

INVERTEBRATE ASSESSMENT

Project Dragon, Port Talbot Docks



ECO02340
1

August 2023

Document status

Version	Revision	Authored by	Reviewed by	Approved by	Review date
1		Alex Harper	Tim Oliver	Tim Oliver	11/08/2023

Approval for issue

Tim Oliver

11 August 2023

File Name

240609 ECO02340 Project Dragon - Invertebrate Assessment

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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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Project	Project	Dragon	
Title	Harbourside Areas Plan		
Status	Drawn By	PM/Checked By	
Final	HM	TO	
Project Number	Scale @ A3	Date Created	
ECO02340	1:4,500	MAY 2023	
Figure Number			Rev
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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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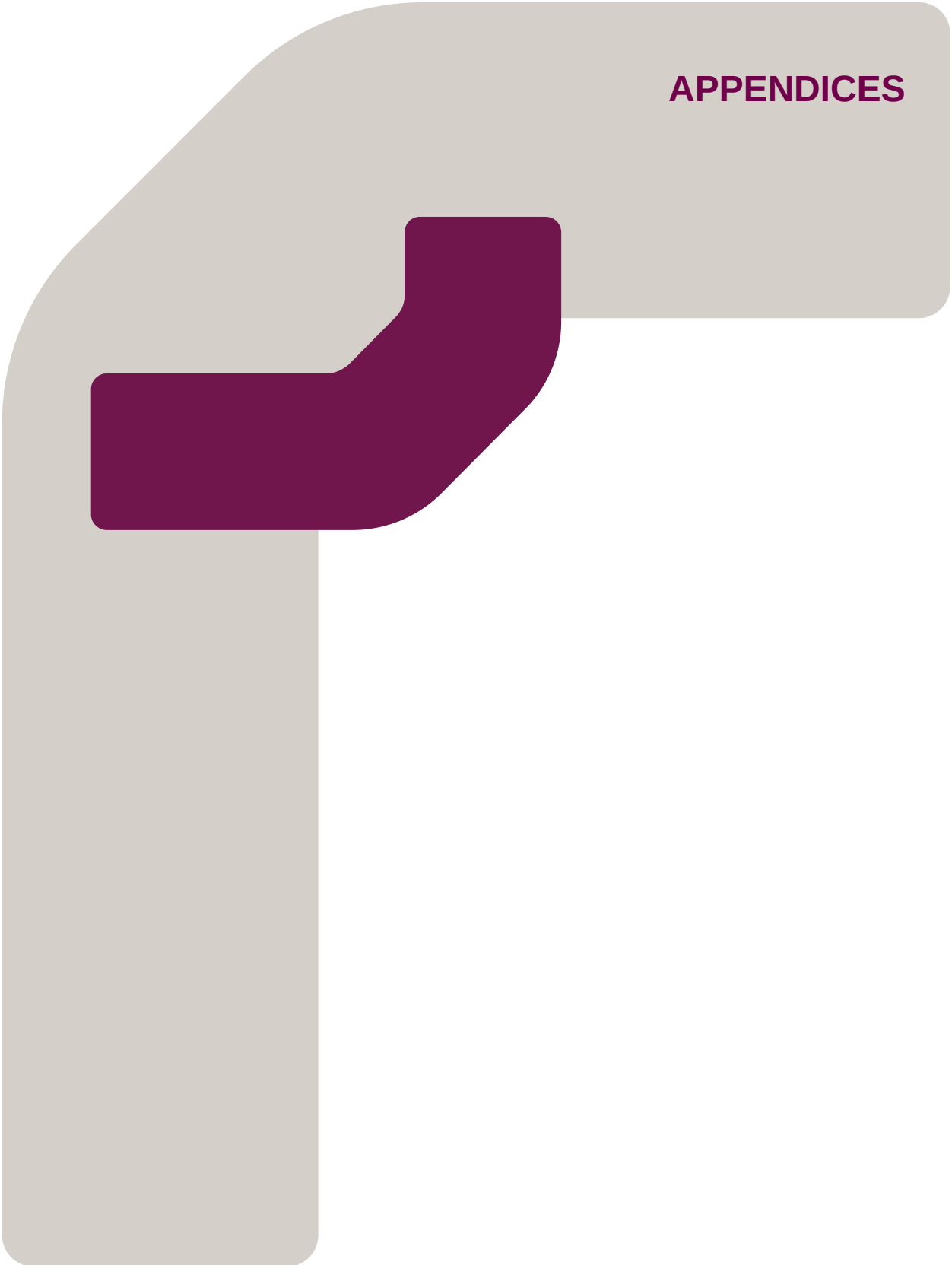
Client **LanzaTech UK Limited**

Project **Project Dragon SAF
Production Facility**

Title **Habitat Plan**

Status	Drawn By	PM/Checked By
DRAFT	HM	TO
Project Number	Scale @ A3	Date Created
ECO02340	1:3,000	AUG 2023
Figure Number		Rev
2		-

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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