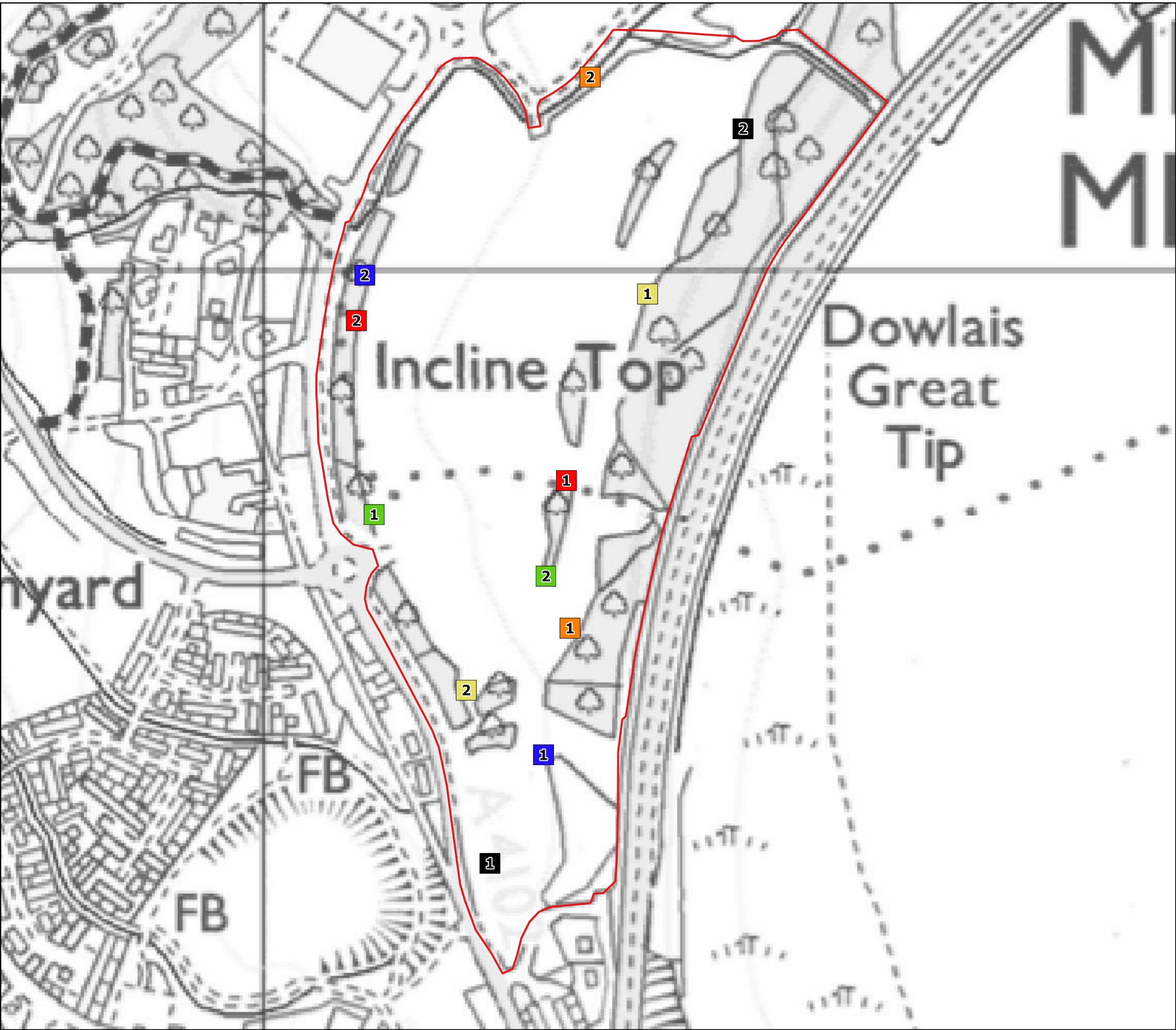




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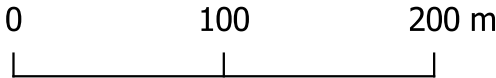
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Key

Site Boundary

Static Detector Locations

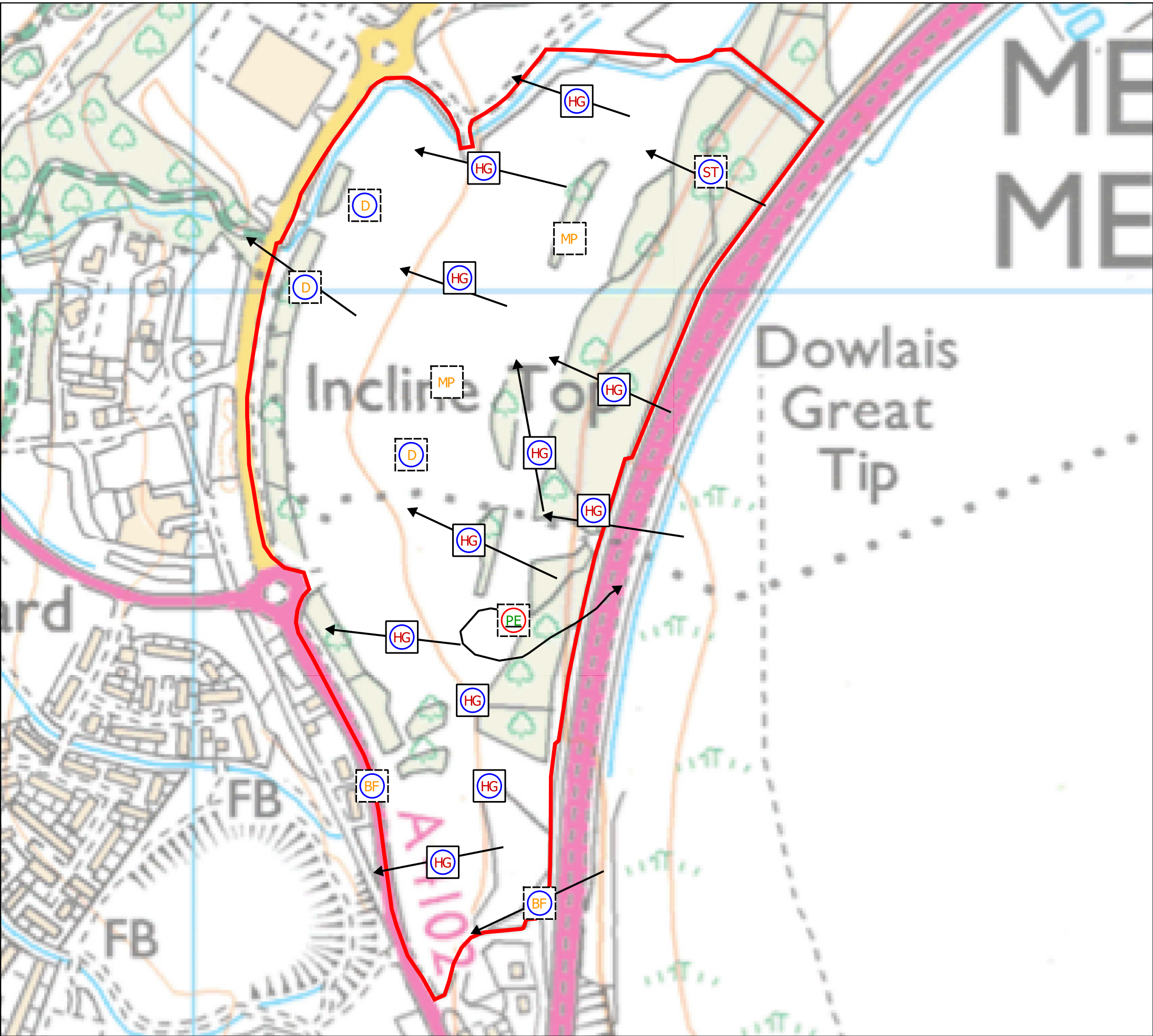
- April
- May
- June
- July
- September
- October



client
Sirius Planning
project
Land Off Goat Mill Road,
Merthyr Tvdil
drawing title
BAT STATIC DETECTOR LOCATION PLAN

scale
1:3592
drawn
KO / JRM
issue
21/9/2021

Figure 16 9131-E-16B



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Key

BoCC Red-Listed Species

HG Herring Gull

ST Song Thrush

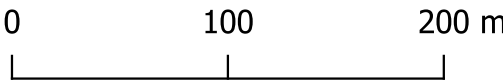
BoCC Amber Listed Species

BF Bullfinch

D Dunnock

MP Meadow Pipit

- Site Boundary
- Fly over only
- NERC Species of Principle Importance
- Schedule 1 Species
- LBAP Species (underlined)
- Confirmed Breeder
- Probable Breeder
- Possible Breeder
- Non-breeder





client
Sirius Planning

project
Land off Goat Mill Road,
Merthyr Tydfil

drawing title
**BREEDING BIRD SURVEY RESULTS -
LOCATIONS OF NOTABLE SPECIES**

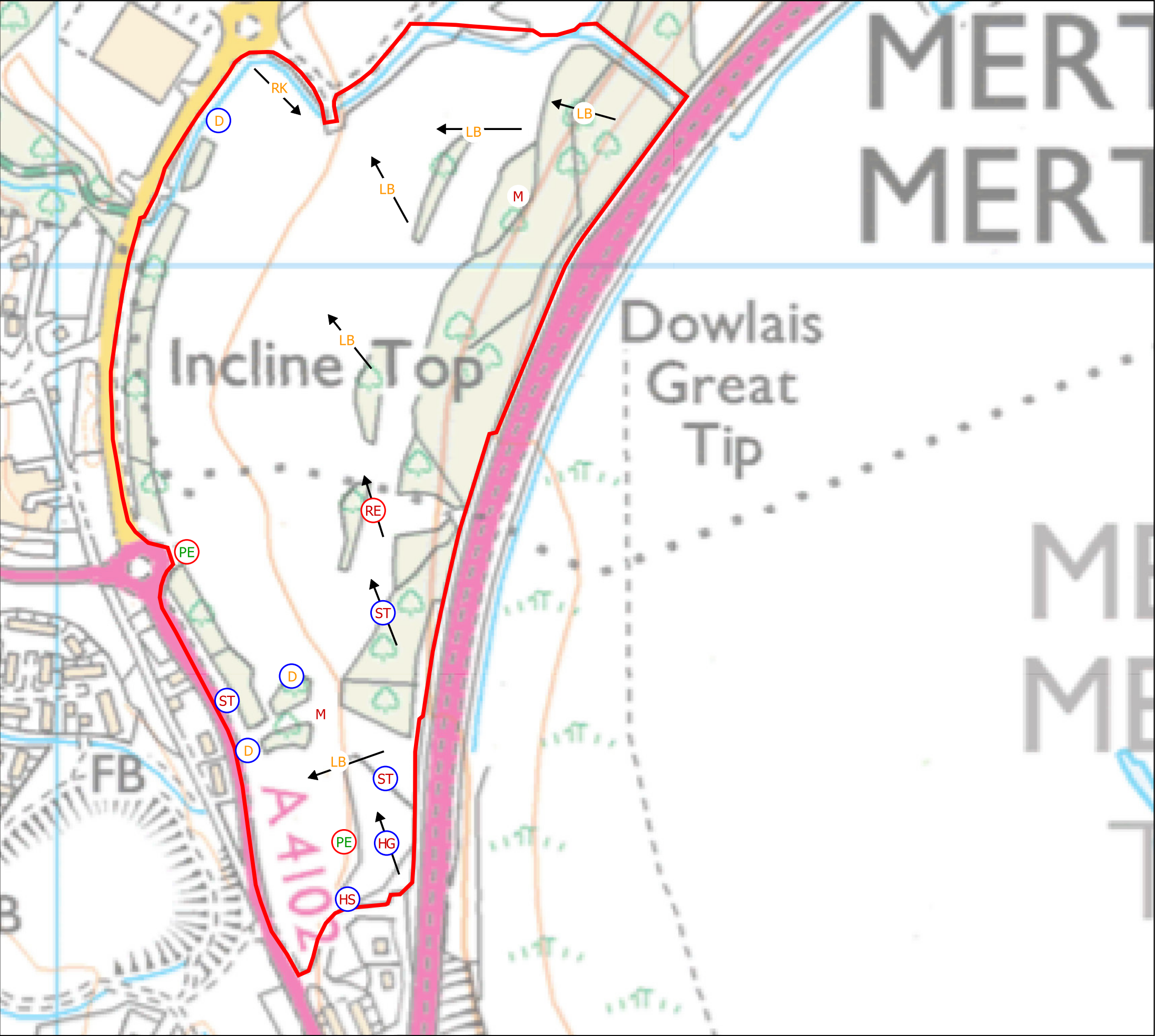
scale
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drawing
SCB / JRM

issue
21/9/2021

rev
9131-E-17B

Figure 17



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Key

Site Boundary

BoCC Red Listed Species

HG Herring Gull

HS House Sparrow

M Mistle Thrush

RE Redwing

ST Song Thrush

BoCC Amber Listed Species

D Dunnock

LB Lesser Black-backed Gull

RK Redshank

Site Boundary

→ Fly over only

 NERC Species of Principal Importance

 Schedule 1 Species

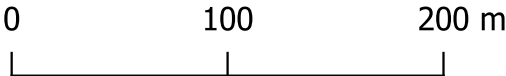
— LBAP Species (underlined)

