODOLOGY	2
1.3 SITE DESCRIPTION	2
1.4 PROPOSED DEVELOPMENT	5
1.5 STUDY AREA	5
2 REGULATORY FRAMEWORK	7
2.1 INTERNATIONAL	7
2.2 NATIONAL (UK)	7
2.3 NATIONAL (WALES)	8
2.4 LOCAL AND REGIONAL	8
2.5 PLANNING FRAMEWORK	8
2.6 PREVIOUS SURVEYS	8
2.7 CONSTRAINTS	8
3 DESK STUDY.....	9
3.1 SUMMARY	9
3.2 BACKGROUND	9
3.3 METHODOLOGY	9
3.4 CONSTRAINTS	9
3.5 RESULTS	9
3.6 PREVIOUS SURVEYS	13
4 PHASE 1 HABITAT SURVEY.....	14
4.1 SUMMARY	14
4.2 BACKGROUND	14
4.3 METHODOLOGY	14
4.4 CONSTRAINTS	15
4.5 RESULTS	15
5 PROTECTED SPECIES.....	20
5.1 BATS	20
5.2 BREEDING BIRDS	24
5.3 REPTILES	27
6 CONCLUSION AND RECOMMENDATIONS	30
7 REFERENCES.....	31
APPENDIX A - PHOTOS.....	32
APPENDIX B - DESIGNATED SITES: MEMORIAL PARK MEADOWS	37
APPENDIX C - SEWBRcC DATA SEARCH SUMMARY	38
APPENDIX D - TARGET NOTES	53

APPENDIX E - SPECIES LIST	54
APPENDIX F - SITE CLEARANCE METHOD STATEMENT (REPTILES)	55
APPENDIX G - REPTILE HIBERNACULUM DESIGN.....	57

Drawings

Drawing number	Title

NON-TECHNICAL SUMMARY

An ecological assessment was undertaken of land on Pant Industrial Estate, Dowlais, Merthyr Tydfil, South Wales in support of a planning application to erect light industrial units and associated infrastructure.

The work involved a phase 1 habitat survey to categorise the habitats present, an assessment of the site's ability to provide suitable habitats for protected species and recommendations for further survey and actions if considered necessary.

The habitats on the site comprise of semi-improved grassland, isolated scrub, bare ground, brash piles and a dry ditch

No non-native invasive species were observed on or immediately adjacent to the site.

There were no waterbodies on or immediately adjacent to the site which could be suitable for use by breeding great crested newts (or other amphibians).

No evidence of badger activity was recorded within or immediately adjacent to the site boundary.

It should be assumed that all areas of scrub will be utilised by nesting birds during the breeding season. There is no habitat suitable for ground nesting species.

The site provides reptiles with some limited habitat for foraging, basking, sheltering and hibernation purposes.

It is considered that no further ecological surveys are necessary at this stage although this will need to be reviewed in light of the final design.

All site clearance works should be undertaken in accordance with a method statement to ensure that amphibians, breeding birds and reptiles are not harmed at any stage of the project.

1 INTRODUCTION

1.1 OBJECTIVE

The objectives of this report are to:

- identify the habitats present on the site;
- identify the potential for protected species to be present on site;
- using the information gathered to determine whether there may be any impacts (both positive and negative) on protected species present;
- provide recommendations for further survey as necessary; and
- suggest outline mitigation and enhancement ideas and principles

1.2 METHODOLOGY

To achieve the objectives set out above, the following actions were taken:

- Field based assessments in respect of
 1. Habitats;
 2. Protected species, primarily:
 - i. Bats;
 - ii. Dormice;
 - iii. Otters;
 - iv. Amphibians (particularly great crested newt);
 - v. Badgers
 - vi. Reptiles; and
 - vii. Breeding birds

The impact assessment has been undertaken by ecological feature rather than by section i.e. each subject is discussed and assessed separately and summarised in conjunction with the others.

1.3 SITE DESCRIPTION

The red line development site boundary encloses an area of approximately 0.5ha and is located to the north of the A465 on Pant Industrial Estate (centred on NGR ST18659604) (Figures 1 & 2).

The site is a brownfield site that was previously used by the ICI as a chemical plant, leaving numerous ground contaminants. There are a number of remnants of the former buildings below ground level, namely footings, concrete slabs and potentially basement voids (although this is yet to be confirmed).

The area of land subject to survey is comprised of semi-improved (poor) grassland and bare ground (a mosaic of concrete and soil). There are isolated areas of scattered scrub in the corners of the site; these are comprised of bramble (*Rubus fruticosus*) and grey willow (*Salix cinerea*) with occasional silver birch (*Betula pendula*). The grassland is rank as a result of a lack of management and is being encroached by tall ruderal species such as rosebay willow herb (*Chamerion angustifolium*) and spear thistle (*Cirsium vulgare*). The grassland is thick with springy turf moss (*Rhytidiadelphus squarrosus*).

There are a number of brush piles on the site created in 2018 when scrub was cleared from the site. The species appear to be predominately grey willow and hawthorn (*Crataegus monogyna*).

There is a very small area (less than 5m²) of marshy grassland towards the sites north eastern corner, the vegetation here was dominated by pond sedge (*Carex riparia* sp.).

The site is level, set down from the northern boundary by approximately 2m and is of entirely made ground; there is a dry ditch on the sites southern boundary formed as a result of the ground levels being raised up.

The site is set in a wholly urban location being surrounded by commercial and industrial units. There is an area to the east of the site that is comprised of bare ground under a sparse canopy of grey willow and silver birch. There is no understorey. The ground layer is dominated by semi improved poor grassland with areas of bare ground.

Species lists and Photographs are at **Appendix A**.

Figure 1 – Detailed view of the site (site boxed red)



(Image courtesy of Google Earth)

Figure 2 – Overview of the development site



1.4 PROPOSED DEVELOPMENT

It is understood that the development proposal is for light industrial units (figure 3) with associated infrastructure (please see Feasibility Study, Powelldobson Architects, 2019 for further information).

1.5 STUDY AREA

The field survey looked at the red line development area itself and up to 20m from the site boundaries wherever possible.

The biological records search covered a search radius of 2000m from the centre of the development site for protected sites (international, national and local), protected and priority species, other species of conservation concern and locally important species. A buffer of 2000m was applied to locally designated sites.

[illegible]

2 REGULATORY FRAMEWORK

2.1 INTERNATIONAL

Prior to the 31st January 2020, European Union legislation required that member states designate sites for the protection of habitats and species included in the annexes of both Council Directive 92/43/EC on the Conservation of Natural Habitats and of Wild Flora and Fauna (the Habitats Directive) and Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). This legislation was implemented in the UK by the Conservation of Habitats and Species Regulations 2017 (“the Habitat Regulations”). This results in sites being designated as Special Areas of Conservation (SACs) and Special Protection Areas respectively (SPAs). Since the UKs exit from the European Union on 31st January 2020, the law responsible for continuing to implement this legislation through the transition period is The Conservation of Habitats and Species (Amendment) (EU EXIT) Regulations 2017. All legislation within the Conservation of Habitats and Species Regulation 2017 still apply within the UK under the amendment to the 2017 regulations until otherwise notified.

2.2 NATIONAL (UK)

The Wildlife and Countryside Act 1981 (as amended) allows sites to be designated as Sites of Special Scientific Interest (SSSI) for one or all of the following categories:

- Flora;
- Fauna;
- Habitat; and
- Geological importance.

European designated sites are automatically designated as SSSIs prior to their designation.

Other relevant legislation includes:

- The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- Countryside and Rights of Way Act 2000;
- Environment (Wales) Act 2016
- Wild Mammals (Protection) Act 1996;
- The Protection of Badgers Act 1992; and
- The Hedgerow Regulations 1997.

Section 40 of the Natural Environment and Rural Communities Act 2006 (as amended) requires all public bodies to have regard wherever possible to conserving biodiversity. Section 42 of the Act requires that a list of habitats and species of Principle Importance for the Conservation of Biological Diversity in Wales be produced; however, this has been replaced by Section 7 of the Environment (Wales) Act 2016 Priority Habitats and Species lists.

The Environment (Wales) Act 2016 requires that all public authorities, when carrying out their functions in Wales, seek to “maintain and enhance biodiversity” where it is within the proper exercise of their functions. In doing so, public authorities must also seek to “promote the resilience of ecosystems”.

This ensures that biodiversity is an integral part of the decisions that public authorities take in relation to Wales. It also links biodiversity with the long-term health and functioning of our ecosystems, therefore helping to align the biodiversity duty with the framework for sustainable natural resource management provided in the Act.

In Wales, this legislation replaces and enhances the Natural Environment and Rural Communities Act (2006) which sought to raise the profile of biodiversity and to make sure that it is considered in all local

authority decisions by ensuring that “Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.”.

Other elements of NERC 2006 may still apply.

Biodiversity Action Plans (BAPs) are tools which are used to monitor, manage and enhance those habitats and species which are of significance to an area or organisation, The United Kingdom BAP lists a number of priority habitats and species which are of conservation concern.

2.3 NATIONAL (WALES)

Planning Policy Wales (Welsh Government, 2016) and Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning (Welsh Assembly Government, September 2009) set out the protection given to wildlife (sites, habitats and species) by the planning system operational in Wales.

2.4 LOCAL AND REGIONAL

The proposed development is wholly within the Merthyr Tydfil County Borough Council (CCBC) area of responsibility. Therefore, all policies adopted by that Planning Authority will apply, including policies which may not be specific to nature conservation or the natural environment but that may apply or be relevant and should be considered during the planning process.

There are a number of habitats and species which are of a high priority to MTCBC. These have been determined following examination of the UK BAP and the Environment (Wales) Act Section 7 list of Priority Species and Habitats and those habitats and species determined to be locally important by the Local Biodiversity Partnership.

2.5 PLANNING FRAMEWORK

The proposed development will be undertaken wholly under the auspices of the Town and Country Planning Act 1990 (as amended).

2.6 PREVIOUS SURVEYS

There are no known previous surveys of this site.

2.7 CONSTRAINTS

The survey was undertaken at a time of year when the full botanical interest may not have been apparent.

3 DESK STUDY

3.1 SUMMARY

There are no records of any priority or protected species, species of local conservation concern or other species of conservation concern from the site or immediately adjacent to it. The closest records are from 318m away.

There is one Site of Special Scientific Interest within 2000m of the proposed development site.

A single Local Nature Reserve was identified within 2000m of the site.

Eight statutorily designated sites, e.g. Sites of Importance for Nature Conservation, were identified within the data search.

3.2 BACKGROUND

A desk study provides background information on historical and current biological data which can identify ecological constraints, mitigation, and biodiversity enhancement opportunities.

3.3 METHODOLOGY

The South East Wales Biodiversity Records Centre (SEWBReC) was consulted in order to provide biological information on the presence of species and sites on or adjacent to the site.

A 2000m search buffer was applied to priority and protected species, species of local conservation concern and other species of conservation concern, statutorily designated sites (for nature conservation purposes) and 2000m locally designated sites.

The Multi-Agency Geographical Information System (MAGIC) website (www.magic.gov.uk) and the Local Biodiversity Action Plan (LBAP) for MTCBC were also consulted.

3.4 CONSTRAINTS

There were no constraints to the data search

3.5 RESULTS

3.5.1 Statutorily protected sites

3.5.1.1 European designated sites

There are no European Designated Sites within 2000m of the development site.

3.5.1.2 United Kingdom designated sites

There is one Site of Special Scientific Interest (SSSI), Cwm Taff Fechan Woodlands, within the data search area, (details at **Table 2** below). The citation for this site is at **Appendix B**.

Table 2 - UK designated sites within 2km of Frontier Medical Group development site

Site	Designation	Grid reference	Area (ha)	Reason for designation
Cwm Taff Fechan Woodlands	SSSI	SO 052101	69ha	Woodland (please see Appendix B for citation)

The site is at a far enough distance from the site to not be impacted by the proposed development. There are no habitats or features on the site that the SSSI has been designated for. This site will not be discussed further in this report.

3.5.2 Non-statutory designations

There are no Sites of Importance for Nature Conservation (SINCs) on the development site. However, the site is within 2000m of eight SINCs.

