

# **A Report to The Bates Partnership**

Intertidal Phase 1 Survey

Burry Port Harbour - Maintenance Dredging  
and Disposal

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# 1. Introduction

Carmarthenshire County Council (CCC) are proposing to undertake maintenance dredging at Burry Port Harbour to restore required water depths. Burry Port Harbour is situated on the northern bank of the Burry Inet (the River Loughor's estuary), approximately 5km west of Llanelli. It comprises an Outer Harbour and an inner West Dock and East Dock and a half-tide gate, is protected by two breakwaters, and is accessed by boats via an Approach Channel aligned parallel to the western breakwater (Figure 1).



Figure 1. Layout of Burry Port Harbour.

The proposed maintenance dredging is to remove sand material that has accumulated within the Approach Channel and Outer Harbour. The dredged material is to be deposited within a designated placement area on the upper foreshore of Burry Port East Beach within an area below mean high water on spring tides (MHWS). The proposed dredging is to be undertaken using excavators. Deposit of the material on Burry Port East Beach is to use dumper/tipper trucks.

The locations and coordinates for the Approach Channel and Outer Harbour dredging areas and the Burry Port East Beach deposit area are provided in Appendix 1. and shown in Figure 2.

## 2. Survey Objective

The objective of this survey is to undertake a Phase 1 Intertidal Habitat Survey of the Approach Channel and Outer Harbour dredging areas and the Burry Port East Beach deposit area, incorporating a 100 m buffer to delineate the Zone of Influence. The Zone of Influence also incorporates the sand transport area through which dredged material will be transported to the Burry Port East Beach deposit area (Figure 2).

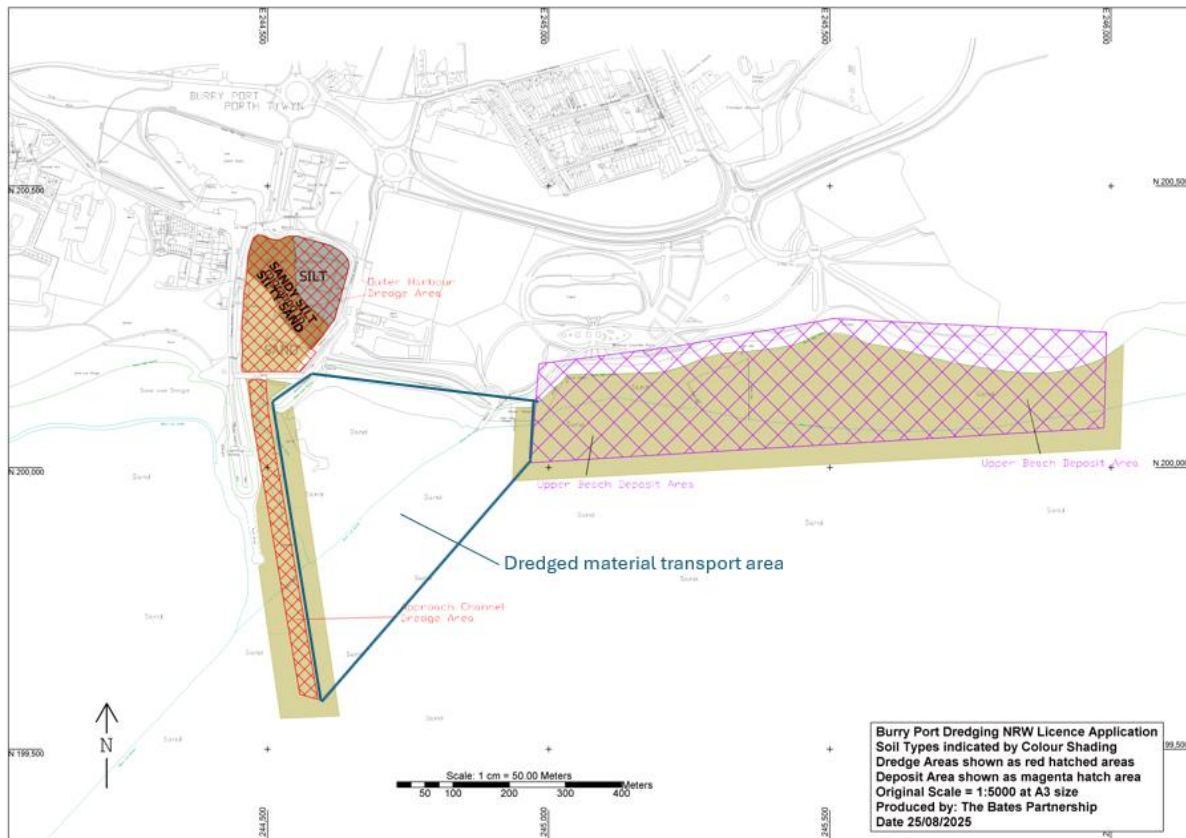


Figure 2. Burry Port dredge area (red hatch area) and deposit area (magenta hatch area), including transport area.

This resulting data is to provide evidence to support a Stage 1 HRA Screening Assessment of whether maintenance dredging at Burry Port Harbour and associated transport and deposit of dredged material is likely to have significant effects on European sites, particularly the Carmarthen Bay and Estuaries SAC and the Burry Inlet SPA / Ramsar Site. The HRA Screening Assessment is not the subject of this report.

## 3. Methodology

This Phase 1 Intertidal Habitat Survey is to collect data on the extent and distribution of intertidal sediment habitats/biotopes across the Zone of Interest. The survey does not

extend into non-intertidal areas, harbour walls or other hard / artificial substrata. The survey method employed to characterise the intertidal sediments is based on Wyn *et al.* (2006<sup>1</sup>) and guidance within NRW Guidance Note GN030b<sup>2</sup>. Where habitats/biotopes are encountered which include important bird food (i.e. bivalves) additional information on bivalve numbers and abundance is also recorded.

### 3.1 Survey Details

The intertidal was surveyed by foot on 2 days (4-5<sup>th</sup> March 2026) over low water spring tides of 0.76m and 0.83m respectively. See Appendix 2 for additional information relating to the survey. The surveys were planned such that the lower shore was surveyed at the lowest point of the tide.

On the advice of the Burry Port Marina Harbour Master, the soft mud areas in the Outer Harbour were surveyed from the pontoons only. Advice on specific safe walking routes to gain access to other areas of the harbour was followed. Certain areas which were not accessible on foot or from the pontoon were avoided on the basis that the substrate was likely to be unsafe (these amounted to approximately 10% of the Outer Marina compound). Lack of direct access to all areas of the Outer Harbour is not considered to be an impediment to providing information on the habitat/biotope characterisation within the Outer Harbour.