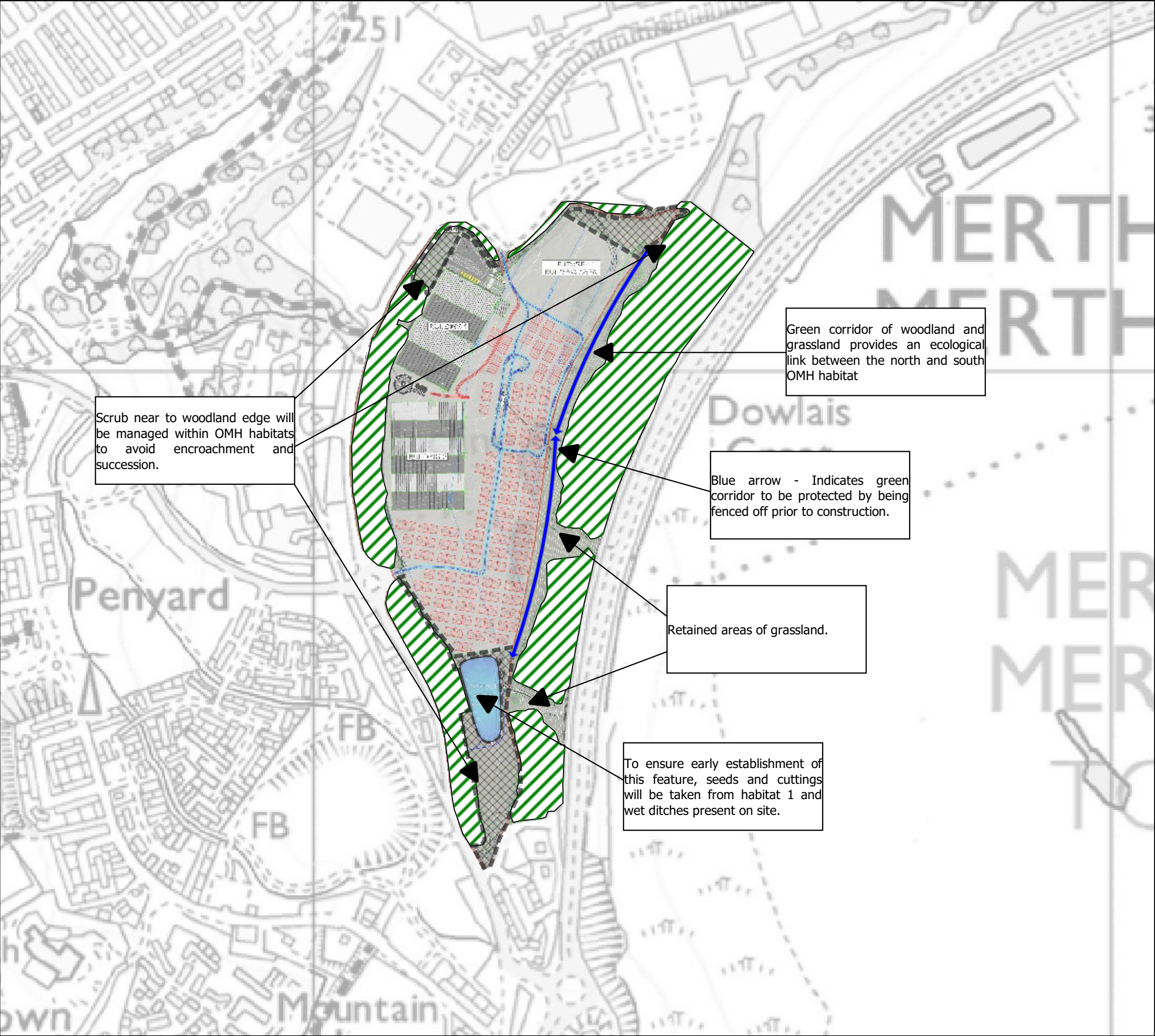


client
Sirius Planning
project
Land off Goat Mill Road,
Merthyr Tydfil
drawing title
SCOPING WINTER BIRD SURVEY RESULTS

scale
1:3500
drawn
SCB / JRM
issue
21/9/2021

drawing / figure number
Figure 18
rev
9131-E-18B





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Key

-  Areas of Retained Open Mosaic Habitat
-  Attenuation Basin
-  Retained Plantation Woodland

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APPENDICES

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APPENDIX A

APPENDIX A LEGISLATION

The Conservation of Habitats and Species Regulations (“The Habitats Regulations”) (Amendment) 2012

European Protected Sites

The Habitats Regulations ratifies into UK law the “Habitats Directive” (92/43/EEC) and the “Birds Directive” (79/409/EEC). It places a duty on the Secretary of State to propose a list of sites which are important for species listed in Annex I and II of the Habitats Directive respectively to the European Commission. Once the Commission and EU Member States have agreed that the sites submitted are worthy of designation, they are identified as Sites of Community Importance (SCIs). The EU Member States must then designate these sites as Special Areas of Conservation (SACs) within six years.

The Regulations require the compilation and maintenance of a register of European sites to include SACs as well as Special Protection Areas (SPAs) designated for birds and sites designated as internationally important wetlands under the Ramsar Convention known as “Ramsar Sites”. These three designations form a collective Europe wide network of internationally protected sites known as Natura 2000. All European sites are also designated under UK law as Sites of Special Scientific Interest (SSSIs; please see below).

Habitats Regulation Assessment

There is a requirement under EU law that Member States’ take measures to reach and maintain European Protected Sites’ at Favourable Conservation Status (FCS). An Appropriate Assessment is required for plans or projects that may potentially damage a European Protected Site. This is based on an assessment against a given European Protected Site’s Conservation Objectives. The process is commonly known as a Habitats Regulations Assessment (HRA).

The HRA must be conducted by, or on behalf of, the Competent Authority. The HRA process assesses plans or projects alone or in combination. It involves a four stage approach as follows:

- Stage One: Screening - also known as the Test of Likely Significant Effect (TOLSE). If the Competent Authority cannot screen out a *likely significant effect*, an Appropriate Assessment is required.
- Stage Two: Appropriate Assessment - the Competent Authority will only agree to plans or projects that will not affect the *integrity* of a European site also known as the “Integrity Test”.
- Stage Three: Alternative Solutions - assesses any alternative solutions of a potentially damaging plan or project that failed the Integrity Test, and if it is determined there are no alternative solutions, the project cannot be agreed to and it will either need to be changed or refused.
- Stage Four: The final stage may allow a plan or project to proceed if after failing stage three if it is for Imperative Reasons of Overriding Public Interest, and only if suitable compensatory measures are secured.

Any plan or project that may have a potentially damaging effect on a transient species or the habitat on which it relies (for example bats or birds), that is both a Qualifying Features of a European Protected Site and considered *functionally linked* with a European Protected Site, are required under law to be considered as part of any HRA process.

European Protected Species

The Habitats Regulations includes a list of animals and plant species taken from the Annex IV of the Habitats Directive that have a natural range which includes any area in Great Britain. These are collectively known as European Protected Species (EPS). The regulations make it an offence to deliberately capture, kill, disturb, take or destroy eggs of, or damage or destroy a breeding or resting place of animals listed in Schedule 2 of the Regulations, and to pick, collect, cut, uproot or destroy wild plants listed in Schedule 5 of the Regulations. All listed EPS are shown in Table 1 below. The Regulations also protect these species alive or dead and parts thereof from various forms of possession and trade.

Table 1: The Habitats Regulations Schedule 2 and Schedule 5 species

Schedule 2 – European Protected Species of Animals		Schedule 5 – European Protected Species of Plants	
Common name	Scientific name	Common name	Scientific name
Horseshoe bats – all species	<i>Rhinolophidae</i>	Shore dock	<i>Rumex rupestris</i>
Bats – all species	<i>Vespertilionidae</i>	Killarney fern	<i>Trichomanes speciosum</i>
Large blue butterfly	<i>Maculinea arion</i>	Early gentian	<i>Gentianella anglica</i>
Wild cat	<i>Felis silvestris</i>	Lady's-slipper	<i>Cypripedium calceolus</i>
Dolphins, porpoises and whales – all species	<i>Cetacea</i>	Creeping marshwort	<i>Apium repens</i>
Hazel dormouse	<i>Muscardinus avellanarius</i>	Slender naiad	<i>Najas flexilis</i>
Pool frog	<i>Rana lessonae</i>	Fen orchid	<i>Liparis loeselii</i>
Sand lizard	<i>Lacerta agilis</i>	Floating-leaved water plantaion	<i>Luronium natans</i>
Fisher's estuarine moth	<i>Gortyna borelii lunata</i>	Yellow marsh saxifrage	<i>Saxifraga hirculus</i>
Great crested newt	<i>Triturus cristatus</i>		
Otter	<i>Lutra lutra</i>		
Lesser Whirlpool Ram's-horn snail	<i>Anisus vorticulus</i>		
Smooth snake	<i>Coronella austriaca</i>		
Sturgeon	<i>Acipenser sturio</i>		
Natterjack toad	<i>Bufo calamita</i>		

Schedule 2 – European Protected Species of Animals		Schedule 5 – European Protected Species of Plants	
Marine turtles	<i>Caretta caretta</i> <i>Chelonia mydas</i> <i>Lepidochelys kempii</i> <i>Eretmochelys imbricata</i> <i>Dermochelys coriacea</i>		

These actions may be made lawful in certain circumstances through the granting of licences by the appropriate authority (Natural Resources Wales). Licences must only be granted after the appropriate authority is satisfied that no satisfactory alternatives are available. In most circumstances, licences are only applied for and granted following full planning permission.

In determining whether or not to grant a licence Natural Resources Wales must apply the requirements of The Conservation of Habitats and Species Regulations 2012 (amendment) and, in particular, the three derogation tests:

- Test 1: A licence can be granted for the purposes of “preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”.
- Test 2: The appropriate authority shall not grant a licence unless they are satisfied “that there is no satisfactory alternative”.
- Test 3: The appropriate authority shall not grant a licence unless they are satisfied “that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (WCA) (as amended) is the principal legislation providing protection for wildlife in the UK. It prescribes legislation for wild birds, other animals, wild plants and non-native species. In addition, it provides for the designation of Sites of Special Scientific Interest (SSSI) in Wales.

Wild birds

The Act makes it an offence (with exception to species listed in Schedule 2) to intentionally:

- kill, injure, or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

For birds listed on Schedule 1 of the Act, protection extends to offences relating to disturbance of these birds while at their nests or their dependent young.

Other animals

The WCA (as amended) makes it an offence to (subject to exceptions) intentionally or recklessly kill, injure or take wild animals listed on Schedule 5 of the Act. For some species, the protection extends to interference with places used for shelter or protection, or intentionally disturbing

animals occupying such places. These species are regarded as “fully protected” and as well as the EPS species listed above include the mammal species water vole *Arvicola terrestris*, pine marten *Martes martes* and red squirrel *Sciurus vulgaris* as well as selected others from a range of species groups including, fish, butterflies, hemipteran bugs, beetles, crickets, dragonflies, moths, spiders, crustaceans, sea-mats, molluscs, Annelid worms and sea anemones (and allies).

There are seven species on Schedule 5 of the Act that not fully protected but are still protected against killing and injuring these include the common reptile species slow worm *Anguis fragilis*, viviparous lizard *Lacerta vivipara*, grass snake *Natrix natrix* and adder *Vipera berus*.

The Act prohibits certain methods of killing, injuring, or taking wild animals, and numerous species are protected against sale only as well as other variations for example Atlantic stream (white-clawed) crayfish *Austropotamobius pallipes* are protected against taking and sale.

Vascular plants, bryophytes, lichens and fungi

With regards to native flora the Act makes it an offence to (subject to exceptions) intentionally pick, uproot or destroy any wild plant listed in Schedule 8. Similarly, the Act prevents the sale, offer or expose for sale, or possess (for the purposes of trade), any live or dead wild plant included in Schedule 8, or any part of, or anything derived from, such a plant.

Non-native species

The Act contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants listed in Schedule 9 in England and Wales.

Sites of Special Scientific Interest

The Act provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs). These sites can be identified for their flora, fauna, geological or physiological interest. In Wales, the power to confirm an SSSI lies with Natural Resources Wales.

Laws protecting areas designated as SSSIs are described in Sections 28 to 33 of Part 2 of the Wildlife and Countryside Act 1981 (as amended). SSSIs are the principle statutory designation of sites in the UK and offences are enforced through Natural Resources Wales. Offences include the following:

SSSI owners and occupiers

- carrying out, causing or allowing operations likely to damage an SSSI without Natural Resources Wales consent.
- failing to keep to a management notice.
- failing to let us know about a change in ownership or occupation of land in an SSSI.

Public bodies

- carrying out or authorising operations likely to damage an SSSI without meeting the requirements to notify Natural Resource Wales.
- failing to minimise any damage to an SSSI and if there is any damage, failing to restore it to its former state so far as is reasonably practical and possible.

Any person

- intentionally or recklessly damaging, destroying or disturbing any of the habitats or features of an SSSI.
- intentionally or recklessly damaging, destroying, obscuring or taking down a site notice put up on land within an SSSI.
- preventing a Natural Resources Wales officer lawfully accessing an SSSI.

Protection of Badgers Act 1992

Badgers and their setts are protected under the Protection of Badgers Act 1992. This act is based on the need to protect badgers from persecution by baiting and deliberate harm or injury.

The act makes it an offence to:

- intentionally capture, kill or injure a badger;
- damage, destroy or block access to their setts;
- disturb badgers in setts;
- treat a badger cruelly;
- deliberately send or intentionally allow a dog into a sett; and
- bait or dig for badgers.

A sett is defined as:

“Any structure or place that displays signs indicating current use by a badger”.

Environment (Wales) Act 2016

Section 6 of the Environment (Wales) Act 2016 imposes a duty on every public authority to maintain and enhance biodiversity in exercising its functions, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions (S6 duty). Resilience of ecosystems is accounted by the following aspects; diversity between and within ecosystems; the connections between and within ecosystems; the scale of ecosystems; the condition of ecosystems (including their structure and functioning); and the adaptability of ecosystems.

Section 7 of the Environment (Wales) Act 2016 requires the Welsh Ministers to publish a list of habitats and species that are of principal importance for the conservation and enhancement of biodiversity in Wales. The list (including 55 habitats and 560 species) has been drawn up in consultation with Natural Resource Wales and draws upon the UK BAP List of Priority Species and Habitats. The section 7 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 6 of the Environment (Wales) Act 2016.

Planning Policy Wales (2018) (PPW)

The Planning Policy Wales (2018) sets out the Welsh Government's planning policy for Wales. As such, the PPW must be a material consideration for local authorities when considering planning decisions. The following points highlight those policies/statements which particularly relate to ecology/biodiversity and the planning system:

Policy 5 – Distinctive and Natural Places

Biodiversity and Ecological Networks

5.42 The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement. Development plan strategies, policies and individual development proposals must take into account the need to:

- promote the conservation of biodiversity, in particular the conservation of wildlife and habitats;
- ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;
- ensure statutorily designated sites are properly protected and managed;
- safeguard protected species; and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil; and
- seek enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.

Maintaining and Enhancing Biodiversity

5.58 Planning authorities should protect and enhance biodiversity and build resilient ecological networks by ensuring that any adverse environmental effects are minimised and mitigated, by:

- ensuring that features and elements of biodiversity or green infrastructure value are retained on site wherever possible, and enhanced or created where appropriate, by adopting best practice site design and green infrastructure principles; and
- when all other options have been exhausted, and where modifications, alternative sites, conditions or obligations are not sufficient to secure beneficial environmental outcomes, offsite compensation for unavoidable damage should be sought.

Local Nature Reserves

Local Nature Reserve (LNR) is a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949.

Local authorities have the powers to acquire, declare and manage LNRs. Parish and town councils can declare LNRs providing power is given by the district or county council. LNRs may or may not have other statutory designations such as SSSI status. LNRs must be controlled by the local authority through ownership, lease or agreement with the owner. The main aim must be

to care for the natural features which make the site special. LNRs are of local, but not necessarily national, importance.

LNRs are usually owned by local authorities, with management often passed onto other organisations such as County Wildlife Trusts etc. They often have good public access and facilities. There is no legal necessity to manage an LNR to any set standard but management agreements and plans often exist. Protection of LNRs is usually provided through local planning policy and through local bylaws.

Non-Statutory Protected Local Sites

Non-statutory Designated Sites are sites designated by local authorities which fall outside the statutory criteria for designation. They are policy protected and included in the Planning Policy Wales (PPW). Local Planning Authorities should set criteria based policies against which proposals for developments on or affecting protected wildlife sites should be judged. Non-statutory sites are given various names including County Wildlife Sites (CWS), Sites of Importance for Nature Conservation (SINC) and Local Wildlife Sites (LWS). A search of the Ancient Woodland Inventory is also included here.

