

**Ecological Survey  
at  
Lower Harglodd  
St David's, Pembrokeshire**



**Client:** Pembrokeshire Nature Partnership

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# Contents

<b>Section</b>		<b>Page number</b>
1.	Site Description	4
2	Desk Exercise	5
3.	Survey Details	5
4	Vegetation Survey	6
4.1	Introduction	6
4.2	Survey Methodology	6
4.3	Results	8
4.3.1	Marshy Grassland	8
4.3.2	Neutral Grassland	10
4.3.3	Heath	12
4.3.4	Improved Grassland	12
4.3.5	Other Habitats	13
4.4	Rare Plants	14
4.5	Invasive Non-native Species	15
4.6	Conservation Assessment of Vegetation	15
4.7	References	15
4.8	Plants Recorded at the Site	24
5.	Fungi	27
6	Breeding Bird Survey	28
6.1	Survey Methodology	28
6.2	Results	28
6.3	Bird Conservation Assessment	31
6.4	References	31
7.	Autumn Passage and Wintering Birds	32
8.	Bats	34
9.	Other Mammals	37
10.	Reptiles and Amphibians	38
10.1	Aims and Objectives	38
10.2	Survey Results	38
10.3	Reptile Population Assessment	41

10.4	Discussion and Recommendations	41
10.5	Summary and Conclusions	42
10.6	References	42
11.	Invertebrates	43
11.1	Aims and Objectives	43
11.2	Survey Details	43
11.3	Results	43
11.3.1	Overview of Invertebrate Records	43
11.3.2	Key Species and Habitat Requirements	47
11.3.3	Potential for Other Notable Species	50
12.	Management	51
12.1	Recent Management	51
12.2	Future Management Recommendations	52



Southern Marsh Orchid, Parc Sara

## 1. Site Description

The surveyed land comprises five enclosures at Lower Harglodd near St David's. Two of the fields lie alongside Dowrog Common, to the north of the A487. The remaining three fields are to the south of the farm, adjoining the common at Waun Fachelich. The Dowrog fields lie on level ground at around 55m above sea level. The ground here is slightly raised relative to the common and is mostly well drained as a result. The southern fields lie between 55m and 65m above sea level on a gentle north-facing slope. Two have been agriculturally-improved, but a third – the 'Rhos Pasture' comprises wet grassland and heathland vegetation.



*Aerial photo of site*

- 1: Parc Sara
- 2: Dowrog Field
- 3: The Roft
- 4: Caerwen
- 5: The Rhos Pasture

## 2. Desk Exercise

A search of the WWBIC database returned only a few records for the site. Most of these related to bird sightings: two records of stonechat came from Dowrog Field, whilst swallow, snipe, red kite, herring gull and grey heron were recorded from the Rhos Pasture, the Roff and Caerwen. No records came from Parc Sara. Numerous other birds have been recorded from the general area, but only reported at tetrad level. The only reptile record was of an adder in the heathland area of the Rhos Pasture; the only amphibian record was of common frog from the ponds here. Very few invertebrates appear to have been recorded. Butterfly records were limited to several sightings of wall brown along the western boundary of Caerwen, whilst lackey was the only moth recorded and common carder the only bee. Records of bluebell, wavy St. John's-wort and three-lobed water-crowfoot came from an aggregated site list for the Rhos Pasture and were not accurately localised. The only bryophyte record was of the common and ubiquitous *Kindbergia praelonga*.

Searches of the Pembrokeshire Rare Plant Register (Evans, 2010) clarified the location of the three-lobed water crowfoot, which had been recorded on the northern boundary near the easternmost pond in February 2017. Wavy St. John's-wort had been recorded further east along this boundary.

The Pembrokeshire Rare Bryophyte Register (Sutton, in prep.) held no records for the site.

Data from the county moth database (Robin Taylor, pers. comm.) gave an indication of records from the tetrad, with most records coming from the adjoining Waun Fachelich and associated commons. These included Haworth's Minor (*Celaena haworthii*), a Section 7 species (of principle importance for conservation in Wales) that is relatively widespread in west Wales. Several other common, but declining, moth species are recorded from the area.

## 3. Survey Details

A rapid assessment visit was made on 1<sup>st</sup> June 2021. This aimed to do the following:

- Record plants, including bryophytes
- Record any protected species of mammals or their signs
- Record any reptiles and amphibians
- Note the locations of any invasive, non-native species of plant or animal.
- Provide feedback on any ecological issues which may impact on short-term management decisions.

Subsequently, a vegetation survey was carried out which mapped all fields according to the National Vegetation Classification. More detailed survey was also carried out of the following groups:

- Breeding Birds
- Reptiles
- Bats
- Other Mammals
- Invertebrates
- Rare Plants
- Wintering Birds

## **4. Vegetation Survey**

### **4.1 Introduction**

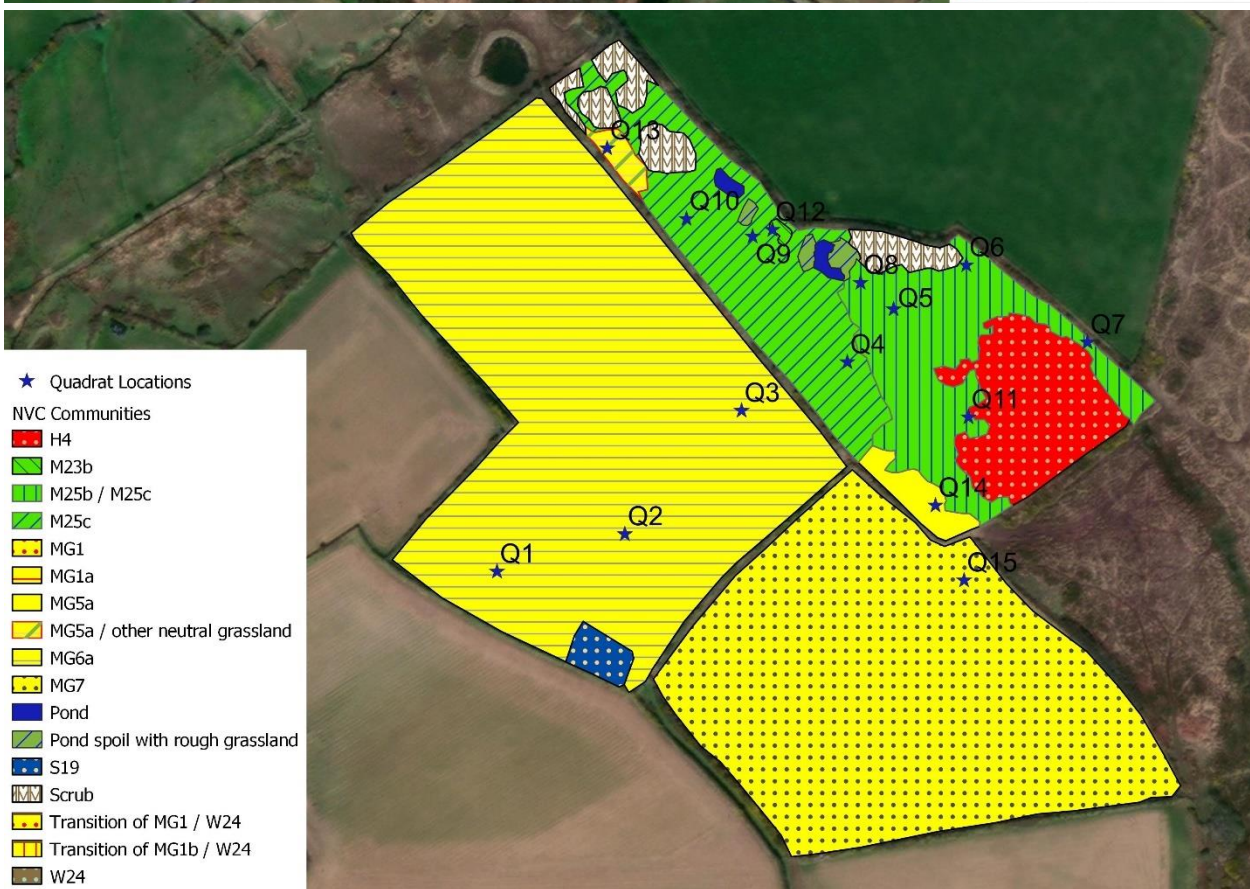
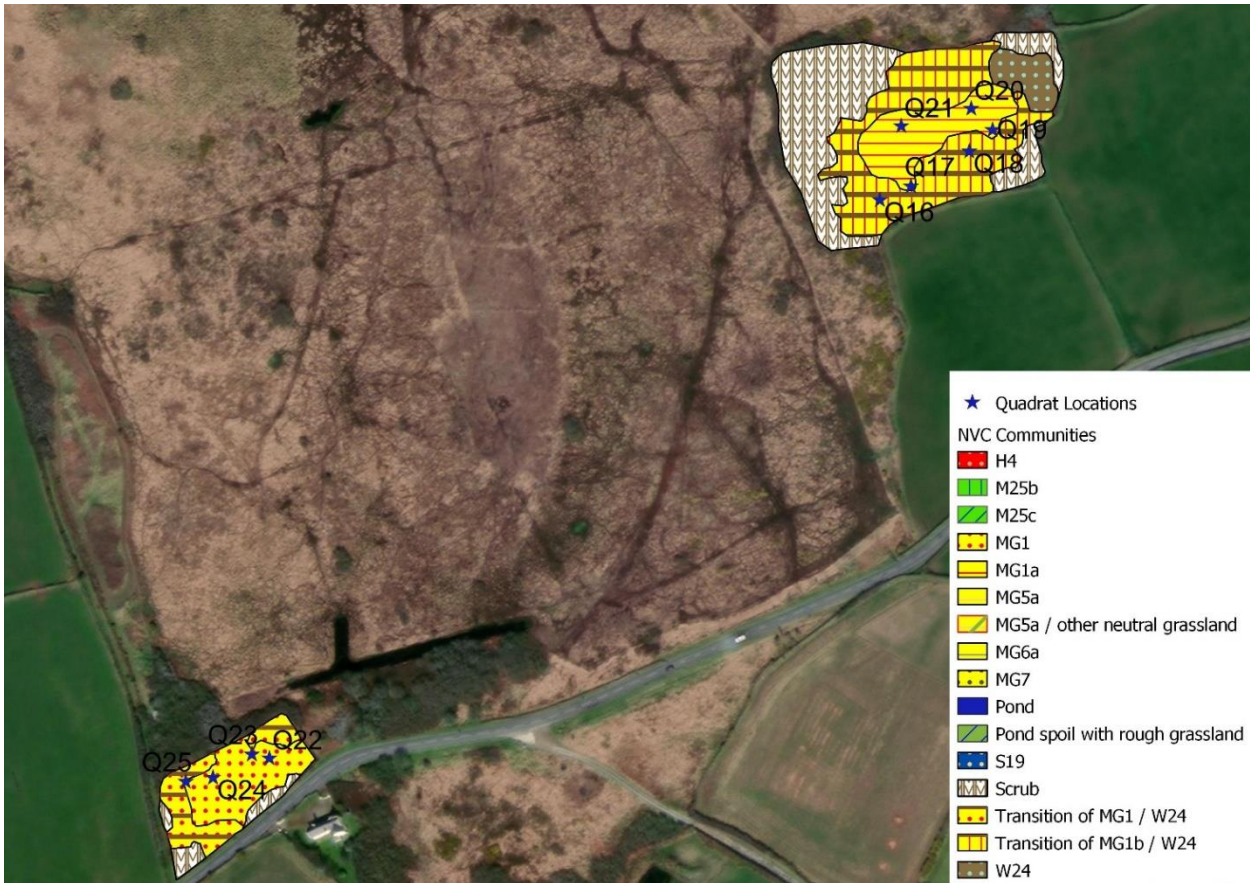
Two of the three other sites within the Connecting the Commons project (Waun Fachelich and Dowrog south) have previously been subject to NVC survey, originally in 1995 as part of the Pembrokeshire Lowland Heathland Survey (Prosser & Wallace, 1996), then more recently and more comprehensively by CCW Phase II Grassland Survey (Bosanquet, 2002). The latter survey included one Lower Harglodd field (The Rhos Pasture) in addition to the adjoining heaths of Waun Fachelich. This field was included in the current survey, allowing some comparison to be made of vegetation change in the c.20-year period between surveys.

