

Appendix E

Invertebrate Assessment

INVERTEBRATE ASSESSMENT

Project Dragon, Port Talbot Docks



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1 INTRODUCTION

1.1 Purpose

- 1.1.1 RPS was commissioned by LanzaTech UK Ltd to prepare an assessment of the invertebrate interest of the land parcels associated with the Project Dragon development, located within Port Talbot Docks.
- 1.1.2 Project Dragon comprises two permanent development areas: the Production Development Zone (PDZ), and the Marine Unloading/Loading Facility to the north of the PDZ. Three temporary construction areas are included in the planning application boundary (TCA West, TCA East and TCA1).

1.2 Scope of this report

- 1.2.1 This invertebrate assessment specifically covers the PDZ and TCA1.
- 1.2.2 The PDZ lies to the south of the internal dock road, Phoenix Way, and is a mosaic of regenerating willow scrub, and extensive stands Japanese knotweed with more localised areas of grassland, gorse scrub, bramble, bracken, and reedbed.
- 1.2.3 A Temporary Construction Area (TCA1) is located at the eastern end of the open water dock. This land parcel is a mix of sparsely vegetated bare ground and short regenerating grassland (Open Mosaic Habitat) with scattered young self-seeded scrub.

1.3 Context

Japanese Knotweed Control

- 1.3.1 The very extensive stands of Japanese knotweed occur in the PDZ and are subject to control measures in 2023 being undertaken by Associated British Ports (ABP) as part of the initiatives to eradicate this species from the dock landholding. A combination of crown stripping and herbicide treatment is being implemented in the PDZ to reduce the vigour of the plants.
- 1.3.2 Around the dense stands, Japanese knotweed continues to spreading into scrub, bramble and grassland habitats. In order to fully assess the extent of this invasive species and provide access for the control measures, the majority of the willow scrub, gorse and bramble was cut down to close to ground level in February 2023 along with the dead stems of the Japanese knotweed.
- 1.3.3 The removal of the scrub has significantly altered the nature of the habitat mosaic within the PDZ and consequently a precautionary assessment has been made of the potential invertebrate assemblage.

Past Surveys

- 1.3.4 Invertebrate survey data was collected for a 23ha land parcel within the docks, referred to as the Harbourside Site in 2021. The habitats in the PDZ and TCA1 have many close similarities with other parts of the wider Harbourside site which extends up to the western boundary of the proposed development.

Precautionary Data Comparison

- 1.3.5 The objective of the invertebrate assessment is to provide a precautionary definition of the predicted invertebrate value of the permanent development area PDZ and one of the temporary

construction areas, TCA1. The assessment draws from the results of the invertebrate survey undertaken for the Harbourside site in 2021 with reference to habitat similarities and differences.

1.3.6 Specific consideration has been given to:

- the assemblage and diversity of the different invertebrate species groups in the wider Harbourside site,
- recorded species with high conservation status and their habitat associations in the wider Harbourside site,
- habitat types and extents with the PDZ and TCA1 compared to the wider Harbourside site,
- the presence/absence of habitat features associated with invertebrate diversity including open water, banks, floristic diversity and habitat mosaics.

1.3.7 The information presented in this report defines the precautionary baseline conditions which will be used to inform the assessment of effects on invertebrates from the proposed development.

1.3.8 The close proximity and substantial cross-over of habitat types means that this approach should provide an accurate assessment of overall invertebrate diversity and value.

2 METHOD

2.1 Harbourside Site Survey, Port Talbot Docks

- 2.1.1 The invertebrate survey was completed for a 23ha Harbourside Site in 2021. The Harbourside site survey area is defined on Figure 1. It covered four of the five compartments (Areas A, B, C West and C East) which were divided according to their location, habitats and topographical features.

Survey Compartments

- 2.1.2 The southernmost area (Area A) and central area (Area C West) are predominantly flat and bounded by bunds/banks on the periphery with only a small amount of scattered scrub. The north-western area (Area B) is a former mineral extraction and much more topographically diverse with many steep slopes, a reedbed/waterbody and areas of seasonally inundated ground with a varied wetland flora.
- 2.1.3 The easternmost compartment (Area C East) is much more densely scrubbed over and is dominated by grey willow with patches of mixed species scrub and grassland. Area C East directly adjoins the PDZ development area and is in part, a continuation of the same scrub and grassland habitats.

Invertebrate Sampling

- 2.1.4 Representative samples were collected from each of the four compartments over three visits on 30 June, 29 July and 25 August 2021. The timing of the summer allowed good coverage across the mid and late summer period.
- 2.1.5 Every attempt was made to undertake the survey visits in warm, sunny and dry conditions, although access had to be arranged in advance. Survey visits were rearranged when the forecast was for poor conditions.
- 30 June 2021 – dry, warm and sunny with a light breeze; close to ideal conditions
 - 29 July 2021 - dry and sunny, c25% cloud cover, c18°C, with cool westerly wind; relatively good conditions
 - 25 August 2021 – dry but overcast with some sunny intervals later, c17°C, with a light breeze; average conditions
- 2.1.6 Sweep-netting (with a 40 cm diameter white-bag net) was the main technique used for sampling the habitat types in the different areas. Grassland, ephemeral vegetation and the foliage of scrub were all swept with the net while the surveyor walked transects through the habitat. The foliage of the willow scrub and mixed species scrub, bramble and scrub were also sampled along the margins.
- 2.1.7 The survey effort in each area related to the variability of the habitats with each of the main habitat types sampled during the survey. The compartments were approximately equal in size and were sampled for a similar length of time with the exception of Area B which took longer because of the greater variation in habitats/micro-habitats.

Analysis

Conservation Status

- 2.1.8 The definitions used by the JNCC for classifying the status of scarce invertebrates of Great Britain are defined below and are based on the degree of rarity and vulnerability to extinction.

Red Data Book Category 1. RDB1-ENDANGERED

- Taxa in danger of extinction if causal factors continue unabated. Includes species occurring as a single colony or only in habitats which are much reduced and highly threatened or which have shown a rapid and continuous decline.

Red Data Book Category 2. RDB2-VULNERABLE

- Taxa believed likely to move into the endangered category in the near future if the causal factors continue operating. Includes species of which most or all populations are decreasing and those which are confined to vulnerable habitats.

Red Data Book Category 3. RDB3-RARE

- Taxa with small populations that are not at present endangered or vulnerable, but are at risk; usually localised within restricted geographical areas or habitats or are thinly scattered over a wider range. Includes species estimated to exist in only fifteen or less post 1970 10km squares or, if more, then in vulnerable habitat.

Red Data Book Category 4. RDBK – Data deficient

- Taxa that are suspected, but not definitely known, to belong to any of the above categories, because of lack of information. Includes taxa recently discovered or recognised in Great Britain which may prove to be more widespread in the future; taxa with very few or perhaps only a single known locality but which belong to poorly recorded or taxonomically difficult groups; species known from very few localities but which occur in inaccessible habitats or habitats which are seldom sampled; species with very few or perhaps only a single known locality and of questionable native status, but not clearly falling into the category of recent colonist, vagrant or introduction.

Nationally Scarce Category a. Na

- Taxa which do not fall within the RDB categories but which are uncommon in Great Britain and are known to occur in 30 or fewer 10km squares or, in less well recorded groups, within seven or fewer vice-counties.

Nationally Scarce Category b. Nb

- Taxa which do not fall within the RDB categories but which are uncommon in Great Britain and are known to occur in between 31 and 100 10km squares or, in less well recorded groups, between eight and twenty vice-counties.

2.1.9 The first species classifications were published in the 1990's. Selected families have been updated and this process is ongoing, some families have only been updated very recently while for many groups the status of scarce invertebrates has not been subject to review since the original lists were published.

2.1.10 Additionally species of principal importance in Wales listed by Section 7 of the Environment (Wales) Act 2016 are also classified as species of conservation concern.

Species Assemblage Quality

2.1.11 The quality of the assemblage recorded in the Harbourside site survey compartments was assessed with reference to the overall species assemblage recorded in the samples; and the proportion of species that are defined as Red Data Book (RDB) species or those classified as being Nationally Scarce and Section 7 species of principal importance, although the latter is heavily skewed towards the butterflies and moths.

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- 2.1.12 The proportion of Nationally Scarce and RDB species was used as a simple and readily comparable indication of quality. For most habitat types, a proportion of between 3 and 5% is an indication that a site has at least some conservation significance. Very high-quality sites of national importance will have a proportion close to or exceeding 10%.

2.2 Production Development Zone - Comparative Assessment of Habitats

- 2.2.1 Due to the removal of the majority of the scrub habitats, bramble and gorse by ABP to enable to full assessment of the extensive stands of Japanese knotweed ahead of crown stripping and herbicide treatments, it has not been possible to undertake an invertebrate survey of the PDZ in 2023. Consequently a precautionary assessment has been made of the potential invertebrate assemblage that the area supported prior to the start of the Japanese knotweed control works.
- 2.2.2 The habitats/features present in the PDZ have been compared against the different features in the other parts of the wider Harbourside site.
- 2.2.3 The species-habitat associations recorded in the docks have been assumed to be occur in the PDZ where equivalent habitat is present.
- 2.2.4 The habitat requirements of all the RDB and nationally scarce species recorded in the Harbourside site as a whole have been reviewed and compared against the habitat conditions and features in the PDZ prior to the cutting back of the willow scrub. Where there is broadly equivalent habitat in the PDZ, the presence of these species has been assumed.

Comparison of Habitat Types

- 2.2.5 Both Area C East and the PDZ have extensive areas of regenerating willow scrub dominated by young multi-stemmed grey willows. The two areas also support naturally regenerating grassland, mixed species scrub including gorse, bramble and bracken with small patches of more open ground. The habitats are found at a similar in scale in both areas, and have a largely equivalent structure and composition.
- 2.2.6 The areas grassland in the PDZ has a more varied composition than Area C East but lack areas of rank grassland where coarse grasses dominate.
- 2.2.7 Japanese knotweed is only present in a few locations in Area C East compared to the densest stands in the PDZ which are c2ha in extent, and make up over 20% of the total area.
- 2.2.8 The main difference relates to topography. The whole of the PDZ is largely level ground with very few banks while Area C East has several bank features, many of which are over 100 years old relating to historic railway lines.
- 2.2.9 Additional habitats present in the PDZ are small stands of seasonally flooded common reed, a small areas of rabbit grazed coastal grassland, and a very small area of dune slack vegetation.
- 2.2.10 The invertebrate survey findings from other parts of the wider Harbourside site have been used to provide information on the habitat types not present in Area C East.
- 2.2.11 Overall, there are many close similarities between Area C East and the PDZ and it is expected that there will be a high level of overlap in the invertebrate species assemblages. In this context the invertebrate data collected for the Harbourside site is considered to provide an accurate representation of the potential invertebrate assemblage in the PDZ when a precautionary approach is applied.

3 RESULTS

3.1 Desk Study

- 3.1.1 Biological data provided by SEWBRc included records of 125 species within 2km of the Harbourside site, comprising ten species of conservation concern, 68 species of principal importance (Section 7) and 47 locally important species. Lepidoptera (butterflies and moths) made up the majority of the records.
- 3.1.2 There are records of three Section 7 species from the PDZ, brown banded carder bee *Bombus humilis*, small blue *Cupido minimus*, wall butterfly *Lasiommata megera* and the cinnabar moth *Tyria jacobaeae*.
- 3.1.3 The following locally important invertebrate species have been recorded within the PDZ in the past red tailed bumblebee *Bombus lapidarius*, early bumblebee *Bombus pratorum*, buff-tailed bumblebee *Bombus terrestris*, white tailed bumblebee *Bombus lucorum*, garden bumblebee *Bombus hortorum* and common carder bee *Bombus pascuorum*.
- 3.1.4 SEWBRc hold records of the S7 species shrill carder bee *Bombus sylvarum* from two locations on northern edge of dock.
- 3.1.5 Past records of invertebrates in Area C comprise the S7 species small heath *Coenonympha pamphilus*, grass rivulet *Perizoma albulata*, wall, brown banded carder bee, and small blue; plus the locally important species red-tailed bumblebee and buff-tailed bumblebee.

3.2 Invertebrate Assemblage

- 3.2.1 The breakdown of the species assemblages recorded in Areas A, B, C West and C East of the Harbourside Site in 2021 is presented in Table 3.1.

Table 3.1: Harbourside - Invertebrate Assemblage All Species

Invertebrate Orders	Numbers of species			
	C East	C West	B	A
Odonata (Dragonflies and damselflies)	3	2	5	1
Orthoptera (Grasshoppers and crickets)	5	5	4	3
Heteroptera (True bugs)	2	11	7	5
Auchenorrhyncha (Hoppers and aphids)	5	4	4	1
Lepidoptera (Butterflies and moths)	18	13	20	15
Coleoptera (Beetles)	20	14	10	5
Diptera (Flies)	69	52	77	41
Hymenoptera (Bees, ants and wasps)	32	20	29	12
Other Orders	2	1	4	2
TOTAL	157	122	160	85

- 3.2.2 For each invertebrate order an assessment has been made of the potential value of the PDZ and TCA1 with reference to habitat features present in these locations and diversity recorded in the wider Harbourside site.