Hedgerows

Hedgerows are designated as Habitats of Principal Importance under the Environment (Wales) Act 2016. The Planning Policy Wales (PPW) emphasises the preservation, restoration and re-creation of priority habitats and ecological networks. Hedgerows are important components of ecological networks linking other important habitats and designated sites.

Hedgerows also receive statutory protection under the Hedgerow Regulations 1997 made under Section 97 of the Environment Act 1995, which came into force in 1997. The regulations introduced new arrangements for local planning authorities in England and Wales to protect important hedgerows in the countryside, by controlling their removal through a system of notification. Important hedgerows are defined by complex assessment criteria, which draw on biodiversity features, historical context and the landscape value of the hedgerow.

Local Biodiversity Action Plan (LBAP)

Local Biodiversity Action Plans (LBAP) identify habitat and species conservation priorities at a local level (typically at the County level), and are usually drawn up by a consortium of local Government organisations and conservation charities.

Birds of Conservation Concern (BoCC)

The Birds of Conservation Concern (BoCC) is jointly prepared by the British Trust for Ornithology (BTO), Joint Nature Conservation Committee (JNCC) and The Royal Society for the Protection of Birds (RSPB).

The report classifies birds according to the extent that they are known to be declining. The classifications are split into groups, Red, Amber and Green, with species classified as Red being those with the greatest declines. The criteria for classifications are presented in *Table 2*.

Table 2: BoCC species classification criteria

Red List Criteria	Amber List Criteria	Green List Criteria
Global Conservation Status - Species listed by BirdLife International as being Globally Threatened using IUCN criteria.	European Conservation status - Categorised as a Species of European Conservation Concern.	All regularly occurring species that do not qualify under any of the red or amber criteria are green listed.
Historical Decline - A severe decline in the UK between 1800 and 1995, without substantial recent recovery.	Historical Decline – Recovery - Red listed for Historical Decline in a previous review but with substantial recent recovery (more than doubled in the last 25 years).	Includes those species listed as recovering from Historical Decline in the last review that have continued to recover and do not qualify under any of the other criteria.
Breeding Population Decline - Severe decline in the UK breeding population size, of more than 50%, over 25 years or the entire period used for assessments since the first BoCC review, starting in 1969 (“longer-term”).	Breeding Population Decline - As for red list criteria and, but with moderate decline (by more than 25% but less than 50%).	
Non-breeding Population Decline - Severe decline in the UK non-breeding population size, of more than 50%, over 25 years or the longer-term.	Non-breeding Population Decline - As for red list criteria and, but with moderate decline (by more than 25% but less than 50%).	
Breeding Range Decline - Severe decline in the UK range, of more than 50%, as measured by number of 10 km squares occupied by breeding birds, over 25 years or the longer-term.	Breeding Range Decline - As for red list criteria and, but with moderate decline (by more than 25% but less than 50%).	
	Rarity - UK breeding population of less than 300 pairs, or non-breeding population of less than 900 individuals.	
	Localisation - At least 50% of the UK breeding or non-breeding population found in 10 or fewer sites.	
	International Importance - At least 20% of the European breeding or non-breeding population found in the UK.	

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APPENDIX B

Non EPS or WCA Sch1 Species Records within 2km

Scientific	Common	NERC Act 2006	Amber Birds	Red Birds	BAP2007	WCA 9	County Notable
Bird							
<i>Actitis hypoleucos</i>	Common Sandpiper				-		
<i>Alauda arvensis</i>	Skylark			-	-		
<i>Anas crecca</i>	Teal				-		
<i>Anas platyrhynchos</i>	Mallard				-		
<i>Anthus pratensis</i>	Meadow Pipit				-		
<i>Anthus trivialis</i>	Tree Pipit			-	-		
<i>Apus apus</i>	Swift		-		-		
<i>Aythya fuligula</i>	Tufted Duck				-		
<i>Chroicocephalus ridibundus</i>	Black-headed Gull		-		-		
<i>Cuculus canorus</i>	Cuckoo			-	-		
<i>Emberiza schoeniclus</i>	Reed Bunting			-	-		
<i>Falco tinnunculus</i>	Kestrel		-		-		
<i>Hipparchia semele</i>	Grayling				-		
<i>Hirundo rustica</i>	Swallow				-		
<i>Larus fuscus</i>	Lesser Black-backed Gull				-		
<i>Linaria cannabina</i>	Linnet			-	-		
<i>Oenanthe oenanthe</i>	Wheatear						
<i>Passer domesticus</i>	House Sparrow			-	-		
<i>Phalacrocorax carbo</i>	Cormorant				-		
<i>Phoenicurus phoenicurus</i>	Redstart				-		
<i>Phylloscopus trochilus</i>	Willow Warbler				-		
<i>Picus viridis</i>	Green Woodpecker				-		
<i>Prunella modularis</i>	Dunnock		-		-		
<i>Pyrrhula pyrrhula</i>	Bullfinch			-	-		
<i>Regulus regulus</i>	Goldcrest						
<i>Riparia riparia</i>	Sand Martin				-		
<i>Sylvia communis</i>	Whitethroat				-		
<i>Vanellus vanellus</i>	Lapwing		-		-		
Insect							
<i>Bombus lapidarius</i>	Large Red Tailed Bumble Bee						-

Scientific	Common	NERC Act 2006	Amber Birds	Red Birds	BAP2007	WCA 9	County Notable
<i>Bombus pratorum</i>	Early Bumble Bee						-
<i>Cordulegaster boltonii</i>	Golden-ringed Dragonfly						-
<i>Erynnis tages</i>	Dingy Skipper				-		-
<i>Erynnis tages tages</i>	Dingy Skipper				-		-
<i>Ischnura pumilio</i>	Scarce Blue-tailed Damselfly						-
<i>Lestes sponsa</i>	Emerald Damselfly						
<i>Orthetrum cancellatum</i>	Black-tailed Skimmer						-
<i>Orthetrum coerulescens</i>	Keeled Skimmer						-
<i>Sympetrum danae</i>	Black Darter						-
Mammal							
<i>Erinaceus europaeus</i>	West European Hedgehog				-		
Plant							
<i>Orthotrichum tenellum</i>	Slender Bristle-moss						-
<i>Weissia controversa</i> var. <i>crispata</i>	<i>Weissia controversa</i> var. <i>crispata</i>						-
Invasive Non-native							
<i>Branta canadensis</i>	Canada Goose						
<i>Epilobium brunnescens</i>	New Zealand Willowherb						
<i>Fallopia japonica</i>	Japanese Knotweed						
<i>Harmonia axyridis</i>	Harlequin Ladybird						

APPENDIX C

Botanical Species List

Habitat 1 - Marshy Grassland		DOMIN Scale					Habitat 2 - Calcareous Grassland		DOMIN Scale		
		Q1	Q2	Q3	Q4	Q5			Q1	Q2	Q3
<i>Cardamine [spp]</i>	Bittercress sp.	0	0	0	2	0	<i>Achillea millefolium</i>	Yarrow	4	0	5
<i>cardamine pratensis</i>	Bittercress sp.	0	1	4	0	3	<i>Aira caryophyllea</i>	Silver hair grass	4	0	3
<i>Carex acuta</i>	Acute sedge	0	0	10	4	0	<i>Anthoxanthum odoratum</i>	Sweet vernal grass	1	3	3
<i>Carex echinata</i>	star sedge	3	1	0	0	0	<i>Anthyllis vulneraria</i>	Kidney vetch	0	5	4
<i>Carex flacca</i>	blue green sedge	0	2	0	0	5	<i>Arrhenatherum elatius</i>	False oat-grass	0	0	2
<i>Carex nigra</i>	black sedge	4	0	0	0	3	<i>Bromus hordeaceus</i>	Soft brome	3	3	0
<i>Carex pseudocyperus</i>	Cyperus sedge	0	0	0	9	0	<i>Carex flacca</i>	Blue green sedge	0	1	3
<i>Centaurea nigra</i>	Common Knapweed	0	2	0	0	0	<i>carex nigra</i>	Black sedge	0	4	0
<i>Cirsium palustre</i>	European swamp thistle	0	4	0	0	0	<i>Carlina vulgaris</i>	Carline thistle	3	0	0
<i>Dactylorhiza majalis praetermissa</i>	southern marsh orchid	2	1	3	0	1	<i>Centaureum erythraea</i>	Common centaury	4	0	0
<i>Deschampsia cespitosa</i>	tufted hairgrass	2	2	0	0	0	<i>Cerastium fontanum</i>	Mouse-ear chickweed	2	0	2
<i>Eleocharis multicaulis</i>	Many-stalked Spike-rush	5	3	3	7	3	<i>Cirsium arvense</i>	Creeping thistle.	2	1	0
<i>Epilobium [spp]</i>	willowherb sp.	0	1	0	0	0	<i>Crepis vesicaria</i>	Beaked hawk's-beard	1	0	2
<i>Festuca rubra agg.</i>	Red fescue	0	2	0	0	0	<i>Dactylis glomerata</i>	Cocks foot	0	1	0
<i>Galium palustre</i>	Marsh-bedstraw	3	4	0	1	0	<i>Daucus carota</i>	Wild carrot	1	0	0
<i>Holcus lanatus</i>	Yorkshire Fog	4	3	2	0	2	<i>Erigeron acer</i>	Bitter fleabane	5	2	0
<i>Hypericum tetrapterum</i>	St. Johns Wort	0	0	1	0	0	<i>Festuca rubra agg.</i>	Red fescue	8	5	8
<i>Juncus conglomeratus</i>	Common rush	0	0	0	8	0	<i>Hieracium 'indeterminate'</i>	St. Johns wort	0	5	0
<i>Juncus effusus</i>	soft rush	8	9	0	5	4	<i>Leontodon hispidus</i>	Rough hawkbit	4	3	2
<i>Juncus inflexus</i>	hard rudh	0	0	0	4	0	<i>Linum catharticum</i>	Fairy flax	4	4	4
<i>Juncus subnodulosus</i>	Blunt-flowered Rush	0	0	0	3	2	<i>Lotus angustissimus</i>	Slender birds foot trefoil	2	0	0
<i>Lychnis flos-cuculi</i>	ragged-robin	0	0	0	3	0	<i>Lotus corniculatus</i>	Common bird's-foot-trefoil	4	4	2
<i>Mentha aquatica</i>	water mint	0	0	3	0	0	<i>Medicago lupulina</i>	Black medik	0	0	2
Moss							<i>Ophrys apifera</i>	Bee orchid	0	0	4
<i>Plantago lanceolata</i>	Ribwort Plantain	2	2	0	0	3	<i>Pilosella officinarum</i>	Mouse-ear hawkweed	5	5	5
<i>Ranunculus acris</i>	meadow buttercup	5	2	3	2	2	<i>plantago lanceolata</i>	Ribwort plantain	2	3	2
<i>Ranunculus flammula</i>	Lesser spearwort	4	4	2	2	5	<i>Polygala vulgaris</i>	Common milkwort	1	2	0
<i>ranunculus repens</i>	creeping buttercup	0	4	2	3	5	<i>Tragopogon pratensis</i>	Goats beard	1	0	0
<i>Rhinanthus minor</i>	Hay rattle	0	2	0	0	0	<i>Trifolium pratense</i>	Red clover	0	3	0
<i>Rumex [spp]</i>	Dock Species	1	0	0	0	0	Bare ground/litter/water/rock/mud		5	8	4

<i>Salix cinerea</i>	common willow	0	0	0	3	2	Total bryophyte		7	3	4
<i>Salix repens</i> agg.	creeping willow	0	0	1	0	2	Total lichen		7	3	7
<i>Trifolium repens</i>	white clover	1	3	0	0	0	Lowland Calcareous Grassland Wildflower Indicator Species				

Habitat 3 - Mesotrophic Grassland		DOMIN Scale			Habitat 4 - Mesotrophic Grassland		DOMIN Scale		
		Q1	Q2	Q3			Q1	Q2	Q3
<i>Achillea millefolium</i>	Yarrow	3	3	0	<i>Agrostis stolonifera</i>	Creeping-bent grass	0	3	0
<i>Agrostis stolonifera</i>	Creeping-bent grass	3	2	3	<i>Anthoxanthum odoratum</i>	Sweet vernal grass	0	3	0
<i>Aira caryophylla</i>	Silver hair grass	2	3	2	<i>Arrhenatherum elatius</i>	False oat-grass	0	4	0
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	5	0	0	<i>Bellis perennis</i>	Common daisy	0	0	1
<i>Arrhenatherum elatius</i>	False oat-grass	0	1	3	<i>Carex flacca</i>	Blue green sedge	3	2	0
<i>Bromus hordeaceus</i>	Soft brome	0	2	0	<i>Carex nigra</i>	Black sedge	3	2	2
<i>Carex flacca</i>	Blue green sedge	2	0	1	<i>Centaurea nigra</i>	Common knapweed	5	4	5
<i>Carex nigra</i>	Black sedge	0	5	3	<i>Centaureum erythraea</i>	Common centaury	0	0	2
<i>Centaurea nigra</i>	Common knapweed	0	5	0	<i>Cynosurus cristatus</i>	Crested dog's tail	5	4	5
<i>Centaureum erythraea</i>	Common centaury	2	4	1	<i>Dactylis glomerata</i>	Cock's-foot	0	3	3
<i>Cerastium fontanum</i>	Mouse-ear chickweed	0	2	4	<i>Festuca rubra</i> agg.	Red fescue	4	4	5
<i>Crataegus monogyna</i>	Hawthorn	0	1	0	<i>Holcus lanatus</i>	Yorkshire fog	5	5	3
<i>Cynosurus cristatus</i>	Crested dogs tail	0	3	3	<i>Leontodon hispidus</i>	Rough hawkbit	0	5	3
<i>Dactylis glomerata</i>	Cocks foot	4	0	3	<i>Linum catharticum</i>	Fairy flax	2	3	0
<i>Festuca ovina</i> agg.	Sheep's fescue	0	3	0	<i>Lotus corniculatus</i>	Birdsfoot trefoil	3	4	4
<i>Festuca rubra</i> agg.	Red fescue	4	3	4	<i>Pilosella officinarum</i>	Mouse ear hawkweed	4	3	0
<i>Holcus lanatus</i>	Yorkshire fog	2	0	2	<i>Plantago lanceolata</i>	Ribwort plantain	2	3	3
<i>Hypericum tetrapterum</i>	St. Johns wort	1	0	0	<i>Ranunculus acris</i>	Meadow buttercup	4	0	0
<i>Leontodon hispidus</i>	Rough hawkbit	4	4	4	<i>Ranunculus repens</i>	Creeping buttercup	3	0	0
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	4	5	4	<i>Taraxacum</i> agg.	Dandelion	1	0	0
<i>Linum catharticum</i>	Fairy flax	5	4	5	<i>Trifolium pratense</i>	Red clover	4	3	5
<i>Lotus corniculatus</i>	Common bird's-foot-trefoil	4	4	4	<i>Trifolium repens</i>	White clover	0	0	5
<i>Luzula multiflora</i>	Common woodrush	0	0	2	<i>Vicia hirsuta</i>	Common vetch	0	1	0
<i>Medicago lupulina</i>	Black medik	0	2	0	<i>Bare ground/litter/water/rock/mud</i>		0	0	3
<i>Pilosella officinarum</i>	Mouse-ear hawkweed	6	5	3	Total bryophyte		4	3	3
<i>Plantago lanceolata</i>	Ribwort plantain	4	4	5	Total lichen		1	1	0
<i>Rhinanthus minor</i>	Hay rattle	3	0	0					
<i>Senecio jacobaea</i>	Ragwort	0	0	1					