### **4.2 Survey Methodology**

Visits were made to the sites on three days in June 2021. The fields were walked, and a visual assessment of boundaries between vegetation types made. A series of 2x2m quadrats were then recorded across the area. All higher and lower plant taxa were recorded in each quadrat using the DOMIN scale of abundance (Table 4.1). Species noted in the grassland communities but not present in quadrats were also recorded. An assessment of species abundance in each community using the DAFOR scale (Dominant, Abundant, Frequent, Occasional, Rare) was then made.

Following survey, the quadrats recorded from the single plant community were grouped together into a floristic table. Following NVC methodology, the occurrence of each species within the group of quadrats was assigned a constancy score as indicated in Table 4.2. The species within the table were then listed in order of their constancy score.

Map 4.1: NVC Communities



## 4.3 Results

### 4.3.1 Marshy Grassland



*Rutted M25b, The Rhos Pasture*

Marshy grassland dominates The Rhos Pasture, but is otherwise restricted to a small patch on the edge of Parc Sara. The majority is dominated by *Molinia caerulea*, and belongs to the ***Molinia caerulea* - *Potentilla erecta* mire (M25)**. Most of this has frequent tall-herbs, including *Angelica sylvestris* and *Filipendula ulmaria*, and is typical of the ***Angelica sylvestris* sub-community (M25c)** (Qs 4-11).

Although *Molinia* is at high cover in this vegetation, horse grazing and a degree of winter poaching has limited the tussock size and litter build-up, allowing a fairly diverse range of associates to occur. *Lythrum salicaria* and *Juncus conglomeratus* are constant – these two species are not included within the published account of M25, but are regularly encountered in Welsh stands of the vegetation; the former is treated as an additional marker for M25c. Other frequent species include *Lotus uliginosus*, *Galium palustre*, *Juncus effusus* and *Ranunculus flammula*, which suggest a transition to the ***Juncus effusus/acutiflorus* - *Galium palustre* rush pasture (M23)** mapped in a wetter area on the eastern side. *Cirsium palustre*, *Iris pseudacorus*, *Succisa pratensis*, *Pulicaria dysenterica* and *Centaurea nigra* are



among the more occasional associates. One subtle feature is the relative bryophyte richness of the vegetation, with *Entosthodon obtusus*, *Riccia beyrichiana* and a non-fruiting *Fossombronia* amongst the species apparently benefiting from the winter trampling and associated lack of litter build-up.

There is a degree of floristic and structural variation within the stand, and some quadrats from shorter and drier vegetation are intermediate with the ***Anthoxanthum odoratum* sub-community (M25b)** (Qs 6-8,11) which was mapped by Bosanquet (2002) in the southern part of The Rhos Pasture. However, two of the sub-community preferentials - *Anthoxanthum* and *Holcus lanatus* - are no more frequent here than in the better-marked M25c elsewhere on the site, and *Agrostis capillaris* is lacking. Although *Angelica sylvestris* is at reduced frequency or lacking, *Filipendula ulmaria* and *Lythrum salicaria* remain generally frequent.



*M25b, The Rhos Pasture (Quadrat 6)*

Distinct examples of ***Juncus effusus/acutiflorus* - *Galium palustre* rush pasture (M23)** appear to be more restricted on The Rhos Pasture than in 2002, suggesting that recent management may have benefited *Molinia* at the expense of rushes. Winter horse-grazing is likely to have focussed on the latter. However, as noted, the two communities intergrade floristically, and distinctions are based on the relative dominance of the two components leaving some room for differing interpretations. That sampled in Q12 forms a distinct strip in

slightly wetter ground along a fence-line, and small patches occur elsewhere in a similar context (including a small ditch-side patch in Parc Sara). *Juncus effusus* dominates, and, in the apparent absence of *Juncus acutiflorus*, these stands can be referred to the ***Juncus effusus* sub-community (M23b)**. *Hydrocotyle vulgaris*, *Filipendula ulmaria*, *Lythrum salicaria* and *Pulicaria dysenterica* are amongst the most prominent species here, and *Dactylorhiza praetermissa* was noted in Parc Sara.

#### 4.3.2 Neutral Grassland



*Cock's-foot tussocks and other coarse grasses are prominent in Parc Sara*

Dry, semi-improved grassland dominates Parc Sara and Dowrog Field. In the absence of recent grazing or mowing management, this has become rank, and dominated by *Arrhenatherum elatius*. This vegetation is a clear fit for ***Arrhenatherum elatius* grassland (MG1)**. A few other coarse grasses - *Dactylis glomerata*, *Festuca rubra*, *Alopecurus pratensis* and *Holcus lanatus* - are also locally abundant. *Agrostis gigantea* was recorded in Parc Sara – this is a local species in Pembrokeshire with a coastal distribution, more typically found as an arable species. Most of this grassland can be placed within the ***Festuca rubra* sub-community (MG1a)**, but where the fescue is absent and *Urtica dioica* and *Galium aparine* present instead, areas of the ***Urtica dioica* sub-community (MG1b)** were mapped. The wildflowers here are typical of the community – tall plants such as *Heracleum sphondylium*,

*Angelica sylvestris* and *Cirsium arvense*, together with scrambling plants such as *Vicia cracca* and *Lathyrus pratensis*. Shorter plants, including *Dactylorhiza praetermissa*, *Carex flacca* and *Succisa pratensis* (the latter introduced as plugs) were occasionally noted, but these are largely being overwhelmed by the coarse growth. Encroachment of *Rubus fruticosus* scrub is also underway, particularly in Dowrog Field.

A different neutral grassland community is present on the grazed, drier fringes of the Rhos Pasture. This is mostly referable to ***Cynosurus cristatus* – *Centaurea nigra* grassland (MG5)**, although areas to the north are poorly characterised. The grass flora is dominated by *Agrostis capillaris*, *Cynosurus cristatus* and *Anthoxanthum odoratum*, whilst *Arrhenatherum* is absent and *Dactylis glomerata* rare. *Lolium perenne* is locally-frequent at low cover. A reasonable range of mesotrophic forbs are present, including frequent *Trifolium pratense* and *Centaurea nigra*, and occasional *Rhinanthus minor*, *Ranunculus acris* and *Hypochoeris radicata*. However, *Lotus corniculatus*, a strong marker for the community, is apparently absent. The calcifugous *Potentilla erecta* is frequent, suggesting affinities to the *Danthonia decumbens* sub-community (MG5c), but in the absence of other, stronger sub-community preferentials, all stands are best placed in the **Typical sub-community (MG5a)**. Other species recorded included *Ervilia hirsuta*, *Carex panicea* and *Conopodium majus*. *Cerastium fontanum*, *Jacobaea vulgaris* and *Equisetum arvense* indicate a degree of regular poaching.



MG5a, The Rhos Pasture (Q14)

### 4.3.3 Heath



*H4 humid heath on the Rhos Pasture*

The drier, upper part of the Rhos Pasture is predominantly humid heath vegetation, assigned to ***Ulex gallii* - *Agrostis curtisii* heath, *Erica tetralix* sub-community (H4c)**. *Ulex gallii* dominates this species-poor vegetation, which also has patches of *Ulex europaeus* and *Rubus fruticosus* scrub. The ericoids *Erica cinerea* and *Calluna vulgaris* are locally abundant, but *Erica tetralix* is rare in the unmanaged areas. The humid heath lacks *Agrostis curtisii*, in common with all Pembrokeshire examples, but otherwise closely resembles the NVC description. The local abundance of *Molinia* precludes reference to dry heath. It is crossed by mown strips which vary the structure. A small number of additional associates, including *Hypericum pulchrum* and *Potentilla erecta*, are found along these mown areas.

### 4.3.4 Improved Grassland

Two of the fields within the survey site – The Roft and Caerwen - are entirely composed of agriculturally-improved grassland. That in The Roft is referable to ***Lolium perenne* – *Cynosurus cristatus* grassland, Typical sub-community (MG6a)**. *Lolium perenne* is dominant, *Holcus lanatus* and *Trifolium repens* are abundant, *Cynosurus* is occasional and locally-abundant, and there is a scattering of associated species including *Cirsium arvense*, *Rumex acetosa*, *Ranunculus repens* and *Trifolium dubium*. In contrast, the more recent ley

in Caerwen is strongly dominated by *Trifolium repens*, with *Lolium multiflorum* abundant in addition to *L. perenne*. This is ***Lolium perenne* – *Trifolium repens* ley (MG7a)**. *Cichorium intybus* is a sown component of the sward, and the few additional associates include a handful of species of damp, disturbed ground in some poached edges, including *Agrostis stolonifera*, *Juncus bufonius* and the hornwort *Phaeoceros laevis*.



*Chicory in Caerwen*

#### 4.3.5 Other Habitats

There are small areas of willow, referable to ***Salix cinerea* – *Galium palustre* woodland (W1)** on the Rhos Pasture. *Oenanthe crocata* is frequent here, suggesting some nitrogen runoff from adjoining improved fields. There are patches of bramble scrub on Parc Sara and Dowrog Field, broadly referable to ***Rubus fruticosus* – *Holcus lanatus* under-scrub (W24)**.

There are also two small ponds of recent origin on the Rhos Pasture with clay margins and wetland plants typical of shallow water such as *Typha latifolia* and *Eleocharis palustris*. A stonewort here was identified as *Chara virgata* or *fragifera*; the latter is a rare species and expert determination would be required. A similarly recent seasonal pond in one corner of The Roft is dominated by *Eleocharis palustris*, and broadly referable to ***Eleocharis palustris* swamp (S19)** as a result.



*Willow scrub (left) and pond (right) on the Rhos Pasture*

#### 4.4 Rare Plants

The Nationally Rare *Didymodon tomaculosus* (sausage beard-moss) was found in small quantity on trampled clay near a pond in the Rhos Pasture – this represents only the second Pembrokeshire and fourth Welsh record of this diminutive species. The uncommon liverwort *Riccia beyrichiana* (purple crystalwort) was also noted in two places in similarly trampled clay – the distribution in the county is closely tied to the heathlands on the St David’s peninsula.

Wavy St. John’s-wort *Hypericum undulatum* is occasional in the M25b in the northern and eastern parts of the Rhos Pasture. A much larger population occurs on adjoining Waun Fachelich. A small population of three-lobed water-crowfoot has also been recorded here, but could not be found following heavy cattle trampling in early winter.



*(left) Didymodon tomaculosus location on cattle path through M25b; (right) Riccia beyrichiana*

#### **4.5 Invasive Non-Native Species**

Introductions of native plant species such as wild carrot and devil' bit scabious have been made, but no invasive non-native plant species were recorded.

#### **4.6 Conservation Assessment of Vegetation**

The marshy grassland in the Rhos Pasture provides the key vegetation interest. The area of M25b, although not notably species-rich, shows no signs of agricultural-modification and has some associated uncommon and rare higher plants and bryophytes. The smaller area of humid heath is mostly rank and species-poor, and perhaps of most significance for the associated population of adders and some invertebrates of interest. The areas of MG5 neutral grassland are small and somewhat damaged by poaching. The location of the field, alongside the extensive heathland and marshy grassland areas on the adjoining St David's Airfield Heaths SSSI, makes it of particular strategic importance. Neutral grassland areas on the two small fields alongside Dowrog Common are of minor vegetation interest, but again are of significance as a semi-improved buffer zone, assisting with protection of the SSSI and providing a diversity of nectar sources from tall herbs which may differ from those on the common.

