An Insect Survey (Diptera & Aculeate Hymenoptera) of Ynyslas Dunes in July 2024, with a focus on the Pantaloon Bee *Dasypoda hirtipes*

NRW Evidence Report No. 877

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Pantaloon Bee *Dasypoda hirtipes*

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Cynhaliwyd arolwg o infertebratau yn y rhan o Dwyni Ynyslas sy'n eiddo preifat, ar 14 a 29 Gorffennaf 2024, gan ganolbwyntio ar Hymenoptera colynnog a Diptera. Cafwyd 125 o gofnodion i gyd o 102 o rywogaethau gan gynnwys 77 o rywogaethau Diptera ac 16 o Hymenoptera colynnog. Cofnodwyd poblogaeth fridio fawr iawn o wenynen *Dasypoda hirtipes* sy'n anfynych yn genedlaethol, gyda'r prif gydgasgliad yn gysylltiedig â thywod wedi'i gywasgu'n ysgafn rhwng cerrig ar draws yr holl ardal barcio o gerrig cywasgedig. Yma, amcangyfrifwyd bod y cydgasgliad yn cynnwys 90,000 o nythod gyda dwysedd o rhwng 7 i fwy na 20 y metr sgwâr. Roedd poblogaeth o faint tebyg o gacynen durio *Cerceris arenaria* yn nythu yn yr un ardal. Roedd clystyrau o Laethysgallen y tir âr (*Sonchus arvensis)* yn arbennig o bwysig ar gyfer benywod gwenyn *Dasypoda hirtipes* sy'n chwilio am fwyd a'r gwrywod sy'n casglu neithdar.

Dylai parcio ceir a phobl yn cerdded helpu i gadw cydgasgliadau nythu mawr o wenyn *Dasypoda hirtipes* a gwenyn turio *Cerceris arenaria.* Pe bai parcio'n cael ei leihau, byddai'n ddefnyddiol monitro'r prif gydgasgliad a chymryd camau o bosib pe bai'r boblogaeth yn dangos arwyddion o ostyngiad sylweddol. Gallai camau gweithredu gynnwys rholio lleiniau dethol o ardal y maes parcio yn ysgafn.

Roedd llac twyni bychan sy'n weddill yn ardal yr arolwg yn cynnal casgliad diddorol o Diptera gwlyptir, gan gynnwys dangosyddion gwlyptir arfordirol fel y pryf hirgoes *Thinophilus ruficornis*, sy'n anfynych yn genedlaethol. Bydd mesurau i atal traffig yn gyfan gwbl rhag mynd dros yr ardaloedd llaith o fudd i'r nodwedd hon.

Executive summary

A survey of the invertebrates of the privately owned part of Ynyslas Dunes was undertaken on 14 and 29 July 2024, focussing on aculeate Hymenoptera and Diptera. In total, 125 records of 102 species were made including 77 Diptera and 16 aculeate Hymenoptera species. A very large breeding population of the Nationally Scarce Pantaloon Bee *Dasypoda hirtipes* was recorded, with the main aggregation associated with loosely compacted sand between stones across the whole of the stoned and compacted car parking area. Here, the aggregation was estimated at 90,000 nests at a density of between 7 to over 20 per sq. metre. A similar-sized population of the Sand Tailed Digger Wasp was nesting in the same area. Stands of Perennial Sow-thistle *Sonchus arvensis* were particularly important for both foraging females and nectaring males of Pantaloon Bee.

Car parking and foot traffic should help to retain large nesting aggregations of Pantaloon Bee and Sand Tailed Digger Wasp. Should parking be reduced, it would be useful to monitor the main aggregation and possibly take action should the population show signs of significant reduction. Actions could include light rolling of selected plots within the car park area.

A small, remnant dune slack within the survey area hosted an interesting assemblage of wetland Diptera, including coastal wetland indicators such as the Nationally Scarce long-legged fly *Thinophilus ruficornis*. Measures to eliminate poaching of damp areas by traffic will benefit this feature.

1. Introduction

Ynyslas Dunes is part of Dyfi SSSI and lies at the southern mouth of the Dyfi Estuary. Ynyslas Dunes supports five invertebrate species that are qualifying features of the SSSI – the ground spider *Agroeca dentigera* at its only UK locality; the Vernal Bee *Colletes cunicularius*; the ground spider *Haplodrassus minor*; the Silky Gallows-spider *Phycosoma inornatum*, and the Sand-running Spider *Rhysodromus fallax*. The dunes also support a nationally important dune invertebrate assemblage which comprises over 270 species including 46 bees & wasps, 107 beetles, 40 flies and 22 spiders.