<i>Taraxacum agg.</i>	Dandelion	1	1	3				
<i>Trifolium pratense</i>	Red clover	4	3	5				
<i>Tussilago farfara</i>	Coltsfoot	0	1	0				
<i>Ulex europaeus</i>	Common gorse	0	0	1				
Bare ground/litter/water/rock/mud		3	5	2				
Total bryophyte		7	6	5				
Total lichen		4	4	2				

Habitat 5 - Calcareous Grassland		DOMIN Scale		
		Q1	Q2	Q3
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	0	4	0
<i>Bellis perennis</i>	Common daisy	0	0	2
<i>Briza media</i>	Quaking grass	9	8	7
<i>Carex flacca</i>	Blue green sedge	3	3	3
<i>Carex hirta</i>	Water sedge	2	0	0
<i>Carex nigra</i>	Black sedge	0	3	2
<i>Centaurea nigra</i>	Common knapweed	5	0	1
<i>Cirsium dissectum</i>	Meadow thistle,	2	0	0
<i>Cynosurus cristatus</i>	Crested dog's tail	0	3	0
<i>Danthonia decumbens</i>	Heath grass	2	0	0
<i>Equisetum [spp]</i>	Willowherb sp.	0	3	0
<i>Festuca rubra agg.</i>	Red fescue	0	4	0
<i>Juncus inflexus</i>	Hard rush	4	3	3
<i>Leontodon hispidus</i>	Rough hawkbit	4	4	4
<i>Linum catharticum</i>	Fairy flax	0	3	3
<i>Lotus corniculatus</i>	Common bird's-foot-trefoil	4	3	2
<i>Medicago lupulina</i>	Black medik	4	4	3
<i>Ophrys apifera</i>	Bee orchid	1	0	0
<i>Phleum pratense sens.lat.</i>	Timothy	0	3	0
<i>Pilosella officinarum</i>	Mouse-ear hawkweed	0	2	0
<i>Plantago lanceolata</i>	Ribwort plantain	2	3	1
<i>Potentilla reptans</i>	Creeping cinquefoil	0	2	0
<i>Prunella vulgaris</i>	Common self-heal	4	2	4
<i>Ranunculus acris</i>	Meadow buttercup	3	3	4
<i>Taraxacum agg.</i>	Dandelion	3	3	2
<i>Trifolium pratense</i>	Red clover	5	4	5

Bare ground/litter/water/rock/mud		0	2	4
Total bryophyte		4	3	5
Calcareous grassland - Wildflower Indicator Species				

Ditch	
Common Reed Mace	<i>Typha latifolia</i>
False Watercress	<i>Apium nodiflorum</i>
Greater willowherb	<i>Epilobium hirsutum</i>
Hard Rush	<i>Juncus inflexus</i>
Western Broad-leaved Orchid	<i>Dactylorhiza majalis</i>

Mixed Bare ground	
Blue Fleabane	<i>Erigeron acer</i>
Carline Thistle	<i>Carlina vulgaris</i>
Cats Ear	<i>Hypochaeris radicata</i>
Cinquefoil sp.	<i>Potentilla sp.</i>
Common Centaury	<i>Centaureum erythraea</i>
Common Knapweed	<i>Centaurea nigra</i>
Compact Rush	<i>Juncus conglomeratus</i>
Eyebright	<i>Euphrasia officinalis</i>
Hypericum sp.	<i>Hypericum Sp.</i>
Lady's Mantle	<i>Alchemilla sp.</i>
Mouse-ear Hawkweed	<i>Hieracium pilosella</i>
Quaking grass	<i>Briza sp.</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Sweet-Brier	<i>Rosa rubiginosa</i>
Tormentil	<i>Potentilla erecta</i>
Wild Strawberry	<i>Fragaria vesca</i>
Yarrow	<i>Achillea millefolium</i>
Yellow Rattle	<i>Rhinanthus minor</i>

None area specific records	
Cock's-foot	<i>Dactylus glomerata</i>
False Oat-grass	<i>Arrhenatherum elatius</i>
Hairy Tare Vetch	<i>Vicia hirsuta</i>
Germander Speedwell	<i>Veronica chamaedrys</i>
Yorkshire Fog	<i>Holcus lanatus</i>
Birds-foot Trefoil	<i>Lotus corniculatus</i>
Compact Rush	<i>Juncus conglomeratus</i>
Creeping cinquefoil	<i>Potentilla reptans</i>
Greater Birds foot Trefoil	<i>Lotus pedunculatus</i>
Hairy Tare Vetch	<i>Vicia hirsuta</i>
Hedge Woundwort	<i>Stachys sylvatica</i>
Horsetail sp.	<i>Equisetum sp.</i>
Male Fern	<i>Dryopteris filix-mas</i>
Ragged Robin	<i>Lychnis flos-cuculi</i>
Ragwort	<i>Jacobaea vulgaris</i>
Sneezewort	<i>Achillea ptarmica</i>
Tall Fescue	<i>Schedonorus arundinaceus</i>
Upright Hedge Parsley	<i>Torilis japonica</i>

Plantation Woodland Species	
Alder	<i>Alnus glutinosa</i>

Ash	<i>Fraxinus excelsior</i>
Aspen	<i>Populus tremula</i>
Common Larch	<i>Larix decidua</i>
Dogwood	<i>Cornus sanguinea</i>
Downy Birch	<i>Betula pubescens</i>
English Oak	<i>Quercus robur</i>
Field Maple	<i>Acer campestre</i>
Goat Willow	<i>Salix caprea</i>
Guelder rose	<i>Viburnum opulus</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus avellana</i>
Holly	<i>Ilex aquifolium</i>
Italian Alder	<i>Alnus cordata</i>
Norway Maple	<i>Acer platanoides</i>
Osier	<i>Salix viminalis</i>
Red alder	<i>Alnus rubra</i>
Red Oak	<i>Quercus rubra</i>
Rowan	<i>Sorbus aucuparia</i>
Scots Pine	<i>Pinus sylvestris</i>
Sea buckthorn	<i>Hippophae rhamnoides</i>
Silver Birch	<i>Betula pendula</i>
Sycamore	<i>Acer pseudoplatanus</i>
White Poplar	<i>Populus alba</i>
White Willow	<i>Salix alba</i>
Wild Cherry	<i>Prunus avium</i>
Common Larch	<i>Larix decidua</i>

APPENDIX D

Breeding Bird Survey and Wintering Bird Survey Results

Breeding Bird Survey Results

Common Name	Scientific Name	Survey 1 (31.07.2019)	Survey 2 (22.08.2019)	Conservation Status	County Status
Blackbird	<i>Turdus merula</i>	4	1	Green list	Common resident breeder
Blackcap	<i>Sylvia atricapilla</i>	5	0	Green list	Common breeding summer visitor and passage migrant
Bluetit	<i>Cyanistes caeruleus</i>	1	4 + 1 family	Green list	Common resident breeder
Bullfinch	<i>Pyrrhula pyrrhula</i>	1	1	Amber list; NERC S41	Common resident breeder
Buzzard	<i>Buteo buteo</i>	1	0	Green list	Common resident breeder
Carrion crow	<i>Corvus corone</i>	5	1	Green list	Common resident breeder
Chaffinch	<i>Fringilla coelebs</i>	1	1	Green list	Common resident breeder
Chiffchaff	<i>Phylloscopus collybita</i>	7	7	Green list	Common breeding summer visitor and passage migrant
Dunnoch	<i>Prunella modularis</i>	0	3	Amber list; NERC S41	Common resident breeder
Feral pigeon	<i>Columba livia</i>	0	2	Green list	Common resident feral breeder
Goldfinch	<i>Carduelis carduelis</i>	1	22	Green list	Common resident breeder
Herring gull	<i>Larus argentatus</i>	22	12	Red list; NERC S41	Common resident breeder

Jay	Garrulus glandarius	1	1	Green list	Common resident breeder
Long-tailed Tit	Aegithalos caudatus	1 Family	1 Family	Green list	Common resident breeder
Magpie	Pica pica	11	3	Green list	Common resident breeder
Meadow pipit	Anthus pratensis	3	3	Amber list	Common resident breeder
Peregrine falcon	Falco peregrinus	4	0	Green list; WCA Sch1;	Locally common resident breeder that continues to suffer persecution
Raven	Corvus corax	1	0	Green list	Locally common resident breeder, especially in the uplands
Robin	Erithacus rubecula	1	3	Green list	Common resident breeder
Song thrush	Turdus philomelos	0	1	Red list; NERC S41	Common resident breeder
Stonechat	Saxicola rubicola	2	0	Green list	Locally common resident breeder, passage migrant and winter visitor.
Swallow	Hirundo rustica	1	0	Green list	Common breeding summer visitor and passage migrant
Wood pigeon	Columba palumbus	9	2	Green list	Common resident breeder, large flocks frequently noted on passage at coastal sites in late autumn
Wren	Troglodytes troglodytes	8	7	Green list	Common resident breeder
Total number of species: 24					

Wintering Bird Survey Results

Common Name	Scientific Name	Survey 1 (04.03.2020)	Conservation Status	County Status
Blackbird	Turdus merula	16	Green list	Common resident breeder
Bluetit	Cyanistes caeruleus	5	Green list	Common resident breeder
Buzzard	Buteo buteo	3 + nest	Green list	Common resident breeder
Chaffinch	Fringilla coelebs	4	Green list	Common resident breeder
Coal tit		4	Green list	Locally common resident breeder
Dunnock	Prunella modularis	6	Amber list; NERC S41	Common resident breeder
Goldcrest	Regulus regulus	1	Green list	Common resident breeder and passage migrant, though numbers can be depleted due to harsh winters
Goldfinch	Carduelis carduelis	23	Green list	Common resident breeder
Great tit	Parus major	7	Green list	Common resident breeder
Herring gull	Larus argentatus	1	Red list; NERC S41	Common resident breeder
House sparrow	Passer domesticus	1	Red list; NERC S41	Common resident breeder
Jay	Garrulus glandarius	1	Green list	Common resident breeder
Lesser black-backed gull	Larus fuscus	23	Amber list	Common resident breeder, passage migrant and winter visitor, breeder on flat holm and on rooftops mainly in Cardiff city centre, but occasionally inland
Long-tailed Tit	Aegithalos caudatus	2	Green list	Common resident breeder
Magpie	Pica pica	18	Green list	Common resident breeder

Mistle thrush	Turdus viscivorus	3	Amber list	Common resident breeder
Nuthatch	Sitta europea	1	Green list	Common resident breeder
Peregrine falcon	Falco peregrinus	2	Green list; WCA Sch1;	Locally common resident breeder that continues to suffer persecution
Redshank	Tringa totanus	1	Amber listed	Scarce and declining resident breeder at coastal sites, though common winter visitor and passage migrant.
Redwing	Turdus iliacus	12	Red list; WCA Sch1	Common winter visitor and passage migrant
Robin	Erithacus rubecula	11	Green list	Common resident breeder
Siskin	Spinus spinus	7	Green list	Locally common resident breeder
Song thrush	Turdus philomelos	3	Red list; NERC S41	Common resident breeder
Treecreeper	Certhia familiaris	2	Green list	Common resident breeder
Wood pigeon	Columba palumbus	2	Green list	Common resident breeder, large flocks frequently noted on passage at coastal sites in late autumn
Wren	Troglodytes troglodytes	10	Green list	Common resident breeder
Total number of species: 26				

APPENDIX E

Activity Transect summary

Weather conditions from activity transects 2020

Date	Sunrise/ Sunset	Wind	Temperature	Cloud Cover	Rain
06.04.2020	20:47	1	14	10	0
19.05.2020	21:07	1	11	10	0
09.06.2020	21:30	2	17	80	0
29.07.2020	21:08	0	14	70	0
20.08.2020	20:25	2	19	100	0
17.09.2020	19:22	1	17	0	0
18.09.2020	04:54	1	10	50	0
14.10.2020	18:21	5	13	70	0

Activity Transect Data

Bat contacts from activity transects 2020

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
6th May 2020						
PC1	20:47	20:52				
PC2	20:58	21:03				

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
PC3	21:05	21:10				
			21:11	Common pipistrelle	3	Unknown
1			21:13	Common pipistrelle	Multiple	Foraging
PC4	21:14	21:19				
			21:14	Common pipistrelle x2	Continuous	Foraging
2			21:21	Common pipistrelle	5	Foraging
PC5	21:21	21:26				
			21:22	Common pipistrelle	Continuous	Foraging
3			21:26	Common pipistrelle	Multiple	Foraging
4			21:26	Soprano pipistrelle	1	Foraging
PC6	21:30	21:35				
			21:31	Common pipistrelle	1	Unknown
			21:32	Soprano pipistrelle	1	Unknown
5			21:35	Common pipistrelle	1	Unknown
PC7	21:38	21:43				
			21:41	Common pipistrelle	1	Unknown
6			21:45	Common pipistrelle	1	Unknown
PC8	21:45	21:50				
			21:45	Common pipistrelle	1	Unknown
			21:49	Common pipistrelle	2	Unknown
			21:49	<i>Plecotus</i> Sp.	1	Foraging
			21:50	<i>Myotis</i> Sp.	1	Foraging
PC9	21:52	21:57				
			21:55	<i>Myotis</i> Sp.	1	Unknown
PC10	22:00	22:05				
			22:02	Common pipistrelle	1	Unknown
			22:03	Unknown	1	Unknown
			22:05	Noctule	1	Unknown
PC11	22:08	22:12				
PC12	22:15	22:20				
			22:18	Soprano pipistrelle	2	Unknown
7			22:20	Common pipistrelle	2	Unknown

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
8			22:23	Common pipistrelle	4	Unknown
PC13	22:23	22:28				
			22:24	Common pipistrelle	2	Unknown
			22:27	Common pipistrelle	1	Unknown
9			22:28	Common pipistrelle	2	Unknown
PC14	22:31	22:36				
			22:32	Common pipistrelle	Multiple	Unknown
10			22:38	Common pipistrelle	3	Unknown
11			22:41	Common pipistrelle	1	Unknown
PC15	22:42	22:47	22:42			
			22:44	Common pipistrelle	Multiple	Unknown
			22:45	Soprano pipistrelle	1	Unknown
			22:46	Serotine	1	Unknown
12			22:47	Common pipistrelle	1	Unknown
PC16	22:50	22:55				
			22:52	Common pipistrelle	2	Unknown
PC17	22:58	23:03				
			23:00	Common pipistrelle	2	Unknown
13			23:04	Common pipistrelle	Continuous	Unknown
PC18	23:05	23:10				
			23:05	Common pipistrelle	Continuous	Unknown
			23:07	Soprano pipistrelle	1	Unknown
14			23:10	Common pipistrelle	2	Unknown
15			23:13	Soprano pipistrelle	1	Unknown
16			23:13	Common pipistrelle	Continuous	Unknown
PC19	23:14	23:19				
			23:17	Common pipistrelle	Continuous	Unknown
17			23:20	Common pipistrelle	2	Foraging
PC20	23:20	23:25				
			23:21	Common pipistrelle	Continuous	Unknown
			23:23	Soprano pipistrelle	2	Unknown
18			23:26	Common pipistrelle	3	Unknown
PC21	23:26	23:31				