#### **4.7 References**

Bosanquet, S.D.S. (2002). CCW Lowland Grassland Survey: St David's Airfield Heaths SSSI and Annexes. Unpublished CCW Report.

Countryside Council for Wales. Supplementary Guidance for NVC Grassland Survey. Unpublished.

Rodwell, J.S. (1992) British Plant Communities Vol 3: Grasslands and Montane Communities. CUP.

Rodwell, J.S. (1991) British Plant Communities Vol 2: Mires and Heaths. CUP.

**Table 4.1 Domin scale for recording vegetation cover.**

Percentage Cover	Domin Value
91-100%	10
76-90%	9
51-75%	8
34-50%	7
26-33%	6
11-25%	5
4-10%	4
<4% with many individuals	3
<4% with several individuals	2
<4% with few individuals	1

**Table 4.2 Constancy Scores**

Percentage of Quadrats	Constancy Value
81-100%	V
61-80%	IV
41-60%	III
21-40%	II
1-20%	I



**Table 4.3 Quadrat (2x2m) Domin values from M23b *Juncus effusus* / *acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community**

Quadrat Number	Q12
Slope	<5
Aspect	NW
Vegetation height (cm)	30-40
Date	18/06/2021
Sub-community	M23b
<i>Juncus effusus</i>	7
<i>Filipendula ulmaria</i>	5
<i>Hydrocotyle vulgaris</i>	5
<i>Iris pseudacorus</i>	4
<i>Lythrum salicaria</i>	4
<i>Agrostis canina</i>	4
<i>Juncus cf. articulatus</i>	4
<i>Anthoxanthum odoratum</i>	3
<i>Holcus lanatus</i>	3
<i>Pulicaria dysenterica</i>	3
<i>Lotus uliginosus</i>	3
<i>Mentha aquatica</i>	3
<i>Brachythecium rutabulum</i>	2
<i>Epilobium palustre</i>	2
<i>Oenanthe crocata</i>	2
<i>Galium palustre</i>	2
<i>Ranunculus flammula</i>	2
<i>Festuca rubra</i>	2
<i>Ranunculus repens</i>	2
<i>Molinia caerulea</i>	2
<i>Carex echinata</i>	2
<i>Lychnis flos-cuculi</i>	1
<i>Carex leporina</i>	1
<i>Ranunculus acris</i>	1
<i>Isolepis setacea</i>	1
<i>Deschampsia cespitosa</i>	1
<i>Cerastium fontanum</i>	1

**Table 4.4 Quadrat (2x2m) Domin values from M25 *Molinia caerulea* - *Potentilla erecta* mire**

Quadrat Number	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Constancy	Constancy in NVC M25c
<i>Slope</i>	level	level	level	<5	level	level	level	level		
<i>Aspect</i>				NW						
<i>Vegetation height (cm)</i>	0-20	30	5-25	20-30	10-50	0-25	10-30	5-20		
	M25c	M25c	M25b	M25c/b	M25c/b	M25c	M25c	M25c/b		
	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021	18/06/2021		
<i>Molinia caerulea</i>	8	9	8	8	9	8	8	9	V	V
<i>Anthoxanthum odoratum</i>	3	4	4	3	3	4	4	4	V	I
<i>Holcus lanatus</i>	3	3	2	2	2	3	3	2	V	II
<i>Juncus conglomeratus</i>	4	1		2	2	4	4	2	V	
<i>Lythrum salicaria</i>	3	3	2	3	3	2		2	V	
<i>Agrostis canina</i>		2	2	2	2	2	2	1	V	II
<i>Plantago lanceolata</i>	3		1	3		3	1		IV	
<i>Potentilla erecta</i>	2	2	3		3	1		2	IV	V
<i>Angelica sylvestris</i>	1	2				1	1	1	IV	V
<i>Juncus effusus</i>			1	4		1	4	2	IV	III
<i>Luzula multiflora</i>	2	2	2			3	2		IV	I
<i>Lotus uliginosus</i>	2	2			2	4	3		IV	III
<i>Ranunculus flammula</i>	2	1		2		1	2		IV	I
<i>Kindbergia praelonga</i>	2				3	2	1	1	IV	I
<i>Brachythecium rutabulum</i>	2	2	3		2	2	3		IV	
<i>Carex viridula ssp. oedocarpa</i>	1		1	3		2			III	
<i>Filipendula ulmaria</i>			4	2		2	4		III	II
<i>Carex panicea</i>	2			3		3	2		III	I

<i>Juncus cf. articulatus</i>	3	3			3	3			III	
<i>Rubus fruticosus</i>		1			1	1		2	III	I
<i>Galium palustre</i>	1		1	1			1		III	III
<i>Calypogeia muelleriana</i>	2	2			2		1		III	
<i>Riccardia chamaedryfolia</i>	1	2			3	1			III	
<i>Lophocolea bidentata</i>	1				2		1		III	I
<i>Fissidens bryoides</i>		1		1		1	1		III	
<i>Festuca rubra</i>	3					2	2		II	II
<i>Ranunculus acris</i>						1	2		II	
<i>Dactylis glomerata</i>				1		1	1		II	
<i>Centaurea nigra</i>		1	2						II	I
<i>Succisa pratensis</i>	1						1		II	III
<i>Juncus cf. acutiflorus</i>			5	4					II	III
<i>Poa humilis</i>	1						1		II	
<i>Vicia cracca</i>	2		2						II	
<i>Pulicaria dysenterica</i>						1	1		II	I
<i>Equisetum arvense</i>						1	1		II	
<i>Iris pseudacorus</i>				1		1			II	
<i>Lathyrus pratensis</i>				1			2		II	
<i>Deschampsia cespitosa</i>	1		2		2				II	I
<i>Cirsium palustre</i>		1					1		II	IV
<i>Isolepis setacea</i>				1		1			II	
<i>Juncus bulbosus</i>				1				1	II	
<i>Calypogeia arguta</i>		1			1				II	
<i>Fissidens taxifolius</i>			1		1				II	
<i>Fossombronia sp.</i>		1	1				1		II	
<i>Archidium alterniflorum</i>			2				1		II	
<i>Rumex acetosa</i>		1							I	
<i>Taraxacum officinale</i> agg.							1		I	I
<i>Anagallis tenella</i>		1							I	

<i>Lychnis flos-cuculi</i>							1			I	
<i>Hypericum tetrapetrum</i>					1					I	I
<i>Scutellaria minor</i>					2					I	II
<i>Calliergon cuspidatum</i>	2									I	I
<i>Hypnum jutlandicum</i>	1									I	
<i>Dactylorhiza praetermissa</i>								1		I	
<i>Dactylorhiza maculata</i>									1	I	I
<i>Dryopteris sp.</i>	1									I	
<i>Mentha aquatica</i>				1						I	II
<i>Ranunculus repens</i>								1		I	
<i>Epilobium palustre</i>							1			I	II
<i>Pseudephemerum nitidum</i>	2				1					I	
<i>Sagina procumbens</i>	1									I	
<i>Bryum subapiculatum</i>	1									I	
<i>Calypogeia fissa</i>					1					I	I
<i>Pellia sp.</i>		1								I	
<i>Ephemerum cf minutissimum</i>					1					I	
<i>Entosthodon obtusus</i>					1					I	
<i>Pleuridium acuminatum</i>					1					I	
<i>Thuidium tamariscinum</i>					1					I	
<i>Riccia beyrichiana</i>			2							I	
<i>Campylium stellatum</i>				2						I	
<i>Bare Ground</i>	4	1	2	2	1	3	2	3			
<i>Litter</i>		3	3	1	3						
<i>Horse Dung</i>		1	1	1	1			1			

**Table 4.5 Quadrat (2x2m) Domin values from MG1 *Arrhenatherum elatius* grassland (MG1)**

Quadrat Number	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Constancy	Constancy in NVC MG1
Slope	level	level	level	level	level	level	level	level	level	level		
Height (cm)	60	40-80	60-80	80	30-80	40-50	40-60	40-70	70-90	25-40		
Sub-community	MG1b	MG1a	MG1b	MG1a	MG1a	MG1a	MG1	MG1	MG1	MG1		
Date	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021		
<i>Arrhenatherum elatius</i>	8	5	9	8	7	3	5	5	7	6	V	V
<i>Dactylis glomerata</i>		7		1	2	2	2		8		III	IV
<i>Holcus lanatus</i>		4		4	6	1	4	5		7	IV	III
<i>Heracleum sphondylium</i>								1	4	4	III	III
<i>Urtica dioica</i>	2		2								I	III
<i>Galium aparine</i>	2		2								I	II
<i>Plantago lanceolata</i>							2		1	1	II	III
<i>Festuca rubra</i>		5		4	5	9	2	1			III	II
<i>Anthoxanthum odoratum</i>					1	2	4		1	2	III	I
<i>Cirsium arvense</i>	2		5	1			5	2			III	III
<i>Rumex acetosa</i>		1		1	1	1	4	2	2		IV	II
<i>Lathyrus pratensis</i>			1	2	2	3					II	II
<i>Rubus fruticosus</i>	8	4	5	5	4					1	III	II
<i>Taraxacum officinale</i>							1	1			I	II
<i>Vicia sativa</i>			1	2			4			4	II	II
<i>Kindbergia praelonga</i>		2									I	I
<i>Alopecurus pratensis</i>								5	4		II	I
<i>Cerastium fontanum</i>										1	I	I

<i>Vicia cracca</i>	2	2	2	2		1						III	I
<i>Pteridium aquilinum</i>	5	4	2	1								II	I
<i>Ranunculus repens</i>							4	2			5	II	I
<i>Lotus uliginosus</i>	2	1		4	2	2					4	III	I
<i>Potentilla reptans</i>				1	5	2						II	I
<i>Stellaria graminea</i>					2							I	I
<i>Phleum pratense</i>								1				I	I
<i>Rumex obtusifolius</i>									1			I	I
<i>Juncus conglomeratus</i>				1								I	
<i>Stachys palustris</i>		2										I	
<i>Equisetum arvense</i>					1		3	3	3	4		III	
<i>Angelica sylvestris</i>		1	1	1		2	5	2	4			IV	
<i>Dryopteris filix-mas</i>		1										I	
<i>Dryopteris dilatata</i>			4									I	
<i>Pulicaria dysenterica</i>					1	4			4			II	
<i>Carex flacca</i>					1							I	
<i>Sonchus arvensis</i>						3						I	
<i>Agrostis gigantea</i>								6				I	
<i>Succisa pratensis</i>									1			I	
<i>Dactylorhiza praetermissa</i>											1	I	
<i>Litter / thatch</i>	3	4	5	5	5	6	5	9	7	8			

**Table 4.6 Quadrat (2x2m) Domin values from MG6 *Lolium perenne* – *Cynosurus cristatus* grassland (MG6) / *Lolium perenne* leys (MG7)**