Odonata (Dragonflies and Damselflies)

- 3.2.3 Two Odonata species were recorded in the Area C East with wetland habitats limited to seasonal flooding in an area of regenerating scrub woodland. Both species were also recorded in wider Harbourside site with the highest diversity associated with reedbed / wetland in Area B, a former mineral extraction, where five species were recorded.
- 3.2.4 Within the PDZ the smaller areas of seasonally flooded common reed have the potential to support Odonata species.
- 3.2.5 The areas of common reed dry out in summer. The stands of reed are more open in the PDZ, than in Harbourside Area B. It is not typical of high value reedbed grows on a low diversity carpet of moss and lacking permanent open water and with limited areas of dense reed growth.
- 3.2.6 Extensive shallow seasonal pooling on the central area of hardstanding rapidly dries out in spring with wetland habitat limited to a small area of dune slack vegetation.
- 3.2.7 Several of the habitat conditions in Area B are not present in the PDZ which lacks permanent open water and reedbed where several species were recorded. In comparison the deep water and vertical-sided engineered edges to the docks at Crown Wharf and Margam Wharf are unlikely to have value for populations of Odonata species, but the reedbed located between the two wharfs has good potential value.
- 3.2.8 The areas grassland and scrub within the PDZ will have provided a foraging habitat for species that disperse more widely from ponds. Under a precautionary basis it is assumed that at least adults of at two species of Odonata will forage in the PDZ and Phoenix Wharf, with potential for all the species recorded in the wider Harbourside site to occur (6 species).
- 3.2.9 Only one Odonata species was recorded flying over the very dry sparsely vegetated habitats in Area A. Although the habitats in TCA1 are similar to Area A its location next to the open water dock with a nearby reedbed means that several Odonata species could forage over this area.

Orthoptera (Grasshoppers and Allies)

- 3.2.10 Six species were recorded in Harbourside as a whole, all but one occurring in at least three of the four survey areas indicating that each species is widely distributed.
- 3.2.11 Speckled bush cricket, a common species associated with woodland edges as hedgerows and gardens, was only recorded in Area C East, while long winged conehead (formerly Nationally Scarce a) was not recorded in this part of the site.
- 3.2.12 On a precautionary basis it is assumed that all six species recorded will have occurred in PDZ.
- 3.2.13 Due to the extent of sparsely vegetated ground, the diversity of Orthoptera species is expected to be lower in TCA1 broadly equivalent to Area A where 3 species were recorded including the long-winged conehead.

Heteroptera (True bugs)

- 3.2.14 In total 12 species were recorded in the whole of Harbourside site, with only two found in Area C East. Species in this group have varied habitat requirements. Diversity was higher in areas of extensive grassland with 11 species recorded in Area C West and 8 species in Area B.
- 3.2.15 The presence of more established but still flower-rich grassland and mixed species scrub are likely to be a main factor affecting this diversity in Area C East, along with the lower diversity of even-aged regenerating grey willow.

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- 3.2.16 The localised areas of grassland and mixed scrub margins in the PDZ would be expected to support a proportion of the assemblage recorded across the Harbourside site as whole, estimated to be at most 50%.

Auchenorrhyncha (Hoppers and aphids)

- 3.2.17 Five species were recorded in Area C East including one Nationally Scarce b species, *Euscelis ohausi*, which was only recorded in this part of the Harbourside site, associated with broom.
- 3.2.18 A second species, *Aphrophora alni*, was only recorded in Area C East but is generally widespread in the region. The adults primarily feed on deciduous trees, while the larvae prefer herbaceous plants, conditions that were not present in other areas of the Harbourside site.
- 3.2.19 A second Nationally Scarce b species *Paralimnus phragmitis* was only found in the reedbed in Area B. There is a low probability that this species could occur in the small areas of common reed in the PDZ.
- 3.2.20 The four other species recorded in the Harbourside site were found in more than one of the survey compartments.
- 3.2.21 For this invertebrate order the species assemblage in the PDZ is expected to be equivalent to Area C East. TCA1 is expected to have limited value for this invertebrate order with only one species was recorded in Area A.

Lepidoptera (Butterflies and Moths)

- 3.2.22 A good diversity of Lepidoptera were recorded across the Harbourside site, with a slightly higher number of species recorded in Area C East where there was more extensive edge habitat where the scrub adjoins both coarse and open grassland. The shrubs also provides a high degree of shelter compared to the majority of the Harbourside site.
- 3.2.23 11 of the 18 species were only recorded in Area C East. This included a nationally scarce species *Scythris picaepennis* which is typically associated with dry sandy or chalky grassland and was recorded in all four survey compartments, indicating it is widely distributed within the docks.
- 3.2.24 Three other nationally scarce species were recorded in the wider Harbourside site. *Chionodes distinctella* was only recorded in Area B and is associated with vegetation on dry, rocky ground, and verges. Area B supports the most optimal habitat for this species.
- 3.2.25 *Ochsenheimeria taurella* was also only recorded in Area B and is associated with coarse grasses. This type of habitat is present across the Harbourside site but is absent from the PDZ.
- 3.2.26 *Thiodia citrana* is associated with grassland where the larvae feed on the flowers and seeds of yarrow *Achillea millefolium*, field wormwood *Artemisia campestre* and stinking camomile *Anthemis cotula*. It was only recorded in Area A but could occur in any of the grassland areas within docks where one of these plant species is present.
- 3.2.27 Two of the six Section 7 Lepidoptera species recorded in the Harbourside site were found in Area C East; wall butterfly *Lasiommata megera* and the very widespread cinnabar moth *Tyria jacobaeae*. Both species will occur in the PDZ.
- 3.2.28 Individual small heath *Coenonympha pamphilus* butterflies has also be recorded in several areas and has been noted in the PDZ. Small heath, which is typically associated with grassland comprising fine grasses in dry, well-drained situations where the sward is short and sparse;
- 3.2.29 Colonies of small blue *Cupido minimus* were recorded in coastal grassland and bunds in Areas A, B and C West, but was not recorded in Area C East. This species utilises sheltered south-facing sparse grassland with populations of kidney vetch and are associated with calcareous grassland,

abandoned quarries, railway embankments and woodland edges. With very little kidney vetch in the PDZ, it is unlikely that the area has importance for small blue.

- 3.2.30 Two other Section 7 species recorded in the docks have the potential to occur in the PDZ: the shaded broad bar moth *Scotopteryx chenopodiata*, associated with a range of open habitats including grassland, woodland rides, and sand dunes; and the sawfly moth *Xanthia icteritia* which is associated with broadleaved woodland, marshes and fens.
- 3.2.31 The diversity recorded in Area C East provides a good indication of the range of species in the PDZ but it has the potential to support a higher diversity of species due to the extensive scrub/grassland edge habitat with 20+ species possible.
- 3.2.32 The species diversity in TCA1 would be expected to be broadly equivalent to Area A but the assemblage would differ with more sparsely vegetated ground, and more extensive scattered scrub. Areas of flower-rich vegetation create a significant source of pollen and nectar. Small blue has been recorded with their foodplant kidney vetch locally abundant.

Coleoptera (Beetles)

- 3.2.33 There was significant variation in the assemblage of Coleoptera recorded across the Harbourside site. Of the 30 Coleoptera species recorded in total, 20 were only found in one of the survey areas.
- 3.2.34 Diversity was very low in Area A where only 5 species were recorded on the largely flat sparse vegetation ground. In comparison, 20 species were recorded in Area C East of which 10 were only recorded elsewhere within the survey area. This included *Meligethes fulvipes* a small rove beetle associated with decaying organic matter.
- 3.2.35 The nationally scarce species recorded in Area C East were *Polydrusus formosus* associated with a wide range of broadleaf trees, and *Hippodamia variegata* which was recorded in all areas and is associated with ruderal, weedy plants on sandy, open soils and substrates.
- 3.2.36 The PDZ would be expected to have supported 20+ species including at least one with a National Scarce status.
- 3.2.37 The assemblage in TCA1 would be expected to be broadly equivalent to Area A with under 10 species.

Diptera (Flies)

- 3.2.38 A large number of Diptera species were recorded in the Harbourside site. The highest diversity was recorded in Area B (77 species) with slightly less in Area C East (69). The number of species in Area A was much lower with a total of 41 species.
- 3.2.39 A total of 10 RDB nationally scarce or provisionally nationally scarce species were recorded across Harbourside as a whole, with five of these recorded in Area C East.

One of these species was only found in Area C East *Sapromyza albiceps*, associated with grassland habitats. *Pherbellia knutsoni* was found in Area C East as well as C West and Area B associated with the coastal dunes and is also assumed to have occurred in the PDZ.

Clistoabdominalis ruralis was found in Areas East, C West and B and associated with scrub/woodland edge habitat. *Eudorylas zermattensis* was found in all four areas which is associated with a range of habitats including coastal and calcareous grassland.

- 3.2.40 All five of these species are also assumed to be present in the PDZ.
- 3.2.41 Four Diptera species were only found in Area B. *Trachysiphonella scutellata* is associated with reedbeds, ditches, open water bodies, fen areas, carr woodland, *Sciapus laetus* associated with brackish marshlands, coastal dunes, and open dry grassland, *Micropeza lateralis* generally

associated with grassland habitats, and *Sapromyza quadricincta* which has varied habitat associations, but often found on trees and shrubs on post industrial land. All four species could also occur in the PDZ, although the extent of wetland and grassland is considerably smaller.

- 3.2.42 The two other scarce species were *Herina palustris* and *Pherbellia griseola* were recorded in dry sandy habitats but were not recorded in Areas C East. *Pyratula perpusilla* was only recorded in Area C West. associated with wetland, coastal grazing marsh, brackish pools, pool margins and in swamps.
- 3.2.43 Based on the habitat associations it is assumed that the PDZ supports a wide range of Diptera species (70+) including the majority of the national scarce Diptera species recorded elsewhere in the Harbourside site as a whole.

Hymenoptera (Bees, wasps, ants)

- 3.2.44 In total, 32 Hymenoptera species were recorded in Area C East, of which 19 were only recorded in this part of site. In comparison 29 species were recorded in Area B, 20 in Area C West and only 12 in Area A.
- 3.2.45 The significant level of variation between the different areas is illustrated by 33 species being recorded in only one of the four areas and only 6 species present in at least three of the survey areas. More diverse species assemblages were recorded in both Area C East and Area B.
- 3.2.46 The assemblage comprised 30 bee species one of which is Nationally Scarce b *Sphecodes ferruginatus*, and 20 species of ichneumon wasps, two of which are nationally scarce *Zatypota albicoxa* and *Anisobas cingulatellus*, both only recorded in Area C East.
- 3.2.47 *Sphecodes ferruginatus* (dull headed wasp) was only recorded in Area C West is a cleptoparasite of small bee species *Lasioglossum fulvicorne* usually found in banks in calcareous habitats.
- 3.2.48 A further national scarce species *Gorytes laticinctus* is associated rough vegetation and bramble in heathland, scrub, coastal dunes, coastal landslips and soft rock cliffs.
- 3.2.49 The high species diversity in Area C East was partly due to the inclusion of a c750m² steep, south-facing, sparsely vegetated soil bank on the boundary with the Tata steel operational area. Both nationally scarce ichneumon wasps were only recorded in Area C East.
- 3.2.50 Due to the absence of sparsely vegetated ground and absence of banks, the diversity in the PDZ is expected to be lower than recorded in Area C East and Area B. Due to the similar flat topography the overall assemblage of Hymenoptera in the PDZ is predicted to be similar to Area C West.

4 DISCUSSION

4.1 Harbourside Site

- 4.1.1 Areas B and C West encompass most of the important habitats for invertebrates within the surveyed Harbourside site. Area B is of highest importance with total of eight key species not recorded in the other parts of the Harbourside site, in part because of the presence of wetland habitats.
- 4.1.2 Although Area C West has a smaller range of habitat types (primarily a mix of open and closed grassland) the species assemblage had high quality with four key species recorded here but not in other survey compartments. The percentage of key species was only slightly lower than in Area B.
- 4.1.3 Fewest species were recorded in Area A comprising a level area of ground with very open vegetation cover with localised areas of closed grassland. Only one key species was found to only occur in this area. The lack of diversity in habitat types and topography is considered to be a significant factor limiting the assemblage of species recorded.
- 4.1.4 Area C East has a close equivalence to the PDZ but is in many ways different character from the other parts of the Harbourside site surveyed in 2021. The features found in the PDZ which were recorded to support invertebrate diversity in Area C East
- scrub/grassland margins,
 - mixed species scrub including gorse and broom,
 - open grassland.
- 4.1.5 The PDZ is larger being c9ha compared to Area C East which is approximately half the size. The PDZ habitats include extensive stands of dense Japanese knotweed making up approximately 20% of the area, and as a habitat comprising a single non-native species it is considered to have low value for invertebrates.

4.2 Production Development Zone

Invertebrate Habitats

Scrub and Margins

- 4.2.1 The regenerating willow shrubs in the PDZ is typically younger than the scrub woodland in Area C East with a lower canopy height and an often sparsely vegetated ground flora.
- 4.2.2 In Area C East the scrub woodland associated with the historic railway embankments is longer established; goat willow is a more substantial component, and bramble is abundant below the canopy with occasional woodland herbs.
- 4.2.3 The extent of scrub edge habitat was higher in the PDZ than Area C East along with the number of sheltered grassland clearings.
- 4.2.4 On balance, based on similarities and differences in habitat conditions it is anticipated that the diversity of invertebrates using the regenerating willow scrub and edge habitats will be broadly equivalent to Area C East.

