LAND AT CARDIFF BAY, GLAMORGAN INVERTEBRATE ASSESSMENT, 2023

David Boyce

DC Boyce
Ecologist
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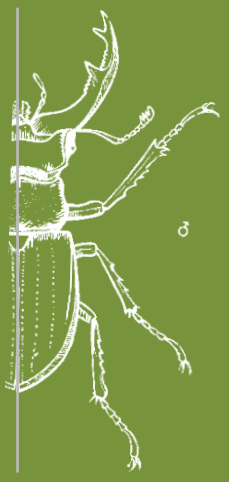

1. INTRODUCTION AND METHODS

This report summarises the findings of an invertebrate survey carried out under contract to ARUP. It follows an earlier invertebrate survey of an adjacent area of brownfield here (Boyce, 2022). It aimed to assess the potential importance for invertebrates of an area of land on the western side of Cardiff Bay, on the southwestern edge of the Cardiff conurbation. The site lies near the southern end of the peninsula that marks the point at which the Ely River flows into Cardiff Bay. It comprises three areas of old hardstandings lying to the north and south of Empire Way, adjacent to the Cardiff Ice Arena and International Swimming Pool. These three survey units (SU) are shown on Figure 1.

The site has developed a mix of dense scrub and ruderal grassland in which flowering plants such as Common Bird's-foot Trefoil *Lotus corniculatus*, Red Clover *Trifolium pratense*, Wild Carrot *Daucus carota*, Oxeye Daisy *Leucanthemum vulgare*, Common Ragwort *Senecio jacobaea* and Common Fleabane *Pulicaria dysenterica* were conspicuous at the time of the survey. The site is hereafter referred to as Cardiff Bay. It lies within the Watsonian county of Glamorgan (vc 34). Central grid references for the northern (SU1), central (SU2) and southern (SU3) blocks approximate to ST181731, ST182729 and ST183728 respectively.

The invertebrate survey was undertaken on the 1st of June and 9th of July 2023. The primary objective of fieldwork during the first visit was to provide an assessment of the quality of invertebrate habitats and to collect terrestrial invertebrates in those groups that were thought likely to be most useful in assessing the quality of the invertebrate fauna. The main focus of the second visit was to look for bumblebees, with special reference to the three Section 7 carder bumblebees known to occur on the Gwent Levels and adjacent areas (Shrill Carder *Bombus sylvarum* Moss Carder *B. muscorum* and Brown-banded Carder *B. humilis* Bumblebees. Other terrestrial invertebrates were also recorded in the course of undertaking the bumblebee survey.

Weather was sunny and warm during both visits to the site. The site was divided into three survey units (SU1, SU2 and SU3), which correspond respectively to the northern, central and southern survey blocks (see Figure 1).

Figure 1. Location of site and survey units – Cardiff Bay, 2023

3. RESULTS

Table 1 below gives a checklist of the invertebrates recorded during fieldwork in 2023. Following this, sub-section 3.1 gives profiles of any species with a formal conservation status that are regarded as key species when assessing the importance of the site for invertebrates. In sub-section 3.2, the list of key species is used to produce a list of key habitat features for invertebrates at Cardiff Bay. Key habitats are defined here as being those that support at least one of the key species identified in sub-section 3.1.

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

The codes in the fourth column of Table 1 refer to the survey units in which species were recorded in 2023. The location of these survey units is shown on Figure 1 above. The emboldened status categories given in the third column of Table 1 and also after the scientific name in sub-section 3.1 refer to those species having a formal rarity/threat status ascribed to them by the UK government conservation agencies. These are defined as follows:

S7 – Species of Principal Importance for the maintenance and enhanement of biodiversity in Wales that are listed in Section 7 of the Environment (Wales) Act, 2016.
Nb – Nationally Scarce Category B. Taxa thought to occur in between 30 and 100 10 km squares of the National Grid.