Quadrat Number	Q1	Q2	Q3	Q15	DAFOR MG7a
	<5	level	<5	level	Stand
Slope	<5	level	<5	level	
Aspect	SW		N		
Average vegetation height	5-15cm	10-20cm	10-20cm	10-20cm	
	MG6a	MG6a	MG6a	MG7a	
	18/06/2021	18/06/2021	18/06/2021	18/06/2021	
<i>Cynosurus cristatus</i>		1	7		
<i>Holcus lanatus</i>	4	5	5		
<i>Dactylis glomerata</i>	1				
<i>Trifolium repens</i>	6	5	5	8	
<i>Trifolium pratense</i>					
<i>Lolium perenne</i>	7	8	7	3	
<i>Ranunculus acris</i>	2				
<i>Rumex acetosa</i>	2				
<i>Taraxacum officinale agg.</i>	1		2	1	
<i>Cerastium fontanum</i>	3	2	3	2	
<i>Cirsium arvense</i>	5	2			r
<i>Kindbergia praelonga</i>				3	
<i>Rhytidadelphus squarrosus</i>				2	
<i>Poa cf. humilis</i>	3	3		2	
<i>Ranunculus repens</i>	5	4	4	4	
<i>Crepis capillaris</i>					r
<i>Senecio jacobaea</i>					r
<i>Daucus carota</i>	1				
<i>Agrostis capillaris</i>			1		
<i>Veronica serpyllifolia</i>			1		
<i>Alopecurus geniculatus</i>			1		
<i>Lolium multiflorum</i>				5	
<i>Cichorium intybus</i>				2	
<i>Agrostis stolonifera</i>				2	
<i>Juncus bufonius</i>				1	
<i>Geranium dissectum</i>				1	
<i>Phaeoceros laevis</i>				2	
<i>Trifolium dubium</i>			2		
<i>Rumex obtusifolius</i>					r
<i>Cirsium vulgare</i>					r
<i>Juncus effusus</i>			1		

#### 4.8 Plants recorded at the site

<i>Agrostis canina</i>	Velvet Bent
<i>Agrostis capillaris</i>	Common Bent
<i>Agrostis vinealis</i>	Brown Bent
<i>Agrostis gigantea</i>	Black Bent
<i>Agrostis stolonifera</i>	Creeping Bent
<i>Aira praecox</i>	Early Hair-grass
<i>Alopecurus geniculatus</i>	Marsh Foxtail
<i>Alopecurus pratensis</i>	Meadow Foxtail
<i>Anagallis tenella</i>	Bog Pimpernel
<i>Angelica sylvestris</i>	Wild Angelica
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass
<i>Arrhenatherum elatius</i>	False Oat-grass
<i>Bellis perennis</i>	Daisy
<i>Callitriche stagnalis</i>	Common Water-starwort
<i>Calluna vulgaris</i>	Heather
<i>Cardamine pratensis</i>	Cuckoo Flower
<i>Carex binervis</i>	Green-ribbed Sedge
<i>Carex echinata</i>	Star Sedge
<i>Carex flacca</i>	Glaucous Sedge
<i>Carex hirta</i>	Hairy Sedge
<i>Carex leporina</i>	Oval Sedge
<i>Carex nigra</i>	Common Sedge
<i>Carex panicea</i>	Carnation Sedge
<i>Carex pilulifera</i>	Pill Sedge
<i>Carex viridula ssp. oedocarpa</i>	Common Yellow Sedge
<i>Centaurea nigra</i>	Lesser Knapweed
<i>Cerastium fontanum</i>	Common Mouse-ear
<i>Cichorium intybus</i>	Chicory
<i>Cirsium arvense</i>	Creeping Thistle
<i>Cirsium palustre</i>	Marsh Thistle
<i>Cirsium vulgare</i>	Spear Thistle
<i>Conopodium majus</i>	Pignut
<i>Coryllus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Crepis capillaris</i>	Beaked Hawksbeard
<i>Cynosurus cristatus</i>	Crested Dog's-tail
<i>Dactylis glomerata</i>	Cock's-foot
<i>Dactylorhiza maculata</i>	Heath Spotted Orchid
<i>Dactylorhiza praetermissa</i>	Southern Marsh Orchid
<i>Daucus carota</i>	Wild Carrot
<i>Deschampsia cespitosa</i>	Tufted Hair-grass
<i>Digitalis purpurea</i>	Foxglove
<i>Dryopteris dilatata</i>	Broad Buckler-fern
<i>Dryopteris filix-mas</i>	Male Fern
<i>Eleocharis palustris</i>	Common Spike-rush



<i>Eleogiton fluitans</i>	Floating Club-rush
<i>Epilobium palustre</i>	Marsh Willowherb
<i>Equisetum arvense</i>	Field Horsetail
<i>Erica cinerea</i>	Bell Heather
<i>Erica tetralix</i>	Cross-leaved Heath
<i>Ervillia hirsuta</i>	Hairy Tare
<i>Festuca arundinacea</i>	Tall Fescue
<i>Festuca rubra</i>	Red Fescue
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Galium aparine</i>	Goose-grass
<i>Galium palustre</i>	Marsh Bedstraw
<i>Galium verum</i>	Lady's Bedstraw
<i>Geranium dissectum</i>	Cut-leaved Cranesbill
<i>Heracleum sphondylium</i>	Hogweed
<i>Holcus lanatus</i>	Yorkshire Fog
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort
<i>Hypericum androsameum</i>	Tutsan
<i>Hypericum pulchrum</i>	Slender St. John's-wort
<i>Hypericum tetrapetrum</i>	Square-stemmed St. John's-wort
<i>Hypericum undulatum</i>	Wavy St. John's-wort
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Iris pseudacorus</i>	Yellow Flag Iris
<i>Isolepis setacea</i>	Bristle Club-rush
<i>Jacobaea vulgaris</i>	Common Ragwort
<i>Juncus acutiflorus</i>	Sharp-flowered Rush
<i>Juncus articulatus</i>	Jointed Rush
<i>Juncus bufonius</i>	Toad Rush
<i>Juncus bulbosus</i>	Bulbous Rush
<i>Juncus conglomeratus</i>	Compact Rush
<i>Juncus effusus</i>	Soft Rush
<i>Lathyrus pratensis</i>	Meadow Vetchling
<i>Lolium multiflorum</i>	Italian Rye-grass
<i>Lolium perenne</i>	Perennial Rye-grass
<i>Lotus corniculatus</i>	Common Bird's-foot Trefoil
<i>Lotus uliginosus</i>	Greater Bird's-foot Trefoil
<i>Luzula campestris</i>	Field Woodrush
<i>Luzula multiflora</i>	Heath Woodrush
<i>Lychnis flos-cuculi</i>	Ragged Robin
<i>Lythrum salicaria</i>	Purple Loostrike
<i>Mentha aquatica</i>	Water Mint
<i>Molinia caerulea</i>	Purple Moor-grass
<i>Oenanthe crocata</i>	Hemlock Water-dropwort
<i>Ononis repens</i>	Restharrow
<i>Pedicularis sylvatica</i>	Lousewort
<i>Phleum pratense</i>	Timothy
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Poa annua</i>	Annual Meadow-grass

<i>Poa humilis</i>	Narrow-leaved Meadow Grass
<i>Potamogeton polygonifolius</i>	Bog Pondweed
<i>Potentilla erecta</i>	Tormentil
<i>Potentilla reptans</i>	Creeping Cinquefoil
<i>Pteridium aquilinum</i>	Bracken
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Ranunculus flammula</i>	Lesser Spearwort
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Ranunculus tripartitus</i>	Three-lobed Water Crowfoot
<i>Rhinanthus minor</i>	Yellow Rattle
<i>Rubus fruticosus</i>	Bramble
<i>Rumex acetosa</i>	Common Sorrel
<i>Rumex acetosella</i>	Sheep's Sorrel
<i>Rumex obtusifolius</i>	Broad-leaved Dock
<i>Sagina procumbens</i>	Procumbent Pearlwort
<i>Salix cinerea</i>	Grey Willow
<i>Scutellaria minor</i>	Lesser Skullcap
<i>Sedum anglicum</i>	English Stonecrop
<i>Sonchus arvensis</i>	Field Sow-thistle
<i>Sparganium erectum</i>	Branched Bur-reed
<i>Stachys officinalis</i>	Betony
<i>Stachys palustris</i>	Marsh Woundwort
<i>Stellaria graminea</i>	Lesser Stitchwort
<i>Stellaria uliginosa</i>	Bog Stitchwort
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Taraxacum officinale</i>	Dandelion
<i>Teucrium scorodonia</i>	Wood Sage
<i>Trifolium dubium</i>	Lesser Trefoil
<i>Trifolium pratense</i>	Red Clover
<i>Trifolium repens</i>	White Clover
<i>Typha latifolia</i>	Great Reedmace
<i>Ulex europaeus</i>	European Gorse
<i>Ulex gallii</i>	Western Gorse
<i>Umbilicus rupestris</i>	Navelwort
<i>Urtica dioica</i>	Nettle
<i>Veronica anagallis-aquatica</i>	Common Water-speedwell
<i>Veronica chamaedrys</i>	Germander Speedwell
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell
<i>Vicia cracca</i>	Tufted Vetch
<i>Vicia sativa</i>	Common Vetch
<i>Viola riviniana</i>	Common Dog Violet

## 5. Fungi

Aside from an unsuccessful search for the rare willow blister (*Cryptomyces maximus*) on grey willow in the Rhos Pasture, no specific fungal survey was carried out and very few ad hoc records were made. Caerwen and The Roft are too agriculturally-improved to be of significance for grassland fungi, and field mushroom (*Agaricus campestris*) was the only species seen here. One creeping thistle in The Roft was noted with white-tip disease, a fungal infection caused by *Phoma macrostoma*. The coarse grassland in Parc Sara and Dowrog Field held no fruiting fungi during summer survey other than ergot (*Claviceps purpurea*) on Yorkshire fog. This common infection of grass flowers caused outbreaks of psychosis and gangrenous poisoning known as St Anthony's fire in the Middle Ages, when cereals such as rye were commonly affected.



*Creeping thistle with white tip disease caused by the fungus *Phoma macrostoma*.*

## 6. Breeding Bird Survey

### 6.1 Survey Methodology

Two visits were made to the site in June 2021, the late start date to the contract limiting the number of visits. These started shortly after dawn and carried on for approximately 1 hour. A circular route was taken around the site, walked slowly, with frequent stops to observe bird activity.

The survey was loosely based on a territory mapping technique, as per that used in the British Trust for Ornithology's (BTO) Common Bird Census (CBC) (Marchant 1983; Bibby et al, 1992).

Following the visits, the records of birds made were collated to determine the approximate location and numbers of breeding pairs for each species. Maps were then produced to display the approximate locations for bird species of conservation concern (Eaton et al, 2015) across the site. Other birds observed within the survey area were not mapped, but are tabulated.

### 6.2 Results

The survey area comprised the two enclosures adjoining Dowrog Common (Parc Sara and Dowrog Field), together with The Rhos Pasture and two adjoining improved grassland fields (The Roft and Caerwen).

10 bird species were apparently breeding within the survey area; 2 of these were confirmed as breeding. 6 'Birds of Conservation Concern' were amongst those breeding or probably breeding:

- Whitethroat (*Sylvia communis*). A bird carrying food to a nest in scrub in Parc Sara represented the only confirmed breeding, but recently fledged young on the Rhos Pasture may have come from a nest here. Singing birds were also noted in Dowrog Field (2), and the western side of Caerwen.
- Reed Bunting (*Emberiza schoeniclus*). A female was apparently disturbed from a nest in rough grassland in Parc Sara.
- Willow Warbler (*Phylloscopus trochilus*). Singing birds were recorded in willow scrub on the boundaries of Parc Sara, Dowrog Field and the Rhos Pasture.
- Dunnock (*Prunella modularis*). 2 singing birds noted in scrub in the Rhos Pasture.
- Linnet (*Carduelis cannabina*). A single territory in heathland in the Rhos Pasture.
- Skylark (*Alauda arvensis*). 1 singing bird above the Roft.

In addition, 4 species of conservation concern were recorded as possibly breeding:

- Cuckoo (*Cuculus canorus*). A singing male in the heathland part of the Rhos Pasture; presumed to be the same bird holding territory on adjoining Waun Fachelich.
- House Sparrow (*Passer domesticus*). Seen on one visit by the pond in the Roft, but more likely to be breeding in the nearby farm buildings than in scrub on the site.