Table 3 - non-statutorily designated sites within 2km of the proposed development site:

Site	Designation	Grid reference	Area (ha)	Reason for designation
Bryniau	SINC	Unknown	Unknown	Complex semi-upland area of limestone-influenced habitats, partly derived from old limestone quarries (Morlais Quarries) and screes associated with the former Morlais Castle. Part of the site is currently in use as a golf course. Extensive calcareous grasslands and screes supporting numerous rare and characteristic species, including nationally scarce plants. Also includes areas of neutral grassland and some small areas of acid grassland. Other habitats include limestone outcrops with ledge communities, bracken stands, limestone scrub and a pond.
Gyrnos Wood	SINC	Unknown	Unknown	Small area of wet woodland and an adjacent field supporting marshy grassland, acid grassland and bracken stands immediately to the north of the Heads of the Valleys Road. There are also some gritstone outcrops and scattered mature trees. The regionally scarce climbing corydalis is present in the bracken stands
Morlais Hill	SINC	Unknown	Unknown	Complex semi-upland area of limestone-influenced habitats, partly derived from old limestone quarries (Morlais Quarries) and screes

Site	Designation	Grid reference	Area (ha)	Reason for designation
				associated with the former Morlais Castle. Part of the site is currently in use as a golf course. Extensive calcareous grasslands and screes supporting numerous rare and characteristic species, including nationally scarce plants. Also includes areas of neutral grassland and some small areas of acid grassland. Other habitats include limestone outcrops with ledge communities, bracken stands, limestone scrub and a pond.
Cwm Tafechan	SINC	Unknown	Unknown	The SINC contains Cwm Taf Fechan SSSI. The limestone geology gives rise to limestone woodlands, species-rich calcareous grasslands, species-rich neutral grasslands and calcareous scrub. Many species of interest have been recorded from the woodlands which are the designated feature of the SSSI. The neutral and calcareous grasslands of the valley slopes and bottom are typically species-rich. Otter ranges along the Afon Taf Fechan, which also supports a range of native fish species including salmon. Nationally rare and scarce invertebrate and bryophyte species have been recorded from the SSSI.
Blaenmorlais	SINC	Unknown	Unknown	A large area supporting a mosaic of upland habitats at the western edge of Merthyr Common. Mainly acid grasslands with acidic flushes, grass-heaths, dry heathlands, marshy grasslands, bracken slopes and smaller areas of wet heathland and scrub. The site also contains small disused quarries (Garth Quarries) and acid screes. A section of the Nant Morlais within the site has steep valley sides with rocky outcrops. A large pond in the south of the site supports a regionally rare plant, and

Site	Designation	Grid reference	Area (ha)	Reason for designation
				several uncommon dragonflies. To the north the site contains an area of limestone spoil tips supporting unimproved upland calcareous grassland, as well as some limestone outcrops and scree.
Merthyr Common North	SINC	Unknown	Unknown	Very extensive area of upland common land supporting a mosaic of both wet and dry moorland habitats. These include extensive areas of unimproved acid grassland, marshy grassland, dry heathland and grass-heath, together with areas of wet heath, acid flush, bracken stands, scree and exposed gritstone bedrock. Tracts of modified blanket bog occur on the highest ground in the north-east of the site; these are often wet with abundant bog-mosses, although sometimes drier where drainage channels have been cut. Numerous small ponds and streams are present, including the headwaters of the Nant Morlais. Several ponds support floating bur-reed, a rare species in Glamorgan. In the north-west of the site, in contrast, there are areas of outcropping limestone, scree and extensive disused quarries (Twynau Gwynion) supporting calcicole grassland and ledge communities of very restricted occurrence in the County Borough. These areas are characteristically species rich, and support many regionally rare and scarce species. Numerous other localised plant species also occur in these habitats.
Taile Hydd	SINC	Unknown	Unknown	unknown
Cyfarthfa Park				Part of an area of mainly ornamental parkland within Merthyr Tydfil. The SINC includes semi-natural woodland and several enclosures of neutral

Site	Designation	Grid reference	Area (ha)	Reason for designation
				grassland in the eastern half of the park. Also includes small areas of plantation woodland and scrub and several woodland ponds.

There are a number of SINC sites within 500m of the site; the site is isolated from all areas which might have any ecological value by commercial and industrial buildings, roads, housing and associated infrastructure. It is therefore considered highly unlikely that any development on the site will adversely impact any of the SINC sites, whether they be within 500m of 2000m, and that therefore they will not be considered further in this report.

3.5.3 Species: SEWReC data search

There are no species records for the proposed development site or its immediate vicinity.

However, there are multiple records for protected species within 2000m of the site. A summary of the species found in the data search buffer and their legislative status is at **Appendix C**.

The records will be discussed through the relevant sections throughout this report.

3.6 PREVIOUS SURVEYS

None known.

4 PHASE 1 HABITAT SURVEY

4.1 SUMMARY

A number of habitats were recorded across and adjacent to the survey area. These included:

- Marshy grassland;
- Semi- improved grassland (poor);
- Isolated scrub;
- Bare ground
- Dry ditch; and
- Other

The potential for a number of protected species was recorded, including habitats suitable for:

- Bats;
- Badgers;
- Breeding birds;
- Reptiles
- Amphibians

The habitats are shown on **Figure 3** below.

4.2 BACKGROUND

The Phase 1 habitat survey was carried out to assess the existing habitats, identify any protected habitats or species that may be present, determine the impact of the proposed works on them, and identify any mitigation measures that may be necessary. This was done by undertaking both a desk study and field survey.

The survey was undertaken on Wednesday 5th February 2020

Phase 1 habitat survey is a way of recording the basic habitat data to form a baseline level of knowledge of the ecology of a site and provide recommendations for future surveys if considered necessary.

4.3 METHODOLOGY

4.3.1 Desk study:

A biological data search was undertaken. Refer to section 3 above.

4.3.2 Field survey:

Experienced surveyors from BE Ecological Ltd carried out a habitat assessment and mapping exercise in December 2019 using the Phase 1 habitat survey technique. Nomenclature follows Stace (1997)¹.

The survey was undertaken by Beth Evans and Hugh Dixon. Beth is the owner of BE ECOLOGICAL LTD and has a postgraduate degree in Environmental Biology: Conservation & Resource Management, specialising in British bats. Beth has 11 years experience of undertaking ecological surveys in both a small scale and large multidisciplinary context. Clients range from national government, local

¹ Stace, C (1997). *New Flora of the British Isles* (2nd Ed.). Cambridge University Press

government, commercial, private and third sector clients. Beth holds licences for bats in both Wales and England.

Hugh has over 20 years experience of ecological consultancy and countryside management gained in a variety of projects with clients ranging from national government, local government, commercial, private and third sector clients. Hugh has been a full member of CIEEM since 2006. Hugh has undertaken a wide range of surveys in respect of habitats and protected species throughout the UK. Hugh holds survey licences for bats, dormice and great crested newts in England and Wales and has held development licences for these groups.

Features of note are assigned Target Notes (TN) and referenced accordingly and described at **Appendix D**.

A full species list is at **Appendix E**.

4.4 CONSTRAINTS

There were no constraints.

4.5 RESULTS

4.5.1 Habitats

The following habitats were found on the site and are mapped on **Figure 3** below:

- Marshy grassland;
- Semi- improved grassland (poor);
- Isolated scrub;
- Bare ground
- Dry ditch; and
- Other

Photos are located at **Appendix A**.

Figure 3 – habitat survey results



4.5.1.1 *Marshy grassland*

This habitat is found in the north east corner of the site. It is no more than 5m² in extent. It has resulted from a depression in the ground retaining water over time (please note, this is not a pond, just a wet area).

Marshy grassland is a priority habitat under the Environment Wales Act 2016. However, due to its small size and lack of species, it is unlikely to be of any significant value. As such this habitat will not be discussed further in this report.

4.5.1.2 *Semi-improved grassland (poor)*

This habitat is found across the site. It is the dominant habitat on the site.

This habitat has a low local ecological interest as a result of the lack of diversity of herbs and grasses found within it and the previous land use of the site (chemical plant); however, its potential to provide protected species such as reptiles with suitable foraging and sheltering habitat raises its value. This habitat will be considered further in this report.

4.5.1.3 *Dry Ditch*

This habitat is only present due to the difference in ground level between the made up ground of the site and the site next door. This habitat is found along the southern boundary.

The ditch is of negligible ecological value and will not be discussed further in this report.

4.5.1.4 *Isolated Scrub*

This habitat is found in limited amounts along the peripheries of the site. It does not provide connections to the wider landscape.

This habitat is considered to be of moderate ecological value and will be discussed further in relation to invertebrates, birds and reptiles.

4.5.1.5 *Bare ground*

There are a number of areas of bare ground comprised of mud and concrete

In itself, this habitat has no ecological interest; however, the interface between it and the adjoining grassland and scrub can provide optimal foraging, basking and sheltering habitat for reptiles.

This habitat will not be specifically considered further in this report, but will be included within other habitat and species assessments.

4.5.1.6 *Other*

There are a number of brash piles scattered across the site where scrub has been removed in previous years.

These are of value to reptiles, breeding birds and invertebrates and will be discussed further in this report in relation to these species.

4.5.1.7 *Non-native invasive plants*

There are records of Japanese knotweed from within 315m of the site; however, there is no evidence of invasive plants on the site.

This classification will, therefore, be considered further in this report.

4.5.2 **Protected species assessment**

4.5.2.1 *Bats*

The closest record for members of this group is 142m from the centre of the proposed development site.

Above ground, there are no trees or buildings on the site that will support roosting bats. It is possible that there are basements beneath the ground level, however, this is yet to be confirmed.

It should be assumed that low numbers of bats are likely to forage occasionally over the site.

This group will be considered further in this report.

4.5.2.2 *Amphibians & great crested newt*

There are no waterbodies on the development site which could be used by this group for breeding purposes. The terrestrial habitat on the site could provide amphibians with suitable foraging and sheltering habitat. However, the nearest record of members of this group is a record of a single adult great crested newt approximately 454m to the north east of the site. The site and the record are separated by a number of industrial units and public highways. It is considered unlikely that great crested newt would utilise these features to access a site that does not have suitable breeding habitat.

It is considered that amphibians are unlikely to pose an ecological constraint to the development and that only common species (frog and toad with the possibility of smooth and / or palmate newts) are likely to be present on the site. Therefore, it is considered that this group can be safely dealt with via a reasonable avoidance method statement to prevent harm to individuals during site clearance. A method statement is attached at **Appendix F**.

This group will not be considered further in this report.

4.5.2.3 *Dormouse*

There are no records of this species within 2km of the development site.

There is some isolated scrub on the site that may be suitable for this species; however, the scrub is limited and not connected to the wider landscape in any shape or form. It is unlikely that the bramble would provide enough food for this species. Again it is unlikely that dormice would use the network of roads to areas of other suitable habitat to get to the development site because of the reasons outlined above. It is considered unlikely that dormice will be impacted by the proposed development.

Dormice will not be mentioned further in this report.

4.5.2.4 *Otters*

There are a number of records for this species in the data search, with the closest being from within 1505m from the centre of the proposed development site.

There are no watercourses on the development site which could be used by this species on the site; There is no suitable lying up habitat. The isolated scrub is considered too sparse for this purpose.

This species will be considered further in this report.

4.5.2.5 Badgers

There are a number of records for this species within the data search with the closest being a road casualty 1408m from the site.

No evidence of this species was recorded from the site or immediately adjacent land. There is not suitable sett excavation and foraging habitat present. It is possible that badger may pass through the site whilst looking for a food source. However, this is probably unlikely.

This species will not be considered further in this report.

4.5.2.6 Breeding birds

There are multiple records for members of this group within the data search but none from the site.

The only nesting bird habitat on the site is in the brash piles and isolated scrub. It should be assumed these are used for nesting purposes during the breeding season.

The habitats on the site are not considered to be suitable for ground nesting birds given the small overlooked nature of the site, the high levels of disturbance on the site, and the availability of avian predator perches.

Scrub and tree nesting species will be considered further in this report.

4.5.2.7 Reptiles

There are records of lizard and slow worm within 550m of the site.

At first glance, the site offers optimal habitat for this species for foraging, basking, sheltering and hibernation purposes. However, on closer inspection, the site is surrounded by roads and commercial infrastructure and highly disturbed. It is considered unlikely that the site is able to support large numbers of reptiles.

It should be assumed that low numbers of slow worm (*Anguis fragilis*) and common lizard (*Lacerta vivipara*) and grass snake (*Natrix natrix*) use the site. It is likely that the population densities of these species are at low levels given the amount of disturbance on the site.

This group will be considered further in this report.