TABLE 1: CHECKLIST OF INVERTEBRATES FROM CARDIFF BAY, 2023			
Species scientific name	**Species English name**	**Status**	**SU**
Cepaea nemoralis	Brown-lipped Snail		**SU2**
Cornu asperum	Garden Snail		**SU2,3**
Theba pisana	Mediterranean Snail		**SU2,3**
Candidula intersecta	Wrinkled snail		**SU2,3**
Ambigolimax valentianus	Iberian Threeband Slug		**SU2,3**
Erythromma najas	Red-eyed Damselfly		**SU2**
Enallagma cyathigerum	Common Blue Damselfly		**SU3**
Ischnura elegans	Blue-tailed Damselfly		**SU3**
Orthetrum cancellatum	Black-tailed Skimmer Dragonfly		**SU2**
Metrioptera roeselii	Roesel's Bush-cricket		**SU2**
Leptophyes punctatissima	Speckled Bush-cricket		**SU3**
Chorthippus brunneus	Field Grasshopper		**SU3**
Dolycoris baccarum	Sloe Bug		**SU3**
Palomena prasina	Common Green Shieldbug		**SU1**
Tingis cardui	Spear Thistle Lacebug		**SU1,3**
Ophonus puncticeps	A ground beetle		**SU3**
Ophonus ardosiacus	A ground beetle		**SU2,3**
Tachyporus nitidulus	A rove beetle		**SU2**
Tasgius ater	A rove beetle		**SU2**
Anthrenus verbasci	A carpet beetle		**SU3**
Meligethes aeneus	A pollen beetle		**SU3**
Rhyzobius chrysomeloides	A ladybird		**SU2**
Hippodamia variegata	Adonis' Ladybird	**Nb**	**SU3**
Coccinella septempunctata	7-spot Ladybird		**SU3**
Oedemera lurida	An Oedemerid beetle		**SU3**
Oedemera nobilis	An Oedemerid beetle		**SU3**
Chrysolina hyperici	A leaf beetle		**SU3**
Phyllotreta flexuosa	A flea beetle		**SU2**
Phyllotreta undulata	A flea beetle		**SU3**
Exapion ulicis	An Apionid weevil		**SU2**
Ischnopterapion loti	An Apionid weevil		**SU1,3**
Oxystoma pomonae	An Apionid weevil		**SU3**
Protapion apricans	An Apionid weevil		**SU2**
Protapion nigritarse	An Apionid weevil		**SU3**
Protapion trifolii	An Apionid weevil		**SU2,3**
Mecinus pascuorum	A weevil		**SU2,3**
Rhamphus pulicarius	A flea weevil		**SU3**
Tychius picirostris	A weevil		**SU3**
Trichosirocalus troglodytes	A weevil		**SU3**
Sitona lineatus	A weevil		**SU3**
Sitona obsoletus	A weevil		**SU1**

Species scientific name	Species English name	Status	SU
Hypera nigrirostris	A weevil		**SU3**
Larinus carlinae	A weevil	**Nb**	**SU3**
Zygaena filipendulae	Six-spot Burnet Moth		**SU1**
Thymelicus lineola	Essex Skipper buttterfly		**SU3**
Pieris rapae	Small White butterfly		**SU3**
Maniola jurtina	Meadow Brown butterfly		**SU3**
Pyronia tithonus	Gatekeeper butterfly		**SU3**
Vanessa atalanta	Red Admiral butterfly		**SU1,2**
Polyommatus icarus	Common Blue butterfly		**SU3**
Tyria jacobaeae	Cinnabar Moth	**S7**	**SU3**
Euclidia glyphica	Burnet Companion moth		**SU3**
Euclidia mi	Mother Shipton moth		**SU3**
Autographa gamma	Silver Y Moth		**SU3**
Chloromyia formosa	Broad Centurion Soldierfly		**SU2**
Merodon equestris	A hoverfly		**SU1**
Scaeva pyrastri	A hoverfly		**SU3**
Volucella bombylans	A hoverfly		**SU1**
Xanthogramma pedissequum	A hoverfly		**SU2**
Sicus ferrugineus	A Conopid fly		**SU2**
Eriothrix rufomaculata	A parasite fly		**SU3**
Ectophasia crassipennis	A parasite fly		**SU2**
Philanthus triangulum	Bee Wolf Wasp		**SU2**
Andrena wilkella	Wilke's Mining Bee		**SU1**
Apis mellifera	Honeybee		**SU3**
Bombus lucorum/terrestris	Buff-tailed/White-tailed Bumblebee workers		**SU3**
Bombus lapidarius	Red-tailed Bumblebee		**SU3**
Bombus pratorum	Early Bumblebee		**SU2**
Bombus pascuorum	Common Carder Bumblebee		**SU3**
Megachile willughbiella	Willughby's Leafcutter Bee		**SU1**
Osmia spinulosa	Spined Mason Bee		**SU1**
Pseudomalus auratus	A ruby-tailed wasp		**SU1**
Lasius niger	Black Garden Ant		**SU3**
Gymnomerus laevipes	Box-headed Mason Wasp		**SU2**
Oniscus asellus	Common Shiny Woodlouse		**SU3**
Philoscia muscorum	Common Striped Woodlouse		**SU3**
Armadillidium vulgare	Common Pill Woodlouse		**SU3**
Araneus diadematus	Garden Cross Spider		**SU3**