- Bullfinch (*Pyrrhula pyrrhula*). A female with food on the northern boundary of Parc Sara was presumed to be breeding in the scrub on Dowrog Common.
- Grasshopper Warbler (*Locustella naevia*). A singing bird in the north-west corner of Parc Sara on one date only.

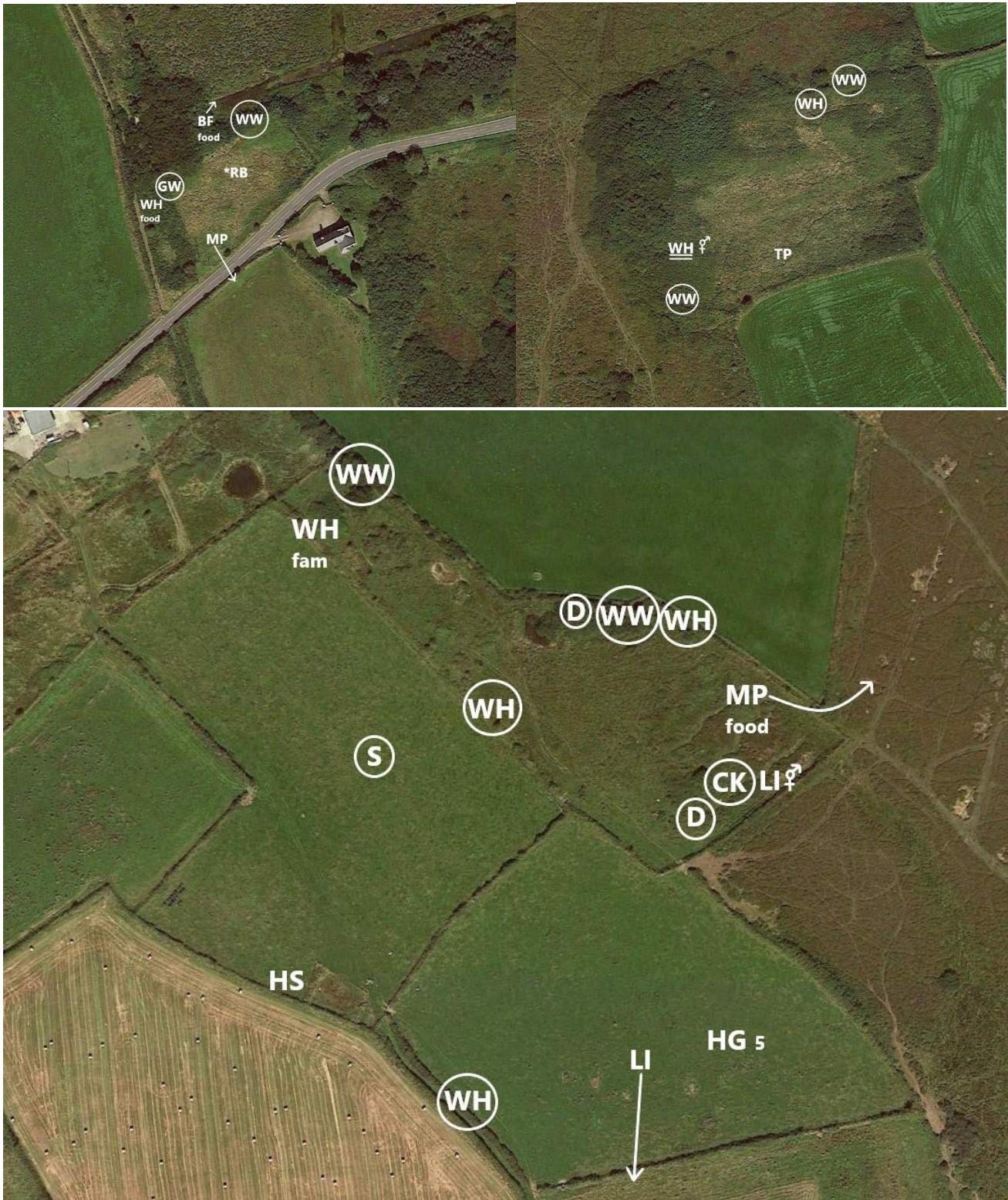
Three further species of conservation concern were recorded foraging or on passage:

- Kestrel (*Falco tinnuculus*). A bird seen hunting on a couple of occasions over Waun Fachelich was also seen over the Rhos Pasture.
- Herring Gull (*Larus argentatus*). A group of five birds on Caerwen on one occasion.
- Greenfinch (*Carduelis chloris*). A single bird overhead on one occasion.
- Tree Pipit (*Anthus trivialis*). A passage bird on Dowrog Field.

Minimum counts for the survey area have been based on the number of different singing birds recorded during the visits. Locations of territories for Birds of Conservation Concern are mapped in Map 6.1.

**Table 6.1 Summary of Birds Seen within the Survey Area**

Species	Map Code	Status within survey area	Number of Territories	Welsh Status <sup>1</sup>	UK Status <sup>2</sup>
Whitethroat	WH	Breeding	6	Red	
Reed Bunting	RB	Breeding	1	Amber	Amber
Willow Warbler	WW	Probable Breeding	5	Red	Amber
Wren	WR	Probable Breeding	4		
Dunnock	D	Probable Breeding	2		Amber
Goldfinch	GO	Probable Breeding	2		
Blackbird	B	Probable Breeding	2		
Linnet	LI	Probable Breeding	1	Red	Red
Sedge Warbler	SW	Probable Breeding	1		
Skylark	S	Probable Breeding	1	Amber	Red
Cuckoo	CK	Possible Breeding	1	Red	Red
Woodpigeon	WP	Possible Breeding	1		
Grasshopper Warbler	GW	Possible Breeding	1	Red	Red
Chaffinch	CH	Possible Breeding	1		
Bullfinch	BF	Possible Breeding	1	Red	Amber
House Sparrow	HS	Possible Breeding	1	Amber	
Kestrel	K	Foraging	n/a	Red	
Herring Gull	HG	Foraging	n/a	Red	Red
Tree Pipit	TP	Passage	n/a	Amber	Red
Siskin	SK	Passage	n/a		
Greenfinch	GR	Passage / Commuting	n/a	Amber	Red
Barn Swallow	SL	Passage / Foraging	n/a		



Map 6.1 Approximate locations of birds of conservation concern seen during survey.

Species codes are included in Table 6.1. Symbology follows standard Common Bird Census protocols, available [here](#). Where birds were seen or heard in a similar location on the second visit, these were assumed to relate to the same territory and have not been mapped.

### 6.3 Bird Conservation Assessment

The two improved grassland fields support a single pair of skylarks; boundary hedge-banks here have poor hedges with whitethroat the only apparent breeder. The Rhos Pasture holds small numbers of typical birds of scrub. The Dowrog Field and Parc Sara hold scrub nesting species around their boundaries; the latter also had nesting reed bunting within the rough grassland part of the field, and may have held nesting grasshopper warbler. The site as a whole is of some local interest for the eight 'birds of conservation concern' which breed or may breed.

Succession to denser scrub or willow woodland, particularly on Dowrog Field, would be likely to increase the numbers and diversity of breeding birds. Introduction of grazing and scrub management, conversely, is likely to decrease numbers, but may increase foraging opportunities for some species such as barn owl. Woodland planting on part of the Roft will similarly increase diversity, although reduce breeding opportunities for skylarks here. The heathland re-creation alongside may, in time, provide additional opportunities for species such as whitethroat and stonechat.

### 6.4 References

Eaton, M. et al (2015) Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds 108.

RSPB (2009) The Population Status of Birds in Wales.



*Areas of rank heathland on the Rhos Pasture support linnet, dunnock and cuckoo*

## 7. Autumn Passage and Wintering Birds

No formal bird survey was carried out during the late summer and autumn months, but work on the heathland re-creation project during October allowed a few anecdotal observations to be made (albeit without binoculars and often whilst driving a dumper truck). A kestrel was regularly seen foraging over Waun Fachelich, sometimes also over the Rhos Pasture. A red kite was seen over Waun Fachelich and Caerwen on October 11<sup>th</sup>; a day which was notable for the 'visible migration' of passerines heading south-east over the Roft around mid-morning. Siskin, redpoll, Lapland bunting, crossbill and numerous skylarks were among the species in this movement. Towards the end of October, a late passage wheatear was the first bird to grace the newly-stripped heathland creation field, along with a flock of herring gulls attracted by the disturbance. Sarah reported lapwings on the field soon afterwards. Wintering raptors were in evidence by early November, with a ringtail (female) hen harrier hunting over the Rhos Pasture and a female merlin dashing through whilst mower-collecting was underway on Waun Fachelich on November 4<sup>th</sup>. A stonechat was seen on the edge of the heathland creation area on the same day, and a few hundred starlings and a mixed flock of herring, lesser black-backed and black-headed gulls were foraging in cut grassland areas.

Between December and February, a visit was made on one morning each month to assess the use of each field by wintering birds. Results are shown in the tables below.

### Wintering Birds, Lower Harglodd 17<sup>th</sup> December 2021

Species	Dowrog Field	Parc Sara	Caerwen	The Roft	Rhos Pasture
Snipe			3		4
Lapwing				(2 over)	
Hen Harrier	1 male				1 female
Meadow Pipit			1		
Skylark				(6 over)	
Wren	1	1	2		
Jackdaw				(3 over)	
Carrion Crow				(2 over)	
Starling				(2 over)	
Song Thrush	1				
Dunnock	1		1		
Redpoll				(1 over)	
Reed Bunting	1	1			

### Wintering Birds, Lower Harglodd 11<sup>th</sup> January 2022

Species	Dowrog Field	Parc Sara	Caerwen	The Roft	Rhos Pasture
Snipe					1
Meadow Pipit			1		1
Wren	2	1			1
Woodpigeon	1				



Great Tit	1				
Blackbird	1				
Song Thrush	1				
Dunnock	1		1		1
Bullfinch	1				
Chaffinch	2				
Reed Bunting	1	1			

#### Wintering Birds, Lower Harglodd 3<sup>rd</sup> February 2022

Species	Dowrog Field	Parc Sara	Caerwen	The Roft	Rhos Pasture
Snipe					4
Meadow Pipit			1		
Wren	2	1		1	2
Woodpigeon					
Great Tit	1				
Blackbird	2				1
Song Thrush	1				
Dunnock	2		1		1
Bullfinch	1				
Chaffinch		1			
Reed Bunting					

The survey results show that use of the fields by wintering birds is limited. A few resident species, such as reed bunting, dunnock and wren remain in small numbers. Winter visiting snipe also occurred in only small numbers – these could be expected to increase in harder winters, but softer muds on other wetlands in the area are likely to provide better foraging opportunities. Hen harriers, known to roost further east on the Airfield Heaths and on Dowrog Common, were seen hunting over the site only on one visit. Additional observations made by Sarah Beynon included a little egret amongst out-wintered cattle on the farm. The site appears to be only of limited value for wintering birds. Numbers may be expected to increase as habitat creation works in the Roft develop. Increases in farmland birds such as finches and buntings could be achieved by the sowing of cereals or wild bird cover crops in Caerwen, but such crops are currently provided elsewhere on the farm.

## 8. Bats



*Static bat detector on the Rhos Pasture boundary bank*

A bat survey was carried out in late August 2021. A transect route was walked, which involved walking slowly around part of the site (Caerwen, The Roft and The Rhos Pasture) with an Echometer bat-detector for approximately one hour after dusk on August 17<sup>th</sup>, then the remainder of the site (Parc Sara and Dowrog Field) for 40 minutes before dawn on the following day. Following this, static detectors were left in three fields (The Rhos Pasture, Dowrog Field and Parc Sara) to record bat activity over a period of seven nights, from August 26<sup>th</sup> to 1<sup>st</sup> September.