### 3.2 Review of existing data

A desk-based review of habitat and invertebrate data (via Data Map Wales<sup>3</sup> and the NBN<sup>4</sup>) relevant to intertidal sediment habitats within the Zone of Impact and immediate area was conducted prior to field work.

The following datasets were reviewed:

- NRW Intertidal Phase 1 map data from 2000
- Environment (Wales) Act Section 7 and OSPAR: Marine Habitats (habitats of Principal Importance under Section 7 of the Environment (Wales) Act 2016 and considered threatened or declining in Wales under the OSPAR Convention)

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<sup>1</sup> Wyn, G., Brazier, P., Birch, K., Bunker, A., Cooke, A., Jones, M., Lough, N., McMath, A. & Roberts, S. 2006. Handbook for Marine Intertidal Phase 1 Biotope Mapping Survey. Report from Countryside Council for Wales

<sup>2</sup> <https://cdn.naturalresources.wales/689357/gn030b-intertidal-sediments-final-24jun2019.pdf>

<sup>3</sup> [https://datamap.gov.wales/maps/new?layergroup=geonode:nrw\\_intertidal\\_phase\\_1\\_habitat\\_survey#/](https://datamap.gov.wales/maps/new?layergroup=geonode:nrw_intertidal_phase_1_habitat_survey#/)

<sup>4</sup> <https://species.nbnatlas.org/>

- Environment (Wales) Act Section 7 and OSPAR: Marine Species (species of Principal Importance under Section 7 of the Environment (Wales) Act 2016 and considered threatened or declining in Wales under the OSPAR Convention)
- Marine Benthic Invertebrate (benthic invertebrate samples collected within Wales from 1988 onwards by Natural Resources Wales and former Environment Agency Wales under the Water Framework Directive (WFD) and Clean Seas Environment Monitoring Program (CSEMP) sampling programs)
- All Wales Non-Native Marine Species
- Marine and intertidal invertebrates listed under the Wildlife & Countryside Act (1981), as amended

A report produced recently by Carmarthenshire County Council (Aubrey, 2026<sup>5</sup>) to characterise intertidal sediments, prepared as part of the process to secure statutory consents for this dredging campaign, was also reviewed.

### 3.2.1 NRW Intertidal Phase 1 map data

This survey was undertaken in 2000 as part of an all-Wales intertidal Phase 1 survey programme. The biotopes recorded that are relevant to the Zone of Interest are shown in Figure 3 and outlined below:

Sediment biotopes within the Outer Harbour included **LS.LMu.UEst.Hed.Ol** (*Hediste* and *Oligochaetes*) and **LMU.SMu.HedMac.Pyg** (*Hediste diversicolor* and *Macoma balthica* with *Pygospio elegans* in littoral sandy mud).

The west and east sides of the Approach Channel were characterised by **LS.LSa.FiSa.Po** (polychaetes in littoral fine sand) and **LS.LSa.MuSa.MacAre** (*Macoma balthica* and *Arenicola marina* in littoral muddy sand) respectively.

The majority of the transport area was recorded as **LS.LSa.MuSa.MacAre** (*Macoma balthica* and *Arenicola marina* in littoral muddy sand) with areas of **SLR.MX.MytX** (*Mytilus edulis* beds on eulittoral mixed substrata) and **LR.FLR.Eph.BLitX** (barnacles and *Littorina* spp. on unstable eulittoral mixed substrata) towards the back of the shore.

In the dredge deposit area, in addition to areas of intertidal sediment characterised as **LS.LSa.MuSa.MacAre** (*Macoma balthica* and *Arenicola marina* in littoral muddy sand) and **LS.LSa.MuSa.Lan** (*Lanice conchilega* in littoral sand), other biotopes recorded within this area indicate that a greater extent of mixed hard substrata were present historically than is observed today. This is indicated by the presence of the following biotopes:

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<sup>5</sup> Aubrey, P., 2026. Phase 1 Habitat Survey Report – Burry Port Harbour Sediment Deposition. A report from Carmarthenshire County Council



- **LR.LLR.F.Fspi.FS** (*Fucus spiralis* on full-salinity upper eulittoral rock)
- **LR.FLR.Eph.BLitX** (Barnacles and *Littorina* spp. on unstable eulittoral mixed substrata)
- **LR.LLR.F.Fves.X** (*Fucus vesiculosus* on variable-salinity eulittoral rock)
- **LR.HLR.MusB.Cht** (*Chthamalus* spp. on exposed upper eulittoral rock)
- **LR.HLR.MusB.Sem.Sem** (*Semibalanus balanoides* on exposed to moderately exposed eulittoral rock)
- **SS.SBR.SMus.MytSS** (Sublittoral *Mytilus edulis* beds on soft substrata)
- **LS.LBR.LMus.Myt.Mx** (*Mytilus edulis* beds on littoral mixed substrata)

It should be noted that the biotopes shown on DataMap Wales were originally recorded in the field using the 1997 version of the biotope classification and were subsequently assigned biotope codes retrospectively in accordance with the 2004 version of the classification. Although the DataMap Wales intertidal habitat data therefore derives from both the 1997 and 2004 classification versions, this does not limit its suitability for inferring habitat characteristics or assessing changes over the past 25 years.