Previous surveys of the dune invertebrate fauna have been undertaken including targeted surveys for *Agroeca dentigera* (Judd *et al*., 2003; Liverpool Museum, 2013; National Museums Liverpool, 2015; National Museums & Galleries Liverpool, 2002b) and for *Colletes cunicularius* (2002). There have also been surveys of the flies and aculeate Hymenoptera of Ynyslas Dunes (Clee, 2001, 2008; Jones & Cheeseborough, 2019; National Museums & Galleries Liverpool, 2002a). The survey in 2019 recorded 57 aculeate species, 17 of which were new to the dunes resulting in a cumulative total of 119 species (Jones & Cheesborough, 2019). Important additions included *Lasioglossum xanthopus* and *Osmia bicolor*. 136 species of flies were recorded in 2019, including 21 predominantly coastal species. A significant decline in the quality of the site's aculeate fauna in 2019 was suspected, perhaps as a result of the hot summer in 2018.

The current survey focussed on aculeate Hymenoptera and Diptera within the area of the dunes not owned and managed by NRW as part of the National Nature Reserve (NNR). There was a particular emphasis placed on establishing the extent of a suspected population of Pantaloon Bee *Dasypoda hirtipes* in this area. The survey area, which falls almost wholly within Ordnance Survey 1km grid square SN6092 (Figure 1), is a narrow area of fore and back dune, bordered by a golf course behind the back dune. There is a small remnant dune slack within the area. A significant part of the survey area is used as a car park with informal camping (camping vans) also taking place. The car park area features compacted stone with lightly compacted sand between the stones.

The Pantaloon Bee was first recorded on Ynyslas Dunes in 1998, with subsequent records in 2001, 2007 and 2019 but always in small numbers (Clee 2001, 2008; Jones & Cheeseborough, 2019). A population was recorded on Aberdyfi Dunes on the north side of the Dyfi Estuary in 2006.

2. Methods

Two survey days were undertaken on 14 and 29 July 2024. These days were selected to coincide with peak activity of Pantaloon Bee.

- 14 July 2024 – a warm, mainly clear day with hot sunshine after 10am
- 29 July 2024 – a warm clear day with hot sunshine throughout the day

On each of the survey days the following techniques were employed:

- Searching for and aerial netting of insects on flowers, leaves and bush foliage
- Searching for nest aggregations of aculeate Hymenoptera
- Sweep-netting over and through ground vegetation, flower heads, sparsely vegetated ground, wetland vegetation and bush foliage.

It was not possible to use an additional preferred method of setting pan traps as the area is too heavily used by visitors who are likely to disturb/remove pan traps.