Grassland

- 4.2.5 The grassland habitats enclosed by the scrub habitats are broadly equivalent to the more established grassland in Area C East with similar scrub edge context. The grassland in the glades is generally less open with lower diversity and abundance of wildflowers. Dewberry is abundant as

low growing cover within areas of grassland creating a more closed structure with fewer patches of unshaded bare ground with the sward.

- 4.2.6 Shading from willows also create different conditions from those found in the expanses of open unshaded grassland in Areas B and C West. Bramble is becoming dominant in areas that were formerly as grassland becomes scrubby through natural succession.
- 4.2.7 The shading from the scrub means that there are few open habitats with sunny south-facing aspect where high diversity was noted in during the survey of the wider Harbourside site.
- 4.2.8 Much of the woodland edge in Area C East is south-facing with gradation from tall coarse grasses to shorter grassland and sparsely vegetated ground creating a combination features of value to species that depend on more than one habitat type/structure.
- 4.2.9 Many of the species in wider Harbourside site associated with the open grassland habitat types are also assumed to occur in the PDZ.

Banks

- 4.2.10 The largely flat topography and an absence of banks means that a number of the species found in the Harbourside site are unlikely to occur in the PDZ development area which excludes the railway embankment.
- 4.2.11 The Area C East survey area has low, steep, south-facing patchily vegetated banks with no equivalent feature in the PDZ.
- 4.2.12 A north-facing railway embankment with ballast substrate and scattered scrub adjoins the southern boundary, outside the application site.

Other Habitats

- 4.2.13 Additional features in the PDZ are stands of seasonally waterlogged common reed and a very small area of dune slack vegetation. Although there is negligible permanent open water habitat it is assumed that some of the species recorded in reedbed in Area B will also occur in the PDZ.
- 4.2.14 Due to the very small extent of dune slack vegetation - c40m², the number of populations of invertebrates that could be sustained by this isolated seasonally flooded habitat will be restricted.
- 4.2.15 With some seasonally waterlogged ground in Area B, it is assumed that some species that were only found in Area B during the 2021 survey will also utilise occur in smaller seasonally waterlogged habitats in the PDZ.

Predicted Invertebrate Diversity

- 4.2.16 A total of 157 invertebrate species were recorded in Area C East over the three survey visits in 2021, which was a very good diversity for relatively uniform habitat types with extensive scrub dominated by even aged grey willow.
- 4.2.17 The diversity in Area C East was associated with the willow scrub/grassland margins, mixed species scrub including gorse and broom, open grassland and south-facing bank. The range of slopes and banks relate to previous industrial activities and the historic railway lines and the boundary with the Tata Steelworks which made a significantly contribution to the diversity recorded.
- 4.2.18 Overall the PDZ is predicted to have an equivalent diversity than Area C East or slightly higher under a precautionary assessment it is estimated that between 155 - 165 species. In each area of the Harbourside site, the ratio of species with conservation status is between 7-8%. Although Area

C East had a relatively high total diversity the percentage of these species was slightly lower than the other three areas with a total of 12, equating to 7% of the recorded assemblage. Notably five of these species were only found in this area.

- 4.2.19 This is a conservative estimate taking into account the extent of Japanese knotweed, absence of bank features in the PDZ and homogeneity of the regenerating grey willow scrub as well as recognising that a small proportion of the species assemblage using the PDZ will not have been recorded in Harbourside site in the 2021 survey.

4.3 Temporary Construction Area

Predicted Invertebrate Diversity

- 4.3.1 TCA1 comprises flat ground with open structured grassland, sparse vegetation and localised areas of open flower-rich vegetation growing on previous developed land that has disturbed in the recent past with many similarities to Area A.
- 4.3.2 Although TCA1 is much smaller than Area A (c1.7ha compared to 6.2ha), under a precautionary approach the species diversity is expected to be broadly equivalent with differences in the species composition.
- 4.3.3 A total of 85 species were recorded in Area A and a smaller number of key species but equated to 9% of the assemblage.
- 4.3.4 Under a precautionary assessment the total species diversity in TCA1 is expected to be between 50 and 70 species given its small size and the absence of any boundary grassland banks but taking into account the areas of flower-rich vegetation. The percentage of species of conservation concern is likely to be in the region of 9% (5 to 6 species).

4.4 Geographical Importance

- 4.4.1 Surveys in recent years of other post-industrial sites located close to the coast have shown that these habitats can have very significant conservation value.
- 4.4.2 Across the Harbourside site as a whole, the species of conservation concern form an average of 8.2% of the total assemblage.
- 4.4.3 The percentage of rare and scarce species at other surveyed post-industrial sites in South Wales is between 8 and 9% indicating that Port Talbot Docks is equivalent to similar locations in the region. At the Harbourside site the percentage of Red Data Book species was 1.6%, lower than the average recorded at other surveyed post-industrial sites where the RDB species are typically over 2% of the assemblage.
- 4.4.4 The diversity recorded in the different invertebrate Orders at the Harbourside site is broadly equivalent to the similar coastal industrial sites in South Wales with the exception of Hymenoptera. Many species in this Order favour, dry sites with high insolation including species that are active early in the year when ambient temperatures are still relatively low. Consequently, Hymenoptera diversity is considered to have been under recorded in the 2021 survey.

5 CONCLUSION

- 5.1.1 The habitats in the PDZ have broad similarity to many of the features in Area C East which provides the closest comparison. Within the wider Harbourside survey area, Area B and Area C West encompassed most of the important habitats. Areas C East was classified as being of relatively lower quality, based on the smaller proportion of Nationally Scarce species but still supported a good diversity of invertebrates.
- 5.1.2 Using a precautionary assessment it is assumed that the PDZ development area will support a good invertebrate diversity similar to the assemblage recorded in adjoining habitats in 2021 (Area C East) where grey willow dominated scrub and grassland edge habitat are the principal habitat components.
- 5.1.3 In this area, a total of 157 species were recorded of which 10 are species with conservation status (Red Data Book, Nationally Scarce) plus two Section 7 species. Overall, it is estimated that the PDZ will support between 155 - 165 species including a number species that were not recorded in other parts of the Harbourside site in the 2021 survey.
- 5.1.4 The percentage of these key species in Area C East was slightly lower than in other Harbourside site survey compartments. The much smaller extent of open flower-rich grassland and open mosaic habitat is likely to have influenced this result.
- 5.1.5 The proportion of species with conservation status in the PDZ is estimated to be between 8-9%, equivalent to Harbourside site as a whole and a higher proportion than Area C East. Of the 26 key species, five were only recorded in Area C East reflecting the limited extent of south facing scrub edge habitat in the other parts of the Harbourside site.
- 5.1.6 TCA1 is located on previous developed land and although much smaller in extent shares many similarities with Area A. A total of 85 species were recorded in Area A with key species making up 9% of the assemblage. Under a precautionary assessment a total of between 55 and 70 species is expected in TCA1 with a similar percentage of key species. It is anticipated that there will be some species associated with pioneer habitats will not have been recorded elsewhere in the Harbourside site.
- 5.1.7 Mitigation for invertebrates will be required to offset damage or loss of habitats in the PDZ. Where full mitigation cannot be achieved within the development boundary footprint, then alternative options should be delivered in the wider docks or through off-site compensation.

FIGURES



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Legend

Site Boundaries

Rev	Description	By	CB	Date



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Legend

- Application Boundary
- Bare Ground/Sparsely Vegetated Ground
- Rubble
- Bracken
- Bramble Scrub
- Bramble Scrub and Japanese Knotweed
- Broadleaved Woodland
- Scrub Woodland (Grey Willow)
- Buildings
- Dune Slack Vegetation
- Dense Scrub
- Ephemeral Vegetation
- Gorse Scrub
- Hardstanding
- Ivy/Bramble/Scattered Scrub
- Japanese Knotweed
- Line of trees - Broadleaved
- Mature Conifer Tree Line
- Naturally Regenerating Grassland
- Naturally Regenerated Grassland (Semi-improved)
- Non-Ruderal (Ivy and Ferns)
- Non-native - invasive species
- Reedbed
- Scattered Scrub
- Scattered Trees
- Standing Water
- Open Water
- Scattered scrub
- Scattered tree - broadleaved
- Security Fence

Rev	Description	By	CB	Date



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APPENDICES

Appendix A

Harbourside Site – Species with Conservation Status

Appendix A: Key Species (RDB, Nationally Scarce and Section 7)

Order: Family	Species	Common name	National Status	Harbourside Site			
				A	B	C East	C West
Orthoptera: Conocephalidae	<i>Conocephalus discolor</i>	Long-winged Conehead	None (Formerly Nationally Scarce a)	X	X		X
Auchenorrhyncha: Cicadellidae	<i>Paralimnus phragmitis</i>		Nationally Scarce b		X		
Auchenorrhyncha: Cicadellidae	<i>Euscelis ohausi</i>		Nationally Scarce b			X	
Lepidoptera: Ypsolophidae	<i>Ochsenheimeria taurella</i>	a moth	Nationally Scarce b		X		
Lepidoptera: Gelechiidae	<i>Chionodes distinctella</i>	a moth	Nationally Scarce a		X		
Lepidoptera: Scythrididae	<i>Scythris picaepennis</i>	a moth	Nationally Scarce b	X	X	X	X
Lepidoptera: Tortricidae	<i>Thiodia citrana</i>	a moth	Nationally Scarce b	X			
Lepidoptera: Nymphalidae	<i>Lasiommata megera</i>	Wall	BAP			X	
Lepidoptera: Nymphalidae	<i>Coenonympha pamphilus</i>	Small Heath	BAP		X		
Lepidoptera: Lycaenidae	<i>Cupido minimus</i>	Small Blue	BAP		X		
Lepidoptera: Geometridae	<i>Scotopteryx chenopodiata</i>	Shaded Broad-bar	BAP	X	X		
Lepidoptera: Erebiidae	<i>Tyria jacobaeae</i>	Cinnabar	BAP	X	X	X	
Lepidoptera: Noctuidae	<i>Cirrhia icteritia</i>	Sallow	BAP		X		
Coleoptera: Nitidulidae	<i>Meligethes fulvipes</i>		Nationally Scarce			X	
Coleoptera: Coccinellidae	<i>Hippodamia variegata</i>	Adonis' Ladybird	Nationally Scarce b	X	X	X	X
Coleoptera: Mordellidae	<i>Mordellistena pseudopumila</i>		RDBK		X		
Coleoptera: Curculionidae	<i>Polydrusus formosus</i>		Nationally Scarce a			X	
Diptera: Keroplatidae	<i>Pyratula perpusilla</i>		Nationally Scarce (formerly RDB3)				X
Diptera: Dolichopodidae	<i>Sciapus laetus</i>		Nationally Scarce		X		
Diptera: Pipunculidae	<i>Clistoabdominalis ruralis</i>		Nationally scarce (formerly RDB1)		X	X	X
Diptera: Pipunculidae	<i>Eudorylas zermattensis</i>		None (Formerly Nationally Scarce a)	X	X	X	X
Diptera: Micropezidae	<i>Micropeza lateralis</i>		pNationally Scarce		X		
Diptera: Ulidiidae	<i>Herina palustris</i>	a picture-winged fly	pNationally Scarce	X	X		X
Diptera: Lauxaniidae	<i>Sapromyza albiceps</i>		pNationally Scarce			X	
Diptera: Lauxaniidae	<i>Sapromyza quadricincta</i>		pNationally Scarce		X		
Diptera: Sciomyzidae	<i>Pherbellia griseola</i>		Nationally Scarce				X
Diptera: Sciomyzidae	<i>Pherbellia knutsoni</i>		RDB3		X	X	X
Diptera: Chloropidae	<i>Trachysiphonella scutellata</i>		None (Formerly Nationally Scarce a)		X		
Hymenoptera: Ichneumonidae	<i>Anisobas cingulatellus</i>	an ichneumon	None (Formerly Nationally Scarce)			X	

Hymenoptera: Ichneumonidae	<i>Zatypota albicoxa</i>	an ichneumon	None (Formerly Nationally Scarce)			X	
Hymenoptera: Crabronidae	<i>Gorytes laticinctus</i>	a digger wasp	RDB3			X	
Hymenoptera: Apidae	<i>Bombus humilis</i>	Brown-banded Carder Bee	BAP		X		
Hymenoptera: Halictidae	<i>Sphecodes ferruginatus</i>	Dull-headed Blood Bee	Nationally Scarce b				X
		Total Diversity	317	85	160	157	122
		RDB		0	2	1	1
		Nationally Scarce a		0	1	1	0
		Nationally Scarce b		3	6	5	6
		P Nationally Scarce		1	3	1	1
		None (former key species)		2	3	2	2
		All scarce/RDB	26	6	15	10	10
		Section 7 Species		2	6	2	0

AN INVERTEBRATE SURVEY AT ABP PORT TALBOT, GLAMORGAN.

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31 October 2023



This report was produced for RPS.