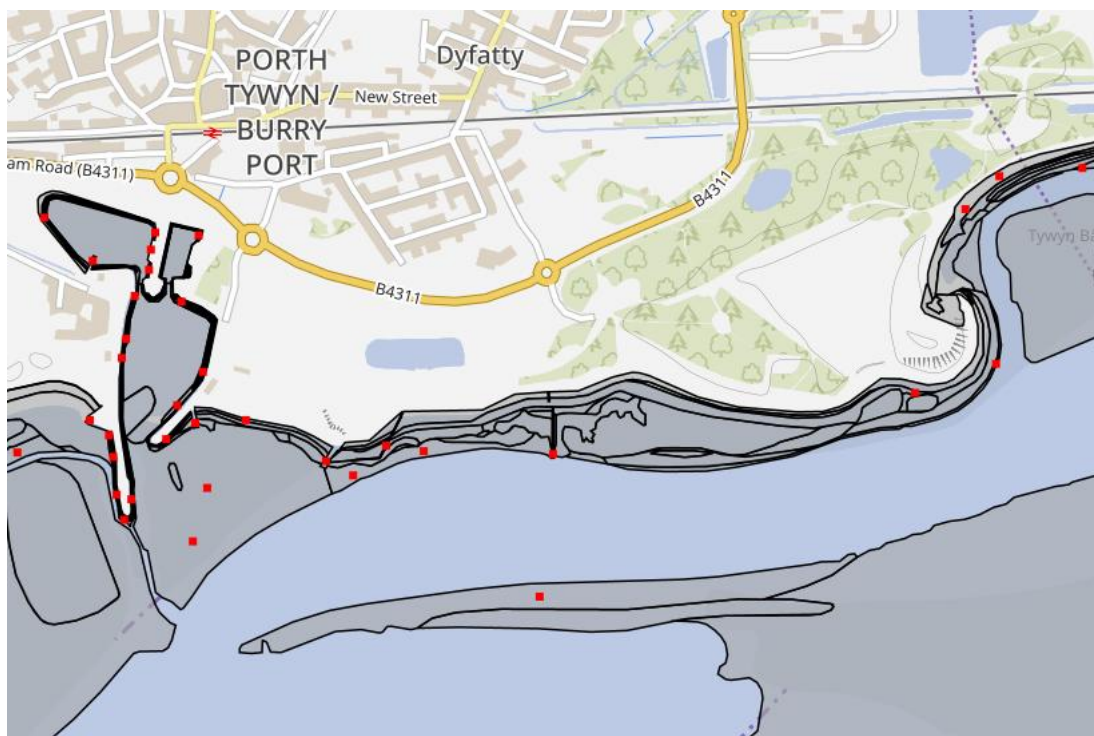


Figure 3. Intertidal Phase 1 map data (biotope polygons and target notes) from 2000. See [Data Map Wales Intertidal Phase 1 data](#) for polygon identification and target note information.



### 3.2.2 Environment (Wales) Act Section 7 and OSPAR: Marine Habitats

‘Intertidal Mudflats’ and ‘Blue Mussel Beds’, both habitats classified as habitats of Principal Importance under Section 7 of the Environment (Wales) Act 2016 and considered threatened or declining under the OSPAR Convention in Wales are recorded on DataMap Wales. This data layer was largely derived from the Intertidal Phase 1 biotope data recorded in 2000 and was last edited in 2010 (Figure 4).

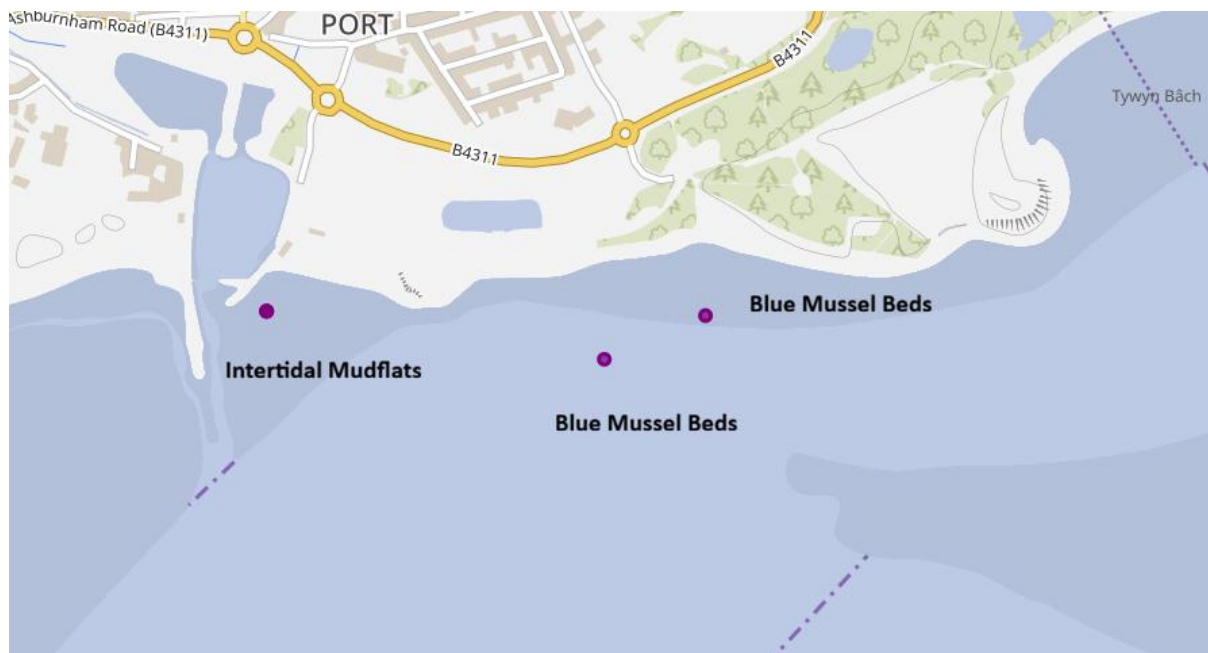


Figure 4. Section 7 and OSPAR intertidal marine habitats, data layer last, edited 2010.

### 3.2.3 Environment (Wales) Act Section 7 and OSPAR: Marine Species

There are no records of species classed of Principal Importance under Section 7 of the Environment (Wales) Act 2016 or of species considered threatened or declining under the OSPAR Convention either within the Zone of Influence or in the surrounding area.

### 3.2.4 Marine Benthic Invertebrates

This data set collates all the benthic invertebrate samples collected within Wales from 1988 onwards by Natural Resources Wales (and formerly Environment Agency Wales) under the Water Framework Directive (WFD) and Clean Seas Environment Monitoring Program (CSEMP) sampling programs. The dataset contains the presence and abundance of benthic invertebrate species at specific NRW marine monitoring points (Figure 5).