The site holds no buildings or trees with potential for roosting bats, so all records relate to foraging or commuting bats. The transect surveys recorded some activity, particularly over The Roft and the Rhos Pasture, where a succession of noctules passed over in a north-westerly direction early on in the survey (20:49 until 21:22, 7 individuals). This was suggestive of a relatively local roost. This is a tree-dwelling species - suitably mature trees with cavities are not obvious in the local landscape, but there may be some in woodland near Middle Mill. Other activity was restricted to foraging common pipistrelles, including individuals around the ponds in the Rhos Pasture and along the boundary bank between here and the Roft.

The following tables summarise the bat activity recorded by the static detector survey:

<b>Dowrog Field</b> Date 26 <sup>th</sup> August – 1 <sup>st</sup> September 2021					
	BAT SPECIES (number of passes)				
	Common pipistrelle	Soprano pipistrelle	Myotis sp.	Greater horseshoe	Noctule
26 <sup>th</sup> August					1
27 <sup>th</sup> August	1	1	1	0	2
28 <sup>th</sup> August	1	1	0	0	4
29 <sup>th</sup> August	1	1	2	0	5
30 <sup>th</sup> August	3	1	1	0	3
31 <sup>st</sup> August	3	1	2	0	3
1 <sup>st</sup> September	1	3	1	1 (0454hrs)	2

<b>Parc Sara</b> Date 26 <sup>th</sup> August – 1 <sup>st</sup> September 2021					
	BAT SPECIES (number of passes)				
	Common pipistrelle	Soprano pipistrelle	Myotis sp.	Greater horseshoe	Noctule
26 <sup>th</sup> August	1	0	1	1 (2010hrs)	0
27 <sup>th</sup> August	4	0	3	0	0
28 <sup>th</sup> August	None recorded				
29 <sup>th</sup> August	2	1	1	1 (2143hrs)	0
30 <sup>th</sup> August	0	1	0	0	0
31 <sup>st</sup> August	None recorded				
1 <sup>st</sup> September	None recorded				

<b>The Rhos Pasture</b> Date 26 <sup>th</sup> August – 1 <sup>st</sup> September 2021					
	BAT SPECIES (number of passes)				
	Common pipistrelle	Soprano pipistrelle	Myotis sp.	Greater horseshoe	Noctule
26 <sup>th</sup> August	1	2	1	0	2
27 <sup>th</sup> August	2	9	1	0	2
28 <sup>th</sup> August	2	4	2	0	8
29 <sup>th</sup> August	5	5	3	0	1
30 <sup>th</sup> August	8	30 (peak 2100-2200hrs and 0500-0600hrs)	7	0	7
31 <sup>st</sup> August	6	15 (peak 2000-2100hrs)	3		3
1 <sup>st</sup> September	3	6	2	2 (0004hrs and 0531hrs)	3

It can be seen from this data that Dowrog Field and Parc Sara had only low numbers of pipistrelles, noctules and a Myotis species, whilst the Rhos Pasture had more regular activity of both common and soprano pipistrelles, as well as daily Myotis and noctule passes. All sites had one or two greater horseshoe bat passes on one or two days, suggestive of commuting individuals rather than foragers.

This survey is of course only a snapshot of bat activity at selected points on the farm, and survey work in other seasons could reveal higher usage of the fields by foraging bats, related to emergence of particular invertebrates such as cockchafers or ghost moths. However, it suggests that the fields are currently only of limited value to foraging bats, despite their well-structured semi-natural vegetation and the presence of organic cattle in some. This may reflect the relatively low number of bats in the exposed, largely unwooded landscape of St Davids. The tree and hedgerow planting subsequently carried out in The Roft may serve to enhance the site for both commuting and foraging bats.



*Newly created and planted hedge-bank in the Roft*

## 9. Other Mammals



*Possible stoat nest hole, the Roft*

Survey of other mammals was limited to searches of suitable habitat for field signs such as burrows, nests or droppings. This produced the following results:

- A single adult badger was seen on the south side of Caerwen whilst a bat survey was being undertaken in August. A well-worn path crosses the hedgebank between Caerwen and The Roft. No setts were encountered.
- A fox was disturbed from the Rhos Pasture doing daylight. Scats were found on the Roft following heathland re-creation work here.
- No signs of otter were seen, but the Rhos Pasture has the potential to be used for commuting or foraging.
- A hole in the clawdd wall alongside the Roft, pictured above, may have been used by a stoat. The desk exercise returned a record of a stoat from Waun Fachelich.
- Nests of small mammals, probably common shrew and/or field vole, were found under two reptile survey sheets in the Rhos Pasture and Dowrog Field. Vole runs were noted through *Molinia* litter in the former.

## 10. Reptiles and Amphibians

### 10.1 Aims and objectives

The aims and objectives of the reptile and amphibian survey were to:

- identify the presence of any reptile or amphibian species using the site
- advise of any implications their presence would have on proposed management

To undertake the reptile survey, artificial cover objects (ACO) were used. These increase the chances of observing otherwise elusive reptiles, which are attracted to these 'refuges' as they can bask on top or regulate their body temperature below the refuges, out of sight from predators. Amphibians also shelter below such refuges on occasion. Although standing water is present on part of the site, the late start to the survey contract meant that recommended amphibian survey techniques could not be used here.

33 ACOs comprising a mixture of black Onduline (bituminous roofing sheets) and corrugated metal sheets, each measuring either 0.5m<sup>2</sup> or 1m<sup>2</sup>, were laid in early June 2021. They were then left to 'bed-in' for a significantly longer period than the 4 weeks recommended in survey guidelines (Froglife, 1999).

The ACOs were laid in areas of suitable habitat for reptiles across the site. Higher numbers were used in semi-natural grassland and heathland areas. Map 10.1 shows refuge locations.

On each visit, ACOs were approached slowly and observed from a distance. This survey method was adopted to observe reptiles basking in the sun. Each ACO was then approached cautiously and turned over to survey for reptile species using the refuge to warm up or shelter underneath. A transect route was also walked slowly, to cover the areas of open ground and potential basking spots between ACOs and any pre-existing natural or artificial refugia.

### 10.2 Survey Results

Records from the five survey visits are summarised in Table 10.1. A plan showing the location of ACOs and the reptiles recorded on the site is shown in Map 10.1.

Barred grass snake (*Natrix helvetica*), adder (*Vipera berus*) and common lizard (*Zootoca vivipara*) were all recorded under ACOs. A single common lizard was the only reptile seen basking during transects, on the clawdd wall between the Rhos Pasture and the Roft.

Common frog (*Rana temporaria*) and common toad (*Bufo bufo*) were recorded. An adult frog was recorded in *Molinia* near a pond on the Rhos Pasture in June, then another was disturbed during heathland re-creation work on the Roft in October. Single adult and juvenile toads were recorded under ACOs on the Rhos Pasture in August.

**Table 10.1: Summary of transect results for reptile species**

Visit	Date	Weather	The Rhos Pasture	The Roft / Caerwen	Dowrog Field	Parc Sara
1	10.8.21	15.6°C 80% cloud Beaufort 1				
2	17.8.21	17.2°C 0/8 cloud Beaufort 0	2 adders		5 adult + 1 juv. grass snake; 2 juv. lizards	1 juv. grass snake
3	26.8.21 (15.30)	17.6°C partial sea mist Beaufort 2			1 grass snake	
4	4.9.21	14.5°C 70% cloud Beaufort 2	1 juvenile adder		1 grass snake	
5	20.9.21	Not recorded				

*Reptile Survey – Artificial Cover Object on the Rhos Pasture*



Map 10.1 Refuge Locations and Herptile Sightings (maximum number)



### 10.3 Reptile Population Assessment

Froglife (1999) provides means of evaluating reptile populations based on survey results using a density of 10 refuges per hectare. “Low”, “good” or “exceptional” populations are based on numbers of adult reptiles recorded by one surveyor in one visit (see Table 10.2).

**Table 10.2:** Reptile population assessment *Froglife* (1999)

Species	Low Population	Good Population	Exceptional Population
Grass snake	Less than 5	5-10	Greater than 10
Adder	Less than 5	5-10	Greater than 10
Slow worm	Less than 5	5-20	Greater than 20
Common lizard	Less than 5	5-20	Greater than 20

Figures in the table refer to the minimum number of adults seen by one surveyor in one day at a refuge density of up to 10 per hectare. The density of refuges used during this survey was approximately that suggested, allowing a comparison using the above table to be made.

The peak grass snake count on Dowrog Field was 5 adults, at an ACO density of 10/ha. This population can thus be described as Good. The population of common lizards here is Low. The grass snake population on Parc Sara is Low. The density of ACOs used on the Rhos Pasture was relatively low (approximately 6 sheets per hectare), but the maximum count of 2 adders here indicates a Low population. The single common lizard here likewise indicates a Low population. The agriculturally improved fields – Caerwen and The Roft – held no reptiles.

### 10.4 Discussion and Recommendations

August - September is an optimal survey period for reptiles. Survey visits were all carried out in suitable weather conditions, and the recommended density of refugia (10 per 1ha of suitable habitat at the site) was met in two of the three fields with suitable habitat. Therefore, the results are considered to provide an accurate account of the status of reptiles on the site.

The Wildlife and Countryside Act 1981, as amended, states that it is an offence to deliberately harm or kill any reptile. Management of the site in the knowledge that reptiles are present consequently requires a strategy to reasonably protect them. A precautionary approach will need to be taken to meet best practice and ensure observance of regulations.

Mechanical scrub and grassland control with a flail-mower is proposed prior to boundary fencing on Dowrog Field. The proposed work will potentially impact on the barred grass snake and common lizard population here. As such, clearance work should take place during the winter hibernation period, or when day time temperatures are between 16-24°C, ie. when reptiles and amphibians are alert and mobile and can move out of an area subject to

disturbance. Any ongoing management, through either grazing or mowing, has the potential to reduce the suitability of the vegetation structure here for grass snakes and their prey.

## 10.5 Summary and Conclusions

A good population of barred grass snakes is present on Dowrog Field, whilst low populations of this species, together with common lizard and adders are variously present elsewhere on the site. Development of a strategy to avoid killing or injuring them during any management work should be required. Particular care should be taken during the implementation of any mechanical grassland or heathland control. Work should be undertaken at a time when reptiles are suitably active and mobile and more likely to be able to avoid being harmed, or during the winter months when they are hibernating.

## 10.6 References

Froglife (1999). Reptile survey, an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife advice sheet 10,

Sewell D, Griffiths RA, Beebee TJC, Foster J and Wilkinson JW (2013) Survey Protocols for the British Herpetofauna. ARG / Universities of Kent and Sussex



*Adder under ACO on the Rhos Pasture*

## 11. Invertebrates

### 11.1 Aims and objectives

The aims and objectives of this survey were to:

- Identify key habitat elements for invertebrates on the site
- Characterise the invertebrate assemblage, focussing on key groups
- Assess whether any notable or protected species are present or likely to be present

### 11.2 Survey Details

A transect survey was carried out over a two-hour period on the late mornings and afternoons of August 10<sup>th</sup> and 26<sup>th</sup> 2021. A few incidental records were also made during the rapid assessment and reptile survey work before this date. The surveys were conducted during warm, still and sunny conditions - it is at this time that most insects, particularly bees and wasps, are most active.

The principal focus of the transect surveys were to characterise the use of the site by aculeate hymenoptera ('aculeates'), ie. social bees/wasps and solitary bees/wasps. Other readily-identified invertebrates were noted in the field and a limited number of specimens were collected for subsequent identification. The latter included flies (Diptera), 'true bugs' (Heteroptera), the former included butterflies and day-flying moths (Lepidoptera), and grasshoppers and crickets (Orthoptera).