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1 Summary

- The four days of sampling from late spring to late summer 2023 produced a diversity of 268 species identified from the terrestrial sample, not a very high diversity for the effort, but for such dry habitat, much of it covered in sallow scrub or Japanese Knotweed and the absence of an early spring sampling it is not much less than expected.
- The sample produced 17 (6.3%) taxa considered here as species of conservation concern, seven of them of RDB quality or equivalent which includes 6 species formally designated RDB or scarce but which are no longer considered to be of national conservation concern due to increasing range or better recording. Some of these species are nonetheless still rare or little known in Wales. Excluding these species the sample produced 11 (4.1%) species of conservation concern nationally.
- This is not very high quality when compared with similar surveys of this type of habitat. It is suggestive of a site with local conservation value, but not likely to be of regional or national significance with a few notable exceptions.
- Because of the nature of the site it is likely that the absence of an April sample, and drought conditions has negatively affected the diversity and possibly quality found.
- Loss or substantial disruption of the habitat at the site will trigger mitigation to avoid the loss of the assemblages of scarce invertebrates.
- Margam Warf, although low diversity, has an important population of *Phytomyza orobanchia* so ideally needs to be retained unless better population so this rare fly are found and protected elsewhere on the site.
- Mitigation should include a funded management plan to maintain and enhance both open habitats and winter-wet *Phragmites* beds and their invertebrate communities.
- Details of how much and which land is to be lost needed before the development of a management protocol.

2 Introduction

The survey area within ABP is fairly large predominantly flat and open flower rich grassland in patches but large areas are covered in Sallow scrub or Japanese Knotgrass. Margam Warf (TCA 1) is particularly devoid of topographical features, largely flat with relatively limited developing scrub. Area C East is much more densely scrubbed over and is dominated by sallow with open areas including well vegetated slopes along the south side. The PDZ area is similar but also includes *Phragmites*-dominated wetland areas. Unfortunately much of it is over-shaded by Japanese Knotweed so devoid of useful habitat. The ABP land was first sampled for invertebrates in 2021 covering land to the south and west of the current survey. Only Area C East (C1) was included in the 2021 survey.

3 Survey Methodology

3.1 SAMPLING TECHNIQUES

Although the site is large, the relative uniformity of much of the area meant that it was possible to take a representative sample from each of the four compartments on each of the four visits. Two of the three compartments (Margam Wharf / TCA 1 and Area C East) are approximately equal in size, the PDZ is significantly larger, however, the extent of readily sampled habitat is approximately equal in the three compartments.

Sweep-netting with a 40 cm diameter white-bag net was the main technique used. The net was swept from side to side as one paced steadily through the grass, herbage or scrub foliage. The same net was used to sample the foliage of sallow and other woody plants along woodland/scrub margins. Specimens were extracted from the net with a pooter or, in the case of larger specimens, individually potted in 30ml soda glass tubes. When sampling was

completed, or the pooter became too full the contents were killed with ethyl acetate then transferred to 30ml soda glass tubes together with a data label.

The sample compartments are marked on the map below (Fig 1).

Figure 1 Map showing sample compartments.



3.2 SAMPLE TIMING

The site was visited on four occasions on 22nd May, 7th July 3rd August and 30th August to give good coverage across the late spring and summer period. The absence of early spring and June samples means some species will have been missed, especially Aculeates and other species that favour warm open sites and fly early in the year.

3.3 CONSTRAINTS

Every attempt was made to visit in warm, sunny and dry conditions, and on this survey, despite the need to book access in advance, this was largely achieved. On the 22nd May conditions were warm and sunny with thin, high cloud, but with a cold NW wind. On the 7th July conditions were warm, sunny and dry but rather windy. On the 3rd August it was overcast, windy, but warm with some sunny intervals. Mostly dry but some showers, rather suboptimal conditions. On the 30th August rather cool at about 17°C, with light breeze SW wind and about 50% cloud cover.

The absence of an early spring visit is a significant constraint, and given the predominance of dry open habitat, this is very likely to have detracted from the overall quality found. Suboptimal conditions on some visits will also have reduced the sample, as did the drought conditions on one visit where the habitat on Margam Warf / TCA 1 was very badly affected with almost no plants in flower in July.

3.4 IDENTIFICATION

Where practical, invertebrates were identified in the field but wherever the slightest doubt existed, one or more specimens were collected for more detailed scrutiny. To achieve rigorously accurate identifications, specimens were identified using the author's own library and entomological collection. Where these proved insufficient, specimens were submitted to relevant experts. Selected specimens have been retained in the author's personal collection as vouchers.

3.5 TAXONOMIC COVERAGE

It is desirable that as wide a taxonomic range as possible is identified, in order to sample numerous ecological types, i.e. invertebrates with widely differing natural histories. As there was only a limited amount of time available for identification, it was important to name the more readily identified groups which do not require very time-consuming techniques or are out with the experience of the worker.

The following orders and families of invertebrates were named to species.

- **Araneae – Spiders**
- **Odonata - Dragonflies and Damselflies**
- **Orthoptera – Grasshoppers and crickets**
- **Hemiptera, Auchenorrhyncha - Froghoppers, Leafhoppers and Planthoppers** (excluding females of difficult genera)
- **Hemiptera, Heteroptera - True Bugs** (excluding smaller Miridae)
- **Neuroptera - Lacewings**
- **Lepidoptera – Butterflies and Moths**
- **Coleoptera – Beetles** (all except small Aleocharine rove beetles and other very small obscure families)
- **Diptera - True Flies** (except, Cecidomyiidae, Chironomidae, Ceratopogonidae, Simuliidae, Phoridae, Sphaeroceridae, and females of some groups which are not identifiable).
- **Hymenoptera, Aculeata (ants, wasps and bees), Sawflies and some Parasitica.**

3.6 ANALYSIS

The quality of the site for invertebrates has been assessed with reference to the species found which are considered to be nationally scarce or rare by the various Natural England Commissioned Reports published by JNCC (e.g. Falk 1991a; Falk 1991b; Hyman, 1992) and subsequently Natural England. These reviews place all nationally scarce species into categories according to their degree of rarity and their vulnerability to extinction and are accepted as the “official” JNCC/NE designations (see Appendix 1). The more recent ones also assess taxa with reference to IUCN threat categories.

Since the first reviews were published in the 1990’s selected families have been updated and this process is ongoing. But this still leaves many groups (e.g. Tipulidae and Sciomyzidae) where statuses have remained unchanged for nearly 30 years while other families (e.g. Larger Brachycera Drake 2017) have been updated very recently. For this reason, in order to facilitate the greatest consistency with earlier surveys, species that were included in earlier reviews, but have lost their status recently, are included in the analysis. These species, no longer considered of conservation concern, are indicated as such in the species accounts. In addition, a number of species that still have official national status but are clearly much more frequent than formerly, and will probably have their status removed when their family is updated, are indicated as such.

Additionally an attempt has been made to gauge the value of the site within a local and regional context. Many of the Nationally Scarce species are also very uncommon in a local or regional context. Also many species which do not merit inclusion in "The reviews of scarce insects" are none-the-less scarce within the region. Biodiversity Action Plan and Amber List species are important here, although the BAP species are heavily skewed towards the Lepidoptera.

As a simple and readily comparable indication of quality, the proportion of Nationally Scarce and RDB species of the total diversity is calculated. The same is done just for the rarest taxa with RDB status. Depending on the habitat type, a proportion of scarce/RDB between 3-5% needs to be exceeded before it can be safely concluded that the site has some conservation

significance. Very high-quality sites of national importance will have a proportion close to or exceeding 10% Nationally Scarce/RDB species.

4 Results

4.1 OVERALL TERRESTRIAL RESULTS

The survey identified 268 species of invertebrate ([Appendix 2](#)), a reasonably good diversity for four days given the nature of the habitat and lack of an early spring and June sample. This is rather less than found in the 2021 survey, which covered a much larger area in four compartments. The habitat covered in 2021 included some very good wetland areas, including permanent water bodies, not represented in the current survey. Also, with the exception of Area C East (covered in both surveys) the 2021 compartments were more open and less dominated by sallow scrub, and with very little Japanese Knotweed. Given these factors the diversity found on this survey is broadly similar to that found in 2021 and there is no reason to think that weather conditions or sample timing have affected this result any more than it did the 2021 result. A broad range of invertebrate groups was covered to a greater or lesser extent and the species list includes representatives of the following groups: spiders, lacewings, dragonflies & damselflies, grasshoppers & crickets, true bugs, froghoppers, moths, butterflies, beetles, true flies, sawflies, wasps, bees and ants. The main technique of sweep-netting was most efficient at sampling flying insects with Diptera found in the greatest number (113 species, 42%). The second largest group found was Hymenoptera (69 species, 26%) which is to be expected on such an open, sunny site close to the coast and would likely have been significantly better with early spring sampling. Third most diverse was Coleoptera (28 species 10%) a fairly typical proportion for this sampling technique. Lepidoptera were next (22 species 8%), half of them butterflies, followed by Hemiptera (20 species 7%).

Of the 268 species identified by this survey, a reasonably good 17 (6.3%) are considered here as Species of conservation concern (defined in section 3.6). This is a respectable proportion of scarce and rare species, comparable with some nature reserves. Of all sites surveyed over many years, this site falls just below the middle for the quality of invertebrates found. Compared to similar sites in South Wales it is broadly similar but a little lower quality, likely to be attributable to the limited range of habitats and extensive scrub and Japanese Knotweed encroachment.

Table 1 Comparison with similar sites.

site	diversity	scarce +RDB	RDB	% scarce +RDB	%RDB
ABP Newport Docks-2015	329	32	7	9.7	2.1
ABP Newport Docks-2018	331	29	6	8.8	1.8
Uskmouth PS 2019	444	38	11	8.6	2.5
TATA Steel	378	31	9	8.2	2.4
Port Talbot ABP 2021	317	26	5	8.2	1.6
Port Talbot ABP 2023	268	17	7	6.3	2.6

An analysis of the important species found reveals that several are not any longer of great conservation concern. In Table 2 below six species have been highlighted in grey as no longer of national conservation status despite still having this status officially in many cases. These are species that have significantly increased in range and abundance in recent years, possibly due to more favourable climatic conditions, or were much overlooked in the past and have subsequently been shown to be commoner than thought. The proportion of scarce species that

are getting commoner is about 35%, relatively typical for this type of survey, which is usually about 30%. Five species highlighted in yellow in the species column really do merit attention as they are judged still to be of national conservation significance not obviously increasing in abundance or range.

Table 2 Summary of scarce species.

Species	National status	Current status	local status
<i>Conocephalus discolor</i>	(Nationally Scarce a) None	no longer scarce	Now well established and common in South Wales, previously recorded at Port Talbot
<i>Paralimnus phragmitis</i>	Nationally Scarce b	Widespread but local and mainly in eastern England	very scarce in Wales, confined to the south, previously recorded at Port Talbot
<i>Scythris picaepennis</i>	Nationally Scarce b	Widespread but local.	Few Welsh records but occurs on the large dunes systems, previously recorded at Port Talbot
<i>Bembecia ichneumoniformis</i>	Nationally Scarce b	Widespread but elusive	Well recorded on similar habitats elsewhere in South Wales
<i>Hippodamia variegata</i>	Nationally Scarce b	becoming commoner	Frequent in S Wales, previously recorded at Port Talbot
<i>Polydrusus formosus</i>	Nationally Scarce a	Rapidly increasing range	Mainly S Wales but increasingly frequent, previously recorded at Port Talbot
<i>Clistoabdominalis ruralis</i>	(RDB1) Nationally scarce	Rapidly increasing its range and abundance but still local	Discovered new for Wales in 2021 at Port Talbot Docks which has a strong population.
<i>Eudorylas zermattensis</i>	(Nationally Scarce) None	Widespread but perhaps overlooked	Few records in Wales, all in the south, certainly under recorded, previously recorded at Port Talbot
<i>Tephritis divisa</i>	(RDBK)	A recent arrival in Britain, rapidly spreading north and west.	In Wales a very recent arrival, first recorded in Newport in 2018 and becoming commoner and spreading west.
<i>Tephritis matricariae</i>	(RDBK)	increasing rapidly	recent arrival, increasing and spreading west.
<i>Pherbellia knutsoni</i>	RDB3	Scattered distribution in S England and S Wales.	This species has important populations on the dune systems of S Wales
<i>Phytomyza orobanchia</i>	Nationally Scarce	Rare and largely confined to southeast England, also Pembrokeshire and Cornwall	One other record in Wales, Freshwater east 2013.
<i>Macronychia polyodon</i>	RDB3 (Nationally Scarce)	Very local and scattered across the southern half of England, and in S Wales	Only two previous Welsh locations, Gower 1954 and Pendine 2013.
<i>Fredegunda diluta</i>	(RDBK)	Scarce and largely confined to E England with scattered records in west.	Only three previous records in Wales, all near Newport.
<i>Philanthus triangulum</i>	RDB2 (None)	Much increased, now common across much of country	Well established along south Wales coast
<i>Sphecodes crassus</i>	Nationally Scarce b	Widespread, possibly overlooked and becoming commoner	Well distributed around the coast of Wales
<i>Sphecodes ferruginatus</i>	Nationally Scarce b	Widespread in the southern half of Britain but very local.	Very few records from Wales, all but one in South Wales.