4.5.3 Invertebrates

It is likely that common species of invertebrates will use the site. However, it is also likely that the site is contaminated. Where possible, enhancements for these species should be included within the final design. There are no food sources present on site that are suitable for rarer species of invertebrates.

5 PROTECTED SPECIES

5.1 BATS

5.1.1 Summary

The closest record for members for this group is 142m from the centre of the proposed development site.

Above ground, there are no trees or buildings on the site that will support roosting bats. It is possible that there are basements beneath the ground level, however, this is yet to be confirmed.

It should be assumed that low numbers of bats are likely to forage occasionally over the site.

5.1.2 Ecology

British bats are small flying nocturnal mammals that feed exclusively upon insects. There are 17 species resident in Britain, ranging in size from the smallest, soprano pipistrelle (*Pipistrellus pygmaeus*) up to the largest noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*) and greater horseshoe bat (*Rhinolophus ferrumequinum*). Bats are active from April through to October and hibernate when insects are in short supply in the winter months. Bats emerge from hibernation in late March - early April and move into their transition / intermediary roosts. Female bats will move to maternity sites by the beginning of May and will give birth to a single baby between June and early July. The baby is reared solely by the mother and is weaned and independent by end of August. After breeding, bats move to transition / intermediary roosts and females will visit males at mating roosts. During the autumn, bats feed voraciously to gain weight for the hibernation ahead.

Although traditionally trees, caves and rock faces were used by roosting bats and are still used, many different structures are used nowadays by bats, which take advantage of readymade (man made) roosts. Structures used frequently include bridges, ice-houses, pill-boxes, disused railway tunnels, houses and barns etc. Bats have home ranges which vary from species to species; from just 3-4km from the roost for the smaller bats while the larger noctule may fly 20km or more. Threats to bats include habitat destruction and the severance of commuting routes, use of agricultural pesticides, intensification of farming methods and deliberate persecution by man. Bats have few natural predators; however, the domestic cat is probably the most efficient predator.

5.1.3 Legislation

5.1.3.1 Conservation of Habitats & Species Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 (as amended) provides safeguards for Protected Species (those listed under Annex IV Habitats Directive). With regards to bats, this makes it an offence to:

- Deliberately (or recklessly in Scotland) capture, injure or kill a bat
- Deliberately (or recklessly in Scotland) disturb a bat in a way that would (significantly in Scotland) affect its ability to survive, breed or rear young (or hibernate or migrate in England, Wales and Northern Ireland) or (significantly in England, Wales and Scotland) affect the local distribution or abundance of the species.
- Damage or destroy a roost (this is an 'absolute' offence)
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat

It is possible to undertake damaging activities under the auspices of a European Protected Species Licence issued by Natural Resources Wales which provides a derogation from the Regulations, meaning that an otherwise illegal operation carried out under licence is lawful.

5.1.3.2 Wildlife & Countryside Act 1981

The Wildlife & Countryside Act 1981 (as amended) is the legislation for England and Wales for nature conservation, making it an offence to:

- Intentionally or recklessly disturb a bat in or at a roost;
- Intentionally or recklessly obstruct access to a roost;
- Intentionally destroy, damage or otherwise disturb a roost (whether bats are present or not); and
- Intentionally or recklessly kill, injure or take (capture) a bat.

5.1.3.3 The Environment (Wales) Act, 2016

The Environment (Wales) Act 2016 requires that all public authorities, when carrying out their functions in Wales, seek to “maintain and enhance biodiversity” where it is within the proper exercise of their functions. In doing so, public authorities must also seek to “promote the resilience of ecosystems”.

This ensures that biodiversity is an integral part of the decisions that public authorities take in relation to Wales. It also links biodiversity with the long-term health and functioning of our ecosystems, therefore helping to align the biodiversity duty with the framework for sustainable natural resource management provided in the Act.

In Wales, this legislation replaces and enhances the Natural Environment and Rural Communities Act (2006) which sought to raise the profile of biodiversity and to make sure that it is considered in all local authority decisions by ensuring that “Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.”.

Other elements of NERC 2006 may still apply.

5.1.4 Bats – Results

There are no trees or buildings on the site suitable for roosting bats. The trees on adjacent land, are thin, young and smooth barked and do not provide suitable habitat for bats either.

There are possibly basements beneath the ground level of the site but this is yet to be confirmed. There are no obvious access points into these areas and they are likely to be some distance beneath made up ground that is now covered in vegetation.

There is some limited foraging habitat available for bats, however, the site is not well connected to other, more suitable areas of foraging and commuting habitat.

CONFIDENCE LEVEL: HIGH

5.1.5 Bats – evaluation

Due to the above, it is considered unlikely that bats will be impacted by the proposed development. The surrounding area is well lit already and it is likely that light tolerant species will continue to forage over the site. It is thought unlikely that large numbers of bats will use the site for foraging due to a lack of connective habitat.

5.1.5.1 Roost locations

Not applicable.

CONFIDENCE LEVEL: HIGH

5.1.5.2 Incidental records

None.

5.1.6 Bats - impact characterisation

It is anticipated that there are no bat roosts on the site and that there will therefore be **no adverse impacts** on them as a result of the development.

It is likely that bat foraging habitat over the development site will be modified by the development. However, bats will be able to continue to forage over the site on completion of the development. It is unlikely that any lighting will impact bats due to the surrounding area already being disturbed and the subject of light pollution from street lights and adjacent buildings.

5.1.7 Bats - assessment without mitigation

It is considered that there will be **no adverse** impacts on bats as a result of the proposed development.

5.1.8 Bats - mitigation measures

Mitigation is not required unless it is found that bats use the basements that may or may not be present on the site. In this eventuality, the extent of mitigation will be determined by the classification of any roost found (e.g. maternity, day roost, night roost etc.), species and numbers of bats.

Protection and enhancement measures will include (but not be limited to):

- A check of the basements by a suitably qualified ecologist should they ever become accessible/exist
- Inclusion of suitable vegetation planting and management within the development proposals;
- Inclusion of bat boxes on new buildings within the new development.

It is recommended that enhancement features to benefit bats are included in the design for the development site. Such measures should include (but not be limited to):

- Inclusion of bat boxes within new buildings;
- Provision of pole mounted bat boxes;
- Inclusion of night flowering plants in the landscaping scheme to increase bat prey availability; and
- Sympathetic landscape planting to provide bats with foraging habitat.

5.1.9 Bats - impact characterisation with mitigation

It is considered that there will be **no adverse** impacts on bats as a result of the development.

5.1.10 Bats - significance of the impact

Without mitigation

It is considered that the significance of the impact is **slight**.

With mitigation

It is considered that the significance of the impact is **neutral**.

5.2 BREEDING BIRDS

5.2.1 Summary

A full breeding bird survey was not undertaken as it should be assumed that all the areas of scrub (both cut and retained) are likely to be used by birds for nesting.

It should be assumed that the isolated scrub and brash piles on the site is used by birds for breeding purposes during the nesting season.

The areas of grassland and bare ground are not considered to be suitable for ground nesting species for breeding purposes as they are small, overlooked and subject of regular disturbance.

5.2.2 Ecology

Most British avian species are found breeding during the spring and summer months, between April and August, although some, such as pigeons, and doves will frequently breed at all times of year, as they are not dependent on small, soft-bodied invertebrates to provide food for their chicks. Some other species, such as barn owl (*Tyto alba*) have also been recorded breeding in the winter months, in years when winters have been mild, and small mammal prey plentiful, although such breeding attempts are unusual, with chicks frequently failing to fledge. The breeding season can be extended for most species if the weather is mild, and food plentiful.

Contrary to common belief, whilst some bird species, such as crows and rooks, nest high in trees, often more than 10m high, the majority of British breeding birds will nest within 2m of the ground (or on the ground) within dense scrub or within holes and other natural and manmade cavities in rocks and walls.

Most bird species take considerably less than 60 days from egg-laying to chick fledging, whilst others, such as barn owl, can take more than 90 days. Many, but not all British species will make multiple breeding attempts if environmental conditions and food availability allow.

5.2.3 Legislation

In Britain, all naturally occurring avian species are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended). The legislation protects all birds, their nests and eggs, and it is an offence to:

- Intentionally kill, injure or take a wild bird;
- Intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built; and
- Intentionally take or destroy the egg of any wild bird.

In addition, birds listed on Schedule 1 of the Act, such as the Red Kite (*Milvus milvus*), are afforded further protection, and it is an offence to:

- Intentionally or recklessly disturb the bird whilst nest building or while at (or near) a nest with eggs or young; and
- Disturb the dependant young of such a bird.

5.2.4 Methodology

5.2.4.1 Habitat assessment

Signs looked for included:

- Availability of nesting habitat;
- Availability of foraging habitat;
- Territorial displays by birds;
- Courtship displays;
- Territory establishment and holding behaviour;
- Nests;
- Food carrying;

5.2.5 Constraints

There were no constraints to the assessment.

5.2.6 Results

5.2.6.1 Desk study

There were no record records of birds from the development site or immediately adjacent land, however, there were multiple records of birds from the data search, with the closest being of breeding mistle thrush and green finch at 937m and 1086m respectively.

5.2.6.2 Habitat assessment

The site was comprised of a mosaic of habitats including scrub, grassland and bare ground.

All habitats on the site were suitable for foraging purposes, providing a variety of food sources. It should be assumed that scrub habitats are used for nesting purposes during the breeding season.

It is considered that the site does not provide suitable habitat for ground nesting species as the open areas are small, overlooked by numerous trees and buildings, all of which could be used by avian predators and subject of regular disturbance.

5.2.7 Breeding birds – evaluation

Birds should be considered to be of **high national** importance as a result of the legislation protecting them.

Within the context of the site, there is limited suitable habitat for the smaller and more common species to utilise for nesting and foraging. It is therefore considered that birds are of a **medium local (site)** ecological importance.

5.2.8 Breeding birds - impact characterisation

It is anticipated that the main body of the site will be cleared in its entirety. It is not certain at this time how much, if any, of the woodland on the southern boundary will be cleared or cut back. Any removal of vegetation will result in the loss of bird breeding and foraging habitat.

5.2.9 Breeding birds - impact assessment without mitigation

In the absence of mitigation, the removal of vegetation during the breeding season would result in the likely disturbance and destruction of nests and the disturbance, killing and injuring of birds (both adults and juveniles). This would constitute a **certain moderate medium term adverse** impact at a **local (site)** level.

5.2.10 Breeding birds - mitigation measures

Mitigation will be required and will include (but not be limited to) the following measures:

- All vegetation and brash removal should be undertaken outwith the breeding season i.e. between mid-August / September and April inclusive;
- Any clearance close to the start and end of this period should only be undertaken following an assessment by a suitably experienced ecologist as the breeding season is not fixed and is subject to annual variation;
- Where clearance is required during the breeding season, all areas should be subject to an assessment no more than 48 hours in advance to check for the presence of breeding birds;
- Should evidence of breeding birds, in particularly nests, be recorded, no clearance may be undertaken within 15m of any nest site until such time as the nest is vacated naturally; and
- Any post-development landscaping plan should include the provision of scrub &/or tree habitats that can be utilised by breeding birds.

Consideration should be given to including measures to benefit birds within the development e.g. installation of bird boxes on new buildings.

5.2.11 Breeding birds - impact characterisation with mitigation

It is considered that there will be a **possible minor short term adverse** impact at a **local (site)** level on breeding birds as a result of the proposed development.

5.2.12 Breeding birds - significance of the impact

Without mitigation

It is considered that the significance of the impact is **slight**.

With mitigation

It is considered that the significance of the impact is **neutral**.

5.3 REPTILES

5.3.1 Summary

No reptile survey was undertaken on the site due to the time of year the visit was carried out; however, a habitat assessment indicated that the site provides optimal habitat for the most common reptile species. However, numbers on the site are likely to be reduced dramatically due to the isolated nature of the site.

A full trapping and translocation exercise is not considered necessary as long as clearance of the site is undertaken in strict adherence to a method statement designed to prevent harm to reptiles.

5.3.2 Ecology

Reptiles are ectothermic, meaning they have to rely on external heat sources to warm their blood sufficiently to allow foraging and other activity. During the winter they are in brumation (similar to hibernation), emerging in April (or when the temperatures are consistently warm enough). Males tend to emerge before females, to enable them to prepare for mating. Females emerge a few weeks later and mating takes place. Female reptiles in the UK generally breed every other year to allow them to build up sufficient energy reserves. Grass snakes are the UK's only egg-laying reptile, eggs are laid in summer in warm piles of decomposing vegetation (or similar) and left to develop and hatch on their own. Young reptiles are born/hatch in late summer/early autumn. Brumation (hibernation) starts again as temperatures fall in the autumn.