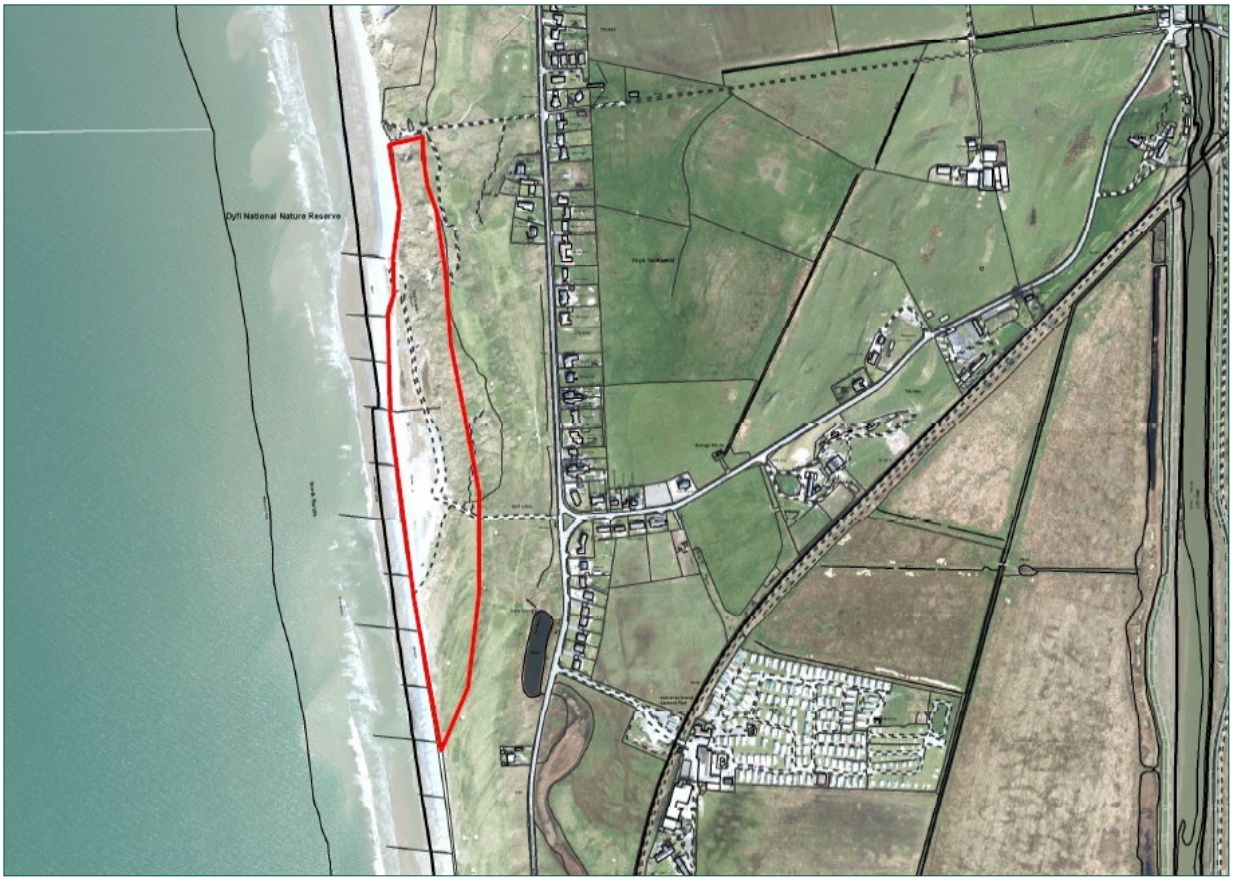

Figure 1. Survey area on Ynyslas Dunes in July 2024, outlined in red.

3. Results

2024 was an exceptionally poor year for insects, with both Diptera and aculeate Hymenoptera populations suffering significantly from the long period of cool and wet conditions throughout the spring. Accordingly, numbers of most species were very low across Britain, even after conditions improved in early July. Accordingly, it would be unwise to consider the results of this one-off survey as providing a fair indication of longer-term trends in invertebrate populations on Ynyslas Dunes. A disappointing tally of species recorded over the two survey days reflects the national experience of extremely low numbers and diversity of insects found at most sites across Britain in 2024.
In total, 125 records of 102 species were made including 77 Diptera and 16 aculeate Hymenoptera species. The full list of species recorded is given in Appendix 1. Just two species have a conservation designation, the Pantaloon Bee and long-legged fly (Dolichopodidae) *Thinophilus ruficornis*, both Nationally Scarce.

3.1 Pantaloon Bee

A substantial population of Pantaloon Bee is established on Ynyslas Dunes. Surprisingly, the vast majority of nests were made in compacted parts of the car park. The bee is making liberal use of loosely compacted sand between stones across the whole of the stoned and compacted car parking area. Also present in this same area were substantial numbers of nesting Sand Tailed Digger Wasp *Cerceris arenaria.*

3.1.1 Estimate of population size

The car park area populated by Pantaloon Bee and Sand Tailed Digger Wasp extended over a length of around 90 metres by an average of around 20 metres width, giving an estimated area of around 1,800 sq. metres used for nesting. An attempt was made to estimate the average density of nests per square metre, which varied between 7 to over 20 per sq. metre (see Figure 5). Taking an average of ten nests per sq. metre, this gives a potential 180,000 nests. It was difficult to distinguish between nests of the two species but, as numbers appeared to be fairly equal, a provisional estimate of nests for each species could be 90,000. This does seem like an extraordinary population size – too large to be so! But, given that nests occur across the whole car park area and that there are additional small aggregations beyond the car park, it is probably safe to at least say that thousands of Pantaloon Bee nests are present. Such a large aggregation is a very unusual occurrence in Britain (Falk, 1991) and could be counted as a noteworthy feature of Ynyslas Dunes.

3.1.2 Nest aggregations

Four aggregations were found at the following locations:

SN 6060 9244 – the main aggregation centred on the car park (Figure 3)
SN 6062 9257 – small aggregation (Figure 4)
SN 6061 9259 – small aggregation (Figure 6)
SN 6059 9266 – small aggregation (Figure 7)

3.1.3 Peak season on Ynyslas Dunes

On 14 July, many male Pantaloon Bees were seen patrolling over and nectaring at various yellow Asteraceae flowers (Figure 2). Males were also flying over nests where females were newly emerging. Together with the presence of many fresh-looking females, this indicated that the first half of July marks the beginning of the peak emergence period at Ynyslas. On 29 July, males were present in smaller numbers and were no longer patrolling over nests, but were still patrolling yellow Asteraceae where they would attempt to mate with foraging females. On this date, most females noted were foraging pollen (Figure 3) so had completed initial burrow excavating and were busy provisioning nests. They were mostly in quite good condition so it can be anticipated that peak season would last another week or two at least. Given a regular spring with warmer conditions, that would bring forward the emergence date observed in 2024, with an indicative peak season for here from late June to late July.