Many of these and those not highlighted, are also species rarely or not previously recorded in Wales notably *Clistoabdominalis ruralis*, *Phytomyza orobanchia*, *Macronychia polyodon* and *Sphecodes ferruginatus*.

Taking into account the revised status of species in Table 1, the total no of species found of conservation concern is 11 (4.1%).

4.2 ASSESSMENT OF COMPARTMENTS

The sample sizes at a compartment level were reasonably good, Area C East and the PDZ exceeding 150 species identified, only Margam Warf falling short of this with 86 species. All three compartments were afforded approximately the same effort, the larger PDZ, being heavily affected by Japanese Knotweed, had no more readily sampled habitat than the other two compartments.

4.2.1 Compartment - Area C East including TCA West

In contrast to the other two compartments this one is very much dominated by sallow scrub, in places dense and impenetrable. Around the peripheries and to a limited extent in clearings and tracks through the scrub is some open flower rich areas with much exposed substrate. Although largely flat, there are some steep slopes in the southern part that contributed to the diversity found. There were no wetland habitats present, not even winter-wet *Phragmites* patches. The four samples taken here produced a total of 156 species identified, a very good diversity for a relatively uniform area dominated by sallow and almost identical to the result from this compartment in 2021 (Gibbs 2021). Of these eight are species of conservation concern, a proportion of 5.1%, rather less than found in 2021 but still suggestive of an area of some quality but less than the overall result, poorer quality than found in the other two compartments. Three species (1.9%) are of RDB or equivalent, adding to the quality of this compartment. Excluding species no longer of national conservation concern (see Table 1). the number of species of conservation concern found is 4 (2.6%) with 2 (1.3%) RDB species.

Of the key species, four are now known to be getting more frequent so no longer of much conservation concern (50%), a fairly high proportion. The apparent lower quality found here can probably be attributed to the dominance of unproductive sallow scrub, lack of wetland habitats and limited area of flower rich and ruderal habitats.

4.2.2 Compartment – Margam Wharf including TCA1

This compartment contrasts with the other two being much more open with sallow scrub just starting to encroach and no Japanese Knotweed. The area is very flat, probably of recent origin compared to the other two compartments, and very drought-prone, as was evident on one visit. There are no wetland areas of note nor any topographical variation other than the wall along the western border. The open areas are fairly flower-rich grassland, notably *Picris hieracioides* Hawkweed Oxtongue and its parasite *Orobanche picridis*. Scrub was very limited, just patches of willows which are not yet of a size to shade out the herbaceous plants. Samples were taken on each of the four visits with 86 species recorded. This is a smaller sample than is ideal, lacks early spring sample and mid-summer sample affected by drought causing most of vegetation to wither. However, for so uniform an area, a species list of 86 species given the constraints, suggests that this compartment has some conservation value. Of the 86 species recorded, six have conservation status or equivalent, a proportion of 7% which is above the threshold for an area of some conservation importance. Excluding species no longer of national conservation concern (see Table 1). the number of species of conservation concern found is 3 (3.5%) with 1 (1.2%) RDB species.

Of the key species, three are of limited national significance being known to have extended their range in recent decades. Of real conservation interest here was the Agromyzid *Phytomyza orobanchia* on the important colony of *Orobancha picridis*.

4.2.3 Compartment - PDZ

This was the largest compartment and rather more diverse in its range of habitats than the other compartments in that it included some wetland areas dominated by *Phragmites*. While these were no more than damp, and often dry during the sampling, they certainly added to both diversity and quality. Were it not for the very large areas dominated by Japanese Knotweed that could not be sampled, and had almost no native vegetation anyway, this large area would have proved much better. A total of 151 species were identified from the four samples, a good diversity given the habitat and constraints, almost as good as the adjacent Area C East. Ten species are here treated as species of conservation concern, a proportion of 6.6%, a quality intermediate between the other two compartments. Four fall into the RDB or equivalent statuses, a proportion of 2.7%, although only one of them is very significant (*Pherbellia knutsoni*) the other three are either increasing or data deficient. However, only four of the scarce species are in the grey-shaded category and no longer of much conservation concern, a relatively low proportion. Two species fall into the best category of clearly of conservation concern, the remainder intermediate or uncertain. Excluding species no longer of national conservation concern (see Table 1). the number of species of conservation concern found is 6 (4%) with 4 (2.6%) RDB species.

Although not the best example of habitat at Port Talbot, includes some interesting areas, especially the *Phragmites* dominated wetlands.

5 Key Species

5.1 RED DATA BOOK

5.1.1 *Clistoabdominalis ruralis* (RDB1) Nationally scarce

Formerly very rare and restricted to SE England and East Anglia, with two old records from Sussex (1876) and the New Forest, Hants (1901), and 8 recent records from Surrey and Kent (Falk & Chandler 2005), Cambridgeshire, Suffolk, Essex, Greater London, Surrey and Dorset. These records suggest that it is quite widespread within this range, and clearly becoming more frequent at the moment with recent records from Somerset it is certainly spreading (pers. obs.) Recorded new for Wales at this site in 2021 when it proved common. Found in woodland rides and edges, chalk downland with scrub and other grassland locations. Has been reared from the common hopper *Euscelis incisus*. Only one found in Area C East.

5.1.2 *Tephritis divisa* (RDBK)

This attractive gall fly was recorded new to Britain from Sussex in August 2004, when they were swept off bristly oxtongue on the outskirts of Bognor Regis. Later the same month the fly was found to be present in large numbers at the original site and was also notes two other Sussex sites in September 2004. Examination of reference collection turned up another specimen from Newhaven, August 2002 showing that the species had been present in Britain for several years. Subsequently the species has been recorded in Essex where it is now well established along the Thames Gateway, with scattered records in North Essex (Hodge, 2005). There is even a recent record from Somerset so it is now well established in Britain and seemingly spreading rapidly in common with several other colonising Tephritids. *Tephritis divisa* is a native of southern Europe. The larvae develop in the flower heads of *Helminthotheca* (*Picris*) *echioides* and possibly other related species. Only noted in the PDZ.

5.1.3 *Tephritis matricariae* (RDBK)

This gallfly with patterned wings was only added to the British list in 2000 based on specimens found in April of that year at Sandwich Bay (Clemons 2000). Since then it has

spread rapidly around the Kent coast and with a few records inland (Clemons 2004) and it is now recorded in London (NBN). It is clearly colonising this country fast but as far as I know this is the first record for East Anglia. The original records were from the dunes at Sandwich and since it has been found on grassy areas in Canterbury and chalk downland between Folkestone and Dover. The larvae develop in the capitula of *Crepis* with *vesicaria*, *taraxacifolia* and *capillaris* the most likely species to be favoured (Clemons 2000). Adults seem to be active from April to September. Frequent here, recorded at Margam Warf and the PDZ.

5.1.4 *Pherbellia knutsoni* RDB3

This yellowish snail-killing fly is widely recorded in southern England from Devon north to Norfolk and in South Wales. In South Wales it is known from the extensive dune systems of Kenfig, Oxwich and Whiteford Burrows (NBN) and was recorded at Port Talbot in 2021. Frequents dry habitats, sand dunes, breck heath and chalk grassland. Presumed to be a parasitoid of snails, the situations where this species is usually found suggests it attacks terrestrial snails. Adults recorded from June to September, presumably in more than one generation (Falk 1991b). Only noted in the PDZ.

5.1.5 *Macronychia polyodon* RDB3 (Nationally Scarce)

This cleptoparasitoid flesh fly is very local in Southern England, extending as far north as Staffordshire, Warwickshire and Norfolk; Glamorgan in South Wales. There are also two older records from Scotland: Culbin Sands and Logie, both in Elgin. In South Wales there is a very old record from dunes on the Gower (1954) and recent records from Pendine, Carmarthenshire (2009 & 2013) (NBN). Frequents heaths, scrubby grassland, and broadleaved woodland. The larvae develop as cleptoparasitoides in the nests of a range of Aculeate Hymenoptera including Digger wasps (Crabronidae) of the genera *Crossocerus*, *Crabro*, *Oxybelus*, *Pemphredon* and *Ectemnius*, and the bumble bee *Bombus terrestris* (Apidae). Adults from March to September (Falk & Pont in prep.). A single female swept in Area C East.

5.1.6 *Fredegunda diluta* RDBK

A very distinctive and, for an Ichneumon, easily identified species. Restricted to reedbeds in eastern England from Humberside to Sussex (Fitton et al 1988). Recently recorded from Newport wetlands reserve (G. Broad pers comm.), Newport Docks and St Mellons (pers. obs.). Whether this species is spreading west from the east of these two records represent a recently detected and isolated South Wales population is not known, but there do not appear to be any records in the west of England. This wasp parasitises the moths *Archanara dissoluta* (Brown-veined Wainscot) and *Arenostola phragmitidis* (Fen Wainscot) both local and specialist species that develop as larvae within reed stems. One swept in the PDZ.

5.1.7 *Philanthus triangulum* RDB2 (None)

The Bee-wolf is a large, spectacular black and yellow wasp which not long ago was a great rarity in this country. Once confined to just a couple of sites on the Isle of White (Richards 1980) it is now widespread over southern England and expanding northwards rapidly (Edwards 1997). In the light of this great increase in range its status will have to be downgraded to Nb or probably removed altogether. Locally it first turned up in Gloucestershire a few years ago (M. Smith pers.comm.) and is now established in the area, first found at Troopers Hill in 2000 (pers. obs.). It frequents warm sunny areas on light, well-drained soil where it digs nests up to 1m in length with 3-34 lateral chambers. These are stocked with worker honeybees *Apis mellifera* (Edwards op.cit.). Surprisingly only noted in Area C East.

5.2 NATIONALLY SCARCE

5.2.1 *Conocephalus discolor* Long-winged Conehead (Nationally Scarce a) None

The Long-winged cone-head, once such an uncommon species of the south coast west to the New Forest, has shown a remarkable spread in recent years. In South Wales its arrival is relatively recent but is now well established, at least in coastal areas. No longer of conservation concern and its status was recently removed (Sutton 2015). Occurs in coarse, mainly ungrazed vegetation in warm places such as downland, coastal reedbeds, heath, bogs and disturbed areas. Nymphs emerge in May maturing in August sometimes surviving until November (Haes & Harding 1997). Only noted in the PDZ.

5.2.2 *Paralimnus phragmitis* Nationally Scarce b

This distinctive leaf-hopper is found in southern Britain north to Norfolk and west to Hampshire and in South Wales where it is recorded in Glamorgan and Carmarthen including both Newpoer and Port talbot Docks (2015 and 2021 respectively). Most records are from East Anglia where it frequents fens, broads and estuaries and other coastal sites. Usually associated with common reed *Phragmites australis*, but also with sea club rush *Bolboschoenus maritimus* and possibly other plants. Adults recorded from May to September (Kirby 1992). Swept in compartment Area C East.

5.2.3 *Scythris picaepennis* Nationally Scarce b

This small, all dark moth is widespread in Britain north to Sutherland but local and scattered (Emmet & Langmaid 2002). Its national status but has recently been applied by Davis (2012). Widely scattered in Wales but very local, notably on the extensive dune systems of the Gower and Carmarthenshire and proved to be common at Port Talbot Docks in 2021 (pers obs). Frequents open grassy areas, both calcareous and sandy, the larvae developing on birds-foot trefoil or wild thyme. Adults on the wing in a single generation peaking in July. Only noted in Area C East.

5.2.4 *Bembecia ichneumoniformis* Nationally Scarce b

The Six-belted Clearwing is, like all clearwings, an elusive species in the field looking more like a wasp than a moth. It is well distributed across southern England north to Cambridgeshire with records from Yorkshire and South Wales (Heath & Emmet 1985; NBN). Recently found much more widely in South Wales including Port Talbot Docks in 2021 (pers. obs.); possibly no longer meriting its national status. Occurs on calcareous downland, cliffs, quarries which offer a south facing aspect and a warm microclimate. The eggs are laid on *Lotus* or *Anthyllis*, the larvae feeding in a silken tunnel within the root. Adults are on the wing from the end of June to mid-August. Swept at Margam Warf and the PDZ.

5.2.5 *Hippodamia variegata* Adonis' Ladybird Nationally Scarce b

The Adonis Ladybird is a black and red species with a very variable number of spots on the elytra. Mainly found in southern and eastern England, very local elsewhere (Hyman & Parsons 1992) but in recent years it has shown a very rapid increase and northward spread. Now well established in Wales, especially along south coast (pers. obs.; NBN). Although it is mainly coastal it occurs on a variety of dry weedy habitats. Adults active from June to September, probably overwintering as an adult in dry situations (Hyman & Parsons 1992). Frequent here and recorded in all three compartments.

5.2.6 *Polydrusus formosus* Nationally Scarce a

This brilliant green leaf-weevil was very locally distributed across southern England becoming much more frequent and now spreading into southern Scotland. In Wales becoming well established in southern counties, rare elsewhere (NBN). Occurs in broad-leaved woodland along rides, clearings and at the fringes. It is phytophagous, recorded from hazel,

oak, alder, birch, cherry and rose. Adults are found from May to September (Hyman & Parsons 1992). Swept in Area C East and Margam Warf.