The four more commonly occurring species of reptile in the UK (adder (*Vipera berus*), grass snake (*Natrix natrix*) slow worm (*Anguis fragilis*) and common lizard (*Lacerta vivipara*) have different preferences for habitat and diet. Adders generally prey on small mammals in drier habitats, grass snakes primarily hunt amphibians in wetter areas and aquatic habitats, slow worms take small, slow-moving invertebrates and inhabit drier areas and common lizards prey on small, faster-moving invertebrates and tolerate both wet and dry habitats.

5.3.3 Legislation

The four common species listed above are protected by the Wildlife and Countryside Act 1981 (as amended) against killing, injury and sale.

Smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) are not found in this area, having very specific geographical distribution within Britain, and so will not be referred to in this report despite the higher legislative protection afforded to them.

5.3.4 Methodology

5.3.4.1 Habitat assessment

The habitat assessment looked for features which would be attractive to reptiles such as:

- south facing banks;
- varied profile ground form;
- basking areas;
- vegetation cover;
- structurally diverse vegetation;
- potential hibernation sites; and

- evidence of suitable prey sources.

5.3.5 Results

5.3.5.1 Desk study

There are records of lizard and slow worm within 550m of the site.

It should be assumed that low numbers of slow worm (*Anguis fragilis*) and common lizard (*Lacerta vivipara*) and possibly but a lot less likely grass snake (*Natrix natrix*) use the site. It is likely that the population densities of these species are at low levels given the amount of disturbance on the site along with its isolated nature.

This group will be considered further in this report.

5.3.5.2 Habitat assessment

At first glance, the site offers optimal habitat for this species for foraging, basking, sheltering and hibernation purposes. However, on closer inspection, the site is surrounded by roads and commercial infrastructure and is highly disturbed. It is considered unlikely that the site is able to support large numbers of reptiles.

The grassland and brash piles are suitable for foraging and hibernating reptiles.

5.3.6 Reptiles – evaluation

Reptiles are protected by UK legislation and therefore they are of **medium to high national** ecological importance.

It should be assumed that slow worm and common lizard are likely to utilise the site. Due to the size of the site, it is uncertain as to whether a full refugia survey would provide any information other than presence or absence. Therefore, an assumption of presence and undertaking works accordingly is an effective protection measure.

Overall the site appears to be generally of **moderate local (site)** value to reptiles.

5.3.7 Reptiles - impact characterisation

It is anticipated that the site will be largely cleared of vegetation, thereby removing the majority of the suitable habitat for this group. In the absence of mitigation, reptiles are likely to be killed or injured during the clearance for the site.

5.3.8 Reptiles - impact assessment without mitigation

It is considered that in the absence of mitigation there would be a **probable minor short term adverse** impact at a **local (site)** level.

5.3.9 Reptiles - mitigation measures

As long as reptile presence is assumed and site clearance is undertaken in accordance with an appropriate method statement, it is considered that a full trapping and translocation exercise is not required, and that habitat manipulation and denial is an appropriate method of ensuring that reptiles are not harmed during the site clearance.

Therefore, the following mitigation will be adopted:

- Clearance will be conducted in accordance with a Method Statement (**Appendix F**) to ensure that should reptiles be found in the course of site clearance or any other development activity, they will not be harmed and can be adequately cared for;
- Clearance will only be undertaken during the reptile active season (April-October, inclusive);
- Clearance outwith this period is possible, but depends on weather and temperatures being suitable to ensure that reptiles are likely to be active;
- There will be no clearance of hibernation habitat outwith the active season or within the correct temperatures;
- Reptiles will be excluded from entering or re-entering the site during clearance/operational phase of works by ensuring that the site is kept as bare ground i.e. clear of any vegetation or other shelter; and
- Any post development landscaping will incorporate a reptile hibernaculum (design at **Appendix G**) on the eastern boundary of the site to provide shelter for reptiles.
- The location of the hibernaculum will need to be within an area that will be accessible to reptiles on completion of the development

5.3.10 Reptiles - impact characterisation with mitigation

It is considered that there will be an **unlikely minor short term adverse** impact at a **local (site)** level as a result of the proposed development.

5.3.11 Reptiles - significance of the impact

Without mitigation

It is considered that the significance of the impact is **slight**.

With mitigation

It is considered that the significance of the impact is **neutral**.

6 CONCLUSION AND RECOMMENDATIONS

Overall the site is of a low to moderate ecological value at a local level due to the habitats present, and its isolated nature.

Breeding birds and reptiles should be assumed to be present on the site. Mitigation for these groups is therefore required. All site clearance should be undertaken under ecological supervision.

Site clearance in respect of reptiles should be undertaken in accordance with an appropriate method statement. This will also benefit other species (e.g. amphibians) which may otherwise be affected by site clearance.

It is considered that no other ecological surveys are required excluding a check of the potential basements for bats if it ever materialises that such basements are present on the site.

It is recommended that the mitigation measures, outlined in the various sections above are incorporated as far as is possible into the design process for this development. and construction methodologies.

It is recommended that consideration be given to the inclusion of enhancement features to benefit wildlife are included within the design of the industrial units and post-development landscaping scheme on the site.

7 REFERENCES

- Battersby, J. (Ed) & Tracking Mammals Partnership. (2005). UK Mammals: Species Status and Population Trends. First Report by the Tracking Mammals Partnership. JNCC/Tracking Mammals Partnership,
- Collins, J (Ed). Bat Surveys for Professional Ecologists - Good Practice Guidelines (BCT, 2016).
- Joint Nature Conservation Committee (2001) *Handbook for phase 1 habitat survey: A technique for environmental audit*. JNCC.
- Joint Nature Conservation Committee (2003). Herpetofauna Workers' Manual JNCC
- Mitchell-Jones, A.J. & McLeish, A.P. (2004) The bat workers' manual (3rd Edition). Joint Nature Conservation Committee.
- Mitchell-Jones, A.J. (2004). Bat Mitigation Guidelines. Natural England
- Planning Policy Wales (2013).
- Protection of Badgers Act (1992).
- Stace, C A (1997) *New Flora of the British Isles* (2nd Ed) Cambridge University Press
- The Conservation of Habitats and Species Regulations 2019.
- The Environment (Wales) Act 2016. (HMSO)
- The Natural Environment and Rural Communities Act (2006) (as amended) (HMSO).
- The Wildlife and Countryside Act 1981 (as amended).
- Welsh Assembly Government (2007). Planning Policy Wales Technical Advice Note 5: *Nature Conservation and Planning*.

APPENDIX A - PHOTOS

PHASE 1 HABITAT SURVEY PHOTOS

Plate 1 – Photograph of isolated scrub in north east corner of the development site



Plate 2 – photograph of bare ground with moss



Plate 3 – photograph of eastern boundary



Plate 4 – Photograph looking north west



Plate 5 – Photograph of adjoining habitat to the east



Plate 6 – Photograph of marshy grassland in north eastern corner



Plate 7– photograph facing south east



Plate 8 – photograph of surrounding habitat



Plate 9- marshy grassland



APPENDIX B - DESIGNATED SITES: MEMORIAL PARK MEADOWS

CYNGOR CEFN GWLAD CYMRU COUNTRYSIDE COUNCIL FOR WALES SITE OF
SPECIAL SCIENTIFIC INTEREST CITATION MERTHYR TYDFIL CWM TAF
FECHAN WOODLANDS

Date of Notification: 1972, 1985

National Grid Reference: SO 052101

O.S. Maps 1:50,000 Sheet number: 160 1:25,000

Sheet number: SO 00, 01, 10

Site Area: 60.9 ha Description:

Where the partially wooded valley of the Taf Fechan crosses the north crop Carboniferous Limestone. Mixed deciduous woodlands cover steep slopes and spoil from quarries with one of the few Glamorgan stations for *Gymnocarpium robertianum*. There are interesting plant communities in flushes around tufa springs and luxuriant growths of bryophytes in the splash zone of the river.

This document is NOT a definitive legal version and has been formatted, updated and partially edited for use on the CCW Web site. This document should not be used in any legal proceedings, public enquiry or any other hearing or appeal. If you require a full legal copy of the document please contact CCW in writing its nature conservation value.

:

APPENDIX C - SEWBRcC DATA SEARCH SUMMARY

PRIORITY AND PROTECTED SPECIES STATUS LISTS

actual_nam	common_nam	sup_group
Chara vulgaris	Common Stonewort	Algae
Chara	Chara	Algae
Acanthis cabaret	Lesser Redpoll	Birds
Accipiter nisus	Sparrowhawk	Birds
Acrocephalus schoenobaenus	Sedge Warbler	Birds
Acrocephalus scirpaceus	Reed Warbler	Birds
Actitis hypoleucos	Common Sandpiper	Birds
Aegithalos caudatus	Long-tailed Tit	Birds
Alauda arvensis	Skylark	Birds
Alcedo atthis	Kingfisher	Birds
Anas crecca	Teal	Birds
Anas penelope	Wigeon	Birds
Anas platyrhynchos	Mallard	Birds
Anthus pratensis	Meadow Pipit	Birds
Anthus trivialis	Tree Pipit	Birds
Apus apus subsp. apus	Apus apus subsp. apus	Birds
Apus apus	Swift	Birds
Ardea cinerea	Grey Heron	Birds
Aythya fuligula	Tufted Duck	Birds
Branta canadensis	Canada Goose	Birds
Bucephala clangula	Goldeneye	Birds
Buteo buteo	Buzzard	Birds
Carduelis carduelis	Goldfinch	Birds
Certhia familiaris	Treecreeper	Birds
Charadrius dubius	Little Ringed Plover	Birds
Chloris chloris	Greenfinch	Birds
Chroicocephalus ridibundus	Black-headed Gull	Birds
Cinclus cinclus	Dipper	Birds
Circus cyaneus	Hen Harrier	Birds
Columba oenas	Stock Dove	Birds
Corvus corax	Raven	Birds
Crex crex	Corncrake	Birds
Cuculus canorus	Cuckoo	Birds
Cyanistes caeruleus	Blue Tit	Birds
Cygnus columbianus	Bewick's Swan	Birds
Cygnus cygnus	Whooper Swan	Birds
Cygnus olor	Mute Swan	Birds
Delichon urbicum	House Martin	Birds
Dendrocopos major	Great Spotted Woodpecker	Birds
Emberiza schoeniclus	Reed Bunting	Birds
Falco columbarius	Merlin	Birds
Falco peregrinus	Peregrine	Birds
Falco tinnunculus	Kestrel	Birds

<i>Ficedula hypoleuca</i>	Pied Flycatcher	Birds
<i>Fulica atra</i>	Coot	Birds
<i>Gallinago gallinago</i>	Snipe	Birds
<i>Hirundo rustica</i>	Swallow	Birds
<i>Lagopus lagopus</i>	Red Grouse	Birds
<i>Larus argentatus</i>	Herring Gull	Birds
<i>Larus fuscus</i> subsp. <i>intermedius</i>	Black-Backed Gull	Birds
<i>Larus fuscus</i>	Lesser Black-backed Gull	Birds
<i>Larus glaucoides</i>	Iceland Gull	Birds
<i>Larus hyperboreus</i>	Glaucous Gull	Birds
<i>Larus marinus</i>	Great Black-backed Gull	Birds
<i>Linaria cannabina</i>	Linnet	Birds
<i>Loxia curvirostra</i>	Common Crossbill	Birds
<i>Lullula arborea</i>	Woodlark	Birds
<i>Melanitta nigra</i>	Common Scoter	Birds
<i>Mergus merganser</i>	Goosander	Birds
<i>Milvus milvus</i>	Red Kite	Birds
<i>Motacilla alba</i> subsp. <i>yarrellii</i>	Pied Wagtail	Birds
<i>Motacilla alba</i>	Pied Wagtail	Birds
<i>Motacilla cinerea</i>	Grey Wagtail	Birds
<i>Motacilla</i>	Motacilla	Birds
<i>Muscicapa striata</i>	Spotted Flycatcher	Birds
<i>Numenius arquata</i>	Curlew	Birds
<i>Oenanthe oenanthe</i>	Wheatear	Birds
<i>Pandion haliaetus</i>	Osprey	Birds
<i>Parus major</i>	Great Tit	Birds
<i>Passer domesticus</i>	House Sparrow	Birds
<i>Perdix perdix</i>	Grey Partridge	Birds
<i>Periparus ater</i>	Coal Tit	Birds
<i>Phalacrocorax carbo</i>	Cormorant	Birds
<i>Phoenicurus phoenicurus</i>	Redstart	Birds
<i>Phylloscopus collybita</i>	Chiffchaff	Birds
<i>Phylloscopus sibilatrix</i>	Wood Warbler	Birds
<i>Phylloscopus trochilus</i>	Willow Warbler	Birds
<i>Picus viridis</i>	Green Woodpecker	Birds
<i>Plectrophenax nivalis</i>	Snow Bunting	Birds
<i>Podiceps cristatus</i>	Great Crested Grebe	Birds
<i>Poecile montana</i>	Willow Tit	Birds
<i>Poecile palustris</i>	Marsh Tit	Birds
<i>Prunella modularis</i>	Dunnock	Birds
<i>Pyrrhula pyrrhula</i>	Bullfinch	Birds
<i>Recurvirostra avosetta</i>	Avocet	Birds
<i>Regulus regulus</i>	Goldcrest	Birds
<i>Riparia riparia</i>	Sand Martin	Birds
<i>Saxicola rubetra</i>	Whinchat	Birds
<i>Saxicola rubicola</i>	Stonechat	Birds
<i>Scolopax rusticola</i>	Woodcock	Birds
<i>Sitta europaea</i>	Nuthatch	Birds