3.1.4 Foraging and nectaring

Good numbers of males were seen patrolling over and nectaring at various yellow Asteraceae (Figure 2), with a strong preference for Perennial Sow-thistle *Sonchus arvensis* being apparent. Males were also nectaring from Common Ragwort *Jacobaea vulgaris,* Hawk's-beard *Crepis* spp. and Dandelion *Taraxacum* sp. Females were only seen foraging and nectaring from Sow-thistle (Figure 2). Intriguingly, on 29 July, although many females were in evidence at nest burrows, very few were seen at flowers within the survey area, or even close by outside the area. It is therefore probable that females are travelling some distance to find forage and nectar resources.

Figure 2. Male Pantaloon Bee (left) nectaring and female (right) foraging on Perennial Sow-thistle.


Figure 3. View of the main nesting aggregation in the car park and (right) approximate extent the aggregation.

Figure 4. Extent of nesting aggregation at at SN6062 9257.

Figure 5. Dense aggregation of Pantaloon Bee and Sand Tailed Digger Wasp burrows.


Figure 6. Nesting aggregation (to the left and beyond net) at SN 6061 9259 and (right) extent of the aggregation.

Figure 7. Nesting aggregation extent at SN 6059 9266 and (right) view of the aggregation.

3.2 Aculeate Hymenoptera (Bees & Wasps) associated with sandy substrates

Apart from the large numbers of Pantaloon Bee and Sand Tailed Digger Wasp, there were low numbers of other aculeates flying on both survey days.

Most numerous of the species associated with sandy habitat were the mining bees *Colletes fodiens* and *Colletes similis*, together with the cuckoo bee *Epeolus variegatus* which is associated with *C. fodiens*. These three species were swept exclusively from flowers of Mayweed *Matricaria* sp. and were most abundant at the southern end of the survey area, beyond the car park. Both *Colletes* species were present on both survey days whilst *E. variegatus* was recorded on 29 July. In one location within the dunes, on 29 July, a number of male Silvery Leafcutter Bee *Megachile leachella* were observed searching for females over an area likely used for nesting by females. This bee is almost exclusively associated with coastal dunes. A single specimen of the Small Gorse Mining-bee *Andrena ovatula* was swept from flowers of *Matricaria* on 29 July. This bee is locally common on sandy coasts and heathlands across southern Britain.

Low numbers of the often-abundant wasp of sandy locations, Common Spiny-digger *Oxybelus uniglumis*, were scattered across the survey area on both survey days. Another species, usually numerous on sandy sites, Large Shield Wasp *Crabro cribrarius* was recorded on 29 July, but only as a single specimen. Several Red-banded Sand Wasp *Ammophila sabulosa* were present on both survey days in the northern section of the survey area in dunes. This wasp is strongly associated with sandy substrates. The spider hunting wasp *Episyron rufipes* was represented by a single specimen in the dune part of the survey area on 29 July. This is often an abundant wasp of dunes and other sandy sites.

The above assemblage of aculeates indicates that the survey area at Ynyslas could be quite significant for species associated with coastal dunes. It is highly likely that a more extensive survey over the period May – August would add significantly to the list of species at this part of Ynyslas Dunes.

3.3 Diptera associated with sandy coastal sites

Several species of fly associated with sandy coastal sites were recorded including Dune Robberfly *Philonicus albiceps*, the silverfly *Chamaemyia flavipalpis*, the fruit flies *Meromyza pratorum* and *Melanum laterale*, two dance flies *Hilara cantabrica* and *Hilara fulvibarba*, and a Hybotid fly *Platypalpus strigifrons*.

3.4 Diptera associated with dune slacks

A small area of remnant dune slack at SN605926 hosted a number of wetland indicator species including two soldierflies, Barred Snout *Nemotelus uliginosus* and Common Green Colonel *Oplodontha viridula*, the long-legged flies *Campsicnemus armatus*, *Hydrophorus oceanus* and *Thinophilus ruficornis* (the latter having a strong coastal wetland affiliation), and the Muscid fly *Lispe pygmaea*. The last species has a strong coastal affiliation and was abundant in the dune slack.
The species included in the two Diptera assemblages described above indicate that the survey area hosts a range of specialist species of sandy coastal and wetland sites. More extensive surveys would very likely add further noteworthy species to these assemblages.