5.2.7 *Eudorylas zermattensis* (Nationally Scarce) None

This small black big-headed fly is widespread in England and South Wales north to Nottinghamshire. Until recently only sixteen known British sites of which twelve are post-1960 but becoming more frequently recorded. In Wales it is apparently rare with only a couple of records from Gwent and The Gower (pers obs). Frequents chalk grassland, coastal sand dunes and the East Anglian Brecklands and very dry, sunny brownfield sites. A Berkshire site is an area of short grass with sandy and limestone banks, while Devil's Ditch, Cambridgeshire is chalk grassland. It is known from very dry open sites elsewhere in Europe. Its biology is unknown but members of the genus *Eudorylas* are parasitoids of leafhoppers of the family Cicadellidae as larvae. Adults recorded from June to September (Falk & Chandler 2005). Port Talbot Docks supports the strongest known colony of this in Wales, common here and recorded in all compartments.

5.2.8 *Phytomyza orobanchia* Nationally Scarce

This tiny fly is either a great rarity, or very overlooked. There are records from just six vice-counties mainly in southeast England, but also with records in Cornwall and Pembrokeshire. The only Welsh record is from Freshwater East, Pembrokeshire, was in 2013. Because this family of flies is ignored by many Dipterists, it is likely that it is more widespread than this, but in 40 years of collecting, this is the first time I have come across it so it must at least be very uncommon. The larvae develop on the seeds of Broomrapes *Orobancha*, at this site utilising the extensive colony of *O. picridis*. Adults have been recorded from May to August (agromyzidae.myspecies.info). Large numbers noted on freshly emerging *O. picridis* on 22 May.

5.2.9 *Sphecodes crassus* Nationally Scarce b

This small black and red cuckoo-bee is very widely distributed in England and Wales as far north as Yorkshire. It is a very difficult species to identify so its true status is not easy to assess but it is certainly very local. In Wales well distributed, especially around the coast and not uncommon (NBN; pers. obs.). Lives in a variety of habitats including heathland, calcareous grassland, soft rock cliffs, landslips and abandoned quarries. It is a cleptoparasitoid of the mining bee genus *Lasioglossum*. Suspected hosts include *L. nitidiusculum*, *L. parvulum*, *L. morio*, *L. pauxillum* and *L. fulvicorne*, of which *L. morio* was recorded during this survey. Whatever the host is, it will almost certainly have a requirement for areas of bare soil or sparse vegetation in sunny spots where they can dig their nests. Adult females are on the wing from May to August, males from July to September; frequenting flowers such as *Calluna*, *Heracleum*, *Jasione*, *Achillea*, *Tripleurospermum*, *Angelica* and *Cirsium* (Falk 1991a). Only found in the PDZ.

5.2.10 *Sphecodes ferruginatus* Nationally Scarce b

This small black and red cuckoo bee is widespread in England as far north as Yorkshire and there are old records for Scotland and Wales. Recent records are restricted to about 10 sites mostly in southern England (Falk 1991a); it is rarely found in any numbers at a site. In Wales there are a very few records from the south coast and one in North Wales (NBN) and it was recorded here in 2021. It has been recorded from a wide variety of habitats including chalk grassland, open woodland, moorland edge and disturbed situations such as chalk pits and road cuttings. Almost certainly requires bare or sparsely vegetated ground or short turf in sunny situations, particularly south facing banks and slopes. It is a cleptoparasitoid of mining bees of the genus *Lasioglossum*; suggested hosts are *L. fulvicorne* and *L. fratellum*, although neither of these were found on this survey but other *Lasioglossum* species were found which might prove to be suitable hosts. These species require bare soil or sparsely vegetated areas in which

to dig their nests. Adult females are recorded from May to August, males from July to August; reported visiting *Potentilla*, *Foeniculum* and *Daucus*. Found in Area C East.

5.3BAP/S41, LOCALLY SIGNIFICANT

5.3.1 *Lasiommata megera* Wall BAP

The Wall is an historically common butterfly and has recently been placed on the UK Biodiversity Action Plan Priority List (see www.ukbap.org.uk/PrioritySpecies.aspx?group=7) because of a rapid decline in its numbers. This decline seems to be particularly serious in the south of England where it is now observed as infrequently as are some of the traditionally 'scarce' species of butterfly. Noted in Area C East and the PDZ.

5.3.2 *Coenonympha pamphilus* Small Heath BAP

This is a widespread butterfly and can be found over most of the British Isles with the exception of the Shetlands and Orkneys and mountainous regions (NBN). It lives in discrete colonies and adults rarely venture far from the colony. Not confined to heathland and can be found in a wide variety of habitats. Populations found in the north have one generation each year, while populations in the south have two generations each year and possibly three in exceptional years. Both population and range declining, hence its addition to the Priority List of UK Biodiversity Action Plan Species. Adults can be found continuously from late May until mid-September as a result (UK Butterflies). Noted in Area C East.

5.3.3 *Hipparchia semele* Grayling BAP

This is the largest of our 'browns', although fairly conspicuous when in flight, it can mysteriously disappear as soon as it lands due to its excellent camouflage. Forms discrete colonies throughout the British Isles and, although colonies occur inland, has a distribution that would suggest that this is primarily a coastal species, at least in the British Isles. Colonies vary considerably in size, the smallest containing a couple of dozen and the largest several thousand especially those found on large expanses of land, such as the heathlands of the New Forest. Well recorded in South Wales, especially along the coast (NBN). Found on sheltered, sunny and dry sites where vegetation is sparse, providing the bare ground that this butterfly requires. Typical sites include heathland, sand dunes, coastal grassland and disused quarries. Adults generally emerge at the start of July, peaking at the end of the month (UK Butterflies). Noted in Area C East.

5.3.4 *Cupido minimus* Small Blue BAP

The Small Blue is our smallest resident butterfly the male is almost black above with a dusting of blue scales, below silvery-grey in colour, with small black spots. Widely distributed from northern Scotland to the south of England, with colonies also in Wales almost all of them in southern counties. However, outside of its strongholds in the south of England, colonies are often isolated pockets, typically in coastal locations. Most colonies consist of fewer than 30 adults, although some may be thousands of individuals. There has been a 27% decline from 2005 to 2014 hence its addition to UK BAP list. The larvae usually feed on *Anthyllis vulneraria* Kidney Vetch but also *Lotus corniculatus* Common Bird's-foot-trefoil and *Hippocrepis comosa* Horseshoe Vetch. Adults on the wing in May and June with a small second brood from the end of July into August. Only noted at Margam Warf where it was frequent.

5.3.5 *Tyria jacobaeae* Cinnabar BAP

This very attractive and well-known day-flying moth that has recently been added to the Priority List of UK Biodiversity Action Plan Species. In Wales it is still quite common and well recorded (NBN). Its addition is due to concern that the species is suffering a significant decline and probably that its food plant is in jeopardy due to new legislation. The larvae feed on Ragwort, a plant much persecuted by many landowners. Ragwort supports many insect

species other than Cinnabar so this moth acts as a flagship for the whole Ragwort dependant fauna. Noted at Margam Warf and the PDZ.

6 Site Evaluation

Surveys of ex-industrial sites along the South Wales coast in recent years, including on ABP land at Newport, and a previous survey at Port Talbot, have shown that these habitats can have very significant conservation value. Because these are mostly open, dry sites with high insolation, they are very favourable to invertebrates active early in the year when ambient temperatures are still relatively low. Spring flying Hymenoptera particularly have proved to be important at many similar sites.

Unfortunately it was not possible to get to the site in April or early May due to other commitments and poor weather conditions. It is certainly possible that this reduced the catch of early-flying species, but as the previous survey at Port Talbot started even later, a comparison with that survey should be valid. It seems clear that the area surveyed overall in 2023 is not as rich in species of conservation value as the more open and varied compartments surveyed in 2021. Although Hymenoptera were rather diverse as might be expected at such a site, there was only two official key species amongst them plus the now downgraded Bee-wolf and a scarce Ichneumon that only has assumed national status. This low proportion could be due to the lack of an early spring sample, but is pretty much in line with what was found in 2021. The heavy overshadowing from willow and Japanese Knotweed is very likely to have reduced the more specialist Hymenoptera. Diptera were not only the most diverse Order but also had the greatest number of scarce species, very few of them species no longer meriting National Status.

The land surveyed at ABP Port Talbot, seems not to be as important overall as the area surveyed in 2021 and does not show the same high quality found on any of the surveys of ABP Newport Docks. However, there are some important findings of species that are not known to be present on the land surveyed in 2021. Should the whole area be lost to development then this would very likely lead to a local biodiversity loss and would require some limited mitigation. Partial loss, alteration or disruption would be much less problematical, especially if it is accompanied by habitat enhancements and a long-term management plan directed towards invertebrate conservation. Indeed if much of Margam Warf and some of the better parts of the areas surveyed in 2021 were used as mitigation, the densely overshadowed areas of Area C East and the PDZ could probably be developed with minimal loss to invertebrate diversity

Area C East, while the most diverse, was the poorest in terms of proportion of conservation significant finds, although there is very little difference between the three compartments. The good diversity is largely down to the range of habitats, with both willow scrub, flower-rich grassland and open, ruderal areas. However, with no wetlands, or even dry *Phragmites* beds it is interesting that this compartment did marginally better (but probably not significantly so) than the PDZ for diversity. This area produced, two important invertebrates, the Flesh-fly *Macronychia polyodont* not previously found on any other surveys although known from a couple of South Wales dune systems, and the blood-bee *Sphecodes ferruginatus* which was found in the same area in 2021, but not at Newport Docks.

Margam Wharf was the least productive, probably associated with the lack of diversity in habitat and very flat topography as well as the area being very drought-prone and thus severely affected on one visit leading to a very small sample. However, quality was reasonably high with six key species recorded, although all but one of these was found elsewhere on this survey. The single really good find was the rare mining-fly *Phytomyza orobanchia* which has recently been given provisional RDB2 status and is by far the most significant single find of the survey. This species was abundant here, and not seen elsewhere, but given that the host-plant *Orobanche picridis* (Oxtongue Broomrape) occurs elsewhere on ABP land at Port Talbot it could be found more widely if looked for at the right time of year.

The loss or disruption of this area is undesirable and it should be considered as a mitigation zone.

The PDZ is by far the largest area, although the very extensive Japanese Knotweed infestation meant that the actual area of habitat that could be sampled was limited and may not be much different to the other two compartments. Although not the most diverse compartment, it did produce the most conservation significant species including several not recorded elsewhere on this survey. The most important were the leafhopper *Paralimnus phragmitis* and the snail-killing fly *Pherbellia knutsoni*, both of them associated with the wetland areas with *Phragmites*. All these areas dried out completely during the course of the summer, but were waterlogged on the early visits. If these wetland patches could be retained, or mitigated for by enhancing other parts of the site, then the PDZ can probably be lost with little detriment to local biodiversity.

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8 Appendix 1: British conservation status categories – definitions.

The following definitions are those used by the JNCC review of the status's of scarce invertebrates of Great Britain.

Red Data Book Category 1. RDB1-ENDANGERED

- Taxa in danger of extinction if causal factors continue unabated. Includes species occurring as a single colony or only in habitats which are much reduced and highly threatened or which have shown a rapid and continuous decline.

Red Data Book Category 2. RDB2-VULNERABLE

- Taxa believed likely to move into the endangered category in the near future if the causal factors continue operating. Includes species of which most or all populations are decreasing and those which are confined to vulnerable habitats.

Red Data Book Category 3. RDB3-RARE

- Taxa with small populations that are not at present endangered or vulnerable, but are at risk; usually localised within restricted geographical areas or habitats or are thinly scattered over a wider range. Includes species estimated to exist in only fifteen or less post 1970 10km squares or, if more, then in vulnerable habitat.

Red Data Book Category 4. RDBK – Data deficient

- Taxa that are suspected, but not definitely known, to belong to any of the above categories, because of lack of information. Includes taxa recently discovered or recognised in Great Britain which may prove to be more widespread in the future; taxa with very few or perhaps only a single known locality but which belong to poorly recorded or taxonomically difficult groups; species known from very few localities but which occur in inaccessible habitats or habitats which are seldom sampled; species with very few or perhaps only a single known locality and of questionable native status, but not clearly falling into the category of recent colonist, vagrant or introduction.

Nationally Scarce Category a. Na

- Taxa which do not fall within the RDB categories but which are uncommon in Great Britain and are known to occur in 30 or fewer 10km squares or, in less well recorded groups, within seven or fewer vice-counties.

Nationally Scarce Category b. Nb

- Taxa which do not fall within the RDB categories but which are uncommon in Great Britain and are known to occur in between 31 and 100 10km squares or, in less well recorded groups, between eight and twenty vice-counties.