<i>Spinus spinus</i>	Siskin	Birds
<i>Strix aluco</i>	Tawny Owl	Birds
<i>Sturnus vulgaris</i>	Starling	Birds
<i>Sylvia atricapilla</i>	Blackcap	Birds
<i>Sylvia borin</i>	Garden Warbler	Birds
<i>Sylvia communis</i>	Whitethroat	Birds
<i>Sylvia undata</i>	Dartford Warbler	Birds
<i>Tachybaptus ruficollis</i>	Little Grebe	Birds
<i>Tringa ochropus</i>	Green Sandpiper	Birds
<i>Turdus iliacus</i>	Redwing	Birds
<i>Turdus merula</i>	Blackbird	Birds
<i>Turdus philomelos</i>	Song Thrush	Birds
<i>Turdus pilaris</i>	Fieldfare	Birds
<i>Turdus torquatus</i>	Ring Ouzel	Birds
<i>Turdus viscivorus</i>	Mistle Thrush	Birds
<i>Tyto alba</i>	Barn Owl	Birds
<i>Vanellus vanellus</i>	Lapwing	Birds
<i>Amblystegium confervoides</i>	Tiny Feather-moss	Bryophytes
<i>Amphidium mougeotii</i>	Mougeot's Yoke-moss	Bryophytes
<i>Andreaea rothii</i> subsp. <i>falcata</i>	<i>Andreaea rothii</i> subsp. <i>falcata</i>	Bryophytes
<i>Anoetangium aestivum</i>	Summer-moss	Bryophytes
<i>Anomobryum concinnum</i>	<i>Anomobryum concinnum</i>	Bryophytes
<i>Anomodon viticulosus</i>	Rambling Tail-moss	Bryophytes
<i>Bartramia pomiformis</i>	Common Apple-moss	Bryophytes
<i>Brachythecium glareosum</i>	Streaky Feather-moss	Bryophytes
<i>Brachythecium salebrosum</i>	Smooth-stalk Feather-moss	Bryophytes
<i>Bryum algovicum</i>	Drooping Thread-moss	Bryophytes
<i>Bryum argenteum</i>	Silver-moss	Bryophytes
<i>Bryum imbricatum</i>	Small-mouthed Thread-moss	Bryophytes
<i>Bryum pallens</i>	Pale Thread-moss	Bryophytes
<i>Bryum pallescens</i>	Tall-clustered Thread-moss	Bryophytes
<i>Calliergonella lindbergii</i>	Lindberg's Plait-moss	Bryophytes
<i>Campyliadelphus chrysophyllus</i>	Golden Feather-moss	Bryophytes
<i>Campylium protensum</i>	<i>Campylium protensum</i>	Bryophytes
<i>Campylium stellatum</i>	Yellow Starry Feather-moss	Bryophytes
<i>Campylopus atrovirens</i>	Bristly Swan-neck Moss	Bryophytes
<i>Cephaloziella divaricata</i>	Common Threadwort	Bryophytes
<i>Cephaloziella hampeana</i>	Hampe's Threadwort	Bryophytes
<i>Climacium dendroides</i>	Tree-moss	Bryophytes
<i>Cololejeunea calcarea</i>	Rock Pouncewort	Bryophytes
<i>Conocephalum salebrosum</i>	<i>Conocephalum salebrosum</i>	Bryophytes
<i>Ctenidium molluscum</i>	Chalk Comb-moss	Bryophytes
<i>Dichodontium flavescens</i>	Yellowish Fork-moss	Bryophytes
<i>Dichodontium palustre</i>	Marsh Forklet-moss	Bryophytes
<i>Dichodontium pellucidum</i>	Transparent Fork-moss	Bryophytes
<i>Dicranum fuscescens</i> agg.	<i>Dicranum fuscescens</i> agg.	Bryophytes
<i>Dicranum majus</i>	Greater Fork-moss	Bryophytes
<i>Didymodon ferrugineus</i>	Rusty Beard-moss	Bryophytes

Didymodon icmadophilus	Slender Beard-moss	Bryophytes
Didymodon spadiceus	Brown Beard-moss	Bryophytes
Distichium capillaceum	Fine Distichium	Bryophytes
Distichium inclinatum	Inclined Distichium	Bryophytes
Ditrichum flexicaule agg.	Ditrichum flexicaule agg.	Bryophytes
Ditrichum flexicaule	Bendy Ditrichum	Bryophytes
Ditrichum gracile	Slender Ditrichum	Bryophytes
Encalypta vulgaris	Common Extinguisher-moss	Bryophytes
Entosthodon fascicularis	Hasselquist's Hyssop	Bryophytes
Entosthodon obtusus	Blunt Cord-moss	Bryophytes
Eucladium verticillatum	Whorled Tufa-moss	Bryophytes
Fissidens crispus	Herzog's Pocket-moss	Bryophytes
Fissidens incurvus	Short-leaved Pocket-moss	Bryophytes
Fissidens osmundoides	Purple-stalked Pocket-moss	Bryophytes
Fissidens rufulus	Beck Pocket-moss	Bryophytes
Frullania teneriffae	Sea Scalewort	Bryophytes
Grimmia orbicularis	Round-fruited Grimmia	Bryophytes
Gymnostomum aeruginosum	Verdigris Tufa-moss	Bryophytes
Gymnostomum calcareum	Blunt-leaf Tufa-moss	Bryophytes
Habrodon perpusillus	Lesser Squirrel-tail Moss	Bryophytes
Hedwigia ciliata	Fringed Hoar-moss	Bryophytes
Hennediella heimii	Heim's Pottia	Bryophytes
Homalothecium lutescens	Yellow Feather-moss	Bryophytes
Hygroamblystegium fluviatile	Brook-side Feather-moss	Bryophytes
Hygroamblystegium tenax	Fountain Feather-moss	Bryophytes
Hygrohypnum luridum var. luridum	Hygrohypnum luridum var. luridum	Bryophytes
Hygrohypnum ochraceum	Claw Brook-moss	Bryophytes
Hymenostylium recurvirostrum	Hook-beak Tufa-moss	Bryophytes
Hypnum cupressiforme var. lacunosum	Roof Plait-moss	Bryophytes
Jungermannia atrovirens	Dark-green Flapwort	Bryophytes
Kindbergia praelonga	Common Feather-moss	Bryophytes
Leiocolea badensis	Scarce Notchwort	Bryophytes
Leiocolea bantriensis	Bantry Notchwort	Bryophytes
Leiocolea turbinata	Top Notchwort	Bryophytes
Lejeunea cavifolia	Micheli's Least Pouncewort	Bryophytes
Loeskeobryum brevirostre	Short-beaked Wood-moss	Bryophytes
Marchantia polymorpha subsp. polymorpha	Marchantia polymorpha subsp. polymorpha	Bryophytes
Microbryum davallianum	Smallest Pottia	Bryophytes
Mnium marginatum var. marginatum	Mnium marginatum var. marginatum	Bryophytes
Mnium marginatum	Bordered Thyme-moss	Bryophytes
Mnium stellare	Starry Thyme-moss	Bryophytes
Neckera crispa	Crisped Neckera	Bryophytes
Nowellia curvifolia	Wood-rust	Bryophytes
Orthothecium intricatum	Fine-leaved Leskea	Bryophytes
Orthotrichum cupulatum	Hooded Bristle-moss	Bryophytes
Orthotrichum pulchellum	Elegant Bristle-moss	Bryophytes
Orthotrichum stramineum	Straw Bristle-moss	Bryophytes

Orthotrichum tenellum	Slender Bristle-moss	Bryophytes
Oxyrrhynchium pumilum	Dwarf Feather-moss	Bryophytes
Palustriella commutata	Curled Hook-moss	Bryophytes
Palustriella falcata	Palustriella falcata	Bryophytes
Pellia neesiana	Nees' Pellia	Bryophytes
Plagiochila britannica	British Featherwort	Bryophytes
Plagiomnium cuspidatum	Woodsy Thyme-moss	Bryophytes
Platydictya jungermannioides	Spruce's Leskea	Bryophytes
Pleuridium subulatum	Awl-leaved Earth-moss	Bryophytes
Pohlia wahlenbergii	Pale Glaucous Thread-moss	Bryophytes
Polytrichastrum alpinum	Alpine Haircap	Bryophytes
Polytrichum strictum	Strict Haircap	Bryophytes
Porella platyphylla	Wall Scalewort	Bryophytes
Preissia quadrata	Narrow Mushroom-headed Liverwort	Bryophytes
Ptilidium ciliare	Ciliated Fringewort	Bryophytes
Racomitrium canescens agg.	Racomitrium canescens agg.	Bryophytes
Racomitrium ericoides	Dense Fringe-moss	Bryophytes
Racomitrium fasciculare	Green Mountain Fringe-moss	Bryophytes
Reboulia hemisphaerica	Hemisphaeric Liverwort	Bryophytes
Rhizomnium pseudopunctatum	Felted Thyme-moss	Bryophytes
Rhynchostegiella teneriffae	Teesdale Feather-moss	Bryophytes
Rhynchostegium murale	Wall Feather-moss	Bryophytes
Riccardia palmata	Palmate Germanderwort	Bryophytes
Riccia beyrichiana	Purple Crystalwort	Bryophytes
Riccia subbifurca	Least Crystalwort	Bryophytes
Sanionia uncinata	Sickle-leaved Hook-moss	Bryophytes
Sarmentypnum exannulatum	Ringless Hook-moss	Bryophytes
Scapania aspera	Rough Earwort	Bryophytes
Scapania nemorea	Grove Earwort	Bryophytes
Schistidium rivulare	River Grimmia	Bryophytes
Sciuro-hypnum populeum	Matted Feather-moss	Bryophytes
Scorpidium cossonii	Intermediate Hook-moss	Bryophytes
Scorpiurium circinatum	Curving Feather-moss	Bryophytes
Seligeria acutifolia	Sharp Rock-bristle	Bryophytes
Seligeria pusilla	Dwarf Rock-bristle	Bryophytes
Solenostoma paroicum	Shining Flapwort	Bryophytes
Syntrichia ruralis var. ruraliformis	Sand-hill Screw-moss	Bryophytes
Taxiphyllum wissgrillii	Depressed Feather-moss	Bryophytes
Thamnobryum alopecurum	Fox-tail Feather-moss	Bryophytes
Thuidium assimile	Philibert's Tamarisk-moss	Bryophytes
Tortella nitida	Neat Crisp-moss	Bryophytes
Tortella tortuosa	Frizzled Crisp-moss	Bryophytes
Tortula modica	Blunt-fruited Pottia	Bryophytes
Tortula subulata	Awl-leaved Screw-moss	Bryophytes
Weissia controversa var. controversa	Weissia controversa var. controversa	Bryophytes
Weissia controversa var. crispata	Weissia controversa var. crispata	Bryophytes
Weissia controversa	Green-tufted Stubble-moss	Bryophytes
Zygodon conoideus	Lesser Yoke-moss	Bryophytes

