LAND AT CARDIFF BAY, GLAMORGAN
INVERTEBRATE ASSESSMENT, 2022

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1. INTRODUCTION

This report summarises the findings of an invertebrate scoping assessment carried out under contract to ARUP. 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 two areas of old hardstandings lying to the east and west of Olympian Drive, adjacent to the Cardiff Ice Arena and International Swimming Pool. These are shown on Figure 1.

These have 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*, Goat's-rue *Galega officinalis*, Wild Carrot *Daucus carota*, 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 eastern and western blocks approximate to SO18047315 and SO17817296 respectively.

2. METHODS

The invertebrate assessment was undertaken on the 9th of August 2022. The primary objectives of fieldwork were to provide an assessment of the quality of invertebrate habitats on the site and to record the presence of any bumblebees, with special reference to the three Section 7 carder bumblebees known to occur on the Gwent Levels and adjacent areas. It should be emphasised that detailed invertebrate surveys were not an element of this study. However, in the course of carrying out the habitat assessment, a little collecting was undertaken in the more flower-rich areas of ruderal grassland.

Weather was sunny and warm, which would seem to be ideal conditions for invertebrate survey. However, this came after a very prolonged spell of dry, warm weather in southern Britain and as a consequence, much of the vegetation had started to die back abd had already finished flowering. The site was divided into two survey units (SU1 and SU2), which correspond respectively to the eastern and western survey blocks. SU1 was divided into two sub-units: SU1A comprising the much larger fenced area to the north of the access road to the ice arena and SU1B being the smaller unfenced square to the south of this road.