4. Discussion

This two-day survey of a relatively small area of sand dune and coastal grassland indicates that, despite the limited survey area and the influence of a very poor season for insects, there is significant invertebrate interest in this section of Ynyslas Dunes. The Pantaloon Bee has clearly become well established here and there are a range of commoner species associated with coastal dunes and wetland.

The compacted sandy ground within the stoned car park area appears to provide good conditions for nesting Pantaloon Bee and Sand Tailed Digger Wasp, supporting up to 180,000 nests. As records of the former between 1998 and 2019 suggested a small population only, either the size of the population was previously underestimated (perhaps because this area was not surveyed in the past) or it has recently expanded to take advantage of suitable breeding habitat.

There are probably other species that will use this area too, particularly spring flying mining bees that emerge from April onwards. It would be worth investigating the car park area in April for the presence of the Vernal Bee which is known from other parts of the dune system.

5. Management recommendations

The substantial nesting aggregations of Pantaloon Bee at Ynyslas appear to be exclusively situated in areas where sand exposures are lightly compacted or are in sand stabilized by sparse vegetation. Aggregations are in sand between compacted stone, at the edges of pedestrian routes and in sparsely vegetated sand. Car parking and foot traffic should help to retain the aggregations. Should parking be reduced, it would be useful to monitor the main aggregation and possibly take action should the population show signs of significant reduction. Actions could include light rolling of selected plots within the car park area.

Mining bees such as Pantaloon Bee are by their nature highly mobile species, adapted to fast changing environments where open exposures of nesting substrates vegetate over as vegetation succession proceeds. Mining bees are able to rapidly exploit new substrate exposures. Given the foregoing, any reductions in the size of existing nest aggregations should be balanced against potential new aggregations elsewhere. In such scenarios, it may be deemed unnecessary to take action to maintain existing nest aggregations.

A foraging resource is essential for maintaining a population of mining bees. Stands of yellow Asteracea should be maintained across the wider Ynyslas Dunes and where possible in areas off site, as it is likely that such stands are providing a foraging resource. Figure 8 shows a typical small stand of Perennial Sow-thistle that was attracting foraging bees.

Figure 8. Stand of Perennial Sow-thistle that was attracting foraging Pantaloon Bee females.

The remnant dune slack within the survey area hosted an interesting assemblage of wetland Diptera, including coastal wetland indicators. Measures to eliminate poaching of damp areas by traffic will benefit this feature.

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Appendix 1: Insects recorded on Ynyslas Dunes in July 2024.

Species	Order	Family	Common name	Grid reference	Date	Comment
Malachius bipustulatus	Coleoptera	Malachiidae	A beetle	SN6092	29/07/2024	
Oedemera nobilis	Coleoptera	Oedemeridae	Swollen thighed beetle	SN6092	29/07/2024	
Platydracus stercorarius	Coleoptera	Staphylinidae	A beetle	SN6092	14/07/2024	
Lagria hirta	Coleoptera	Tenebrionidae	A beetle	SN6092	29/07/2024	
Anthomyia procellaris	Diptera	Anthomyiidae	A fly	SN6092	14/07/2024	
Philonicus albiceps	Diptera	Asilidae	Dune Robberfly	SN 6058 9278	14/07/2024	
Calliphora vicina	Diptera	Calliphoridae	A blowfly	SN6092	29/07/2024	
Chamaemyia aridella	Diptera	Chamaemyiidae	A silver fly	SN6092	14/07/2024	
Chamaemyia aridella	Diptera	Chamaemyiidae	A silver fly	SN6092	29/07/2024	
Chamaemyia flavipalpis	Diptera	Chamaemyiidae	A silver fly	SN6092	14/07/2024	
Chamaemyia flavipalpis	Diptera	Chamaemyiidae	A silver fly	SN6092	29/07/2024	
Chamaemyia herbarum	Diptera	Chamaemyiidae	A silver fly	SN6092	29/07/2024	
Chamaemyia juncorum	Diptera	Chamaemyiidae	A silver fly	SN605926	29/07/2024	
Cetema cereris	Diptera	Chloropidae	A frit fly	SN6092	14/07/2024	
Cetema cereris	Diptera	Chloropidae	A frit fly	SN6092	29/07/2024	
Cetema neglectum	Diptera	Chloropidae	A frit fly	SN6092	14/07/2024	
Cetema neglectum	Diptera	Chloropidae	A frit fly	SN605926	29/07/2024	
Cetema sp.	Diptera	Chloropidae	A frit fly	SN6092	14/07/2024	Female of *C. neglectum* or *C. simile*
Diplotoxa messoria	Diptera	Chloropidae	A frit fly	SN605926	29/07/2024	
Melanum laterale	Diptera	Chloropidae	A frit fly	SN605926	29/07/2024	
Meromyza femorata	Diptera	Chloropidae	A frit fly	SN605926	29/07/2024	
Meromyza pratorum	Diptera	Chloropidae	A frit fly	SN6092	29/07/2024	
Oscinella frit	Diptera	Chloropidae	A frit fly	SN6092	29/07/2024	
Oscinella vindicata	Diptera	Chloropidae	A frit fly	SN6092	29/07/2024	
Oscinomorpha minutissima	Diptera	Chloropidae	A frit fly	SN6092	29/07/2024	
Thaumatomyia notata	Diptera	Chloropidae	A frit fly	SN6092	29/07/2024	
Campsicnemus armatus	Diptera	Dolichopodidae	A long-legged fly	SN605926	29/07/2024	
Chrysotus sp.	Diptera	Dolichopodidae	A long-legged fly	SN605926	29/07/2024	Female *C. suavis* or *C. palustris*
Dolichopus griseipennis	Diptera	Dolichopodidae	A long-legged fly	SN605926	14/07/2024	In relict dune slack
Dolichopus griseipennis	Diptera	Dolichopodidae	A long-legged fly	SN6092	29/07/2024	