Cottus gobio	Bullhead	Fish
Salmo salar	Atlantic Salmon	Fish
Salmo trutta subsp. fario	Brown Trout	Fish
Salmo trutta	Brown/Sea Trout	Fish
Clavulinopsis laeticolor	Handsome Club	Fungi and Slimy
Gliophorus laetus	Heath Waxcap	Fungi and Slimy
Gliophorus psittacinus	Parrot Wax-Cap	Fungi and Slimy
Hygrocybe calciphila	Limestone Waxcap	Fungi and Slimy
Hygrocybe calyptriformis var. calyptriformis	Pink meadow cap	Fungi and Slimy
Hygrocybe ceracea	Butter Waxcap	Fungi and Slimy
Hygrocybe chlorophana	Golden Waxcap	Fungi and Slimy
Hygrocybe coccinea	Scarlet Hood	Fungi and Slimy
Hygrocybe colemanniana	Toasted Waxcap	Fungi and Slimy
Hygrocybe conica	Blackening Wax-Cap	Fungi and Slimy
Hygrocybe fornicata	Hygrocybe fornicata	Fungi and Slimy
Hygrocybe helobia	Garlic Waxcap	Fungi and Slimy
Hygrocybe insipida	Spangle Waxcap	Fungi and Slimy
Hygrocybe intermedia	Fibrous Waxcap	Fungi and Slimy
Hygrocybe miniata	Vermilion Waxcap	Fungi and Slimy
Hygrocybe mucronella	Bitter Waxcap	Fungi and Slimy
Hygrocybe pratensis var. pallida	Pale Waxcap	Fungi and Slimy
Hygrocybe pratensis var. pratensis	Meadow Wax-Cap	Fungi and Slimy
Hygrocybe reidii	Honey Waxcap	Fungi and Slimy
Hygrocybe russocoriacea	Cedarwood Waxcap	Fungi and Slimy
Hygrocybe virginea var. virginea	Snowy Wax-Cap	Fungi and Slimy
Microglossum olivaceum	Earth Tongue	Fungi and Slimy
Abraxas sylvata	Clouded Magpie	Invertebrates
Abrostola tripartita	Spectacle	Invertebrates
Abrostola triplasia	Dark Spectacle	Invertebrates
Acasis viretata	Yellow-barred Brindle	Invertebrates
Acronicta menyanthidis	Light Knot Grass	Invertebrates
Acronicta rumicis	Knot Grass	Invertebrates
Aeshna cyanea	Southern Hawker	Invertebrates
Aeshna juncea	Common Hawker	Invertebrates
Aeshna mixta	Migrant Hawker	Invertebrates
Agriphila latistria	White-streak Grass-veneer	Invertebrates
Agrochola helvola	Flounced Chestnut	Invertebrates
Agrotis cinerea	Light Feathered Rustic	Invertebrates
Allophytes oxyacanthae	Green-brindled Crescent	Invertebrates
Amblyptilia acanthadactyla	Beautiful Plume	Invertebrates
Amphipoea lucens	Large Ear	Invertebrates
Anax imperator	Emperor Dragonfly	Invertebrates
Apamea furva	Confused	Invertebrates
Apamea remissa	Dusky Brocade	Invertebrates
Apamea unanimitis	Small Clouded Brindle	Invertebrates
Argynnis paphia	Silver-washed Fritillary	Invertebrates
Autographa bractea	Gold Spangle	Invertebrates
Beris fuscipes	Short-horned Black Legionnaire	Invertebrates

Boloria euphrosyne	Pearl-bordered Fritillary	Invertebrates
Boloria selene	Small Pearl-bordered Fritillary	Invertebrates
Bombus hortorum	Small Garden Bumblebee	Invertebrates
Bombus lapidarius	Large Red Tailed Bumblebee	Invertebrates
Bombus lucorum	White-Tailed Bumblebee	Invertebrates
Bombus monticola	Bilberry (Blaeberry) Bumblebee	Invertebrates
Bombus pascuorum	Common Carder Bee	Invertebrates
Bombus pratorum	Early Bumblebee	Invertebrates
Bombus terrestris	Buff-Tailed Bumblebee	Invertebrates
Bombus	Bumblebee	Invertebrates
Callophrys rubi	Green Hairstreak	Invertebrates
Catoptria margaritella	Silver-stripe Grass-veneer	Invertebrates
Catoptria pinella	Pearl Grass-veneer	Invertebrates
Celastrina argiolus	Holly Blue	Invertebrates
Ceramica pisi	Broom Moth	Invertebrates
Charissa obscurata	Annulet	Invertebrates
Coenagrion puella	Azure Damselfly	Invertebrates
Coenonympha pamphilus	Small Heath	Invertebrates
Cordulegaster boltonii	Golden-ringed Dragonfly	Invertebrates
Craniophora ligustri	Coronet	Invertebrates
Crossocerus binotatus	Crossocerus binotatus	Invertebrates
Cupido minimus	Small Blue	Invertebrates
Cyaniris semiargus	Mazarine Blue	Invertebrates
Deileptenia ribeata	Satin Beauty	Invertebrates
Diarsia rubi	Small Square-spot	Invertebrates
Ecliptopera silaceata	Small Phoenix	Invertebrates
Elodes minuta	Elodes minuta	Invertebrates
Enallagma cyathigerum	Common Blue Damselfly	Invertebrates
Entephria caesiata	Grey Mountain Carpet	Invertebrates
Epirrhoe galiata	Galium Carpet	Invertebrates
Ernodes articularis	Ernodes articularis	Invertebrates
Erynnis tages tages	Dingy Skipper	Invertebrates
Erynnis tages	Dingy Skipper	Invertebrates
Euchoeca nebulata	Dingy Shell	Invertebrates
Eugnorisma glareosa	Autumnal Rustic	Invertebrates
Eupithecia distinctaria subsp. constrictata	Thyme Pug	Invertebrates
Eupithecia innotata form fraxinata	Ash Pug	Invertebrates
Eupithecia inturbata	Maple Pug	Invertebrates
Eupithecia virgaureata	Golden-rod Pug	Invertebrates
Gonomyia conoviensis	Gonomyia conoviensis	Invertebrates
Grammoptera ruficornis	Grammoptera ruficornis	Invertebrates
Harmonia axyridis	Harlequin Ladybird	Invertebrates
Hipparchia semele	Grayling	Invertebrates
Hoplodrina blanda	Rustic	Invertebrates
Hydria undulata	Scallop Shell	Invertebrates
Hypenodes humidalis	Marsh Oblique-barred	Invertebrates
Ischnura elegans	Blue-tailed Damselfly	Invertebrates
Ischnura pumilio	Scarce Blue-tailed Damselfly	Invertebrates

Lasiommata megera	Wall	Invertebrates
Leopoldius signatus	Leopoldius signatus	Invertebrates
Lestes sponsa	Emerald Damselfly	Invertebrates
Leucania comma	Shoulder-striped Wainscot	Invertebrates
Libellula depressa	Broad-bodied Chaser	Invertebrates
Libellula quadrimaculata	Four-spotted Chaser	Invertebrates
Limnophora nigripes	Limnophora nigripes	Invertebrates
Lipsothrix errans	Northern Yellow Splinter	Invertebrates
Lipsothrix nervosa	Southern Yellow Splinter	Invertebrates
Lithophane ornitopus lactipennis	Grey Shoulder-knot	Invertebrates
Lithophane socia	Pale Pinion	Invertebrates
Litoligia literosa	Rosy Minor	Invertebrates
Lycia hirtaria	Brindled Beauty	Invertebrates
Lymantria monacha	Black Arches	Invertebrates
Melanargia galathea	Marbled White	Invertebrates
Melanchra persicariae	Dot Moth	Invertebrates
Mesoleuca albicillata	Beautiful Carpet	Invertebrates
Mniotype adusta	Dark Brocade	Invertebrates
Mompha terminella	Enchanters Cosmet	Invertebrates
Mythimna turca	Double Line	Invertebrates
Nebula salicata subsp. latentaria	Striped Twin-spot Carpet	Invertebrates
Olindia schumacherana	White-barred Twist	Invertebrates
Orchesia micans	Orchesia micans	Invertebrates
Orthetrum cancellatum	Black-tailed Skimmer	Invertebrates
Orthetrum coerulescens	Keeled Skimmer	Invertebrates
Orthosia gracilis	Powdered Quaker	Invertebrates
Oxycera pygmaea	Pygmy Soldier	Invertebrates
Panemeria tenebrata	Small Yellow Underwing	Invertebrates
Papestra biren	Glaucous Shears	Invertebrates
Plectrocnemia brevis	Plectrocnemia brevis	Invertebrates
Polyploca ridens	Frosted Green	Invertebrates
Pyrausta purpuralis	Common Purple & Gold	Invertebrates
Pyrrosoma nymphula	Large Red Damselfly	Invertebrates
Rhagium mordax	Rhagium mordax	Invertebrates
Scotopteryx chenopodiata	Shaded Broad-bar	Invertebrates
Selenia lunularia	Lunar Thorn	Invertebrates
Spania nigra	Liverwort Snipefly	Invertebrates
Spilosoma lubricipeda	White Ermine	Invertebrates
Spilosoma lutea	Buff Ermine	Invertebrates
Standfussiana lucerneae	Northern Rustic	Invertebrates
Stilbia anomala	Anomalous	Invertebrates
Stratiomys potamida	Banded General	Invertebrates
Sympetrum danae	Black Darter	Invertebrates
Sympetrum striolatum	Common Darter	Invertebrates
Syngrapha interrogationis	Scarce Silver Y	Invertebrates
Tetheella fluctuosa	Satin Lutestring	Invertebrates
Thaumastoptera calceata	Thaumastoptera calceata	Invertebrates
Thecophora fulvipes	Thecophora fulvipes	Invertebrates

Tiliacea aurago	Barred Sallow	Invertebrates
Tinodes dives	Tinodes dives	Invertebrates
Tinodes unicolor	Tinodes unicolor	Invertebrates
Triphosa dubitata	Tissue	Invertebrates
Tyria jacobaeae	Cinnabar	Invertebrates
Venusia blomeri	Blomer's Rivulet	Invertebrates
Xanthorhoe ferrugata	Dark-barred Twin-spot Carpet	Invertebrates
Xestia castanea	Neglected Rustic	Invertebrates
Austropotamobius pallipes	White-clawed Freshwater Crayfish	freshwater)
Porrhomma rosenhaueri	Porrhomma rosenhaueri	Invertebrates
Sabacon viscayanum subsp. ramblaianum	Sabacon viscayanum subsp. ramblaianum	Invertebrates
Dermatocarpon miniatum	Dermatocarpon miniatum	Lichens
Melanohalea laciniatula	Melanohalea laciniatula	Lichens
Peltigera canina	Peltigera canina	Lichens
Peltigera leucophlebia	Peltigera leucophlebia	Lichens
Solorina saccata	Solorina saccata	Lichens
Verrucaria caerulea	Verrucaria caerulea	Lichens
Chiroptera	Unknown Bat	Mammals (terrestrial)
Dama dama	Fallow Deer	Mammals (terrestrial)
Eptesicus serotinus	Serotine	Mammals (terrestrial)
Erinaceus europaeus	Hedgehog	Mammals (terrestrial)
Lutra lutra	Otter	Mammals (terrestrial)
Meles meles	Badger	Mammals (terrestrial)
Mustela nivalis	Weasel	Mammals (terrestrial)
Myotis daubentonii	Daubenton's Bat	Mammals (terrestrial)
Myotis nattereri	Natterer's Bat	Mammals (terrestrial)
Myotis	Myotis Bat Species	Mammals (terrestrial)
Neovison vison	American Mink	Mammals (terrestrial)
Nyctalus noctula	Noctule Bat	Mammals (terrestrial)
Pipistrellus pipistrellus agg.	Pipistrelle agg.	Mammals (terrestrial)
Pipistrellus pipistrellus	Common Pipistrelle	Mammals (terrestrial)
Pipistrellus pygmaeus	Soprano Pipistrelle	Mammals (terrestrial)
Pipistrellus	Pipistrellus Bat Species	Mammals (terrestrial)
Plecotus auritus	Brown Long-eared Bat	Mammals (terrestrial)
Plecotus	Long-eared Bat Species	Mammals (terrestrial)
Rhinolophus hipposideros	Lesser Horseshoe Bat	Mammals (terrestrial)
Sciurus carolinensis	Grey Squirrel	Mammals (terrestrial)
Sciurus vulgaris	Red Squirrel	Mammals (terrestrial)
Sorex araneus	Common Shrew	Mammals (terrestrial)
Anguis fragilis	Slow-worm	Reptiles and Amphibians
Bufo bufo	Common Toad	Reptiles and Amphibians
Lissotriton helveticus	Palmate Newt	Reptiles and Amphibians
Rana temporaria	Common Frog	Reptiles and Amphibians
Triturus cristatus	Great Crested Newt	Reptiles and Amphibians
Zootoca vivipara	Common Lizard	Reptiles and Amphibians
Acer campestre	Field Maple	Vascular Plants
Aconitum napellus agg.	Monk's-Hood agg.	Vascular Plants