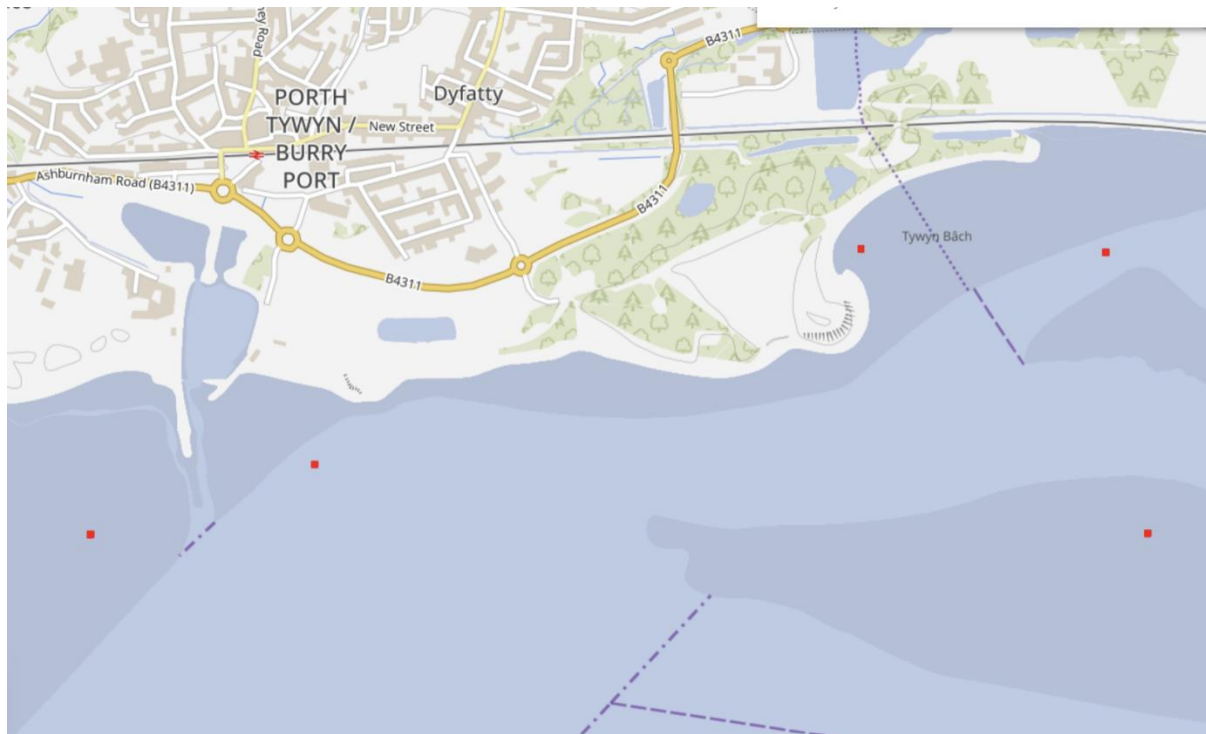


Figure 5. Locations for benthic invertebrate sampling by NRW. See [DataMap Wales Marine Invertebrates](#) for further information on each point.

The point to the west of the Approach Channel contains data relating to monitoring undertaken in 2020, where the biotope LS.LSa.FiSa.Po (polychaetes in littoral fine sand) is assigned.

The point to the east of the Approach Channel contains data from 2017 and includes low numbers of the polychaetes *Capitella* sp., *Nephtys cirrosa*, the bivalve *Macomangulus tenuis* and amphipod *Haustorius arenarius*.

### 3.2.5 All Wales Non-Native Marine Species

The distribution of marine non-native species was reviewed on the relevant data layer on DataMap Wales. All records outside the Outer Harbour in Figure 6 are for *Elminius modestus* (the widespread non-native barnacle) on artificial hard structures, except for 2 records for *Crepidula fornicata* (slipper limpet) from 2008 at the southern end of the western breakwater. All other non-native species records in Figure 6 are from within the Outer Harbour and are listed below, including the date of the most recent (or only) record:

- *Sargassum muticum* (wire weed) – 2009
- *Botrylloides diegensis* (colonial seasquirt) – 2009
- *Bugula neritina* (bryozoan) 2009

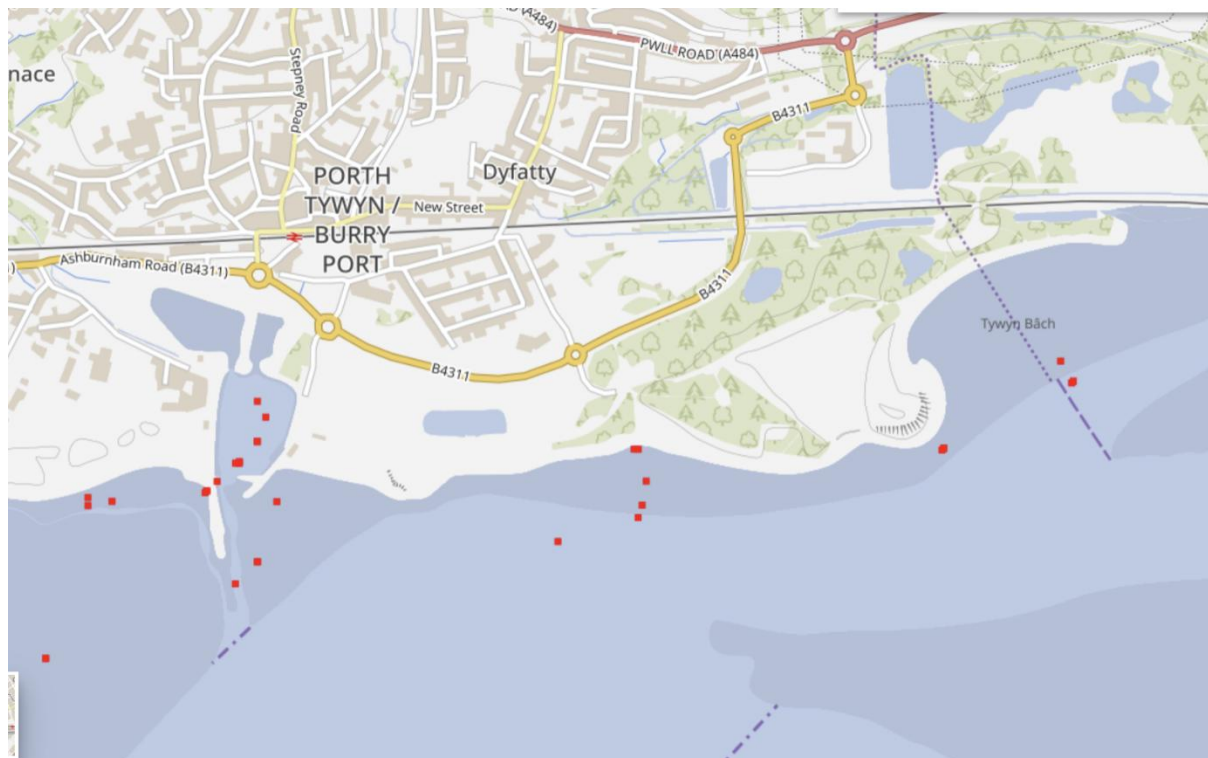


Figure 6. Locations for marine non-native species. See for [DataMap Wales marine non-native species](#) information on displayed points.

### 3.2.6 Marine and intertidal invertebrates protected under the Wildlife and Countryside Act (1981)

A search for records of Schedule 5 listed marine and intertidal invertebrate species associated with sedimentary habitats (see list of species below) within or close to the Zone of Influence was undertaken. No records were found.