3.1. Key terrestrial invertebrates at Cardiff Bay – 2022

Two key species: Adonis' Ladybird and the weevil *Larinus carlinae* were recorded at Cardiff Bay in 2023. However, as is mentioned in the profile for each of these given below, they have both increased their range considerably over the last two decades, which is thought to relate to the ongoing rise in average annual temperatures caused by human-induced climate change. They are likely to lose their Nationally Scarce status at the next review of their respective groups and are not therefore high priorities for conservation action. The Cinnabar Moth was recorded at Cardiff Bay this year and is listed on Section 7 of the Environment Act (Wales) as a Species of Principal Importance but is not included here as a key species. This is because it is listed in Section 7 for 'research only' and though having declined in other parts of Britain, is still relatively common and does not appear to have decreased so markedly in Wales.

Despite careful searching during both visits to the site, there was no evidence that this site supports populations of the Shrill Carder Bumblebee, or either of the other two Section 7 carder bumblebees known to occur along this part of the Welsh coast.

3.1.1. Adonis' Ladybird *Hippodamia variegata* (Goeze, 1777). **Nb.**

Adonis' Ladybird is a 'classic' red ladybird with black spots but is easily distinguished by a combination of its small size, elongate body form, concentration of spots in the rear half of the elytra and white- and black-marked thorax. It is a species of southern England, north as far as Yorkshire with most records coming from the eastern half. There are only a handful of sites in Wales, all in the extreme southeast. Like most of the larger ladybirds, it feeds on aphids on plants growing in dry, open habitats where there is much bare ground such as sand dunes, ruderal grassland, arable margins and brownfield sites. Though it is still listed as Nationally Scarce, it has undergone a significant range expansion, which is thought to be a result of the ongoing rise in average annual temperatures. At Cardiff Bay, it was found in SU3 in June and a number were also recorded on the flowerheads of Wild Carrot in the same survey unit during the July visit.

3.1.2. a weevil *Larinus carlinae* (Olivier, 1807) **Nb.**

The genus *Larinus* includes two British species, both of which are large, dark weevils with a thin covering of yellow-white scales. *L. carlinae* can be distinguished from the much rarer *L. turbinatus* by its broader, straighter rostrum. The rostrum is much more elongate than in the very similar *Rhinocyllus conicus*. It is restricted to the southern part of England and Wales, where it occurs on various species of thistles in the genera *Cirsium* and *Carduus*. It is found in a range of dry, open habitats where there are good quantities of its foodplants. It is particularly associated with ruderal vegetation, where disturbance has favoured the establishment of large thistle populations. As with the Adonis' Ladybird, *L. carlinae* has also expanded its British range considerably in response to rising average annual temperatures over the last two decades and is likely to lose its Nationally Scarce status at the next review of the family. At Cardiff Bay, it was recorded on Spear Thistle *Cirsium vulgare* on scattered ruderal vegetation in SU3 during the June visit.

3.2. Key invertebrate habitat at Cardiff Bay

3.2.1. Flower-rich ruderal grassland

Associated key species: Adonis' Ladybird; *Larinus carlinae*.

Both of the key invertebrates described above are associated with areas of flower-rich ruderal grassland. As defined here, this habitat feature is associated with those parts of SU3 where there is still a relatively short, patchy sward with some areas of bare substrate and an abundance of flowering plants such as Common Bird's-foot Trefoil, Red Clover, Wild Carrot and Common Fleabane. Because both of the key invertebrate species associated with this habitat feature have markedly expanded their British range in recent years, these areas are assessed as of no more than Local Importance for invertebrates.

3.3. Other invertebrate habitat at Cardiff Bay

At Cardiff Bay, no key species were found in association with stands of ranker, less species-rich grassland and scrub or very sparsely vegetated areas of hardstandings. These are assessed as being of only Low Importance for invertebrates.

4. DISCUSSION

The absence of any of the key bumblebees at the same time that good numbers were present on nearby sites on the Gwent Levels, indicates that this is not likely to be an important site for bumblebees. However, SU1 does have flower-rich ruderal habitats that support some invertebrate interest, though this is not thought to be of sufficient note to preclude development of the site. All three survey units have some stands of flower-rich ruderal grassland with the most significant area being at the eastern end of SU3. There is also a good stand of this key habitat on the northern and eastern boundaries of SU1. SU2 is generally of lower interest for invertebrates

Using the CIEEM's Geographical Frame of Reference (GFR) an overall assessment of Local to Low Importance of Cardiff Bay for terrestrial invertebrates is thought to be most appropriate.

5. ACKNOWLEDGEMENTS

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6. REFERENCES

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