Aconitum napellus	Monk's-hood	Vascular Plant
Adoxa moschatellina	Moschatel	Vascular Plant
Agrimonia eupatoria	Agrimony	Vascular Plant
Agrostis vinealis	Brown Bent	Vascular Plant
Aira caryophyllea	Silver Hair-grass	Vascular Plant
Alchemilla filicaulis subsp. vestita	Lady's-Mantle	Vascular Plant
Alchemilla glabra	Smooth Lady's-mantle	Vascular Plant
Alchemilla vulgaris agg.	Lady's-Mantle agg.	Vascular Plant
Alchemilla xanthochlora	Intermediate Lady's-mantle	Vascular Plant
Allium ursinum	Ramsons	Vascular Plant
Anagallis tenella	Bog Pimpernel	Vascular Plant
Anemone nemorosa	Wood Anemone	Vascular Plant
Anthyllis vulneraria	Kidney Vetch	Vascular Plant
Aphanes arvensis	Parsley-piert	Vascular Plant
Arabis hirsuta	Hairy Rock-cress	Vascular Plant
Arenaria serpyllifolia agg.	Thyme-Leaved Sandwort agg.	Vascular Plant
Arenaria serpyllifolia subsp. leptoclados	Slender Sandwort	Vascular Plant
Arenaria serpyllifolia	Thyme-Leaved Sandwort	Vascular Plant
Asplenium trichomanes subsp. trichomanes	Spleenwort	Vascular Plant
Asplenium viride	Green Spleenwort	Vascular Plant
Botrychium lunaria	Moonwort	Vascular Plant
Briza media	Quaking-grass	Vascular Plant
Bromopsis erecta	Upright Brome	Vascular Plant
Bromopsis ramosa	Hairy-brome	Vascular Plant
Buxus sempervirens	Box	Vascular Plant
Callitriche hamulata	Intermediate Water-starwort	Vascular Plant
Calystegia pulchra	Hairy Bindweed	Vascular Plant
Carduus nutans	Musk Thistle	Vascular Plant
Carex caryophyllea	Spring-sedge	Vascular Plant
Carex flacca	Glaucous Sedge	Vascular Plant
Carex hostiana	Tawny Sedge	Vascular Plant
Carex laevigata	Smooth-stalked Sedge	Vascular Plant
Carex montana	Soft-leaved Sedge	Vascular Plant
Carex otrubae	False Fox-sedge	Vascular Plant
Carex panicea	Carnation Sedge	Vascular Plant
Carex paniculata	Greater Tussock-sedge	Vascular Plant
Carex pilulifera	Pill Sedge	Vascular Plant
Carex pulicaris	Flea Sedge	Vascular Plant
Carex rostrata	Bottle Sedge	Vascular Plant
Carex spicata	Spiked Sedge	Vascular Plant
Carex sylvatica	Wood-sedge	Vascular Plant
Carex viridula subsp. brachyrrhyncha	Long-stalked Yellow-sedge	Vascular Plant
Carex viridula subsp. oedocarpa	Common Yellow-sedge	Vascular Plant
Catapodium rigidum	Fern-grass	Vascular Plant
Centaurea scabiosa	Greater Knapweed	Vascular Plant
Ceratocarpus claviculata	Climbing Corydalis	Vascular Plant
Ceratophyllum demersum	Rigid Hornwort	Vascular Plant
Ceterach officinarum	Rustyback	Vascular Plant

Chaenorhinum minus	Small Toadflax	Vascular Plant
Chenopodium rubrum	Red Goosefoot	Vascular Plant
Chrysosplenium alternifolium	Alternate-leaved Golden-saxifrage	Vascular Plant
Circaea lutetiana x alpina = C. x intermedia	Upland Enchanter's-nightshade	Vascular Plant
Cirsium acaule	Dwarf Thistle	Vascular Plant
Conopodium majus	Pignut	Vascular Plant
Cornus sanguinea	Dogwood	Vascular Plant
Cotoneaster horizontalis	Wall Cotoneaster	Vascular Plant
Cotoneaster microphyllus	Small-leaved Cotoneaster	Vascular Plant
Cotoneaster simonsii	Himalayan Cotoneaster	Vascular Plant
Crassula helmsii	New Zealand Pigmyweed	Vascular Plant
Crocosmia pottsii x aurea = C. x crocosmiiflora	Montbretia	Vascular Plant
Cruciata laevipes	Crosswort	Vascular Plant
Cystopteris fragilis	Brittle Bladder-fern	Vascular Plant
Dactylorhiza fuchsii	Common Spotted-orchid	Vascular Plant
Dactylorhiza maculata	Heath Spotted-orchid	Vascular Plant
Dactylorhiza praetermissa	Southern Marsh-orchid	Vascular Plant
Danthonia decumbens	Heath-grass	Vascular Plant
Dipsacus fullonum	Wild Teasel	Vascular Plant
Drosera rotundifolia	Round-leaved Sundew	Vascular Plant
Dryopteris carthusiana	Narrow Buckler-fern	Vascular Plant
Eleocharis quinqueflora	Few-flowered Spike-rush	Vascular Plant
Elodea canadensis	Canadian Waterweed	Vascular Plant
Elymus caninus	Bearded Couch	Vascular Plant
Empetrum nigrum	Crowberry agg.	Vascular Plant
Epilobium brunnescens	New Zealand Willowherb	Vascular Plant
Epilobium tetragonum	Square-stalked Willowherb	Vascular Plant
Epipactis helleborine	Broad-leaved Helleborine	Vascular Plant
Equisetum sylvaticum	Wood Horsetail	Vascular Plant
Equisetum telmateia	Great Horsetail	Vascular Plant
Erica cinerea	Bell Heather	Vascular Plant
Erica tetralix	Cross-leaved Heath	Vascular Plant
Erigeron acris	Blue Fleabane	Vascular Plant
Eriophorum angustifolium	Common Cottongrass	Vascular Plant
Eriophorum latifolium	Broad-leaved Cottongrass	Vascular Plant
Eriophorum vaginatum	Hare's-tail Cottongrass	Vascular Plant
Erodium cicutarium	Common Stork's-bill	Vascular Plant
Erophila glabrescens	Glabrous Whitlowgrass	Vascular Plant
Euphorbia amygdaloides	Wood Spurge	Vascular Plant
Euphrasia nemorosa x confusa	Eyebright	Vascular Plant
Euphrasia nemorosa	Eyebright	Vascular Plant
Euphrasia officinalis agg.	Eyebright agg.	Vascular Plant
Euphrasia officinalis subsp. pratensis	Eyebright	Vascular Plant
Fallopia japonica	Japanese Knotweed	Vascular Plant
Fallopia sachalinensis	Giant Knotweed	Vascular Plant
Filago minima	Small Cudweed	Vascular Plant
Filago vulgaris	Common Cudweed	Vascular Plant
Frangula alnus	Alder Buckthorn	Vascular Plant

<i>Galium mollugo</i> subsp. <i>erectum</i>	Upright Hedge Bedstraw	Vascular Plant
<i>Galium mollugo</i>	Hedge Bedstraw	Vascular Plant
<i>Galium odoratum</i>	Woodruff	Vascular Plant
<i>Galium sternerii</i>	Limestone Bedstraw	Vascular Plant
<i>Galium verum</i>	Lady's Bedstraw	Vascular Plant
<i>Geum rivale</i> x <i>urbanum</i> = <i>G. x intermedium</i>	Hybrid Avens	Vascular Plant
<i>Geum rivale</i>	Water Avens	Vascular Plant
<i>Gymnadenia conopsea</i> subsp. <i>conopsea</i>	Fragrant Orchid	Vascular Plant
<i>Gymnadenia conopsea</i>	Fragrant Orchid	Vascular Plant
<i>Gymnocarpium robertianum</i>	Limestone Fern	Vascular Plant
<i>Helianthemum nummularium</i>	Common Rock-rose	Vascular Plant
<i>Helictotrichon pubescens</i>	Downy Oat-grass	Vascular Plant
<i>Helleborus viridis</i>	Green Hellebore	Vascular Plant
<i>Hippophae rhamnoides</i>	Sea-buckthorn	Vascular Plant
<i>Huperzia selago</i>	Fir Clubmoss	Vascular Plant
<i>Hyacinthoides non-scripta</i> x <i>hispanica</i> = <i>H. x massartiana</i>	Bluebell	Vascular Plant
<i>Hyacinthoides non-scripta</i>	Bluebell	Vascular Plant
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort	Vascular Plant
<i>Hypericum pulchrum</i>	Slender St John's-wort	Vascular Plant
<i>Inula conyzae</i>	Ploughman's-spikenard	Vascular Plant
<i>Jasione montana</i>	Sheep's-bit	Vascular Plant
<i>Juncus inflexus</i>	Hard Rush	Vascular Plant
<i>Knautia arvensis</i>	Field Scabious	Vascular Plant
<i>Lagarosiphon major</i>	Curly Waterweed	Vascular Plant
<i>Lamiastrum galeobdolon</i> subsp. <i>montanum</i>	Yellow Archangel	Vascular Plant
<i>Lathraea squamaria</i>	Toothwort	Vascular Plant
<i>Lathyrus linifolius</i>	Bitter-vetch	Vascular Plant
<i>Lemna trisulca</i>	Ivy-leaved Duckweed	Vascular Plant
<i>Leontodon hispidus</i>	Rough Hawkbit	Vascular Plant
<i>Leontodon saxatilis</i>	Lesser Hawkbit	Vascular Plant
<i>Linum catharticum</i>	Fairy Flax	Vascular Plant
<i>Luzula multiflora</i>	Heath Wood-rush	Vascular Plant
<i>Luzula pilosa</i>	Hairy Wood-rush	Vascular Plant
<i>Luzula sylvatica</i>	Great Wood-rush	Vascular Plant
<i>Lysimachia nemorum</i>	Yellow Pimpernel	Vascular Plant
<i>Lysimachia nummularia</i>	Creeping-Jenny	Vascular Plant
<i>Lysimachia vulgaris</i>	Yellow Loosestrife	Vascular Plant
<i>Lythrum portula</i>	Water-purslane	Vascular Plant
<i>Meconopsis cambrica</i>	Welsh Poppy	Vascular Plant
<i>Melica nutans</i>	Mountain Melick	Vascular Plant
<i>Melica uniflora</i>	Wood Melick	Vascular Plant
<i>Mentha aquatica</i>	Water Mint	Vascular Plant
<i>Mentha arvensis</i> x <i>aquatica</i> = <i>M. x verticillata</i>	Whorled Mint	Vascular Plant
<i>Mimulus guttatus</i>	Monkeyflower	Vascular Plant
<i>Moehringia trinervia</i>	Three-nerved Sandwort	Vascular Plant
<i>Montia fontana</i> subsp. <i>amporitana</i>	Blinks	Vascular Plant
<i>Mycelis muralis</i>	Wall Lettuce	Vascular Plant