- *Alkmaria romijni* (Tentacled lagoon worm)
- *Armandia cirrhosa* (Lagoon sandworm)
- *Caecum armoricum* (*De Folin's lagoon snail*)
- *Edwardsia ivelli* (Ivell's sea anemone)
- *Gammarus insensibilis* (Lagoon sand shrimp)
- *Nematostella vectensis* (Starlet sea anemone)
- *Pachycordyle michaeli* (Brackish sea fir)
- *Tenellia adspersa* (Lagoon sea slug)
- *Thyasira gouldii* (Northern hatchet shell)
- *Victorella pavida* (Trembling sea mat)

### 3.2.7 Carmarthenshire County Council characterisation of intertidal sediments

A recent report prepared by Carmarthenshire County Council (Aubrey, 2026) did not identify any habitats or species of conservation importance within the dredge deposit area, nor did it record the presence of infaunal bivalve species. Comparison with aerial imagery from 2000 within this report indicates a notable change in intertidal substrate composition, with the area having transitioned from mixed hard substrata to one now predominantly characterised by sand. Figure 7 and Table 1 indicate the area surveyed and information associated with target notes respectively. See Appendix 3 for images taken at each target note location indicated in Figure 7.



Figure 7. Area surveyed during Carmarthenshire County Council Phase survey and location of Target Notes.

Table 1. Information associated with Carmarthenshire County Council Phase 1 survey, (Aubrey, 2026).

| Target Note No | Notes                                                                                                                        |
|----------------|------------------------------------------------------------------------------------------------------------------------------|
| 1              | Western edge of coastal defence below car park, outside deposition area no image                                             |
| 2              | Concrete enclosed structure outside of deposition site, no evidence of Mussels                                               |
| 3              | Collapsed road/track surface made up of clinker and rock                                                                     |
| 4              | Pulverised Fuel Ash, PFA, cliff with recent deposits of sand seaward of the cliff face, adding protection to the friable PFA |
| 5              | Base of wind turbine – ref only                                                                                              |
| 6              | Section of rocks/cement aggregate/bricks used in collapsed gabions as coastal defence                                        |
| 7              | Investigation for presence of Cockles/bivalves depth 400mm No bivalves found                                                 |
| 8              | Investigation for presence of Cockles/bivalves depth 400mm No bivalves found                                                 |
| 9              | Investigation for presence of Cockles/bivalves depth 400mm No bivalves found                                                 |
| 10             | Investigation for presence of Cockles/bivalves depth 400mm No bivalves found                                                 |

### 3.2 Survey Design

In view of the time elapsed since the most recent Intertidal Phase 1 survey (i.e. 2000) and the need to confirm the absence of priority habitats of conservation importance (i.e. Intertidal Mudflats and Blue Mussel Beds), a systematic sampling grid was employed to characterise intertidal habitats/biotopes across the Zone of Influence.

Positions for the dredging, transport and deposit areas had been provided by the Client and a 100m buffer was drawn around these in QGIS. QGIS was then used to create a 50m spaced grid over the Zone of Influence. Grid points were uploaded to the QField App on a mobile phone to locate grid points in the field. The positions of target notes and potential transition boundaries were recorded using the app 'GPS Logger'. All images were also geo-referenced.

Sampling grid locations at 100m intervals were generally used to cover the lateral extent of the Zone of Influence. In some areas, 50m transects were applied up and down the shore to capture habitat/biotope zonation. Additional sampling locations and target notes were also recorded within and outside the Zone of Influence to confirm the characteristics of adjacent habitats and biotopes. Figure 8 shows the identification numbers and locations of grid points within the Zone of Influence where data were collected.

At each sampling grid location, the methodology described by Wyn *et al.* (2006) was applied to assign an intertidal biotope to at least Level 5 within the JNCC (2022) biotope classification hierarchy wherever possible. Biotopes assigned in the field were reviewed following completion of the survey to confirm that classifications had been applied as accurately and consistently as possible. This post-survey review involved checking field records against habitat descriptions, species assemblages, and physical characteristics to ensure alignment with the relevant biotope definitions.

While walking between sampling grid points, the sediment surface was inspected for evidence of additional infaunal species and for changes in sediment type or biotope. Observations focused on diagnostic surface features, including circular surface holes indicative of cockles (*Cerastoderma edule*) and other bivalves, keyhole-shaped openings associated with sand gaper (*Mya arenaria*), star-shaped apertures characteristic of peppery furrow shell (*Scrobicularia plana*), worm casts indicative of lugworm (*Arenicola marina*), and the presence of conspicuous polychaete tubes (e.g. *Lanice conchilega*).

GIS outputs are provided as ESRI shape files.





Figure 8. Identification numbers and locations of grid points within Zone of Influence where data collected.

### 3.3 Features of the Sediment

Sediment characteristics were recorded at each sampled point in accordance with MNCR guidance<sup>6</sup>:

**Surface relief** - overall relief of the habitat scale of 1-5, from very even (surface completely uniform 1) to highly uneven (surface perhaps with numerous mounds or drainage channels 5).

**Firmness** - an indication of the degree of softness or compactness of the sediment on the scale: 1 very firm (no indentation when walked on; difficult to dig with fingers), 2 (make a slight indentation; fingers only in), 3 (sink ankle deep; hand in), 4 (sink knee deep; can penetrate up to elbow) to 5 very soft (sink thigh deep; whole arm in).

**Stability** – on scale of 1-5 from highly stable (movement of sediment very unlikely 1) to highly mobile (sediment constantly being moved 5).

**Sorting** - an indication of the uniformity of the particle size on scale of 1-5, from very well sorted (sediment composed of a single grain size 1) to very poorly sorted (sediment with wide range of grain sizes 5).

<sup>6</sup> [https://mhc.jncc.gov.uk/media/1039/lhabform\\_2017.pdf](https://mhc.jncc.gov.uk/media/1039/lhabform_2017.pdf)

**Black layer** - an indication of the depth of the anoxic layer, on the scale: 1 = not visible, 2>20 cm below surface, 3=5-20 cm below surface, 4=1-5 cm below surface, 5=<1 cm below surface.

**Sediment type** – for example mud, fine sand, medium sand or coarse sand.

**Accretion and erosion** – notable areas of accretion and erosion were also noted.

### 3.4 Bird Food Resource

Where bivalve species were recorded, the importance of the habitat/biotope as a food resource for birds was assessed by counting the number of individual bivalve species within a defined sampling area. These data were used to determine bivalve abundance in accordance with the JNCC SACFOR abundance scale<sup>7</sup>.

This was not undertaken within the Outer Harbour for safety reasons (i.e. soft mud).

### 3.5 Geo-referenced Site Images

A series of geo-referenced images was collected during the survey, with each image embedded with spatial metadata at the time of capture. These images are provided as a separate output accompanying this report. The spatial information allows the photographs to be visualised within common platforms such as Google Earth Pro or Google Maps where they can be displayed in their recorded locations and used to support spatial interpretation of the study area.