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
			23:27	Common pipistrelle	Continuous	Unknown
			23:27	Soprano pipistrelle	1	Unknown
19			23:31	<i>Plecotus</i> Sp.	1	Unknown
20			23:32	Common pipistrelle	1	
PC22	23:33	23:38				
			23:35	Common pipistrelle	Multiple	Unknown
PC23	23:39	23:44				
			23:40	Common pipistrelle	1	Unknown
			23:45	Common pipistrelle	Multiple	Unknown, Foraging
PC24	23:45	23:50				
			23:46	Common pipistrelle	Multiple	Unknown
19th May 2020						
PC19	21:10	21:15				
PC18	21:19	21:24				
PC17	21:26	21:31				
PC16	21:33	21:38				
			21:38	Common pipistrelle x2	1	Commuting
PC15	21:42	21:47				
			21:43	Common pipistrelle	1	Unknown
PC14	21:51	21:56				
PC13	21:59	22:04				
			21:59	Common pipistrelle	1	Unknown
			22:00	Soprano pipistrelle	1	Unknown
			22:03	Common pipistrelle	1	Unknown
PC12	22:07	22:12				
			22:08	<i>Plecotus</i> Sp.	1	Unknown
			22:08	Common pipistrelle	1	Unknown
			22:12	Common pipistrelle	1	Unknown
PC11	22:15	22:20				
			22:16	<i>Plecotus</i> Sp.	1	Unknown
1			22:22	Common pipistrelle	1	Unknown
PC10	22:24	22:29				

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
PC9	22:33	22:38				
			22:38	Common pipistrelle	1	Unknown
PC8	22:41	22:46				
PC7	22:48	22:53				
PC6	22:58	23:03				
PC5	23:04	23:09				
			23:08	Common pipistrelle	1	Unknown
			23:09	Common pipistrelle	1	Foraging
PC4	23:11	23:16				
PC3	23:18	23:23				
			23:20	Common pipistrelle	1	Unknown
			23:22	Common pipistrelle	1	Unknown
PC2	23:24	23:29				
PC1	23:30	23:35				
PC24	23:36	23:41				
PC23	23:42	23:47				
PC22	23:48	23:53				
2			23:54	Common pipistrelle	2	Unknown
PC21	23:56	00:01				
PC20	00:02	00:07				
9th June 2020						
PC18	21:30	21:35				
PC19	21:38	21:45				
PC20	21:44	21:49				
			21:45	Common pipistrelle	1	Unknown
PC21	21:51	21:56				
1			21:59	Common pipistrelle		Unknown
PC22	22:01	22:06				
			22:01	Common pipistrelle	3	Unknown
PC23	22:07	22:12				
PC24	22:14	22:19				
			22:17	Common pipistrelle	1	Unknown
PC1	22:20	22:25				

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
PC18	21:07	21:12				
PC19	21:16	21:21				
PC20	21:24	21:29				
			21:28	Common pipistrelle	1	Commuting
P21	21:30	21:35				
			21:30	Common pipistrelle	Continuous	Foraging
PC22	21:38	21:43				
			21:38	Common pipistrelle	1	Unknown
			21:40	Common pipistrelle	3	Foraging
1			21:44	Common pipistrelle	1	Unknown
PC23	21:45	21:50				
PC24	21:52	21:50				
PC1	21:58	22:03				
			21:59	Common pipistrelle	1	Unknown
			22:02	Common pipistrelle	2	Unknown
PC2	22:06	22:11				
			22:09	Common pipistrelle	1	Unknown
			22:11	Common pipistrelle x2	1	Unknown
PC3	22:13	22:18				
			22:14	Common pipistrelle	1	Unknown
			22:17	Common pipistrelle x2	1	Unknown
PC4	22:20	22:25				
PC5	22:26	22:31				
PC6	22:34	22:39				
			22:35	Soprano pipistrelle X2	1	Unknown
			22:36	Common pipistrelle	1	Unknown
PC7	22:42	44:47				
			22:46	Common pipistrelle	1	Unknown
PC8	22:49	22:54				
			22:51	Common pipistrelle	2	Unknown
PC9	22:57	23:02				

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
2			22:03	Common pipistrelle	2	Unknown
PC10	23:05	23:10				
PC11	23:13	23:18				
PC12	23:22	23:27				
			23:23	Noctule	2	Unknown
3			23:29	Common pipistrelle	1	Unknown
PC13	23:31	23:36				
Pc14	23:37	23:42				
PC15	23:46	23:51				
			23:50	Common pipistrelle	1	Unknown
PC16	23:56	00:01				
PC17	00:02	00:07				
			00:04	Common pipistrelle	1	Unknown
20th August 2020						
PC22	20:25	20:30				
PC23	20:32	20:37				
PC24	20:39	20:44				
PC1	20:46	20:51				
PC2	20:53	20:58				
1			21:00	Common pipistrelle	1	Unknown
PC3	21:02	21:07				
			21:02	Common pipistrelle	2	Unknown
			21:07	Common pipistrelle	1	Unknown
PC4	21:10	21:15				
			21:11	Common pipistrelle	1	Unknown
			21:13	Common pipistrelle	1	Unknown
PC5	21:17	21:22				
			21:21	Common pipistrelle	1	Unknown
PC6	21:24	21:29				
			21:27	Common pipistrelle	1	Unknown
PC7	21:32	21:37				
PC8	21:41	21:46				
PC9	21:48	21:53				

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
PC10	21:55	22:00				
2			22:01	Common pipistrelle	Multiple	Foraging
PC11	22:03	22:08				
			22:05	Common pipistrelle	1	Unknown
PC12	22:12	22:17				
			22:12	Common pipistrelle	1	Unknown
PC13	22:19	22:24				
PC14	22:23	22:30				
PC15	22:33	22:38				
PC16	22:42	22:47				
PC17	22:49	22:54				
PC18	22:56	23:01				
			22:59	Common pipistrelle	1	Unknown
PC19	23:02	23:07				
PC20	23:08	23:13				
PC21	23:16	23:21				
17th September 2020						
PC7	19:22	19:27				
PC6	19:35	19:40				
			19:40	Nathusius pipistrelle	1	Unknown
PC5	19:41	19:46				
PC4	19:48	19:52				
1			19:52	Common pipistrelle	3	Commuting & Foraging
PC3	19:55	20:00				
			19:56	Soprano pipistrelle	Multiple	Foraging
			19:58	Common pipistrelle	Multiple	Unknown
			19:59	Soprano pipistrelle	Multiple	Unknown
PC2	20:02	20:07				
			20:03	Common pipistrelle	Multiple	Unknown
PC1	20:10	20:15				
			20:13	Common pipistrelle		Unknown
PC24	20:16	20:21				

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
PC23	20:22	20:27				
PC22	20:28	20:33				
2			20:34	Common pipistrelle	Multiple	Unknown
3			20:35	Common pipistrelle	1	Unknown
PC21	20:37	20:42				
PC20	20:44	20:49				
			20:45	Common pipistrelle	Multiple	Unknown
			20:47	Common pipistrelle x2	Multiple	Foraging
4			20:49	Soprano pipistrelle	1	Unknown
PC19	20:51	20:56				
			20:51	Common pipistrelle	Multiple	Unknown
			20:54	Soprano pipistrelle	1	Unknown
			20:55	Common pipistrelle	1	Unknown
5			20:58	Common pipistrelle x3	Multiple	Unknown
6			20:59	Common pipistrelle	Multiple	Social & Unknown
7			20:59	<i>Myotis</i> Sp.	1	Unknown
PC18	21:00	21:05				
			21:00	Common pipistrelle	Multiple	Social & Unknown
			21:00	Soprano pipistrelle	Multiple	Unknown
PC17	21:08	21:13				
PC16	21:15	21:20				
			21:16	Common pipistrelle	1	Commuting
PC15	21:23	21:28				
			21:24	Soprano pipistrelle	1	Unknown
			21:25	<i>Plecotus</i> Sp.	1	Commuting
			21:27	Common pipistrelle	1	Foraging
6			21:29	Common pipistrelle	1	Foraging
PC14	21:32	21:37				
			21:32	Common pipistrelle	Multiple	Commuting & Social
7			21:38	Common pipistrelle	1	Unknown
PC13	21:40	21:45				
			21:40	Common pipistrelle	2	Unknown

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
PC12	21:47	21:52				
			21:47	Soprano pipistrelle	1	Unknown
			21:47	<i>Plecotus</i> Sp.	1	Unknown
PC11	21:54	21:59				
			21:55	Common pipistrelle	1	Unknown
			21:57	<i>Myotis</i> Sp.	1	Unknown
PC10	22:01	22:06				
			22:03	Soprano pipistrelle	1	Unknown
8			22:06	Common pipistrelle	1	Unknown
PC9	22:09	22:14				
			22:10	<i>Plecotus</i> Sp.	1	Unknown
PC8	22:10	22:21				
18th September 2020						
PC7	04:54	04:57				
PC6	05:00	05:03				
PC5	05:04	05:07				
PC4	05:08	05:11				
PC3	05:13	05:16				
PC2	05:17	05:20				
PC1	05:22	05:25				
PC24	05:27	05:30				
PC23	05:32	05:35				
PC22	05:36	05:39				
PC21	05:40	05:43				
PC20	05:45	05:48				
PC19	05:49	05:52				
PC18	05:54	05:57				
PC17	05:58	06:01				
PC16	06:02	06:05				
PC15	06:07	06:10				
PC14	06:13	06:16				
			06:13	Common pipistrelle	1	Unknown
			06:16	Bat species	1	Commuting

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
PC13	06:18	06:21				
			06:19	Common pipistrelle	1	Unknown
			06:19	Soprano pipistrelle	1	Commuting
1			06:21	Common pipistrelle	1	Commuting
PC12	06:22	06:25				
			06:26	Soprano pipistrelle	1	Unknown
PC11	06:27	06:30				
			06:27	Common pipistrelle	11	Unknown
			06:30	Soprano pipistrelle	1	Unknown
PC10	06:32	06:35				
PC9	06:38	06:41				
PC8	06:42	06:45				
14th October 2020						
PC19	18:21	18:26				
PC20	18:27	18:32				
PC21	18:37	18:42				
			18:37	Common pipistrelle	1	Unknown
			18:41	Common pipistrelle X2	2	Unknown
PC22	18:44	18:49				
			18:44	Common pipistrelle	1	Unknown
			18:48	Common pipistrelle X2	1	Unknown
			18:49	Pipistrelle species	1	Unknown
PC23	18:51	18:56				
PC24	18:57	19:02				
			19:01	Common pipistrelle	1	Unknown
PC1	19:04	19:09				
			19:05	Common pipistrelle	1	Unknown
PC2	19:14	19:19				
			19:17	Common pipistrelle	2	Unknown
PC3	19:23	19:28				
			19:27	Soprano pipistrelle	2	Unknown and social
1			19:30	Common pipistrelle	1	Unknown

Ref	PC Start	PC End	Contact Time	Species	Pass	Behaviour
PC4	19:31	19:36				
			19:34	Common pipistrelle	1	Unknown
2			19:37	Common pipistrelle	1	Unknown
PC5	19:39	19:44				
PC6	19:47	19:52				
PC7	19:55	20:00				
PC8	20:03	20:08				
PC9	20:09	20:14				
PC10	20:17	20:22				
PC11	20:24	20:29				
PC12	20:33	20:34				
PC13	20:41	20:46				
PC14	20:47	20:52				
PC15	20:54	20:59				
PC16	21:01	21:06				
PC17	21:08	21:13				
PC18	21:14	21:19				

APPENDIX F

Static (passive) activity summary 2020

Recording Period	Unit No.	Start Date	End Date	Survey Hours	Total Av. per hour	Total Registrations	Common Pipistrelle			Soprano Pipistrelle			Nathusius' pipistrelle			Myotis Species			Pipistrelle Species		
							Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
April	1	06/05/2020	11/05/2020	48	3.3	158	131	53	2.73	18	9	0.37	0	0	0.00	2	1	0.04	0	0	0.00
April	2	06/05/2020	11/05/2020	48	44.2	2122	1906	769	39.66	195	114	4.06	0	0	0.00	5	3	0.10	0	0	0.00
May	1	19/05/2020	24/05/2020	45	5.9	264	246	144	5.48	9	3	0.20	0	0	0.00	1	1	0.02	0	0	0.00
May	2	19/05/2020	24/05/2020	45	6.5	291	255	103	5.68	26	12	0.58	0	0	0.00	2	2	0.04	0	0	0.00
June	1	09/06/2020	14/06/2020	42	11.0	462	428	263	10.23	4	2	0.10	26	23	0.62	0	0	0.00	1	1	0.02
June	2	09/06/2020	14/06/2020	42	2.3	95	73	27	1.74	7	4	0.17	0	0	0.00	11	10	0.26	0	0	0.00
July	1	29/07/2020	03/08/2020	48	12.0	576	415	175	8.64	7	4	0.15	89	36	1.85	39	16	0.81	3	1	0.06
July	2	29/07/2020	03/08/2020	48	13.1	629	572	200	11.90	22	9	0.46	0	0	0.00	20	7	0.42	0	0	0.00
September	1	17/09/2020	22/09/2020	64	3.2	204	146	59	2.30	42	22	0.66	0	0	0.00	12	9	0.19	0	0	0.00
September	2	17/09/2020	22/09/2020	64	15.3	971	801	338	12.60	112	44	1.76	23	13	0.36	17	8	0.27	15	9	0.24
October	1	14/10/2020	19/10/2020	72	3.2	234	127	80	1.75	11	7	0.15	19	13	0.26	23	7	0.32	49	18	0.68
October	2	14/10/2020	19/10/2020	72	3.6	259	239	109	3.30	9	5	0.12	0	0	0.00	1	1	0.01	0	0	0.00

Recording Period	Unit No.	Start Date	End Date	Survey Hours	Total Av. per hour	Total Registrations	Long Eared Species			Noctule			Nyctalus Species			Lesser Horseshoe			Serotine		
							Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
April	1	06/05/2020	11/05/2020	48	3.3	158	3	1	0.06	4	2	0.08	0	0	0.00	0	0	0.00	0	0	0.00
April	2	06/05/2020	11/05/2020	48	44.2	2122	15	5	0.31	0	0	0.00	0	0	0.00	0	0	0.00	1	1	0.02
May	1	19/05/2020	24/05/2020	45	5.9	264	1	1	0.02	7	5	0.16	0	0	0.00	0	0	0.00	0	0	0.00
May	2	19/05/2020	24/05/2020	45	6.5	291	1	1	0.02	6	3	0.13	1	1	0.02	0	0	0.00	0	0	0.00
June	1	09/06/2020	14/06/2020	42	11.0	462	1	1	0.02	2	1	0.05	0	0	0.00	0	0	0.00	0	0	0.00
June	2	09/06/2020	14/06/2020	42	2.3	95	1	1	0.02	3	2	0.07	0	0	0.00	0	0	0.00	0	0	0.00
July	1	29/07/2020	03/08/2020	48	12.0	576	15	5	0.31	7	5	0.15	0	0	0.00	1	1	0.02	0	0	0.00
July	2	29/07/2020	03/08/2020	48	13.1	629	4	2	0.08	11	5	0.23	0	0	0.00	0	0	0.00	0	0	0.00
September	1	17/09/2020	22/09/2020	64	3.2	204	3	2	0.05	1	1	0.02	0	0	0.00	0	0	0.00	0	0	0.00
September	2	17/09/2020	22/09/2020	64	15.3	971	3	1	0.05	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
October	1	14/10/2020	19/10/2020	72	3.2	234	5	2	0.07	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
October	2	14/10/2020	19/10/2020	72	3.6	259	5	2	0.07	3	3	0.04	1	1	0.01	1	1	0.01	0	0	0.00

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APPENDIX G

NVC Communities Summary

TABLEFIT results of the five habitat types have been presented; (a) the results best diagnosis and species list, and (b) the information for the five best fits (Fit#) to the NVC communities. Each habitat had a value of analysis parameter of *Mixed composition and cover* with percentage cover-abundance scale for samples and five fitted communities to output.