Myosotis discolor	Changing Forget-me-not	Vascular Plant
Myosotis laxa	Tufted Forget-me-not	Vascular Plant
Myosotis secunda	Creeping Forget-me-not	Vascular Plant
Narcissus pseudonarcissus subsp. major	Spanish Daffodil	Vascular Plant
Narcissus pseudonarcissus subsp. pseudonarcissus	Daffodil	Vascular Plant
Narthecium ossifragum	Bog Asphodel	Vascular Plant
Neottia ovata	Common Twayblade	Vascular Plant
Nuphar lutea	Yellow Water-lily	Vascular Plant
Odontites vernus	Red Bartsia	Vascular Plant
Ononis repens	Common Restharrow	Vascular Plant
Ophrys apifera	Bee Orchid	Vascular Plant
Orchis mascula	Early-purple Orchid	Vascular Plant
Oreopteris limbosperma	Lemon-scented Fern	Vascular Plant
Osmunda regalis	Royal Fern	Vascular Plant
Oxalis acetosella	Wood-sorrel	Vascular Plant
Paris quadrifolia	Herb-paris	Vascular Plant
Pedicularis sylvatica	Lousewort	Vascular Plant
Persicaria bistorta	Common Bistort	Vascular Plant
Persicaria lapathifolia	Pale Persicaria	Vascular Plant
Persicaria minor	Small Water-pepper	Vascular Plant
Petasites hybridus	Butterbur	Vascular Plant
Phegopteris connectilis	Beech Fern	Vascular Plant
Phragmites australis	Common Reed	Vascular Plant
Picris hieracioides	Hawkweed Oxtongue	Vascular Plant
Pimpinella saxifraga	Burnet-saxifrage	Vascular Plant
Pinguicula vulgaris	Common Butterwort	Vascular Plant
Plantago media	Hoary Plantain	Vascular Plant
Platanthera bifolia	Lesser Butterfly-orchid	Vascular Plant
Platanthera	Platanthera	Vascular Plant
Poa compressa	Flattened Meadow-grass	Vascular Plant
Polygala serpyllifolia	Heath Milkwort	Vascular Plant
Polygala vulgaris	Common Milkwort	Vascular Plant
Polypodium interjectum	Intermediate Polypody	Vascular Plant
Polystichum aculeatum	Hard Shield-fern	Vascular Plant
Polystichum setiferum	Soft Shield-fern	Vascular Plant
Populus tremula	Aspen	Vascular Plant
Potamogeton crispus	Curled Pondweed	Vascular Plant
Potamogeton polygonifolius	Bog Pondweed	Vascular Plant
Poterium sanguisorba subsp. sanguisorba	Salad Burnet	Vascular Plant
Primula veris x vulgaris = P. x polyantha	False Oxlip	Vascular Plant
Primula veris	Cowslip	Vascular Plant
Prunus laurocerasus	Cherry Laurel	Vascular Plant
Prunus padus	Bird Cherry	Vascular Plant
Pseudorchis albida	Small-white Orchid	Vascular Plant
Pulicaria dysenterica	Common Fleabane	Vascular Plant
Ranunculus aquatilis	Common Water-crowfoot	Vascular Plant
Ranunculus ficaria subsp. bulbilifer	Lesser Celandine	Vascular Plant
Ranunculus omiophyllus	Round-leaved Crowfoot	Vascular Plant

Reseda luteola	Weld	Vascular Plant
Rhamnus cathartica	Buckthorn	Vascular Plant
Rhinanthus minor	Yellow-rattle	Vascular Plant
Rhododendron ponticum	Rhododendron ponticum	Vascular Plant
Rorippa nasturtium-aquaticum x microphylla = R. x sterilis	Hybrid Water-cress	Vascular Plant
Rosa caesia subsp. caesia	Hairy Dog-rose	Vascular Plant
Rosa caesia subsp. vosagiaca	Glaucous Dog-rose	Vascular Plant
Rosa rugosa	Japanese Rose	Vascular Plant
Rubus saxatilis	Stone Bramble	Vascular Plant
Salix alba	White Willow	Vascular Plant
Salix purpurea	Purple Willow	Vascular Plant
Salix repens	Creeping Willow	Vascular Plant
Sanguisorba officinalis	Great Burnet	Vascular Plant
Sanicula europaea	Sanicle	Vascular Plant
Saxifraga granulata	Meadow Saxifrage	Vascular Plant
Saxifraga hypnoides	Mossy Saxifrage	Vascular Plant
Saxifraga tridactylites	Rue-leaved Saxifrage	Vascular Plant
Scrophularia auriculata	Water Figwort	Vascular Plant
Scutellaria minor	Lesser Skullcap	Vascular Plant
Sedum forsterianum	Rock Stonecrop	Vascular Plant
Senecio erucifolius	Hoary Ragwort	Vascular Plant
Serratula tinctoria	Saw-wort	Vascular Plant
Sherardia arvensis	Field Madder	Vascular Plant
Silene flos-cuculi	Ragged-Robin	Vascular Plant
Sinapis arvensis	Charlock	Vascular Plant
Solidago virgaurea	Goldenrod	Vascular Plant
Sorbus aria	Common Whitebeam	Vascular Plant
Sparganium angustifolium	Floating Bur-reed	Vascular Plant
Spergularia rubra	Sand Spurrey	Vascular Plant
Stachys officinalis	Betony	Vascular Plant
Stachys palustris	Marsh Woundwort	Vascular Plant
Succisa pratensis	Devil's-bit Scabious	Vascular Plant
Tilia cordata	Small-leaved Lime	Vascular Plant
Torilis nodosa	Knotted Hedge-parsley	Vascular Plant
Tragopogon pratensis	Goat's-beard	Vascular Plant
Trichophorum caespitosum	Deergrass	Vascular Plant
Trichophorum germanicum	Deergrass	Vascular Plant
Trifolium campestre	Hop Trefoil	Vascular Plant
Trifolium medium	Zigzag Clover	Vascular Plant
Triglochin palustre	Marsh Arrowgrass	Vascular Plant
Tripleurospermum inodorum	Scentless Mayweed	Vascular Plant
Trisetum flavescens	Yellow Oat-grass	Vascular Plant
Trollius europaeus	Globeflower	Vascular Plant
Ulex gallii	Western Gorse	Vascular Plant
Vaccinium myrtillus	Bilberry	Vascular Plant
Valeriana dioica	Marsh Valerian	Vascular Plant
Veronica catenata	Pink Water-Speedwell	Vascular Plant

Veronica montana	Wood Speedwell	Vascular Plant
Veronica officinalis	Heath Speedwell	Vascular Plant
Veronica polita	Grey Field-speedwell	Vascular Plant
Veronica scutellata	Marsh Speedwell	Vascular Plant
Viburnum lantana	Wayfaring-tree	Vascular Plant
Viburnum opulus	Guelder-rose	Vascular Plant
Vicia tetrasperma	Smooth Tare	Vascular Plant
Viola canina	Heath Dog-violet	Vascular Plant
Viola palustris subsp. palustris	Marsh Violet	Vascular Plant
Viola palustris	Marsh Violet	Vascular Plant
Viola reichenbachiana	Early Dog-violet	Vascular Plant
Vulpia myuros	Rat's-tail Fescue	Vascular Plant
Wahlenbergia hederacea	Ivy-leaved Bellflower	Vascular Plant

APPENDIX D - TARGET NOTES

Target note number	Description
TN 1	Brash Piles
TN 2	Marshy grassland

APPENDIX E - SPECIES LIST

Semi Improved grassland

Bramble, rosebay willow herb, creeping bent, timothy, cocksfoot, ribwort plantain, scaly male fern, springy turf moss, curled dock, spear thistle, common bent, common sorrel, self heal, foxglove, creeping cinquefoil, bittercress sp. , nettle, wild raddish, common sorell, hard rush and soft rush

Marshy grassland

Pond sedge, bramble, rosebay willow herb, creeping bent, timothy, cocksfoot, common bent, creeping cinquefoil, bittercress sp. , nettle, hard rush and soft rush

Scrub

Blackthorn, Bramble, Dogwood, grey willow, butterfly bush and silver birch

APPENDIX F - SITE CLEARANCE METHOD STATEMENT (REPTILES)

1. Following a reptile habitat assessment, it was considered that the site has the potential to support a population of slow worm (*Anguis fragilis*), common lizard (*Lacerta vivipara*) and possibly grass snake (*Natrix natrix*). The presence of reptiles should therefore be assumed, hence the need for a Method Statement to ensure that works are carried out in such a way as to avoid harm to reptiles.
2. Vegetation will be cleared from directly affected areas only e.g. areas to be built on, used for storage, be part of the construction site or forming part of any landscaping scheme.
3. Once cleared, the vegetation will be maintained as close to bare ground as possible either by ongoing repeated cutting using brush cutters with knife blades to ensure that there is no potential for reptiles to utilise the site after the initial clearance. This is the preferred method as it reduces the potential for killing and injuring of reptiles and other animals when using tractor towed flails and mowers. Reptile fencing will not be required as long as the bare ground / short vegetation habitat is maintained.
4. All arisings will be raked off and spread (creating habitat piles) on unaffected land or removed from site for disposal. The orientation of the cutting will be designed to push reptiles into unaffected areas once the areas for clearance have been identified without having to undertake a full translocation exercise.

Figure 5: Orientation of cutting



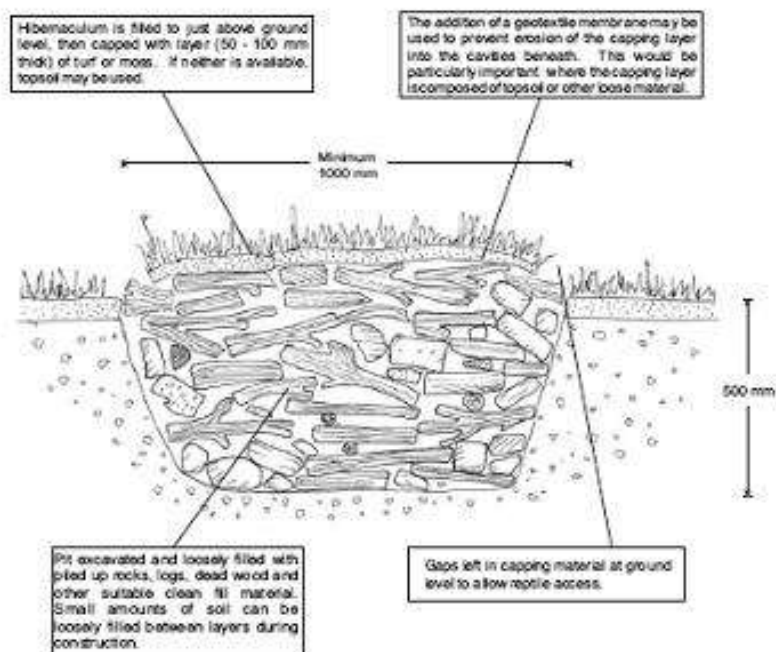
5. Scrub will be cleared to ground level between September and March only, using a chainsaw with the stem material saved to be used for the creation of a hibernaculum on unaffected land. Stumps and roots will only be removed by machine (under ecological supervision) once the clearance is complete and between April and September (or when temperatures are consistently above 12 degrees for a period of 7 days) to safeguard hibernating reptiles.
6. The grassland will be cut in three phases. The first phase will reduce the vegetation height to 75mm; the second will reduce it to ≈30mm; the third phase will reduce the height to as close to ground level as possible. There will be a time delay of 48 hours between cuts.

7. After clearance, should the vegetation be allowed to regrow above 150mm high, it will be cut and raked as short as possible, ≤ 30 mm wherever possible.
8. Ground excavation may only take place during temperatures where reptiles are active.
9. Potential hibernacula will only be cleared while day time temperatures are consistently over 12°C for a period of at least seven days prior as otherwise reptiles may be killed or injured as a result of inconsistent (low) temperatures (during the day and night) and/or low prey availability. Potential hibernacula will only be dismantled by hand unless the supervising ecologist gives the approval for machine dismantling.
10. If reptiles are observed within the clearance area during the works, a decision on how to deal with them will be made on site in light of the conditions on site at the time and the state of the animals themselves. There are three options for dealing with them:
 - It may be possible to leave the animals alone to find their own way into cover, depending on where they are seen, what they are doing and their apparent activity levels; or
 - Capture, remove from site and take into temporary captivity until such time as they can be released adjacent to the cleared area (a vivarium will be prepared in case it is required); or
 - Should conditions allow, capture and translocate the animals to a safe area immediately adjacent to the site.
 - If anymore than 10 reptiles are found, all works will cease and the Local Planning Authority Ecologist engaged with
11. Habitat (e.g. hibernation sites for other species especially amphibians) can be identified and avoided by following this method statement.
12. All vegetation and site clearance will be supervised by a suitably experienced ecologist.

APPENDIX G - REPTILE HIBERNACULUM DESIGN

Hibernaculum on free-draining ground

Where ground conditions allow, the hibernaculum should be incorporated into a shallow pit. This design is more likely to remain frost-free, and will be less obtrusive and thus unlikely to be subject to interference.



Hibernaculum on impermeable ground

Where ground conditions are impermeable, then an 'above-ground' or mounded design should be utilised in order to prevent the hibernaculum from flooding. This design should also be used if it is not possible to excavate a pit for any other reason.