Species	Order	Family	Common name	Grid reference	Date	Comment
Dolichopus latilimbatus	Diptera	Dolichopodidae	A long-legged fly	SN605926	14/07/2024	In relict dune slack
Dolichopus plumipes	Diptera	Dolichopodidae	A long-legged fly	SN605926	14/07/2024	In relict dune slack
Dolichopus plumipes	Diptera	Dolichopodidae	A long-legged fly	SN605926	29/07/2024	In relict dune slack
Hercostomus germanus	Diptera	Dolichopodidae	A long-legged fly	SN605926	29/07/2024	In relict dune slack
Hydrophorus oceanus	Diptera	Dolichopodidae	A long-legged fly	SN605926	29/07/2024	In relict dune slack
Medetera saxatilis	Diptera	Dolichopodidae	A long-legged fly	SN605926	14/07/2024	In relict dune slack
Sympycnus pulicarius	Diptera	Dolichopodidae	A long-legged fly	SN605926	29/07/2024	In relict dune slack
Thinophilus ruficornis	Diptera	Dolichopodidae	A long-legged fly	SN605926	29/07/2024	Local species of coastal wetlands
Scaptomyza pallida	Diptera	Drosophilidae	A fruit fly	SN6092	14/07/2024	
Scaptomyza pallida	Diptera	Drosophilidae	A fruit fly	SN6092	29/07/2024	
Empis albinervis	Diptera	Empididae	A dance fly	SN6092	14/07/2024	
Hilara cantabrica	Diptera	Empididae	A dance fly	SN6092	14/07/2024	
Hilara cantabrica	Diptera	Empididae	A dance fly	SN6092	29/07/2024	
Hilara fulvibarba	Diptera	Empididae	A dance fly	SN6092	29/07/2024	
Rhamphomyia variabilis	Diptera	Empididae	A dance fly	SN6092	29/07/2024	
Hyadina humeralis	Diptera	Ephydridae	A shore fly	SN6092	29/07/2024	
Hydrellia subalbiceps	Diptera	Ephydridae	A shore fly	SN605926	29/07/2024	
Philygria picta	Diptera	Ephydridae	A shore fly	SN6092	29/07/2024	
Psilopa nitidula	Diptera	Ephydridae	A shore fly	SN6092	29/07/2024	
Scatella stagnalis	Diptera	Ephydridae	A shore fly	SN6092	29/07/2024	
Platypalpus annulipes	Diptera	Hybotidae	A fly	SN6092	14/07/2024	
Platypalpus strigifrons	Diptera	Hybotidae	A fly	SN6092	29/07/2024	
Lonchoptera lutea	Diptera	Lochopteridae	A pointed-wing fly	SN6092	14/07/2024	
Lonchoptera bifurcata	Diptera	Lonchopteridae	A pointed-wing fly	SN6092	29/07/2024	
Coenosia femoralis	Diptera	Muscidae	A fly	SN6092	14/07/2024	
Coenosia femoralis	Diptera	Muscidae	A fly	SN605926	29/07/2024	
Coenosia pedella	Diptera	Muscidae	A fly	SN6092	29/07/2024	
Coenosia pumila	Diptera	Muscidae	A fly	SN6092	14/07/2024	
Coenosia testacea	Diptera	Muscidae	A fly	SN6092	14/07/2024	
Coenosia testacea	Diptera	Muscidae	A fly	SN6092	29/07/2024	
Coenosia testacea	Diptera	Muscidae	A fly	SN6092	29/07/2024	
Coenosia tigrina	Diptera	Muscidae	A fly	SN6092	14/07/2024	
Coenosia tigrina	Diptera	Muscidae	A fly	SN605926	29/07/2024	
Helina confinis	Diptera	Muscidae	A fly	SN6092	29/07/2024	