The survey was carried out by sweep netting and direct searching in areas considered of value to aculeates. Sweep netting of low-growing vegetation was conducted using a 40cm diameter net. Direct searching was undertaken in combination with sweep netting and involved recording readily identifiable insects on flower-heads, in flight etc. Floristically-rich areas were searched so as to record any flower-visiting aculeates.

A moth survey was also carried out, using an MV bulb in a Skinner trap with portable generator, overnight on August 17<sup>th</sup> 2021. This was positioned in a mown area of the heathland at the southern end of the Rhos Pasture, where it would potentially have drawn from Waun Fachelich as well.

### 11.3 Results

#### 11.3.1 Overview of Invertebrate Records

Habitat quality for invertebrates is low in the two improved grassland fields, Caerwen and the Roft. A few species of common bees and butterflies were recorded nectaring at thistles here. Habitat quality is low-moderate in the two rank grassland fields, Parc Sara and Dowrog Field. Although semi-improved, structural diversity is low, with no areas of short vegetation or bare

ground, and only limited areas of scrub and a short length of ditch. Habitat quality is at least moderate in the Rhos Pasture, where heathland, scrub, ponds, grassland and marshy grassland habitats provide a range of different niches. There are small areas of bare ground here, a wide range of foodplants, and a reasonable variety of pollen and nectar sources at different times of the year.

Ten species of bee were recorded across the farm – a low number, but reflective of the limited nature of the survey effort and the scarcity of bare ground. These did, however, include the wood-carving leaf-cutter bee (*Megachile ligniseca*), apparently a new species for Pembrokeshire, nesting in an old fence-post on the Rhos Pasture. An uncommon cuckoo bee, Barbut's cuckoo bumblebee (*Bombus barbutellus*), was recorded in a bumblebee nest apparently excavated by a badger on Dowrog Field. Another species with few local records, bull-headed furrow bee (*Lasioglossum zonulum*), was nectaring on wild angelica in Parc Sara and Dowrog Field.

Nine common butterfly species were recorded in low numbers, including common blue and wall. Four common species of Orthoptera were noted in the Rhos Pasture, but other fields held only a few meadow grasshoppers at best. A single nest of the slender ant was found in rank grassland in Parc Sara – this is a widespread species, but with few Pembrokeshire records. Only a small sample of ten common hoverfly species was recorded, many of these nectaring on either wild angelica or common fleabane in Dowrog Field. Recording of dragonflies and damselflies was limited to the adult stages, and the ponds on the Rhos Pasture held only a handful of common species when surveyed. Small red damselfly has been reported from the ponds here, but this species was only confirmed, surprisingly, from the ditch in Parc Sara – perhaps a wanderer from the nearby firebreak pool on the Dowrog. A full list of species recorded is given in Table 11.1 below.



*This old fence post in the Rhos Pasture (left) held the wood-carving leaf-cutter bee; the bank end by the gateway into the Rhos Pasture (right) had one of the few suitable areas of bare ground for nesting solitary bees, including common green furrow-bee.*

Table 11.1 Invertebrates Recorded at Lower Harglodd 2021

Species	English Name	Sex / Stage	Rhos Pasture	The Roft	Parc Sara	Dowrog Field
<b>Bees</b>						
<i>Anthophora furcata</i>	Fork-tailed Flower Bee	Female	10-Aug			
<i>Bombus lapidarius</i>	Red-tailed Bumblebee	Worker	10-Aug			10-Aug
<i>Bombus lucorum</i>	White-tailed Bumblebee	Worker	10-Aug			10-Aug
<i>Bombus pascuorum</i>	Common Carder Bee	Queen	10-Aug		26-Aug	10-Aug
<i>Lasioglossum calceatum</i>	Common Furrow Bee	Female	10-Aug			
<i>Lasioglossum morio</i>	Common Green Furrow Bee	Male	10-Aug		26-Aug	
<i>Lasioglossum morio</i>	Common Green Furrow Bee	Female	26-Aug			
<i>Megachile ligniseca</i>	Wood-carving Leafcutter Bee	Female	10-Aug			
<i>Lasioglossum albipes</i>	Bloomed Furrow-bee	Male		26-Aug		
<i>Lasioglossum zonulum</i>	Bull-headed furrow-bee	Male			26-Aug	10-Aug
<i>Bombus barbutellus</i>	Barbut's Cuckoo Bee	female				22-Jun
<b>Sawflies</b>						
<i>Arge pagana</i>	Rose Sawfly	adult				26-Aug
<i>Athalia rosae</i>	Turnip Sawfly	adult				26-Aug
<i>Tenthredo mesomela</i>						22-Jun
<b>Ants</b>						
<i>Leptothorax acervorum</i>	Slender Ant					22-Jun
<b>Flies</b>						
<i>Beris vallata</i>	Common Orange Legionnaire	adult	10-Aug			10-Aug
<i>Chrysops viduatus</i>	Square-spot Deerfly	adult	10-Aug			10-Aug
<i>Eristalis intricaria</i>	Furry Dronefly	adult	10-Aug			10-Aug
<i>Haemotopa pluvialis</i>	Cleg	adult	10-Aug			10-Aug
<i>Rhingia campestris</i>	Common Snout Hoverfly	adult			26-Aug	26-Aug
<i>Eupeodes luniger</i>	Common Spotted Field Syrph	adult			26-Aug	
<i>Eristalis tenax</i>	The Dronefly	adult			26-Aug	26-Aug
<i>Syrphus vitripennis</i>	Glass-winged Syrphus	adult				26-Aug
<i>Episyrphus balteatus</i>	Marmalade Hoverfly	adult				26-Aug
<i>Platycybeus albimanus</i>	White-footed Hoverfly	adult				26-Aug
<b>Butterflies</b>						
<i>Coenonympha pamphilis</i>	Small Heath	adult	22-Jun			
<i>Pyronia tithonus</i>	Gatekeeper	adult	10-Aug	10-Aug		
<i>Thymelicus sylvestris</i>	Small Skipper	adult	10-Aug			
<i>Polyommatus icarus</i>	Common Blue	adult	10-Aug		26-Aug	
<i>Maniola jurtina</i>	Meadow Brown	adult	10-Aug	10-Aug		
<i>Lasiommata megera</i>	Wall	adult	10-Aug	10-Aug		
<i>Pararge aegeria</i>	Speckled Wood	adult		26-Aug		
<i>Aglais urticae</i>	Small Tortoiseshell	adult		26-Aug		
<i>Vanessa atalanta</i>	Red Admiral	adult		10-Aug		26-Aug
<i>Aglais io</i>	Peacock	adult				26-Aug
<b>Dragonflies and Damselflies</b>						
<i>Coenagrion puella</i>	Azure Damselfly	adult	10-Aug			
<i>Sympetrum striolatum</i>	Common Darter	adult	10-Aug	26-Aug		
<i>Ceriagrion tenellum</i>	Small Red Damselfly	adult			26-Aug	
<i>Anax imperator</i>	Emperor				22-Jun	

## Grasshoppers-Groundhoppers

<i>Chorthippus brunneus</i>	Field Grasshopper	adult	10-Aug	
<i>Chorthippus parallelus</i>	Meadow Grasshopper	adult	10-Aug	26-Aug
<i>Tetrix subulata</i>	Slender Groundhopper	adult	10-Aug	
<i>Tetrix undulata</i>	Common Groundhopper	adult	10-Aug	

## Spiders

<i>Araneus diadematus</i>	Garden Orb Spider	adult	10-Aug	26-Aug
<i>Heliophanus flavipes</i>	a Jumping Spider	adult	10-Aug	
<i>Xysticus cristatus</i>	Common Crab Spider	adult	10-Aug	

## Bugs

<i>Phytocoris varipes</i>	a plant bug	adult	17-Aug	
<i>Zicrona caerulea</i>	Blue Shieldbug	larva	20-Sep	

## Beetles

<i>Nanophyes marmoratus</i>	Loosestrife Weevil	adult	10-Aug	
<i>Trichosirocalus troglodytes</i>	a weevil	adult	26-Aug	
<i>Platydacus stercorarius</i>	a Rove Beetle	adult	10-Aug	10-Aug
<i>Coccinella septempunctata</i>	7-spot ladybird	adult	26-Aug	
<i>Nicrophorus investigator</i>	Banded Sexton Beetle	adult	17-Aug	

## Molluscs

<i>Vertigo antvertigo</i>	Marsh Whorl Snail	adult	17-Aug	
<i>Cepaea hortensis</i>	White-lipped Snail	adult		26-Aug
<i>Cepaea nemoralis</i>	Brown-lipped Snail	adult		22-Jun

## Moths

<i>Autographa gamma</i>	Silver Y	adult	10-Aug	26-Aug
<i>Chrysoteuchia culmella</i>	Garden Grass Veneer	adult	10-Aug	26-Aug
<i>Tyria jacobaea</i>	Cinnabar	adult	10-Aug	
<i>Anarsia spartiella</i>	Small Sober	adult	21-Jun	
<i>Macrothylacia rubi</i>	Fox Moth	Larva		10-Aug
<i>Hadena bicruris</i>	Lychnis	adult	17-Aug	
<i>Gonepteryx rhamni</i>	Brimstone	adult	17-Aug	
<i>Eilema lurideola</i>	Common Footman	adult	17-Aug	
<i>Phragmatobia fuliginosa</i>	Ruby Tiger	adult	17-Aug	
<i>Lycophotia porphyrea</i>	True Lover's Knot	adult	17-Aug	
<i>Ochropleura plecta</i>	Flame Shoulder	adult	17-Aug	
<i>Abrostola tripartita</i>	Spectacle	adult	17-Aug	
<i>Noctua pronuba</i>	Large Yellow Underwing	adult	17-Aug	
<i>Plusia festucae</i>	Gold Spot	adult	17-Aug	
<i>Perizoma affinitata</i>	Rivulet	adult	17-Aug	
<i>Parapoynx stratiotata</i>	Ringed China-mark	adult	17-Aug	
<i>Chortodes pygmina</i>	Small Wainscot	adult	17-Aug	
<i>Xestia c-nigrum</i>	Setaceous Hebrew Character	adult	17-Aug	
<i>Noctua interjecta</i>	Least Yellow Underwing	adult	17-Aug	
<i>Epirrhoe alternata</i>	Common Carpet	adult	17-Aug	
<i>Elophila nymphaeata</i>	Brown China-mark	adult	17-Aug	
<i>Ennomos alniaria</i>	Canary-shouldered Thorn	adult	17-Aug	
<i>Hoplodrina blanda</i>	Rustic	adult	17-Aug	
<i>Xanthorhoe ferrugata</i>	Dark-barred Twin-spot Carpet	adult	17-Aug	
<i>Xanthorhoe spadicearia</i>	Red Twin-spot Carpet	adult	17-Aug	
<i>Mythimna impura</i>	Smoky Wainscot	adult	17-Aug	
<i>Apamea monoglypha</i>	Dark Arches	adult	17-Aug	
<i>Idaea fuscovenosa</i>	Dwarf Cream Wave	adult	17-Aug	

<i>Amphipoea cf. lucens</i>	cf. Large Ear	adult	17-Aug
<i>Pheosia tremula</i>	Swallow Prominent	adult	17-Aug
<i>Hepialus sylvina</i>	Orange Swift	adult	17-Aug
<i>Xestia sexstrigata</i>	Six-striped Rustic	adult	17-Aug
<i>Hydriomena furcata</i>	July Highflyer	adult	17-Aug
<i>Crocallis elinguarina</i>	Scalloped Oak	adult	17-Aug
<i>Hydraecia micacea</i>	Rosy Rustic	adult	17-Aug
<i>Acronicta rumicis</i>	Knot Grass	adult	17-Aug
<i>Hada nana</i>	Shears	adult	17-Aug
<i>Notodonta ziczac</i>	Pebble Prominent	adult	17-Aug
<i>Noctua fimbriata</i>	Broad-bordered Yellow Underwing	adult	17-Aug
<i>Oxypteryx immaculatella</i>	Twilight Neb	adult	17-Aug
<i>Crambus pascuella</i>	Inlaid Grass Veneer	adult	17-Aug
<i>Agonopterix subproprinquella</i>	Ruddy Flatbody	adult	17-Aug
<i>Agriphila tristella</i>	Common Grass Veneer	adult	17-Aug
<i>Cochylis atricapitana</i>	Black-headed Conch	adult	17-Aug
<i>Mirificarma mulinella</i>	Gorse Groundling	adult	17-Aug
<i>Blastobasis adustella</i>	Dingy Dowd	adult	17-Aug
<i>Endothenia marginana</i>	Bordered Marble	adult	17-Aug
<i>Coleophora cf. juncicolella</i>	Least Case-bearer	adult	17-Aug
<i>Eupoecelia angustana</i>	Marbled Conch	adult	17-Aug
<i>Epiblema scutalana</i>	Thistle Bell	adult	17-Aug
<i>Cydia ulicetana</i>	Grey Gorse Piercer	adult	17-Aug
<i>Epiphyas postvittana</i>	Light Brown Apple Moth	adult	17-Aug
<i>Coptotriche marginea</i>	Bordered Carl	adult	17-Aug



(left) Fox moth larva; (right) Canary-shouldered Thorn

### 11.3.2 Key Species and Habitat Requirements

The following accounts focus on the species of particular conservation concern recorded during the survey.