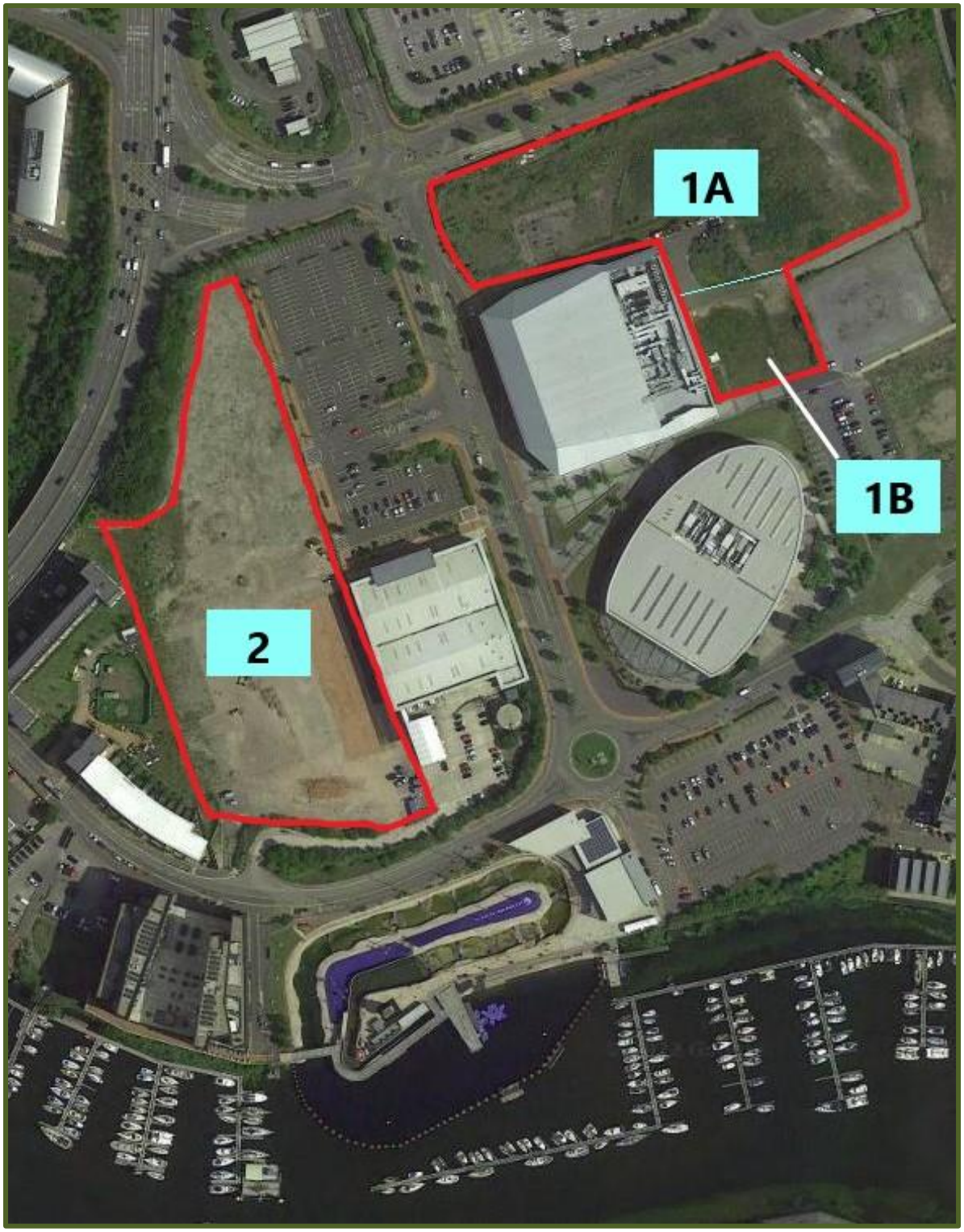

Figure 1. Location of site and survey units – Cardiff Bay, 2022

3. RESULTS

Table 1 below gives a checklist of the invertebrates recorded during fieldwork in 2022. Following this, sub-section 3.1 gives profiles of those species with a formal conservation status that are regarded as key species when assessing the importance of the site for invertebrates. In sub-section 3.2, the 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 at is usually 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 2022. 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 RECORDED AT CARDIFF BAY, 2022			
Species scientific name	**Species English name**	**Status**	**Survey units**
Cornu asperum	Garden Snail		1A
Metrioptera roeselii	Roesel's Bush-cricket		2
Chorthippus brunneus	Field Grasshopper		1B, 2
Pseudochorthippus parallelus	Meadow Grasshopper		2
Zygaena filipendulae	Six-spot Burnet Moth		1B, 2
Thymelicus lineola	Essex Skipper buttterfly		1A
Pieris rapae	Small White butterfly		2
Maniola jurtina	Meadow Brown butterfly		1A, 1B, 2
Pyronia tithonus	Gatekeeper butterfly		1A, 2
Vanessa cardui	Painted Lady butterfly		1B
Celastrina argiolus	Holly Blue butterfly		2
Polyommatus icarus	Common Blue butterfly		1A, 2
Chiasmia clathrata	Latticed Heath moth		1A, 2
Euclidia glyphica	Burnet Companion moth		1A
Eristalis tenax	A drone fly		1A, 2
Eriothrix rufomaculata	A parasite fly		1A
Andrena flavipes	Yellow-legged Mining Bee		1A
Apis mellifera	Honeybee		1A, 1B, 2
Bombus terrestris	Buff-tailed Bumblebee		2
Bombus lucorum/terrestris	Buff-tailed/White-tailed Bumblebee workers		1A, 1B, 2
Bombus lapidarius	Red-tailed Bumblebee		1A, 2
Bombus humilis	Brown-banded Carder Bumblebee	**S7**	1A
Bombus pascuorum	Common Carder Bumblebee		1A, 1B
Nomada flavopicta	Blunthorn Nomad Bee	**Nb**	1A
Lasioglossum albipes	Bloomed Furrow Bee		1A
Osmia spinulosa	Spined Mason Bee		1A

3.1. Key terrestrial invertebrates at Cardiff Bay – 2022

Two key species were recorded at Cardiff Bay in 2022. the Brown-banded Carder Bumblebee and the Blunthorn Nomad Bee. No Shrill Carder *Bombus sylvarum* or Moss Carder Bumblebees *B. muscorum*, were recorded here.