Habitats 2, 4 and 5 were subject to further condition assessments which are summaries in Tables C.

Habitat 1- Marshy Grassland

(a)

Habitat 1- Marshy Grassland	
EUNIS community code and name	Atlantic and sub-Atlantic humid meadows (E3.41)
NVC community	<i>Cynosurus cristatus</i> - <i>Carex panicea</i> - <i>Caltha palustris</i> grassland (MG8b)
NVC sub-community	Typical
Mean Goodness-of-fit and its component parts (GoF_1, GoF_2, GoF_3, GoF_4)	31 - very poor (75, 40, 26, 42)
Species list	<i>Cardamine pratensis</i> , <i>Carex acuta</i> , <i>Carex echinate</i> , <i>Carex flacca</i> , <i>Carex nigra</i> , <i>Carex pseudocyperus</i> , <i>Centaurea nigra</i> , <i>Cirsium palustre</i> , <i>Dactylorhiza majalis praetermissa</i> , <i>Deschampsia cespitosa</i> , <i>Eleocharis multicaulis</i> , <i>Festuca rubra</i> agg., <i>Galium palustre</i> , <i>Holcus lanatus</i> , <i>Hypericum tetrapterum</i> , <i>Juncus conglomeratus</i> , <i>Juncus effusus</i> , <i>Juncus inflexus</i> , <i>Juncus subnodulosus</i> , <i>Lychnis flos-cuculi</i> , <i>Mentha aquatica</i> , <i>Plantago lanceolata</i> , <i>Ranunculus acris</i> , <i>Ranunculus flammula</i> , <i>ranunculus repens</i> , <i>Rhinanthus minor</i> , <i>Salix cinerea</i> , <i>Salix repens</i> agg and <i>Trifolium repens</i>

(b)

Habitat 1- Marshy Grassland					
Fit#	Eunis community code	NVC community/ sub-community type	Mean GoF	Four component GoF values	NVC community/sub-community name
1	E3.41	MG8b	31	75 40 26 42	<i>Cynosurus cristatus</i> - <i>Carex panicea</i> - <i>Caltha palustris</i> grassland
2	E3.41	M23	28	95 32 22 40	<i>Juncus effusus</i> / <i>acutiflorus</i> - <i>Galium palustre</i> rush-pasture
3	E3.41	M23b	27	91 34 22 35	<i>Juncus effusus</i> - <i>Galium palustre</i> rush-pasture
4	E3.4	MG14b	27	60 34 27 49	<i>Carex nigra</i> - <i>Agrostis stolonifera</i> - <i>Senecio aquaticus</i> grassland
5	E3.41	M23a	26	80 33 21 37	<i>Juncus acutiflorus</i> - <i>Galium palustre</i> rush-pasture

Habitat 2- Calcareous Grassland 1

(a)

Habitat 2- Calcareous Grassland 1	
EUNIS community code and name	Sub-Atlantic <i>semi</i> -dry calcareous grassland (E1.26)
NVC community	<i>Festuca ovina</i> – <i>Carlina vulgaris</i> grassland (CG1f)
NVC sub-community	<i>Festuca rubra</i> - <i>Scilla verna</i>
Mean Goodness-of-fit and its component parts (GoF_1, GoF_2, GoF_3, GoF_4)	47 - very poor (67, 54, 46, 64)
Species list	<i>Achillea millefolium</i> , <i>Aira caryophyllea</i> , <i>Anthoxanthum odoratum</i> , <i>Anthyllis vulneraria</i> , <i>Arrhenatherum elatius</i> , <i>Bromus hordeaceus</i> , <i>Carex flacca</i> , <i>carex nigra</i> , <i>Carlina vulgaris</i> , <i>Centaureum erythraea</i> , <i>Cerastium fontanum</i> , <i>Cirsium arvense</i> , <i>Crepis vesicaria</i> , <i>Dactylis glomerata</i> , <i>Daucus carota</i> , <i>Erigeron acer</i> , <i>Festuca rubra</i> , <i>Hieracium</i> sect. <i>Vulgata</i> , <i>Leontodon hispidus</i> , <i>Linum catharticum</i> , <i>Lotus corniculatus</i> , <i>Medicago lupulina</i> , <i>Ophrys apifera</i> , <i>Pilosella officinarum</i> , <i>plantago lanceolata</i> , <i>Polygala vulgaris</i> , <i>Tragopogon pratensis</i> and <i>Trifolium pratense</i> .

(b)

Habitat 2- Calcareous Grassland 1					
Fit#	Eunis community code	NVC community/ sub-community type	Mean GoF	Four component GoF values	NVC community/sub-community name
1	E1.26	CG1f	47	67 54 46 64	<i>Festuca rubra</i> - <i>Scilla verna</i>
2	B3.31	MC9c	41	58 26 72 54	<i>Festuca rubra</i> - <i>Holcus lanatus</i> - <i>Achillea millefolium</i>
3	B3.31	MC11c	39	79 32 54 51	<i>Festuca rubra</i> - <i>Daucus carota</i> - <i>Sanguis minor</i>
4	B3.31	MC11	38	100 25 65 41	<i>Festuca rubra</i> - <i>Daucus carota</i>
5	E1.26	CG6a	37	62 40 46 51	<i>Avenula pubescens</i> - <i>Dactylis glomerata</i> - <i>Briza media</i>

(c)

Criteria for:	Criteria	Outcome
Species Rich Grassland	Cover of rye grasses and white clover <10%?	Does meet criteria for Species Rich Grassland
	Species rich? (>15 species incl. grasses)	
	High cover of wildflowers and sedges (>30% excl. white clover creeping buttercup and injurious weeds)	
BAP priority Habitat	Wildflower indicator threshold reached	Does not meet BAP Priority Habitat requirements.
BAP calcareous grassland	<5% undesirable species	Does not meet BAP Calcareous grassland requirements.
	>30% wildflowers & sedges	
	Bare ground <10%	
	Invasive trees and shrubs <5%	
	Min. 2 frequent and 3 occasional indicator sp.	

Habitat 3- Mesotrophic Grassland 1

(a)

Habitat 3- Mesotrophic Grassland 1	
EUNIS community code and name	Atlantic <i>Cynosurus-Centaurea</i> pastures (E2.112)
NVC community	<i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> grassland (MG5a)
NVC sub-community	<i>Lathyrus pratensis</i>
Mean Goodness-of-fit and its component parts (GoF_1, GoF_2, GoF_3, GoF_4)	44 - very poor (77, 50, 38, 63)
Species list	<i>Achillea millefolium</i> , <i>Agrostis stolonifera</i> , <i>Aira caryophylla</i> , <i>Anthoxanthum odoratum</i> , <i>Arrhenatherum elatius</i> , <i>Bromus hordeaceus</i> , <i>Carex flacca</i> , <i>Carex nigra</i> , <i>Centaurea erythraea</i> , <i>Cerastium fontanum</i> , <i>Crataegus monogyna</i> , <i>Cynosurus cristatus</i> , <i>Dactylis glomerata</i> , <i>Festuca ovina</i> , <i>Festuca rubra</i> , <i>Holcus lanatus</i> , <i>Hypericum tetrapterum</i> , <i>Leontodon hispidus</i> , <i>Leucanthemum vulgare</i> , <i>Linum catharticum</i> , <i>Lotus corniculatus</i> , <i>Luzula multiflora</i> , <i>Medicago lupulina</i> , <i>Pilosella officinarum</i> , <i>Plantago lanceolata</i> , <i>Rhinanthus minor</i> , <i>Senecio jacobaea</i> , <i>Taraxacum agg.</i> , <i>Trifolium pratense</i> , <i>Tussilago farfara</i> and <i>Ulex europaeus</i> .

(b)

Habitat 3- Mesotrophic Grassland 1					
Fit#	Eunis community code	NVC community/ sub-community type	Mean GoF	Four component GoF values	NVC community/sub-community name
1	E2.112	MG5a	44	77 50 38 63	<i>Cynosurus cristatus</i> – <i>Centaurea</i> - <i>Lathyrus pratensis</i>
2	E2.112	MG5	42	76 48 39 60	<i>Cynosurus cristatus</i> – <i>Centaurea</i>
3	E2.112	MG5b	42	77 53 34 57	<i>Cynosurus cristatus</i> – <i>Centaurea</i> - <i>Galium verum</i>
4	E1.26	CG3c	41	72 52 33 60	<i>Bromus erectus</i> - <i>Knautia arvensis</i> - <i>Bellis perennis</i>
5	E1.26	CG2c	38	69 51 29 63	<i>Festuca ovina</i> - <i>Avenula</i> - <i>Holcus lanatus</i> - <i>Trifolium repens</i>

Habitat 4- Mesotrophic Grassland 2

(a)

Habitat 4- Mesotrophic Grassland 2	
EUNIS community code and name	Atlantic <i>Cynosurus-Centaurea</i> pastures (E2.112)
NVC community	<i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> grassland (MG5a)
NVC sub-community	<i>Lathyrus pratensis</i>
Mean Goodness-of-fit and its component parts (GoF_1, GoF_2, GoF_3, GoF_4)	71 - good (81, 75, 67, 100)
Species list	<i>Agrostis stolonifera</i> , <i>Anthoxanthum odoratum</i> , <i>Arrhenatherum elatius</i> , <i>Bellis perennis</i> , <i>Carex flacca</i> , <i>Carex nigra</i> , <i>Centaurium erythraea</i> , <i>Cynosurus cristatus</i> , <i>Dactylis glomerata</i> , <i>Festuca rubra</i> , <i>Holcus lanatus</i> , <i>Leontodon hispidus</i> , <i>Linum catharticum</i> , <i>Lotus corniculatus</i> , <i>Pilosella officinarum</i> , <i>Plantago lanceolata</i> , <i>Ranunculus acris</i> , <i>Ranunculus repens</i> , <i>Taraxacum</i> agg., <i>Trifolium pratense</i> , <i>Trifolium repens</i> and <i>Vicia hirsute</i> .

(b)

Habitat 4- Mesotrophic Grassland 2					
Fit#	Eunis community code	NVC community/ sub-community type	Mean GoF	Four component GoF values	NVC community/sub-community name
1	E2.112	MG5a	71	81 75 67 100	<i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> - <i>Lathyrus pratensis</i>
2	E2.112	MG5	69	79 70 67 100	<i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> - Typical
3	E2.112	MG5b	67	75 70 65 94	<i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> - <i>Galium verum</i>
4	E3.41	MG8	62	74 57 70 76	<i>Cynosurus cristatus</i> – <i>Caltha palustris</i>
5	E3.41	MG8b	56	85 62 48 75	<i>Cynosurus cristatus</i> - <i>Carex panicea</i> - Typical

(c)

Criteria for:	Criteria	Outcome
Species Rich Grassland	Cover of rye grasses and white clover <10%?	Site does meet criteria for species rich grassland but is currently in poor condition* *Condition Category C- BAP grassland currently in 'poor condition'- Failed criterion 5
	Species rich? (>15 species incl. grasses)	
	High cover of wildflowers and sedges (>30% excl. white clover creeping buttercup and injurious weeds)	
BAP priority Habitat	Wildflower indicator threshold reached	
BAP Species Rich Grassland	<5% undesirable species	
	>30% wildflowers & sedges	
	Bare ground <10%	
	Invasive trees and shrubs <5%	
	Min. 2 frequent and 3 occasional indicator sp.	

Habitat 5- Calcareous Grassland 2

(a)

Habitat 5 - Calcareous Grassland 2	
EUNIS community code and name	Sub-Atlantic semi-dry calcareous grassland (E1.26)
NVC community	Bromus erectus grassland (CG3c)
NVC sub-community	Knautia arvensis-Bellis perennis
Mean Goodness-of-fit and its component parts (GoF_1, GoF_2, GoF_3, GoF_4)	51 - poor (75, 69, 36, 81)
Species list	<i>Anthoxanthum odoratum</i> , <i>Bellis perennis</i> , <i>Briza media</i> , <i>Carex flacca</i> , <i>Carex hirta</i> , <i>Centaurea nigra</i> , <i>Cirsium dissectum</i> , <i>Cynosurus cristatus</i> , <i>Danthonia decumbens</i> , <i>Festuca rubra</i> , <i>Juncus inflexus</i> , <i>Leontodon hispidus</i> , <i>Linum catharticum</i> , <i>Lotus corniculatus</i> , <i>Medicago lupulina</i> , <i>Ophrys apifera</i> , <i>Phleum pratense sens.lat.</i> , <i>Pilosella officinarum</i> , <i>Plantago lanceolata</i> , <i>Potentilla reptans</i> , <i>Prunella vulgaris</i> , <i>Ranunculus acris</i> , <i>Taraxacum agg.</i> and <i>Trifolium pratense</i> .