**Twilight Neb (*Oxypteryx immaculatella*)** pRDB3

This blackish micro-moth is very local, with an extremely patchy and disjointed distribution in south-east and south-west England, western Ireland and a few coastal sites in Wales. Recorded more evenly in the northern half of Scotland although still uncommon. It is found between May and early October in a variety of habitats. Slender St. John's-wort has been suggested as a foodplant, and this plant is present in the heath area of the Rhos Pasture from where a single adult was attracted to light. There are several similar looking Gelechiid species, and Robin Taylor confirmed the specimen through genitalia dissection.

**Wood-carving Leaf-cutter Bee (*Megachile ligniseca*)**

This is an uncommon bee, frequent only in the south-east of England and with few records in west Wales aside from a cluster on Gower. It mostly flies between early July and mid-August. It collects pollen from a variety of sources, and is often found nectaring at thistles or brambles. Nesting takes place in timber such as old trees and fence posts. Cells are lined with leaves, particularly sycamore. A single female was caught on the north end of the Rhos Pasture, where it was nesting in an old fence-post on the clawdd wall. A fresh hole in a fallen dead gorse trunk in the southern part of this field may also have been excavated by this species.



*Megachile ligniseca* (photo by David Williams)



### **Small Red Damselfly (*Ceriagrion tenellum*) Nationally Scarce**

This is a species of shallow pools and streams on boggy heathland, and has been long known from Dowrog and some of the surrounding commons. It had recently been reported from the new ponds on the Rhos Pasture, and a probable male was seen here briefly in flight during vegetation survey in June. A confirmed sighting was made on Parc Sara during the invertebrate survey in August. The species needs clean water, and new shallow pools in the area – such as those subsequently created on the Roft – should benefit it.

### **Wall (*Lasiommata megera*) Section 7**

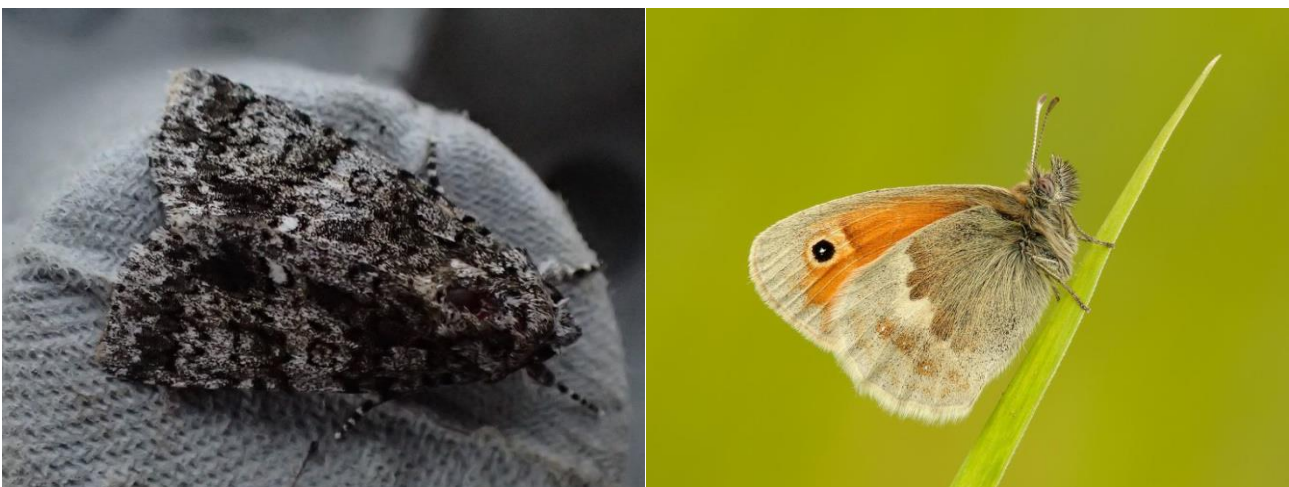
This is a widespread but rapidly declining butterfly in the ‘brown’ family. It is associated with stone walls and rocky banks, and the larvae feed on various common grasses. Single adults were seen on the boundary bank between the Rhos Pasture and the Roft, and on the clawdd wall on the west side of the latter. New banks and stone piles in the Roft may benefit this species if kept open.

### **Small Heath (*Coenonympha pamphilis*) Section 7**

This is another widespread but declining species, listed on Section 7 of the Environment Wales Act as a species ‘of principle importance for conservation’. Typically associated with heathland, but also in other habitats such as road verges where the vegetation is short and open. The larvae feed on fine-leaved grasses such as fescues and bents.

### **Knot Grass (*Acronicta rumicis*) Section 7**

This black, grey and white moth is still a widespread and common species across much of Britain, but, along with other common moths, has apparently been listed on Section 7 of the Environment Wales Act due to a decline in numbers. It is found in a variety of habitats, and has various different larval foodplants.



*Knot grass (left); small heath (right) - photo by Iain Leach*

### 11.3.3 Potential for Other Notable Species

#### **Marsh fritillary (*Euphydryas aurinia*)**

This butterfly, subject of much conservation attention, is now rare or extinct in the St David's area. Plug plants of devil's bit scabious have been planted in Parc Sara and Dowrog Field, but the dry grassland here is unsuitable as marsh fritillary habitat. The *Molinia* area in the Rhos Pasture is more suitable, and has a sufficiently open structure in places. The scabious is rare here though, and a chance colonisation event seems unlikely.

#### **Small Pearl-bordered Fritillary (*Boloria selene*)**

Another fritillary – small pearl-bordered – is perhaps more likely to occur on the Rhos Pasture, and a brief, unconfirmed sighting was made of a possible adult in flight in June. The larvae feed on violets. It is a widespread but declining species, listed on Section 7 of the Environment Wales Act.

#### **Moss Carder Bee (*Bombus muscorum*)**

Of the three scarcer ginger-brown carder bees (shrill, brown and moss), moss carder is perhaps the most likely to occur here. There are records from the St David's area, and it prefers damp, tall, flower-rich habitats such as those present on the Rhos Pasture.

#### **Scarce Blue-tailed Damselfly (*Ischnura pumilio*)**

This damselfly is a wandering opportunist – quick to colonise new ponds, but quick to disappear again as soon as they become well vegetated and other damselfly species colonise. It is likely to appear on the new ponds on the Roft within a year or two.

#### **Haworth's Minor (*Celaena haworthii*)**

The author has trapped this moorland species, whose larvae feed on common cotton grass, on adjoining Waun Fachelich in the past. It is a Section 7 species, albeit still widespread in Wales. Although cotton grass was not noted on the Rhos Pasture, there is potential for the plant and the moth to colonise this field or the new wet areas on the Roft in due course. Other common, but declining, Section 7 moth species such as small square-spot and latticed heath are also likely to be here.

## 12. Management

### 12.1 Recent Management



*Recently excavated pond in the Rhos Pasture, with cattle-trampled margins*

Little information is discernible from aerial photography. A photograph from 1969 is not of sufficient resolution to determine the degree of grazing or other management. Grazing with Welsh black cattle has been the key management in Caerwen, the Roft and the Rhos Pasture in recent years; horses have grazed here too. The photo below shows rank *Molinia* dominating the Rhos Pasture in 2014, prior to the introduction of restoration grazing. The strongly tussocky structure and build-up of leaf litter at that time is no longer evident.

Ponds have been dug in the Roft and the Rhos Pasture since 2014, strips have been mown through the heath here, and coarse vegetation has continued to spread in Parc Sara and Dowrog Field in the absence of grazing or mowing.

Heathland creation work in the Roft, carried out following this survey, has been reported on separately.



*The Rhos Pasture in 2014 prior to restoration grazing (photo by Sarah Beynon)*

## 12.2 Future Management Recommendations

### The Rhos Pasture

Some poaching and creation of cattle-trails through wet clay areas in the Rhos Pasture is beneficial to the bryophytes, *Ranunculus tripartitus* and some other plants including devil's bit scabious. However, cattle-grazing on The Rhos Pasture should be timed to avoid the winter months as disturbance of open ground at this time can impact on these species. *Molinia* is at its most palatable and nutritious between May and early July, so grazing of moor-grass pastures to reduce tussock strength can be most effective at these times. Spring and late summer / early autumn grazing is perhaps ideal. Some light horse-grazing during drier winter periods may help to tackle gorse and rushes, but excessive poaching should be avoided – occasional mowing of these areas may be preferable.

If mowing is used in the Rhos Pasture, this should seek to create a variety of structures within the marshy grassland, by creating meandering paths rather than mowing larger blocks. Removal of cut material to avoid a mulching effect would be necessary, and this should be left as a series of small or piles on areas currently dominated by bracken or bramble. These piles may be used by grass snakes and small mammals as they decay. Given the presence of adders and common lizards on the site, any clearance should take place during warm weather (above 16°C) in late summer, or during the winter hibernation period.

Some specific creation of bare clay areas within the marshy grassland would be beneficial for *Didymodon tomaculosus* and other small species, and a small area between tractor ruts was subsequently scraped – arisings were spread on the adjoining heathland re-creation field.



*(left) Scraped area in the Rhos Pasture; (right) new pools in the Roft heathland creation*

### **Parc Sara and Dowrog Field**

Rank grassland on the two fields adjoining Dowrog Common will be subject to management through grazing and/or flail-mowing. They will potentially become more botanically species-rich as a result, but some invertebrates, breeding birds and reptiles may be affected. Given the presence of a strong grass snake population on Dowrog Field, any clearance here should take place during warm weather (above 16°C) in late summer, or during the winter hibernation period.

### **The Roft**

Heathland creation work over much of this field should not follow a prescriptive approach – management decisions should be made reactively according to development of vegetation here. As a general principle, the approach taken should look to kickstart natural processes rather than try to achieve set outcomes. Bare ground and ‘weed’ species will inevitably be prominent in the early years, but invertebrates, bryophytes and other less-competitive species will benefit enormously from this early successional stage. If or when there is a high cover of heather and other heathland plants established, many of these species will disappear.

### **Caerwen**

Whether this is retained as a ley, managed for arable or bird-friendly crops, or developed as permanent pasture, avoidance of fertiliser or muck inputs should be key to protect adjoining land from potentially nitrogen-rich run-off.