3.1.1. Brown-banded Carder Bumblebee *Bombus humilis* Illiger, 1806. **S7**.

This is a medium-sized, pale ginger-brown bumblebee, lacking any trace of black hairs on the abdomen (unlike the common *Bombus pascuorum*), and possessing a few black hairs above the wing base (these being absent in the very similar *Bombus muscorum*). *B. humilis* is associated with large expanses of open, flower-rich habitats. Pollen is collected from a variety of plants, although species such as clovers, labiates, knapweeds and Red Bartsia are generally preferred. On sites where heathland is the main habitat, heathers are visited. Queens emerge from hibernation in May and early-June. Workers are active from June to September, and males appear in August and September. Small nests are constructed on the ground surface in moderately tall, but non-tussocky grassland, and are covered with moss and dead grass gathered initially by the queen and later by the workers. Nests seldom contain as many as 100 workers.

B. humilis is a southern species in Britain, with most records from the south and west coasts of England and Wales. The most northerly recent British records are from Anglesey, although old localities extend north to Cumbria. *B. humilis* has suffered a considerable decline and is now absent from many former sites, particularly away from the coast. The largest remaining inland population is on Salisbury Plain. Because of its decline, *B. humilis* is listed as a Species of Principal Importance for the Conservation of Biodiversity. Two workers were found foraging on the few remaining Red Clover plants that were still flowering in SU1A.

3.1.2.Blunthorn Nomad Bee *Nomada flavopicta* (Kirby, 1802). **Nb.**

The Blunthorn Nomad has the abdomen entirely black and yellow with the markings on the second and third abdominal tergites being widely separated, yellow, lateral bars and a number of conspicuous yellow markings on the otherwise black thorax, including two yellow spots on the scutellum. Females have an almost hairless pronotum and prominent pointed tips to the fore coxae. *N. flavopicta* is very locally distributed in flower-rich grasslands, brownfield sites and heaths across southern Britain. It is very scarce in Wales, where it is confined to scattered sites most of which are near the coast. As its name suggests, it is a cleptoparasite that feeds on the brood and pollen store of blunthorn bees (genus *Melitta*). A single female was recorded in flight at Cardiff Bay, in SU1A. A this site it is most likely that its host is the Clover Blunthorn bee *Melitta leporina*, which has large populations on the lowlands and Levels around Cardiff.

3.2. Key invertebrate habitat at Cardiff Bay

3.2.1. Flower-rich ruderal grassland

Associated key species: Brown-banded Carder Bumblebee; Blunthorn Nomad Bee.

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 SU1A and SU1B 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. These areas are considered to be are assessed as of 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 at Cardiff Bay. These are assessed as being of only Low Importance for invertebrates.

4. DISCUSSION

The absence of significant numbers of any of the key bumblebees only a day before large numbers were recorded at a nearby site on Wentloog Level, where I had also been undertaking invertebrate surveys for ARUP, 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 and it is possible that a combination of the drought this summer and the relatively late timing of the visit may have resulted in some potentially important species being missed. For example, SU1A has large stands of Goat's-rue, which had almost all finished flowering by the time of this visit, but which can be an important nectar and pollen source for anthophilous insects, including bumblebees.

Set against this, the lack of flowers in late-summer, when the key carder bumblebees have their peak season makes it very unlikely that this is a site of great significance for them. I would therefore assess SU1 as being of no more than Local Importance for invertebrates using the CIEEM's Geographical Frame of Reference (GFR). SU2 is mostly unvegetated hard standings with just a few peripheral areas of ruderal vegetation. This is believed to be of only Low Importance for invertebrates using the CIEEM's GFR.

5. ACKNOWLEDGEMENTS

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