## 4. Results

### 4.1 Habitats/Biotopes

Data collected in the field is collated in Appendix 4, including characterising species for mapped biotopes. Figure 9 illustrates a map of the biotopes based on information recorded in the field. Note that boundaries between different biotopes on intertidal sediment shores transition over many meters. Appendix 5 lists species an biotopes recorded on site.

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<sup>7</sup> <https://mhc.jncc.gov.uk/media/1009/sacfor.pdf>



The south portion of the Outer Marina was characterised by elevated, well drained medium sand, interspersed with shallow channels with a thin surface film of mud and diatoms. Species diversity is low in these areas and characterised by *Eurydice pulchra* and *Bathyporeia* sp. with *Arenicola marina* (lug worm) at an abundance of Rare in the damper edges of the channels. These areas are assigned the biotope **LS.LSa.MoSa.AmSco.Eur** (*Eurydice pulchra* in littoral mobile sand).

Other areas of mud located away from the pontoons in the north-west corner of the Outer Marina, were not safely accessible on foot. However, adjacent areas with comparable physical characteristics (sandy mud rather than soft mud) were accessible. Although a similar species assemblage to wetter soft mud areas was recorded, the abundance was less.

**LS.LMu.Mest** (polychaete/bivalve-dominated mid estuarine mud shores) is assigned to these areas in view of the lower abundance of *H. diversicolor* and bivalves (*S. plana* and *A. arenaria*).

The upper extent of this more sandy mud habitat on the western side of the Outer Harbour was characterised by a band of a sand-binding filamentous green alga.

Although not directly surveyed due to inability to access safely, freshwater input to the Outer Harbour through direct watercourses and also through seepage of freshwater through the harbour walls, the biotope **LS.LMu.UEst** (polychaete/oligochaete-dominated upper estuarine mud) can be expected in this area (these relatively thin bands of mud are not mapped) and are confined to narrow discrete areas where the Outer Harbour receives freshwater inputs.

#### 4.1.2 Approach Channel and Transport Area – description of habitats/biotopes

The area immediately outside the Outer Harbour is characterised by elevated, well-drained, medium-grained sand supporting a species-poor infaunal community of the isopod *Eurydice pulchra* and the amphipods *Bathyporeia* sp. and *Haustorius arenarius*. These elevated areas of dry sand, approximately 1–2 m in height, slope down towards the edge of the Approach Channel. A similar species-poor infaunal community was recorded in firmer, damp sand along the landward edge of the Transport Area. Both these areas have been assigned the biotope **LS.LSa.MoSa.AmSco.Eur** (*Eurydice pulchra* in littoral mobile sand). The same biotope has also been applied to the medium sand associated with mobile sand waves on the lower shore, where extremely low abundances or a complete absence of visible infauna were recorded.

The medium to fine wet sand in between the upper and lower shore areas had a similar infaunal community but with the addition of the polychaetes *Scolecopsis* sp. and *Nephtys* sp. This broad band is assigned the biotope of **LS.LSa.MoSa.AmSco** (amphipods and *Scolecopsis* spp. in littoral medium-fine sand). The lack of sufficient abundance of *Nephtys* sp. and lack of other obvious polychaete species is the basis upon which a biotope within the **LS.LSa.FiSa.Po** (polychaetes in littoral fine sand) has not been assigned. Where *Nephtys* sp. was more consistently recorded towards the extreme lower shore, the biotope **LS.LSa.FiSa.Po** (polychaetes in littoral fine sand) was assigned. However numbers were not considered high enough to warrant assigning a *Nephtys*-characterised biotope.

Towards the southern end of the Zone of Interest below the Transport Area, *Cerastoderma edule* (cockle) was recorded in 4 of the sampling grid locations at numbers of < 20 individuals/m<sup>2</sup>. This abundance is not sufficiently high to assign the biotope of **LS.LSa.MuSa.CerPo** (*Cerastoderma edule* and polychaetes in littoral muddy sand) as significantly higher numbers of cockles are needed for this. This occurrence of cockles within the **LS.LSa.FiSa.Po** biotope was localised and limited in extent.

### 4.1.3 Deposit Area (Burry Port East Beach) – description of habitats/biotopes

The back of the shore in this area was eroding, exposing infrastructure from a legacy power station (large lumps of concrete, metal encasements and cement pipes) and fly ash material. A community of talitrid amphipods (sand hoppers) occurs along the back of the majority of this sandy shoreline where decomposing seaweed occurs. This area is assigned a biotope code of **LS.LSa.St.Tal** (talitrids on the upper shore and strand-line). The exception to this is where the shore widens for a short stretch and the area of talitrid amphipods is backed by barren sand **LS.LSa.MoSa.BarSa** (barren littoral coarse sand). Areas of fly ash material at the top of the shore is recorded as **LS.LCS.Sh.BarSh** (barren littoral shingle) as there was no obvious epifauna.

The rest of the upper shore is described as a wide band of medium grained damp sand, characterised by a sparse fauna of the isopod *Eurydice pulchra* and amphipods *Bathyporeia* sp. and *Haustorius arenarius*. Towards the mid shore, medium-fine wet sand supports a similar sparse fauna of amphipods, isopods and low numbers of the polychaete *Scolecopsis* sp. This area is assigned the biotope **LS.LSa.MoSa.AmSco** (amphipods and *Scolecopsis* spp. in littoral medium-fine sand). Occurrences of *Nephtys* sp. and the bivalve *Macomangulus tenuis* increase towards the lower shore. However, the lack of sufficient numbers of *Nephtys* sp. and lack of other obvious polychaete species is the basis upon which the LS.LSa.FiSa.Po (polychaetes in littoral fine sand) has not been assigned.

Where *Nephtys* sp. and the bivalve *Macomangulus tenuis* were more consistently recorded towards the extreme lower shore, the biotope LS.LSa.FiSa.Po (polychaetes in littoral fine sand) was assigned. However numbers were not considered high enough to warrant assigning a *Nephtys*-characterised biotope.

Towards the lower shore at the eastern end of the Zone of Influence in this block, fine sand supports dense *Cerastoderma edule* (cockle). Other characterising species include the polychaetes *Nephtys* sp. and *Scolecopsis* sp., and the bivalve *Macomangulus tenuis*. Numbers of cockles at the sampling grid locations and target note points range from 80-4000 individuals per m<sup>2</sup>. These areas are assigned the biotope **LS.LSa.MuSa.CerPo** (*Cerastoderma edule* and polychaetes in littoral muddy sand).

## 4.2 Environment (Wales) Act Section 7 and OSPAR: Marine Habitats and Species

‘Intertidal Mudflats’, classed as a habitat of Principal Importance under Section 7 of the Environment (Wales) Act 2016 and considered threatened or declining under the OSPAR

Convention, was recorded within the Outer Harbour. Note that the habitat ‘Blue Mussel Beds’ was not recorded.