(b)

Habitat 5 - Calcareous Grassland 2					
Fit#	Eunis community code	NVC community/ sub-community type	Mean GoF	Four component GoF values	NVC community/sub-community name
1	E1.26	CG3c	51	75, 69, 36, 81	<i>Bromus erectus</i> - <i>Knautia arvensis</i> - <i>Bellis perennis</i>
2	E1.26	CG1e	36	53, 43, 44, 59	<i>Festuca ovina</i> - <i>Carlina</i> - <i>Koeleria macrantha</i>
3	E1.26	CG6a	35	72, 55, 18, 49	<i>Avenula pubescens</i> - <i>Dactylis glomerata</i> - <i>Briza media</i>
4	E1.26	CG2c	32	57, 54, 19, 81	<i>Festuca ovina</i> - <i>Avenula</i> - <i>Holcus lanatus</i> - <i>Trifolium repens</i>
5	E1.26	CG3	30	74, 45, 15, 54	<i>Bromus erectus</i> - Typical

(c)

Criteria for:	Criteria	Outcome
Species Rich Grassland	Cover of rye grasses and white clover <10%?	Habitat is not considered a species rich grassland and does not meet the BAP criteria for priority habitat.
	Species rich? (>15 species incl. grasses)	
	High cover of wildflowers and sedges (>30% excl. white clover creeping buttercup and injurious weeds)	
BAP priority Habitat	Wildflower indicator threshold reached	
BAP calcareous grassland	<5% undesirable species	
	>30% wildflowers & sedges	
	Bare ground <10%	
	Invasive trees and shrubs <5%	
	Min. 2 frequent and 3 occasional indicator sp.	

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APPENDIX H

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**LAND AT GOAT MILL RD, MERTHYR TYDFIL
INVERTEBRATE SURVEY, 2020**

David Boyce

DC Boyce
Ecologist
November 2020



1. INTRODUCTION

This report details the findings of an invertebrate survey carried out under contract to fpcr. It aims to assess the importance for invertebrates of an area of land at Goat Mill Road, which lies on the eastern edge of Merthyr Tydfil. The site lies on gentle west-facing slopes on the western edge of the disused opencast workings at Dowlais Great Tip. Altitudes range from approximately 320m. asl. at the north-eastern corner of the site, to around 280m. asl. along its western edge. It comprises a mixture of ruderal vegetation on old brownfield land with marshy grassland, mixed plantation woodland and scrub. For the sake of brevity, the site is hereafter referred to as 'Goat Mill Road'. It lies within the county of Glamorgan (Watsonian vice county 41). A central grid reference for the site approximates to SO062069.

2. METHODS

Survey work in 2020 was undertaken on the 10th of May, 25th of June and 3rd of September. On the first day, a rapid visual 'walkover' assessment of the area was undertaken. Using the results of the initial walkover, the range of invertebrate habitats present on the site was identified and it was then possible to prioritise those areas where follow-up survey was required.

The main emphasis for more detailed invertebrate surveys was on those habitats likely to have the greatest invertebrate interest (eg. short ruderal vegetation, marshy grassland and scrub edge). Other less promising habitat types (eg. dense mixed plantations) were also surveyed in less detail, with the aim being to ensure complete coverage of the whole range of main invertebrate habitats represented on the site.

In addition to general spot-searching techniques, some more specialised sampling methods were used to ensure all potentially important habitat features were sampled effectively. Grassland, wetland and ruderal vegetation were mostly sampled by sweeping the vegetation with a heavy-duty entomological sweep net and beating tall herbaceous plants over a white plastic tray. Ground-active invertebrates in grass tussocks and litter were sampled by shaking them out over a white plastic tray. Catches were collected into tubes with either ethyl acetate or iso-propyl alcohol. Subsequently, all samples were identified down to species level. A range of invertebrate groups have been covered, with a full checklist of all species identified given in Table 3.1. The survey methods, including the choice of taxa selected for sampling follow Natural England's advice for undertaking invertebrate site assessments (Drake, *et. al.*, 2007).

For the purposes of this survey, a series of four survey units (abbreviated SU1 to 4 in this report) have been identified, which correspond to the main blocks of distinctly different habitat present across the site. These survey units are shown on Figure 2.1 below. These survey units are shown on Figure 2.1 below and Table 2.1 describes them briefly. The six-figure grid reference given in this table and shown on Figure 2.1 marks the approximate central point of the survey unit.

Table 2.1. Invertebrate sample stations at Goat Mill Road, Merthyr Tydfil - 2020

Sample station	Grid ref	Description
1	SO062070	Short, ruderal vegetation on old brownfield site. Sparse vegetation with much bare, gravelly ground and patchy herb-rich sward including common bird's-foot trefoil <i>Lotus corniculatus</i> , red clover <i>Trifolium pratense</i> , kidney vetch <i>Anthyllis vulneraria</i> , common vetch <i>Vicia sativa</i> , wild thyme <i>Thymus pulegioides</i> and yarrow <i>Achillea millefolium</i> . Some areas of damp mesotrophic grassland, especially to north of unit with hardheads <i>Centaurea nigra</i> , meadow vetchling <i>Lathyrus pratensis</i> . Scattered, low birch <i>Betula</i> sp. and grey willow <i>Salix cinerea</i> .
2	SO062065	Damp, marshy grassland with species-rich and diverse, open sward with rushes <i>Juncus</i> spp., small sedges <i>Carex</i> spp., ragged robin <i>Lychnis flos-cuculi</i> , tufted vetch <i>Vicia cracca</i> lesser spearwort <i>Ranunculus flammula</i> , and southern marsh orchid <i>Dactylorhiza praetermissa</i> .. Sheltered by surrounding scrubby woodland
3	SO063067	Rather rank neutral grassland on west-facing slopes. Quite herb-rich, with common bird's-foot trefoil, red clover, meadow vetchling, common vetch. Scattered scrub.
4	SO061071	Wet basin, with rush- dominated poor fen. Brown mosses, lady's smock <i>Cardamine pratensis</i> , small sedges and bottle sedge <i>Carex rostrata</i> are amongst the characteristic associates. Scattered, low grey willow scrub.

SITE PLAN - FOR IDENTIFICATION PURPOSES

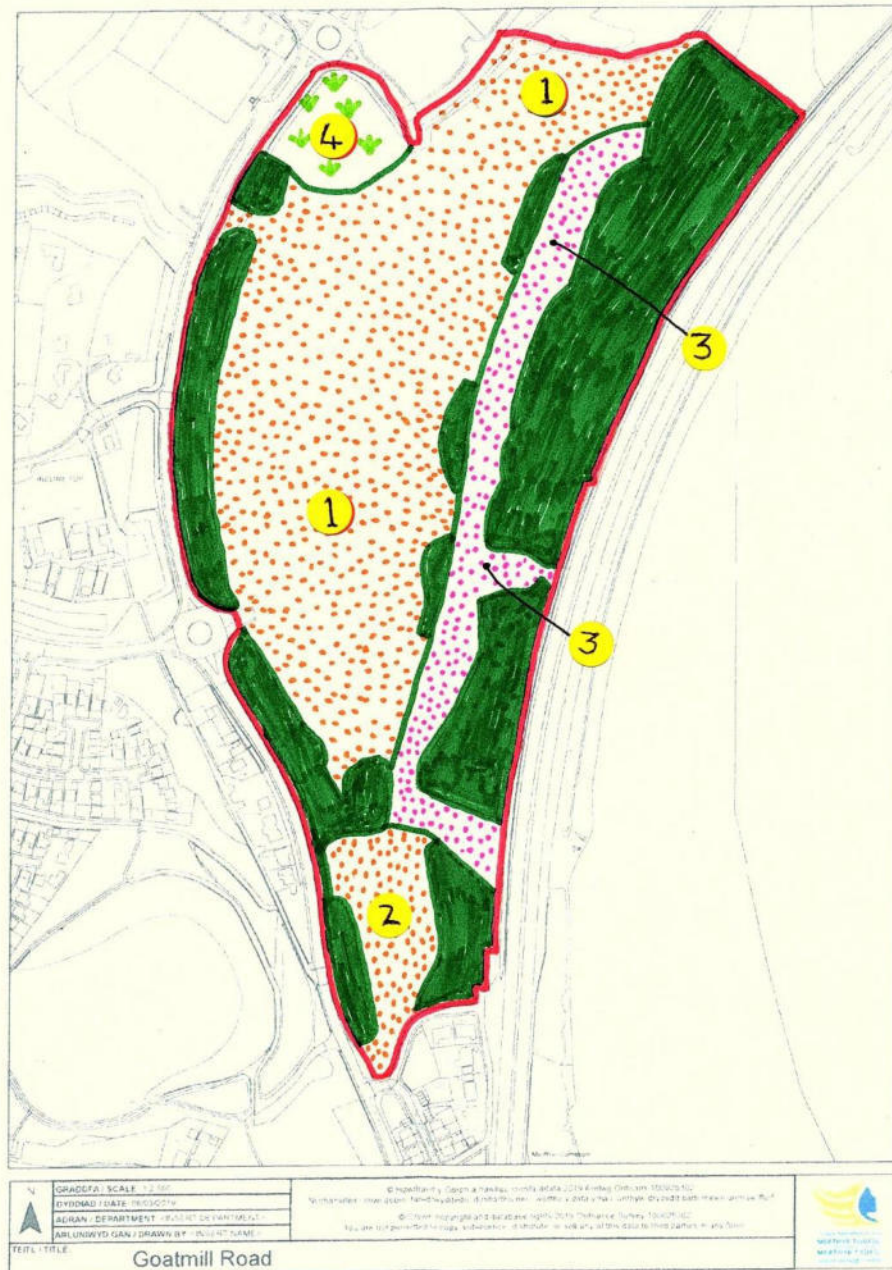


Figure 2.1. Location of invertebrate survey units at Goat Mill Road, Merthyr Tydfil - 2020

3. RESULTS

Table 3.1 below gives a checklist of all the invertebrates recorded during the three days' fieldwork in 2020. Following this, sub-section 3.1 lists those species with a formal conservation status that are regarded as key species when assessing the importance of the site for invertebrates. In sub-section 3.2, the key species are used to produce a list of key habitat features for invertebrates at Goat Mill Road. Key habitats are defined here as being those that support at least one of the key species identified in sub-section 3.1. A brief review of the significance of other habitats in which no key species were recorded is given in sub-section 3.3. An overall assessment of the importance of the site for invertebrates is provided in section 4.

The importance of the various invertebrate habitats assigned in sub-sections 3.2 and 3.3 and section 4 is framed in terms of the Chartered Institute of Ecology and Environmental Management's (CIEEM) Geographical Frame of Reference (CIEEM, 2018). This includes a series of geographically-defined importance categories, from 'International/European' for the most important sites, down to 'Local' at the lowest end of the scale. I have included an additional category, of 'Low Importance' for those habitats/sites that are of low to negligible significance for invertebrates and do not therefore merit inclusion in any of the CIEEM GFR categories.

The codes in the fourth column of Table 3.1 refer to the survey units in which species were recorded in 2020. The location of these survey units is shown on Figure 2.1 above. The emboldened status categories given in the third column of Table 3.1 and also after the scientific name in sub-section 3.1 refer to those species having a formal rarity/threat status ascribed to them by the UK government conservation agencies. These are defined as follows:

S7 – Species of Principal Importance for the maintenance and enhancement of biodiversity in Wales that are listed in Section 7 of the Environment (Wales) Act, 2016.

NS – Nationally Scarce. In more recent second status reviews, the Na and Nb sub-divisions have been subsumed into a single category covering species occurring in 16 to 100 hectads in Britain. Unlike the previous 'N' category, which covered the same range, the amalgamation does not necessarily result from inadequate information on their UK distribution.

Nb – Nationally Scarce Category B. Taxa thought to occur in between 31 and 100 hectads in Britain. Only applies to species without a recent revision of their British rarity/threat status. It has now been subsumed with 'N' and 'Na' into a single 'NS' category.

N – Nationally Scarce. Taxa which are estimated to occur within the range of 16 to 100 10km squares, but where division into Na or Nb status has not been attempted due to limited availability of information on British distribution. Only applies to species without a recent revision of their British rarity/threat status. It has now been subsumed with 'Na' and 'Nb' into a single 'NS' category.

Table 3.1. Checklist of invertebrates recorded at Goat Mill Road - 2020

Species scientific name	Species English name	Status	Survey unit
<i>Deroceras reticulatum</i>	Netted field slug		1,2
<i>Deroceras invadens</i>	Tramp slug		1
<i>Arion subfuscus</i> agg.	Dusky slug		1,2,3
<i>Arion circumscriptus</i>	An Arionid slug		1,2
<i>Arion hortensis</i> agg.	Garden slug		1,2,3,4
<i>Arion intermedius</i>	Hedgehog slug		1,2,4
<i>Cepaea hortensis</i>	White-lipped snail		1,2
<i>Cepaea nemoralis</i>	Brown-lipped snail		1
<i>Candidula intersecta</i>	Wrinkled snail		1
<i>Monacha cantiana</i>	Kentish snail		1
<i>Trochulus striolatus</i>	Strawberry snail		1,2
<i>Aegopinella nitidula</i>	Dull glass snail		1,2,3
<i>Aegopinella pura</i>	Delicate glass snail		1,2
<i>Oxychilus alliarius</i>	Garlic snail		1
<i>Oxychilus cellarius</i>	Cellar snail		1
<i>Vertigo pygmaea</i>	Common whorl snail		1
<i>Vitina pellucida</i>	Pellucid glass snail		1
<i>Pyrhosoma nymphula</i>	Large red damselfly		1
<i>Enallagma cyathigerum</i>	Common blue damselfly		1
<i>Anax imperator</i>	Emperor dragonfly		1
<i>Libellula depressa</i>	Broad-bodied chaser dragonfly		1
<i>Orthetrum coerulescens</i>	Keeled skimmer dragonfly		1
<i>Sympetrum striolatum</i>	Common darter dragonfly		1,4
<i>Tetrix subulata</i>	Slender groundhopper		2
<i>Omocestus viridulus</i>	Common green grasshopper		1
<i>Chorthippus brunneus</i>	Field grasshopper		1
<i>Chorthippus parallelus</i>	Meadow grasshopper		2
<i>Myrmeleotettix maculatus</i>	Mottled grasshopper		2
<i>Forficula auricularia</i>	Common earwig		1,2
<i>Aelia acuminata</i>	Bishop's mitre shieldbug		1
<i>Dolycoris baccarum</i>	Hairy shieldbug		1,3
<i>Palomena prasina</i>	Common green shieldbug		1
<i>Piezodorus lituratus</i>	Gorse shieldbug		1
<i>Megalonotus dilatatus</i>	A ground bug	NS	1
<i>Peritrechus geniculatus</i>	A ground bug		1,3
<i>Plinthisus brevipennis</i>	A ground bug		1
<i>Stygnocoris rusticus</i>	A ground bug		1
<i>Stygnocoris sabulosus</i>	A ground bug		1,3
<i>Heterotoma planicornis</i>	A Mirid bug		3
<i>Eupelix cuspidata</i>	A Cicadellid leafhopper		1
<i>Hydroporus longulus</i>	A diving beetle		1
<i>Ocys harpaloides</i> agg.	A ground beetle		2
<i>Pterostichus strenuus</i>	A ground beetle		1,2