9 Appendix 2: Terrestrial Species list.

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Araneae: Thomisidae	<i>Misumena vatia</i>			X		
Araneae: Salticidae	<i>Euophrys frontalis</i>				X	
Araneae: Salticidae	<i>Talavera aequipes</i>				X	
Odonata: Coenagriidae	<i>Ischnura elegans</i>	Blue-tailed Damselfly			X	X
Odonata: Coenagriidae	<i>Enallagma cyathigerum</i>	Common Blue Damselfly		X		X
Odonata: Aeshnidae	<i>Anax imperator</i>	Emperor Dragonfly		X		
Odonata: Libellulidae	<i>Orthetrum cancellatum</i>	Black-tailed Skimmer			X	X
Odonata: Libellulidae	<i>Sympetrum striolatum</i>	Common Darter		X		X
Odonata: Libellulidae	<i>Sympetrum sanguineum</i>	Ruddy Darter				X
Orthoptera: Conocephalidae	<i>Conocephalus discolor</i>	Long-winged Conehead	(Nationally Scarce a) None			X
Orthoptera: Phaneropteridae	<i>Leptophyes punctatissima</i>	Speckled Bush Cricket		X	X	X
Orthoptera: Acrididae	<i>Omocestus viridulus</i>	Common Green Grasshopper		X		X
Orthoptera: Acrididae	<i>Chorthippus brunneus</i>	Common Field Grasshopper		X	X	X
Orthoptera: Acrididae	<i>Chorthippus parallelus</i>	Meadow Grasshopper		X	X	X
Orthoptera: Acrididae	<i>Myrmeleotettix maculatus</i>	Mottled Grasshopper		X		X
Neuroptera: Hemerobiidae	<i>Hemerobius humulinus</i>					X
Heteroptera: Acanthosomatidae	<i>Acanthosoma haemorrhoidale</i>	Hawthorn Shieldbug		X		
Heteroptera: Scutelleridae	<i>Eurygaster testudinaria</i>	Tortoise Shieldbug				X
Heteroptera: Pentatomidae	<i>Aelia acuminata</i>	Bishop's Mitre Shieldbug		X	X	X
Heteroptera: Pentatomidae	<i>Dolycoris baccarum</i>	Hairy Shieldbug		X	X	X
Heteroptera: Pentatomidae	<i>Palomena prasina</i>	Common Green Shieldbug		X		X
Heteroptera: Pentatomidae	<i>Piezodorus lituratus</i>	Gorse Shieldbug			X	
Heteroptera: Coreidae	<i>Coreus marginatus</i>	Dock Bug		X		
Heteroptera: Coreidae	<i>Coriomeris denticulatus</i>	Denticulate Leatherbug		X	X	X
Heteroptera: Rhopalidae	<i>Chorosoma schillingii</i>			X	X	
Heteroptera: Rhopalidae	<i>Corizus hyoscyami</i>			X	X	X
Heteroptera: Rhopalidae	<i>Rhopalus subrufus</i>				X	
Heteroptera: Lygaeidae	<i>Nysius huttoni</i>			X		
Heteroptera: Berytidae	<i>Gampsocoris punctipes</i>			X		X

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Heteroptera: Nabidae	<i>Himacerus mirmicoides</i>			X		
Heteroptera: Miridae	<i>Adelphocoris lineolatus</i>					X
Heteroptera: Miridae	<i>Heterotoma planicornis</i>			X		X
Heteroptera: Miridae	<i>Stenodema laevigata</i>			X		
Auchenorrhyncha: Aphrophoridae	<i>Philaenus spumarius</i>			X		X
Auchenorrhyncha: Aphrophoridae	<i>Neophilaenus campestris</i>					X
Auchenorrhyncha: Cicadellidae	<i>Paralimnus phragmitis</i>		Nationally Scarce b			X
Lepidoptera: Glyphipterigidae	<i>Glyphipterix simpliciella</i>	Cocksfoot Moth				X
Lepidoptera: Coleophoridae	<i>Coleophora trifolii</i>	a moth				X
Lepidoptera: Scythrididae	<i>Scythris picaepennis</i>	a moth	Nationally Scarce b	X		
Lepidoptera: Tortricidae	<i>Aethes francillana</i>	a moth			X	
Lepidoptera: Sesiidae	<i>Bembecia ichneumoniformis</i>	Six-belted Clearwing	Nationally Scarce b		X	X
Lepidoptera: Zygaenidae	<i>Zygaena filipendulae</i>	Six-spot Burnet			X	X
Lepidoptera: Pieridae	<i>Pieris rapae</i>	Small White		X		
Lepidoptera: Nymphalidae	<i>Lasiommata megera</i>	Wall	UK BAP	X		X
Lepidoptera: Nymphalidae	<i>Pararge aegeria</i>	Speckled Wood		X		
Lepidoptera: Nymphalidae	<i>Coenonympha pamphilus</i>	Small Heath	UK BAP	X		
Lepidoptera: Nymphalidae	<i>Aphantopus hyperantus</i>	Ringlet				X
Lepidoptera: Nymphalidae	<i>Maniola jurtina</i>	Meadow Brown		X	X	X
Lepidoptera: Nymphalidae	<i>Pyronia tithonus</i>	Gatekeeper		X		X
Lepidoptera: Nymphalidae	<i>Hipparchia semele</i>	Grayling	UK BAP	X		
Lepidoptera: Nymphalidae	<i>Vanessa cardui</i>	Painted Lady		X		
Lepidoptera: Lycaenidae	<i>Cupido minimus</i>	Small Blue	UK BAP		X	
Lepidoptera: Lycaenidae	<i>Polyommatus icarus</i>	Common Blue		X	X	X
Lepidoptera: Lasiocampidae	<i>Malacosoma neustria</i>	Lackey		X		
Lepidoptera: Sphingidae	<i>Macroglossum stellatarum</i>	Humming-bird Hawk-moth		X		
Lepidoptera: Geometridae	<i>Aspitates ochrearia</i>	Yellow Belle		X	X	
Lepidoptera: Erebidae	<i>Tyria jacobaeae</i>	Cinnabar	UK BAP		X	X
Lepidoptera: Noctuidae	<i>Autographa gamma</i>	Silver Y			X	X
Coleoptera: Carabidae	<i>Ophonus puncticeps</i>				X	
Coleoptera: Scirtidae	<i>Microcara testacea</i>					X

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Coleoptera: Elateridae	<i>Agrypnus murinus</i>					X
Coleoptera: Cantharidae	<i>Rhagonycha fulva</i>			X		X
Coleoptera: Cantharidae	<i>Malthodes marginatus</i>			X		
Coleoptera: Melyridae	<i>Cordylepherus viridis</i>			X	X	X
Coleoptera: Byturidae	<i>Byturus tomentosus</i>	Raspberry Beetle		X		
Coleoptera: Coccinellidae	<i>Rhyzobius litura</i>				X	
Coleoptera: Coccinellidae	<i>Exochomus quadripustulatus</i>	Pine Ladybird		X		X
Coleoptera: Coccinellidae	<i>Adalia bipunctata</i>	2-spot Ladybird		X	X	
Coleoptera: Coccinellidae	<i>Coccinella septempunctata</i>	7-spot Ladybird		X	X	X
Coleoptera: Coccinellidae	<i>Harmonia axyridis</i>	Harlequin Ladybird		X		X
Coleoptera: Coccinellidae	<i>Hippodamia variegata</i>	Adonis' Ladybird	Nationally Scarce b	X	X	X
Coleoptera: Coccinellidae	<i>Propylea quatuordecimpunctata</i>	14-spot Ladybird		X		X
Coleoptera: Tenebrionidae	<i>Lagria hirta</i>					X
Coleoptera: Tenebrionidae	<i>Isomira murina</i>			X		X
Coleoptera: Oedemeridae	<i>Oedemera lurida</i>				X	X
Coleoptera: Oedemeridae	<i>Oedemera nobilis</i>	Swollen-thighed Beetle		X		X
Coleoptera: Chrysomelidae	<i>Chrysolina hyperici</i>			X	X	X
Coleoptera: Apionidae	<i>Oxystoma pomonae</i>			X		
Coleoptera: Curculionidae	<i>Mecinus pascuorum</i>				X	X
Coleoptera: Curculionidae	<i>Tachyerges salicis</i>			X		
Coleoptera: Curculionidae	<i>Tychius meliloti</i>					X
Coleoptera: Curculionidae	<i>Tychius picirostris</i>				X	
Coleoptera: Curculionidae	<i>Trichosirocalus troglodytes</i>			X	X	X
Coleoptera: Curculionidae	<i>Philopodon plagiatum</i>	Marram Weevil		X		
Coleoptera: Curculionidae	<i>Polydrusus cervinus</i>			X		
Coleoptera: Curculionidae	<i>Polydrusus formosus</i>		Nationally Scarce a	X	X	
Diptera: Tipulidae	<i>Nephrotoma flavescens</i>			X		
Diptera: Tipulidae	<i>Tipula fascipennis</i>					X
Diptera: Tipulidae	<i>Tipula paludosa</i>				X	
Diptera: Limoniidae	<i>Symplecta stictica</i>			X		
Diptera: Bibionidae	<i>Dilophus febrilis</i>					X

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Diptera: Rhagionidae	<i>Chrysopilus asiliformis</i>					X
Diptera: Rhagionidae	<i>Rhagio tringarius</i>					X
Diptera: Tabanidae	<i>Chrysops relictus</i>			X		
Diptera: Stratiomyidae	<i>Chorisops tibialis</i>			X		
Diptera: Therevidae	<i>Thereva nobilitata</i>					X
Diptera: Asilidae	<i>Leptogaster cylindrica</i>			X	X	
Diptera: Hybotidae	<i>Hybos culiciformis</i>					X
Diptera: Hybotidae	<i>Platypalpus cursitans</i>					X
Diptera: Hybotidae	<i>Platypalpus major</i>					X
Diptera: Hybotidae	<i>Platypalpus pallidiventrus</i>					X
Diptera: Empididae	<i>Empis tessellata</i>					X
Diptera: Dolichopodidae	<i>Chrysotus gramineus</i>					X
Diptera: Dolichopodidae	<i>Chrysotus neglectus</i>			X		
Diptera: Dolichopodidae	<i>Dolichopus griseipennis</i>			X	X	X
Diptera: Dolichopodidae	<i>Dolichopus latilimbatus</i>					X
Diptera: Dolichopodidae	<i>Medetera saxatilis</i>			X	X	X
Diptera: Dolichopodidae	<i>Thrypticus bellus</i>					X
Diptera: Dolichopodidae	<i>Sympycnus pulicarius</i>					X
Diptera: Dolichopodidae	<i>Syntormon pallipes</i>				X	X
Diptera: Lonchopteridae	<i>Lonchoptera lutea</i>					X
Diptera: Syrphidae	<i>Melanostoma mellinum</i>	a hoverfly				X
Diptera: Syrphidae	<i>Platycheirus albimanus</i>	a hoverfly		X		
Diptera: Syrphidae	<i>Platycheirus scutatus</i>	a hoverfly				X
Diptera: Syrphidae	<i>Paragus haemorrhous</i>	a hoverfly		X	X	X
Diptera: Syrphidae	<i>Episyrphus balteatus</i>	a hoverfly				X
Diptera: Syrphidae	<i>Eupeodes luniger</i>	a hoverfly		X		X
Diptera: Syrphidae	<i>Scaeva selenitica</i>	a hoverfly			X	
Diptera: Syrphidae	<i>Sphaerophoria scripta</i>	a hoverfly		X		X
Diptera: Syrphidae	<i>Syrphus vitripennis</i>	a hoverfly		X		
Diptera: Syrphidae	<i>Xanthogramma pedissequum</i>	a hoverfly		X		X
Diptera: Syrphidae	<i>Cheilosia vernalis</i>	a hoverfly		X		

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Diptera: Syrphidae	<i>Eristalis tenax</i>	a hoverfly		X		
Diptera: Syrphidae	<i>Helophilus pendulus</i>	a hoverfly		X		
Diptera: Syrphidae	<i>Pipizella viduata</i>	a hoverfly				X
Diptera: Pipunculidae	<i>Eudorylas obscurus</i>					X
Diptera: Pipunculidae	<i>Clistoabdominalis ruralis</i>		(RDB1) Nationally Scarce	X		
Diptera: Pipunculidae	<i>Eudorylas zermattensis</i>		(Nationally Scarce) None	X	X	X
Diptera: Pipunculidae	<i>Tomosvaryella geniculata</i>			X	X	
Diptera: Pipunculidae	<i>Tomosvaryella kuthyi</i>			X		
Diptera: Conopidae	<i>Thecophora atra</i>					X
Diptera: Conopidae	<i>Sicus ferrugineus</i>			X		
Diptera: Pallopteridae	<i>Palloptera scutellata</i>	a picture-winged fly				X
Diptera: Ulidiidae	<i>Herina lugubris</i>	a picture-winged fly		X	X	X
Diptera: Tephritidae	<i>Urophora quadrifasciata</i>					X
Diptera: Tephritidae	<i>Sphenella marginata</i>			X	X	X
Diptera: Tephritidae	<i>Tephritis divisa</i>		(RDBK)			X
Diptera: Tephritidae	<i>Tephritis formosa</i>					X
Diptera: Tephritidae	<i>Tephritis matricariae</i>		(RDBK)		X	X
Diptera: Tephritidae	<i>Tephritis neesii</i>			X	X	
Diptera: Tephritidae	<i>Terellia serratulae</i>					X
Diptera: Lauxaniidae	<i>Calliopum aeneum</i>			X		
Diptera: Lauxaniidae	<i>Minettia longipennis</i>			X		
Diptera: Lauxaniidae	<i>Minettia tabidiventris</i>			X	X	X
Diptera: Lauxaniidae	<i>Minettia fasciata</i>			X		X
Diptera: Lauxaniidae	<i>Minettia tubifer</i>			X	X	X
Diptera: Lauxaniidae	<i>Sapromyza quadripunctata</i>			X		X
Diptera: Chamaemyiidae	<i>Chamaemyia aridella</i>				X	
Diptera: Chamaemyiidae	<i>Chamaemyia herbarum</i>				X	X
Diptera: Chamaemyiidae	<i>Chamaemyia polystigma</i>			X	X	X
Diptera: Heterocheilidae	<i>Heterocheila buccata</i>			X		