No species of conservation importance were recorded during the survey.

### 4.3 All Wales Non-Native Marine Species

- The non-native barnacle *Elminius modestus* was observed on artificial hard substrate within the Outer Harbour and sea defence structure running parallel to the Approach Channel.
- The non-native alga *Agarophyton vermiculophyllum* was widespread in the mud in the vicinity of the pontoons inside the Outer Harbour.
- No other marine or intertidal non-native species were recorded.

### 4.4 Features of the Sediment

Sediment characteristics recorded across the Zone of Influence indicate a predominance of well-sorted fine to medium sands outside the Outer Harbour.

Across the Approach Channel, Transport Area and Burry Port East Beach, sediments were typically flat to gently rippled, with surface relief generally low to moderate. Ripple marks, drainage channels and sand waves were common features, particularly on the mid to lower shore, reflecting a highly mobile sedimentary environment. Sediment firmness in these areas ranged from firm to moderately soft, with sands generally well drained on the upper shore and becoming increasingly damp towards the mid and lower shore. Stability scores indicate that much of the open shore is moderately to highly mobile, consistent with regular reworking by tidal and wave action. Sediments were typically well sorted, dominated by a narrow grain size range.

The majority of sandy sediments were well oxygenated, with no visible black anoxic layer present at the surface or within the upper sediment profile. Where darker sediment layers were recorded, these were generally at depths greater than 5–10 cm and were localised, occurring primarily within areas of muddy fine sand or in shallow pools with standing water.

Within the Outer Harbour, sediment characteristics were more variable and reflected the sheltered conditions. Areas of muddy sand and soft mud were recorded, particularly adjacent to the pontoons and along the western side of the harbour. These sediments were typically very soft to soft, with low surface relief and high stability. In these locations, a shallow black anoxic layer was recorded within the upper few centimetres of the sediment profile, indicating reduced oxygen penetration. Burrows,



siphon marks and feeding traces were common surface features within these muddy habitats.

Overall, the sediment features recorded are characteristic of a dynamic, high-energy sandy intertidal system, transitioning to more stable, finer sediments under sheltered estuarine conditions within the Outer Harbour.

## 4.5 Bird Food Resource

Positions where *Cerastoderma edule* (cockle) and *Macromangulus tenuis* (thin tellin) were recorded, including the total number of individuals per m<sup>2</sup> are shown in Figures 10 and Figure 11 respectively. Where numbers of cockles were highest, the 1cm size class dominated. Locations where relatively fewer *C. edule* were present, individuals were mixture of 1cm and 1-3cm size classes.



Figure 10. Distribution of *Cerastoderma edule* (cockle) and number of individuals per m<sup>2</sup>.



Figure 11. Distribution of *Macromangulus tenuis* (thin tellin) and numbers per m<sup>2</sup>.

## 4.6 Site Imagery

Site view images are not replicated in this report in their entirety. They are supplied as a separate contract output. However a selection of images are included in Appendix 5.

# 5. Summary

## 5.1 Intertidal Sediments

The sandy intertidal shore in front of Burry Port Harbour and Burry Port East Beach comprises a broad, gently sloping sand flat extending from the upper shore to the low water mark. Sediments are dominated by clean, fine to medium sand, with little evidence of organic enrichment. The sand is generally well oxygenated, with minimal or no development of a black anoxic layer observed during sampling.

The upper shore is characterised by dry to slightly damp, well-drained sand, becoming progressively firmer and more compacted towards the mid and lower shore as moisture retention increases. Sediment mobility is high across much of the shore, particularly on the lower shore, where ripple marks, elevated well-drained areas, and mobile sand waves indicate active reworking by tidal and wave processes. Stable sedimentary features, such as tubes of *Lanice conchilega* (sand mason worm), are largely absent, reflecting the highly dynamic physical regime.



Biological communities are generally sparse and typical of mobile sandy shore environments. Infaunal assemblages are species-poor and dominated by mobile amphipods and isopods adapted to unstable, well-oxygenated sediments. Abundance is low and distribution patchy, with low densities or a complete absence of infauna recorded in areas of very mobile sand. However, at the lower shore towards the eastern extent of Burry Port East Beach, high numbers of cockles (*Cerastoderma edule*) were recorded, forming an infaunal assemblage typical of less mobile conditions.

The intertidal sediments within the Outer Harbour comprise predominantly fine-medium, well drained sand, interspersed with areas of firmer muddy sand and localised patches of soft, wet mud. Sediment mobility within the harbour is variable, ranging from low in more sheltered areas to high closer to the harbour entrance, reflecting sediment movement into the southern end of the Outer Harbour.

## 5.2 Environment (Wales) Act Section 7 and OSPAR: Marine Habitats and Species

The 'Blue Mussel Beds' records shown on DataMap Wales originate from biotopes mapped during the Intertidal Phase 1 survey carried out in 2000 within the Dredge Deposit area. At that time, the biotopes supporting the identification of 'Blue Mussel Beds' included LS.LBR.LMus.Myt.Mx (*Mytilus edulis* beds on littoral mixed substrata) on the upper and mid shore, and SS.SBR.SMus.MytSS (*Mytilus edulis* beds on sublittoral sediment) on the extreme lower shore.

These biotopes, along with others recorded during the 2000 survey, indicate that the intertidal zone then supported mixed and more structurally complex substrata, rather than the predominantly sandy sediments present today - most likely reflecting geomorphological change over the past two decades, including sand build-up and shifting channel positions. This aligns with the comparison of aerial imagery from 2000 to 2023 indicated in the Aubrey (2026) report.

## 5.3 Non-Native Marine Species

With the exception of the non-native barnacle (*Elminius modestus*) on hard substrata, previously recorded non-native marine species were not observed during this survey.

The non-native red alga *Agarophyton vermiculophyllum* was recorded embedded in the soft mud in the vicinity of the pontoons in the Outer Harbour. Whilst this is a new location for this species in Wales, it has previously been recorded elsewhere in Wales (Gwynedd and Anglesey<sup>8</sup>) and also elsewhere in the Burry Inlet (Figure 12).

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<sup>8</sup> There is also an unconfirmed record for Newport, Pembrokeshire.