<i>Pterostichus niger</i>	A ground beetle		2
<i>Amara lunicollis</i>	A ground beetle		1
<i>Curtonotus aulicus</i>	A ground beetle		1
<i>Harpalus affinis</i>	A ground beetle		1
<i>Bradycellus verbasci</i>	A ground beetle		1,3
<i>Calathus fuscipes</i>	A ground beetle		1
<i>Agonum emarginatum</i>	A ground beetle		1
<i>Paradromius linearis</i>	A ground beetle		1,2,3,4
<i>Anacaena globulus</i>	A Hydrophilid water beetle		1
<i>Coelostoma orbiculare</i>	A Hydrophilid water beetle		1
<i>Eusphalerum torquatum</i>	A rove beetle		3
<i>Philorinum sordidum</i>	A rove beetle		1
<i>Metopsia clypeata</i>	A rove beetle		1
<i>Reichenbachia juncorum</i>	A Pselaphine rove beetle		2
<i>Tachyporus nitidulus</i>	A rove beetle		1
<i>Tachyporus dispar</i>	A rove beetle		1,2,4
<i>Oxypoda elongatula</i>	A rove beetle		2,4
<i>Amischa analis</i>	A rove beetle		1
<i>Atheta fungi</i> agg.	A rove beetle		1,2,4
<i>Stenichnus collaris</i>	A rove beetle		1
<i>Drusilla canaliculata</i>	A rove beetle		1,2
<i>Stenus aceris</i>	A rove beetle		1
<i>Stenus ossium</i>	A rove beetle		1,2,3
<i>Stenus brunnipes</i>	A rove beetle		1,4
<i>Octhephilum fracticorne</i>	A rove beetle		2
<i>Xantholinus longiventris</i>	A rove beetle		1,2
<i>Quedius semiobscurus</i>	A rove beetle		2,3
<i>Staphylinus dimidiaticornis</i>	A rove beetle		1
<i>Philonthus carbonarius</i>	A rove beetle		1,3
<i>Agriotes obscurus</i>	A click beetle		1
<i>Prosternon tessellatum</i>	A click beetle		1
<i>Micrambe ulicis</i>	A Cryptophagid beetle		1,3
<i>Rhyzobius litura</i>	A ladybird		1,3
<i>Coccinella septempunctata</i>	7-spot ladybird		1,2
<i>Cis boleti</i>	A Ciid beetle		1
<i>Oedemera lurida</i>	An Oedemerid beetle		1,2
<i>Plateumaris sericea</i>	A reed beetle		3
<i>Cassida prasina</i>	A tortoise beetle	NS	1
<i>Gonioctena olivacea</i>	A leaf beetle		3
<i>Chaetocnema hortensis</i>	A flea beetle		2
<i>Chaetocnema picipes</i>	A flea beetle		2
<i>Neocrepidodera transversa</i>	A flea beetle		1,2,3
<i>Apion frumentarium</i>	An Apionid weevil		1
<i>Perapion hydrolapathi</i>	An Apionid weevil		3
<i>Exapion ulicis</i>	An Apionid weevil		1,3

Catapion seniculus	An Apionid weevil		3
Eutrichapion ervi	An Apionid weevil		1,3
Eutrichapion viciae	An Apionid weevil		2
Ischnopterapion loti	An Apionid weevil		3
Ischnopterapion modestum	An Apionid weevil		1,2,3
Oxystoma cracca	An Apionid weevil		3
Oxystoma subulatum	An Apionid weevil		3
Stenopterapion tenue	An Apionid weevil		1,3
Protapion apricans	An Apionid weevil		1,3
Protapion assimile	An Apionid weevil		1,2,3
Protapion filirostre	An Apionid weevil	Nb	3
Anthonomus rubi	A weevil		1,4
Mecinus pascuorum	A weevil		1,2,3
Tychius picirostris	A weevil		1
Trichosirocalus troglodytes	A weevil		1,2,3
Polydrusus formosus	A weevil	Na	2
Coelositona cambricus	A weevil		2,3,4
Sitona humeralis	A weevil		1
Sitona lineatus	A weevil		1
Sitona striatellus	A weevil		3
Sitona sulcifrons	A weevil		1
Sitona suturalis	A weevil		1,3
Hypera nigrirostris	A weevil		1,3
Hypera plantaginis	A weevil		1,3
Hypera postica	A weevil		3
Hypera venusta	A weevil		1
Hypera arator	A weevil		2
Bembecia ichneumoniformis	6-belted clearwing moth	Nb	1
Zygaena filipendulae	6-spot burnet		3
Erynnis tages	Dingy skipper butterfly	S7	1,2
Thymelicus sylvestris	Small skipper butterfly		1
Ochlodes sylvanus	Large skipper butterfly		1
Anthocharis cardamines	Orange tip butterfly		2
Pieris rapae	Small white butterfly		1
Pieris napi	Green-veined white butterfly		2
Gonepteryx rhamni	Brimstone butterfly		2
Coenonympha pamphilus	Small heath butterfly	S7	1
Aphantopus hyperantus	Ringlet butterfly		2
Maniola jurtina	Meadow brown butterfly		1,3
Vanessa atalanta	Red admiral butterfly		1
Aglais io	Peacock butterfly		3
Aglais urticae	Small tortoiseshell butterfly		1
Polyommatus icarus	Common blue butterfly		1,3
Pyrausta despicata	A Pyralid moth		1
Tyria jacobaeae	Cinnabar moth	S7	3

<i>Euclidia glyphica</i>	Burnet companion moth		1,2
<i>Euclidia mi</i>	Mother Shipton moth		3
<i>Autographa gamma</i>	Silver Y moth		1
<i>Chloromyia formosa</i>	Broad centurion soldierfly		2
<i>Stratiomys potamida</i>	Banded general soldierfly		1
<i>Leptogaster cylindrica</i>	Striped slender robberfly		3
<i>Chrysotoxum bicinctum</i>	A hoverfly		3
<i>Chrysotoxum festivum</i>	A hoverfly		3
<i>Episyrphus balteatus</i>	A hoverfly		1
<i>Helophilus pendulus</i>	A sun-fly		3
<i>Rhingia campestris</i>	A hoverfly		2
<i>Sericomyia silentis</i>	A hoverfly		2
<i>Tachina fera</i>	A parasite fly		3
<i>Apis mellifera</i>	Honeybee		3
<i>Bombus terrestris</i>	Buff-tailed bumblebee		1
<i>Bombus lucorum/terrestris</i>	Buff-tailed/white-tailed bumblebee workers		1
<i>Bombus hortorum</i>	Garden bumblebee		1
<i>Bombus lapidarius</i>	Red-tailed bumblebee		1,2
<i>Bombus pascuorum</i>	Common carder bumblebee		1,2
<i>Sphecodes ephippius</i>	Bare-saddled blood bee		2
<i>Megachile willughbiella</i>	Willughby's leafcutter bee		1
<i>Lasius flavus</i>	Yellow meadow ant		1,2,3
<i>Lasius niger</i>	Black garden ant		1,2
<i>Myrmica rubra</i>	A red ant		1
<i>Myrmica ruginodis</i>	A red ant		1,2,3,4
<i>Myrmica scabrinodis</i>	A red ant		1,2,3
<i>Ancistrocerus parietum</i>	A mason wasp		1
<i>Trichoniscus pusillus</i>	Common pigmy woodlouse		2,4
<i>Platyarthus hoffmannseggi</i>	Ant woodlouse		1
<i>Philoscia muscorum</i>	Common striped woodlouse		1,2,3
<i>Porcellio scaber</i>	Common rough woodlouse		1
<i>Armadillidium vulgare</i>	Common pill woodlouse		1
<i>Steatoda phalerata</i>	A Theridiid spider		1
<i>Araneus quadratus</i>	An orb-weaving spider		1,4
<i>Hypsosinga pygmaea</i>	An orb-weaving spider		2,4
<i>Pisaura mirabilis</i>	Nursery web spider		2
<i>Clubiona subtilis</i>	A Clubionid spider		1
<i>Micaria pulicaria</i>	A Gnaphosid spider		1

3.1. Key invertebrates at Goat Mill Road - 2020

171 invertebrate species were recorded at Goat Mill Road in 2020. Of these, five are key species with a formal threat and/or rarity status. These status categories are shown as emboldened abbreviations after the scientific species name in the accounts below. They have been explained at the beginning of section 3.. Two other Lepidoptera that are listed in Section 7 of the Environment Act (Wales) as Species of Principal Importance, the small heath butterfly and cinnabar moth, are not listed here as key species. This is because they are listed in Section 7 for 'research only' and though having declined in other parts of Britain, they are still relatively common and do not appear to have decreased so markedly in Wales. The weevil *Polydrusus formosus* is listed as Nationally Scarce 'A' in the last review of this group (Hyman & Parsons, 1992). At that time, it was only known from wood-edges and clearings in a handful of southern English counties. Since then, it has spread across much of England and Wales and is also now known from southern Scotland. It will certainly lose its conservation status in the updated Review of Curculionoidea currently in preparation and is not therefore considered to be a key species for the purposes of this study.

The survey units (abbreviated 'SU') in the following accounts have been described in Table 2.1 and their location is shown on Figure 2.1.

3.1.1. A ground bug *Megalonotus dilatatus* (Herrich-Schäffer, 1840). **N.**

There are six British species in the genus *Megalonotus*. All are mid-sized ground bugs with one large tooth and some smaller ones on the ventral face of the front femora. Like the common *M. chiragra*, this is an all-black insect, but it can be easily distinguished by the absence of erect pubescence on the dorsal surface. It is very locally distributed in mainland Britain, usually being found in dry, open habitats, such as unimproved grassland, heaths and dunes. It occurs very locally across southern England and Wales, north as far as Anglesey and it has also been found on the Isle of Man. It seems to favour loose areas of bare, sandy soil on warm path edges and banks. It is frequently found around the edge of gorse clumps on heathland sites, though the nature of this association is not understood. At Goat Mill Road, a single adult was collected from moss and litter in SU1, close to the edge of a patch of European gorse *Ulex europaeus* scrub.

3.1.2. A tortoise beetle *Cassida prasina* Illiger, 1798. **NS.**

C. prasina can be distinguished from other predominantly green tortoise beetles by a combination of its entirely yellow legs, the red mark at the base of the elytra and the strong ridges on elytral intervals 2 and 4. It has a scattered distribution across southern England, with most colonies being south of a line between the Severn and Wash. Elsewhere, there are just a very few, predominantly coastal populations in south-west England, Wales, northern England and Scotland. Larvae feed on yarrow *Achillea millefolium* and sneezewort *A. ptarmica*, where these are growing in open situations. At Goat Mill Road, a single adult was tapped from the former plant in SU1 during the September visit to the site.

3.1.3. A weevil *Protapion filirostre* (Kirby, 1808). Nb.

The genus *Protapion* is quite readily distinguished from other Apionid weevils by the highly domed form of the elytra. This is the only all-black species, its congeners otherwise having variable amounts of orange-yellow colouration on the legs. *P. filirostre* is a scarce insect, restricted to southern counties of England and Wales. It is found in grassland and short, ruderal vegetation, where there are large stands of its main foodplant, black medick *Medicago lupulina*. At Goat Mill Road, a single adult was tapped from this plant growing in species-rich mesotrophic grassland in SU3.

3.1.4. Six-belted clearwing moth *Bembecia ichneumoniformis* (Denis & Schiffermüller, 1775). Nb.

This very attractive clearwing is readily recognised by a combination of the six yellow bands on the abdomen and the orange markings on the wings. It is widely, but very sparsely distributed across England and Wales north as far as Yorkshire. Open habitats such as calcareous and coastal grassland, brownfield sites and pioneer heathland sites are favoured, often on south-facing aspects. Sites selected for breeding also have an abundance of bare ground, which creates the very warm, dry (xerothermic) micro-climate this species requires. The female lays her eggs on isolated clumps of common bird's-foot trefoil and kidney vetch. Many of the British sites of the six-belted clearwing are on the coast, but it also occurs inland where the habitat is suitable, as for example on the downs in south-east England. An adult was seen in SU1 during the June visit to Goat Mill Road.

3.1.5. Dingy skipper butterfly *Erynnis tages* (Linnaeus, 1758). S7.

This distinctive species is usually single brooded, flying between late-April and late-June, although partial second broods can occur in late-July and August. Larvae feed on common bird's-foot trefoil *Lotus corniculatus*, greater bird's-foot trefoil *Lotus pedunculatus* and horseshoe vetch *Anthyllis vulneraria*. Adults are frequently seen flying rapidly and low over the ground, or basking on bare ground or low vegetation. The dingy skipper occurs in a wide range of open habitats, including coastal dunes, maritime grassland and undercliffs, chalk grassland, woodland rides, heathland and road verges. It is widely distributed in central and southern England, but becomes scarcer to the north and east. Scottish and Irish populations are mainly coastal. In Wales, its largest populations are in the south, with large colonies still to be found along the coast, on sand dunes and maritime grassland, but also inland on post-industrial brownfield sites. Elsewhere, it has declined, with a particularly severe loss of inland colonies and for this reason, it has been included on the Section 7 priority species list for Wales. Adults were seen in good numbers during the May visit to Goat Mill Road; in SU1, SU2 and SU3.

3.2. Key invertebrate habitats at Goat Mill Road, Merthyr Tydfil - 2020

3.2.1. Dry ruderal vegetation

Associated key species: *Megalonotus dilatatus*; *Protapion filirostre*; six-belted clearwing moth; dingy skipper butterfly.

Survey units 1 and 2 have large areas of dry, ruderal vegetation on former brownfield with patches of low-growing vegetation interspersed with expanses of bare, gravelly ground. The flora is quite species-rich, with an abundance of flowering herbs such as kidney vetch, common bird's-foot trefoil and black medick. The latter two are the foodplants of the three key species associated with this habitat feature at Goat Mill Road. The short height of the sward, allied to the presence of patches of bare ground creates a warm, dry (xerothermic) microclimate required by these three key species and many other important invertebrates. Brownfields in south Wales.

There is some overlap with the more mature closed-sward grassland described below, as stands of this vegetation can also be suitable for the key species, provided the sward is short and the foodplants are present in abundance. The dingy skipper in particular may breed in both of these habitat features and is listed as a key species for both.

This habitat feature is considered to be of Local to County Importance for invertebrates.

3.2.2. Closed-sward species-rich grassland

Associated key species: *Cassida prasina*; dingy skipper butterfly.

Closed grassland with a relatively short, herb-rich sward marks the next successional stage from the open, ruderal vegetation described in the preceding sub-section. The largest areas of this habitat feature are to be found in the survey unit 3, but there are also many smaller stands as part of the mosaic of successional stages within the main areas of brownfield at SU1 and SU2.

This habitat feature is also assessed as being of Local to County Importance for invertebrates.

3.3. Other invertebrate habitats at Goat Mill Road, Merthyr Tydfil - 2020

3.3.1. Marshy grassland

No key species were found in association with the area of marshy grassland in the north-western part of the site (SU4). It is assessed to be of no more than Low to Local Importance for invertebrates.

3.3.2. Coniferous and broadleaved plantation woodland

The stands of dense plantation woodland and scrub (green areas on Figure 2.1) are assessed as being of Low Importance for invertebrates.

4. CONCLUSIONS

The survey work undertaken in 2020 indicates that the site at Goat Mill Road, Merthyr Tydfil has a moderately diverse invertebrate fauna that includes some notable species, including a strong breeding colony of the dingy skipper butterfly.

Overall, this is assessed to be a site of Local to County Importance for invertebrates.

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6. REFERENCES

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