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Diptera: Sciomyzidae	<i>Pherbellia cinerella</i>			X	X	X
Diptera: Sciomyzidae	<i>Pherbellia knutsoni</i>		RDB3			X
Diptera: Sciomyzidae	<i>Elgiva cucularia</i>					X
Diptera: Sepsidae	<i>Sepsis cynipsea</i>			X		
Diptera: Sepsidae	<i>Sepsis duplicata</i>			X		
Diptera: Sepsidae	<i>Sepsis orthocnemis</i>			X		
Diptera: Sepsidae	<i>Sepsis punctum</i>			X		
Diptera: Agromyzidae	<i>Ophiomyia curvipalpis</i>	a leaf-miner fly		X		
Diptera: Agromyzidae	<i>Cerodontha luctuosa</i>	a leaf-miner fly				X
Diptera: Agromyzidae	<i>Chromatomyia nigra</i>	a leaf-miner fly				X
Diptera: Agromyzidae	<i>Phytomyza orobanchia</i>	a leaf-miner fly	Nationally Scarce		X	
Diptera: Chloropidae	<i>Chlorops pumilionis</i>					X
Diptera: Chloropidae	<i>Cryptonevra diadema</i>					X
Diptera: Chloropidae	<i>Cryptonevra flavitarsis</i>					X
Diptera: Chloropidae	<i>Meromyza femorata</i>					X
Diptera: Chloropidae	<i>Meromyza athletica</i>			X		
Diptera: Chloropidae	<i>Platycephala planifrons</i>					X
Diptera: Chloropidae	<i>Thaumatomyia glabra</i>				X	
Diptera: Chloropidae	<i>Thaumatomyia hallandica</i>				X	
Diptera: Chloropidae	<i>Thaumatomyia notata</i>			X		
Diptera: Chloropidae	<i>Calamoncosis minima</i>					X
Diptera: Chloropidae	<i>Lipara lucens</i>					X
Diptera: Chloropidae	<i>Oscinella frit</i>			X	X	X
Diptera: Drosophilidae	<i>Scaptomyza pallida</i>			X		
Diptera: Ephydriidae	<i>Psilopa nitidula</i>				X	
Diptera: Ephydriidae	<i>Scatella stagnalis</i>					X
Diptera: Ephydriidae	<i>Scatella lacustris</i>					X
Diptera: Ephydriidae	<i>Hydrellia griseola</i>			X	X	X
Diptera: Ephydriidae	<i>Hydrellia maura</i>					X
Diptera: Anthomyiidae	<i>Delia platura</i>			X	X	X
Diptera: Anthomyiidae	<i>Pegomya meridiana</i>			X		

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Diptera: Muscidae	<i>Coenosia testacea</i>			X	X	
Diptera: Muscidae	<i>Lispocephala erythrocer</i>					X
Diptera: Muscidae	<i>Schoenomyza litorella</i>				X	X
Diptera: Muscidae	<i>Eudasyphora cyanicolor</i>				X	
Diptera: Muscidae	<i>Helina reversio</i>				X	
Diptera: Calliphoridae	<i>Melanomya nana</i>			X		X
Diptera: Polleniidae	<i>Pollenia pediculata</i>					X
Diptera: Rhinophoridae	<i>Rhinophora lepida</i>			X		X
Diptera: Sarcophagidae	<i>Macronychia polyodon</i>		RDB3 (Nationally Scarce)	X		
Diptera: Sarcophagidae	<i>Sarcophaga filia</i>			X	X	X
Diptera: Sarcophagidae	<i>Sarcophaga nigriventris</i>				X	
Diptera: Sarcophagidae	<i>Sarcophaga incisilobata</i>			X		
Diptera: Tachinidae	<i>Voria ruralis</i>				X	
Diptera: Tachinidae	<i>Phryxe vulgaris</i>					X
Diptera: Tachinidae	<i>Pales pavid</i>					X
Diptera: Tachinidae	<i>Siphona geniculata</i>			X	X	
Diptera: Tachinidae	<i>Nowickia ferox</i>			X		
Hymenoptera: Cephidae	<i>Cephus spinipes</i>	a sawfly			X	
Hymenoptera: Tenthredinidae	<i>Athalia cordata</i>	a sawfly		X		
Hymenoptera: Tenthredinidae	<i>Athalia rosae</i>	a sawfly		X		X
Hymenoptera: Tenthredinidae	<i>Tenthredo brevicornis</i>	a sawfly			X	X
Hymenoptera: Tenthredinidae	<i>Tenthredo scrophulariae</i>	a sawfly				X
Hymenoptera: Ichneumonidae	<i>Agrypon gracilipes</i>	an ichneumon				X
Hymenoptera: Ichneumonidae	<i>Therion circumflexum</i>	an ichneumon		X		
Hymenoptera: Ichneumonidae	<i>Exetastes adpressorius</i>	an ichneumon		X	X	
Hymenoptera: Ichneumonidae	<i>Charops cantator</i>	an ichneumon			X	
Hymenoptera: Ichneumonidae	<i>Collyria trichophthalma</i>	an ichneumon			X	
Hymenoptera: Ichneumonidae	<i>Cremastus geminus</i>	an ichneumon		X		
Hymenoptera: Ichneumonidae	<i>Diplazon laetatorius</i>	an ichneumon			X	X
Hymenoptera: Ichneumonidae	<i>Enizemum ornatum</i>	an ichneumon				X
Hymenoptera: Ichneumonidae	<i>Homotropus pictus</i>	an ichneumon				X

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Hymenoptera: Ichneumonidae	<i>Syrphoctonus tarsatorius</i>	an ichneumon		X	X	
Hymenoptera: Ichneumonidae	<i>Ctenichneumon panzeri</i>	an ichneumon				X
Hymenoptera: Ichneumonidae	<i>Perithous divinator</i>	an ichneumon		X		
Hymenoptera: Ichneumonidae	<i>Fredegunda diluta</i>	an ichneumon	(RDBK)			X
Hymenoptera: Ichneumonidae	<i>Itoplectis maculator</i>	an ichneumon				X
Hymenoptera: Ichneumonidae	<i>Netelia fuscicornis</i>	an ichneumon		X		X
Hymenoptera: Gasteruptiidae	<i>Gasteruption assectator</i>	a parasitic wasp				X
Hymenoptera: Crabronidae	<i>Crossocerus elongatulus</i>	Slender Digger Wasp		X		
Hymenoptera: Crabronidae	<i>Ectemnius lapidarius</i>	a digger wasp		X		
Hymenoptera: Crabronidae	<i>Lindenius albilabris</i>	a digger wasp		X		
Hymenoptera: Crabronidae	<i>Oxybelus uniglumis</i>	Common Spiny Digger Wasp				X
Hymenoptera: Crabronidae	<i>Pemphredon inornata</i>	a digger wasp		X		
Hymenoptera: Crabronidae	<i>Pemphredon lethifer</i>	a digger wasp		X	X	
Hymenoptera: Crabronidae	<i>Pemphredon lugubris</i>	Mournful Wasp		X		
Hymenoptera: Crabronidae	<i>Psenulus pallipes</i>	Pale Footed Black Wasp				X
Hymenoptera: Crabronidae	<i>Cerceris arenaria</i>	Sand Tailed Digger Wasp		X		
Hymenoptera: Crabronidae	<i>Cerceris rybyensis</i>	Ornate Tailed Digger Wasp		X		
Hymenoptera: Crabronidae	<i>Philanthus triangulum</i>	Bee Wolf	RDB2 (None)	X		
Hymenoptera: Sphecidae	<i>Ammophila sabulosa</i>	Red Banded Sand Wasp		X		X
Hymenoptera: Andrenidae	<i>Andrena scotica</i>	Chocolate Mining Bee		X		
Hymenoptera: Andrenidae	<i>Andrena nitida</i>	Grey-patched Mining Bee		X		
Hymenoptera: Andrenidae	<i>Andrena minutula</i>	Common Mini-miner		X		
Hymenoptera: Andrenidae	<i>Andrena semilaevis</i>	Shiny-margined Mini-miner		X		
Hymenoptera: Andrenidae	<i>Andrena dorsata</i>	Short-fringed Mining Bee		X		
Hymenoptera: Andrenidae	<i>Andrena ovatula</i>	Small Gorse Mining Bee		X		X
Hymenoptera: Andrenidae	<i>Andrena flavipes</i>	Yellow-legged Mining Bee		X		
Hymenoptera: Apidae	<i>Apis mellifera</i>	Western Honey Bee		X	X	X
Hymenoptera: Apidae	<i>Bombus terrestris</i>	Buff-tailed Bumblebee		X	X	X
Hymenoptera: Apidae	<i>Bombus lapidarius</i>	Red-tailed Bumblebee		X	X	X
Hymenoptera: Apidae	<i>Bombus pascuorum</i>	Common Carder Bee		X	X	X

Order: Family	Species	Vernacular	National Status	Area C East	Margam Wharf	PDZ
Hymenoptera: Colletidae	<i>Colletes fodiens</i>	Hairy-saddled Colletes		X		
Hymenoptera: Colletidae	<i>Hylaeus communis</i>	Common Yellow-face Bee			X	X
Hymenoptera: Colletidae	<i>Hylaeus brevicornis</i>	Short-horned Yellow-face Bee		X		
Hymenoptera: Colletidae	<i>Hylaeus hyalinatus</i>	Hairy Yellow-face Bee		X		X
Hymenoptera: Halictidae	<i>Halictus tumulorum</i>	Bronze Furrow Bee				X
Hymenoptera: Halictidae	<i>Lasioglossum cupromicans</i>	Turquoise Furrow Bee		X		
Hymenoptera: Halictidae	<i>Lasioglossum leucopus</i>	White-footed Furrow Bee		X		X
Hymenoptera: Halictidae	<i>Lasioglossum morio</i>	Green Furrow Bee		X		X
Hymenoptera: Halictidae	<i>Lasioglossum smeathmanellum</i>	Smeathman's Furrow Bee			X	
Hymenoptera: Halictidae	<i>Lasioglossum punctatissimum</i>	Long-faced Furrow Bee				X
Hymenoptera: Halictidae	<i>Lasioglossum villosulum</i>	Shaggy Furrow Bee		X		
Hymenoptera: Halictidae	<i>Lasioglossum zonulum</i>	Bull-headed Furrow Bee				X
Hymenoptera: Halictidae	<i>Lasioglossum calceatum</i>	Common Furrow Bee			X	X
Hymenoptera: Halictidae	<i>Lasioglossum fulvicorne</i>	Chalk Furrow Bee		X		
Hymenoptera: Halictidae	<i>Sphecodes crassus</i>	Swollen-thighed Blood Bee	Nationally Scarce b			X
Hymenoptera: Halictidae	<i>Sphecodes geoffrellus</i>	Geoffroy's Blood Bee		X		
Hymenoptera: Halictidae	<i>Sphecodes ferruginatus</i>	Dull-headed Blood Bee	Nationally Scarce b	X		
Hymenoptera: Halictidae	<i>Sphecodes gibbus</i>	Dark-winged Blood Bee		X		
Hymenoptera: Halictidae	<i>Sphecodes monilicornis</i>	Box-headed Blood Bee		X		
Hymenoptera: Halictidae	<i>Sphecodes puncticeps</i>	Sickle-jawed Blood Bee		X		
Hymenoptera: Megachilidae	<i>Megachile centuncularis</i>	Patchwork Leafcutter Bee		X		
Hymenoptera: Megachilidae	<i>Hoplitis claviventris</i>	Wetted Mason Bee		X		
Hymenoptera: Formicidae	<i>Lasius niger sens. lat.</i>	an ant		X	X	
Hymenoptera: Tiphidae	<i>Tiphia femorata</i>	a solitary wasp		X	X	X
Hymenoptera: Vespidae	<i>Ancistrocerus parietum</i>	Wall Mason Wasp		X		
Total diversity			268	156	86	151
all scarce/RDB (including scarce and RDB species no longer considered of conservation concern)			17	8	6	10
% scarce/RDB (including scarce and RDB species no longer considered of conservation concern)			6.3	5.1	7	6.6
no RDB (including RDB species no longer considered of conservation concern)			6	3	1	4
% RDB (including RDB species no longer considered of conservation concern)			2.2	1.9	1.2	2.7

all scarce/RDB (EXCLUDING scarce and RDB species no longer considered of conservation concern)	11	4	3	6
% scarce/RDB (EXCLUDING scarce and RDB species no longer considered of conservation concern)	4.1	2.6	3.5	4.0
no RDB (EXCLUDING RDB species no longer considered of conservation concern)	6	2	1	4
% RDB (EXCLUDING RDB species no longer considered of conservation concern)	2.2	1.3	1.2	2.6