Species	Order	Family	Common name	Grid reference	Date	Comment
Helina obscurata	Diptera	Muscidae	A fly	SN6092	14/07/2024	
Helina quadrum	Diptera	Muscidae	A fly	SN6092	29/07/2024	
Helina reversio	Diptera	Muscidae	A fly	SN6092	14/07/2024	
Hydrotaea dentipes	Diptera	Muscidae	A fly	SN6092	29/07/2024	
Lispe pygmaea	Diptera	Muscidae	A fly	SN605926	14/07/2024	In relict dune slack
Schoenomyza litorella	Diptera	Muscidae	A fly	SN6092	14/07/2024	
Schoenomyza litorella	Diptera	Muscidae	A fly	SN605926	29/07/2024	
Rivellia syngenesiae	Diptera	Platystomatidae	A picture-wing fly	SN605926	29/07/2024	In relict dune slack
Rhinophora lepida	Diptera	Rhinophoridae	A woodlouse fly	SN6092	14/07/2024	
Sarcophaga melanura	Diptera	Sarcophagidae	A flesh fly	SN6092	14/07/2024	
Scathophaga litorea	Diptera	Scathophagidae	A dung fly	SN6092	14/07/2024	
Coremacera marginata	Diptera	Sciomyzidae	A snail-killing fly	SN6092	29/07/2024	
Pherbellia cinerella	Diptera	Sciomyzidae	A snail-killing fly	SN6092	14/07/2024	
Pherbellia cinerella	Diptera	Sciomyzidae	A snail-killing fly	SN6092	29/07/2024	
Sepsis cynipsea	Diptera	Sepsidae	A fly	SN6092	29/07/2024	
Sepsis fulgens	Diptera	Sepsidae	A fly	SN6092	14/07/2024	
Sepsis orthocnemis	Diptera	Sepsidae	A fly	SN6092	29/07/2024	
Sepsis violacea	Diptera	Sepsidae	A fly	SN6092	29/07/2024	
Themira minor	Diptera	Sepsidae	A fly	SN605926	29/07/2024	
Chaetopedella scutellaris	Diptera	Sphaeroceridae	A lesser-dung fly	SN6092	29/07/2024	
Nemotelus uliginosus	Diptera	Stratiomyidae	Barred Snout	SN605926	14/07/2024	In relict dune slack
Oplodontha viridula	Diptera	Stratiomyidae	Common Green Colonel	SN605926	14/07/2024	In relict dune slack
Episyrphus balteatus	Diptera	Syrphidae	Marmalade Hoverfly	SN6092	29/07/2024	
Eristalis tenax	Diptera	Syrphidae	Common Dronefly	SN6092	29/07/2024	
Helophilus pendulus	Diptera	Syrphidae	Common Tiger Hoverfly	SN6092	29/07/2024	
Helophilus trivittatus	Diptera	Syrphidae	Large Tiger Hoverfly	SN6092	29/07/2024	
Melanostoma mellinum	Diptera	Syrphidae	A hoverfly	SN6092	14/07/2024	
Melanostoma mellinum	Diptera	Syrphidae	A hoverfly	SN6092	29/07/2024	
Scaeva pyrastri	Diptera	Syrphidae	Pied Hoverfly	SN6092	29/07/2024	
Sphaerophoria scripta	Diptera	Syrphidae	A hoverfly	SN6092	29/07/2024	
Siphona geniculata	Diptera	Tachinidae	A parsitoid fly	SN6092	14/07/2024	
Siphona geniculata	Diptera	Tachinidae	A parsitoid fly	SN6092	29/07/2024	
Thereva nobilitata	Diptera	Therevidae	Common Stilleto	SN6092	14/07/2024	
Trixoscelis obscurella	Diptera	Trixoscelididae	A spiny-winged fly	SN6092	29/07/2024	

Species	Order	Family	Common name	Grid reference	Date	Comment
Andrena ovatula	Hymenoptera	Andrenidae	Small Gorse Mining Bee	SN60639244	29/07/2024	
Bombus lapidarius	Hymenoptera	Apidae	Red-tailed Bumblebee	SN6092	14/07/2024	
Bombus lapidarius	Hymenoptera	Apidae	Red-tailed Bumblebee	SN6092	29/07/2024	
Bombus pascuorum	Hymenoptera	Apidae	Common Carder Bumblebee	SN6092	14/07/2024	
Bombus pascuorum	Hymenoptera	Apidae	Common Carder Bumblebee	SN6092	29/07/2024	
Bombus vestalis	Hymenoptera	Apidae	Vestal Cuckoo Bee	SN6092	29/07/2024	
Epeolus variegatus	Hymenoptera	Apidae	Black-thighed Epeolus	SN606922	29/07/2024	1 swept from Mayweed
Colletes fodiens	Hymenoptera	Colletidae	Hairy-saddled Colletes	SN606922	14/07/2024	Several on Mayweed flowers
Colletes similis	Hymenoptera	Colletidae	Bare-saddled Colletes	SN606922	14/07/2024	Several on Mayweed flowers
Colletes similis	Hymenoptera	Colletidae	Bare-saddled Colletes	SN606922	29/07/2024	Several on Mayweed flowers
Cerceris arenaria	Hymenoptera	Crabronidae	Sand Tailed Digger Wasp	SN6092	14/07/2024	Widespread over survey area with a large nesting aggregation in the car park
Cerceris arenaria	Hymenoptera	Crabronidae	Sand Tailed Digger Wasp	SN6092	29/07/2024	Widespread over survey area with a large nesting aggregation in the car park
Crabro cribarius	Hymenoptera	Crabronidae	Large Shield Wasp	SN 6057 9288	29/07/2024	
Oxybelus uniglumis	Hymenoptera	Crabronidae	Common Spiny-digger	SN6092	14/07/2024	Widespread over survey area
Oxybelus uniglumis	Hymenoptera	Crabronidae	Common Spiny-digger	SN6092	29/07/2024	Widespread over survey area
Lasioglossum villosulum	Hymenoptera	Halictidae	Shaggy Furrow Bee	SN 6061 9280	29/07/2024	
Sphecodes gibbus	Hymenoptera	Halictidae	Dark-winged Blood Bee	SN 6056 9297	14/07/2024	
Megachile leachella	Hymenoptera	Megachilidae	Silvery Leafcutter Bee	SN 6059 9266	29/07/2024	
Dasypoda hirtipes	Hymenoptera	Mellitidae	Pantaloon Bee	SN 606 925	14/07/2024	Widespread on flowers with a large nesting aggregation in the car park
Dasypoda hirtipes	Hymenoptera	Mellitidae	Pantaloon Bee	SN 606 925	14/07/2024	Widespread on flowers with a large nesting aggregation in the car park
Episyron rufipes	Hymenoptera	Pompilidae	Red-legged Spider Wasp	SN 6060 9268	29/07/2024	
Ammophila sabulosa	Hymenoptera	Sphecidae	Red-banded Sand Wasp	SN 6062 9259	14/07/2024	
Tyria jacobaeae	Lepidoptera	Erebidae	Cinnabar moth	SN6092	29/07/2024	
Lycaena phlaeas	Lepidoptera	Lycaenidae	Small Copper	SN6092	29/07/2024	
Polyommatus icarus	Lepidoptera	Lycaenidae	Common Blue	SN6092	29/07/2024	
Maniola jurtina	Lepidoptera	Nymphalidae	Meadow Brown	SN6092	29/07/2024	
Chortippus brunneus	Orthoptera	Acrididae	Field Grasshopper	SN6092	29/07/2024	
Omocestus viridulus	Orthoptera	Acrididae	Common Green Grasshopper	SN6092	29/07/2024	

Data Archive Appendix

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

~~[B] A full set of maps produced in JPEG format~~.

~~[C] A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers~~.

~~[D] A set of raster files in ESRI and ASCII grid formats~~.

~~[E] A database named [name] in Microsoft Access 2000 format with metadata described in a Microsoft Word document [name.doc]~~.

~~[F] A full set of images produced in [jpg/tiff] format~~.

[G] Species records held in Welsh Invertebrate Database (WID).

Metadata for this project is publicly accessible through Natural Resources Wales' Data Discovery Service https://metadata.naturalresources.wales/geonetwork/srv (English version) and https://metadata.cyfoethnaturiol.cymru/geonetwork/cym/ (Welsh Version). The metadata is held as record no. **NRW_DS161345**.