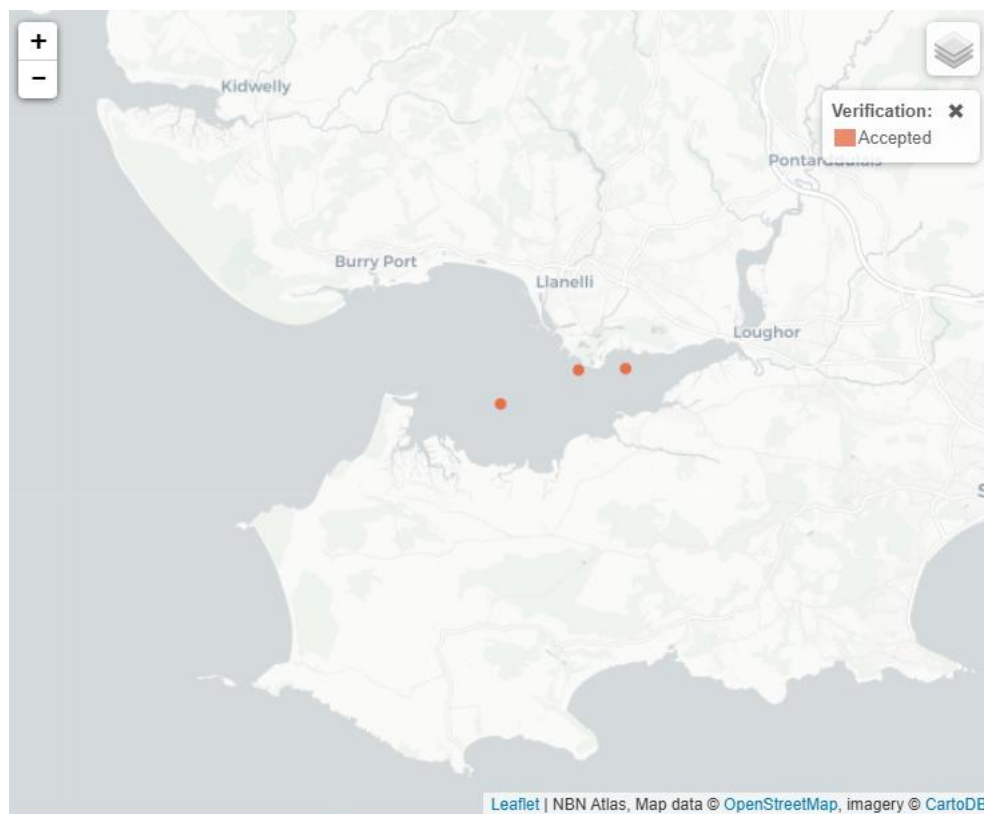


Figure 12. Distribution of previous records for the non-native red alga *Agarophyton vermiculophyllum* in the Burry Inlet. See [NBN](#) for further information on species records.

## 5.4 Bird Food Resource

Survey results indicate that sediment habitats within the Zone of Influence for the Dredge Channel, Transport Area and majority of the Burry Port East Beach provide limited foraging value for specialist bivalve-feeding birds. A small number of sampling points along the southern edge of the Transport Area supported cockles at a low density of <20 individuals per m<sup>2</sup>. The extent of *C. edule* in this area was localised and limited in extent.

Comparatively higher numbers of *C. edule* were recorded in the mid to lower shore at the east end of Burry Port East Beach in an area of fine sands. The majority of this occurrence of *C. edule* was within the 100m buffer zone outside the proposed dredge disposal footprint.

The low numbers of *Macromangulus tenuis* (thin tellin) indicate that this species is likely to contribute only marginally to overall bivalve prey availability.

## Appendix 1 – OSGB Co-ordinates for Burry Port Harbour Dredge and Deposit Areas

| Approach Channel Dredging Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Outer Harbour Dredging Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Burry Port East Beach Deposit Area                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The dredging area for the Approach Channel is defined by the following OSGB coordinates (eastings and northings):</p> <ul style="list-style-type: none"> <li>• 244520.56 200157.90</li> <li>• 244545.14 200153.24</li> <li>• 244524.70 200134.93</li> <li>• 244508.89 200120.62</li> <li>• 244507.38 200114.22</li> <li>• 244507.94 200108.14</li> <li>• 244519.95 200095.29</li> <li>• 244600.71 199641.94</li> <li>• 244535.55 199629.91</li> <li>• 244475.91 199949.68</li> <li>• 244468.68 200011.92</li> <li>• 244474.90 200027.24</li> <li>• 244465.37 200052.93</li> <li>• 244454.60 200110.50</li> <li>• 244447.97 200158.55</li> <li>• 244520.56 200157.90</li> </ul> | <p>The dredging area for the Outer Harbour is defined by the following OSGB coordinates (eastings and northings):</p> <ul style="list-style-type: none"> <li>• 244559.42 200167.38</li> <li>• 244448.71 200167.38</li> <li>• 244444.94 200234.41</li> <li>• 244448.33 200300.31</li> <li>• 244453.98 200354.91</li> <li>• 244463.40 200401.98</li> <li>• 244471.68 200428.72</li> <li>• 244499.92 200427.21</li> <li>• 244507.83 200413.66</li> <li>• 244526.28 200415.54</li> <li>• 244538.71 200423.07</li> <li>• 244559.42 200423.07</li> <li>• 244572.22 200412.53</li> <li>• 244615.90 200398.97</li> <li>• 244641.51 200380.14</li> <li>• 244650.17 200365.08</li> <li>• 244644.52 200334.96</li> <li>• 244559.42 200167.38</li> </ul> | <p>The deposit area on Burry Port East Beach below mean high water on spring tides is defined by the following OSGB coordinates (eastings and northings):</p> <ul style="list-style-type: none"> <li>• 244982.42 200184.68</li> <li>• 245228.38 200216.14</li> <li>• 245505.80 200264.76</li> <li>• 245992.00 200240.45</li> <li>• 245987.71 200070.28</li> <li>• 244968.12 200008.79</li> <li>• 244982.42 200184.68</li> </ul> |

## Appendix 2 – Survey Details

|                          |                                                                                                                                                                            |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Survey Location:</b>  | Burry Port Marina, Approach Channel & Burry Port East Beach                                                                                                                |
| <b>Survey Type:</b>      | Foot Survey                                                                                                                                                                |
| <b>Surveyors:</b>        | Aethne Cooke (main surveyor)<br>Mike Camplin (health & safety companion)                                                                                                   |
| <b>Survey Equipment:</b> | Spade, 0.5mm sieve, bucket, specimen containers, mobile phone with uploaded geo-referenced sample grid, mobile charging pack, throw line, 1st aid kit, hand sanitiser, PPE |
| <b>Survey Day 1:</b>     | <b>4<sup>th</sup> March 2026</b>                                                                                                                                           |
| Weather                  | Sunny, light wind, 9-12° C                                                                                                                                                 |
| Time of Low Water        | 1319 hrs                                                                                                                                                                   |
| Height of Low Water      | 0.76m                                                                                                                                                                      |
| Survey Start Time        | 1000 hrs                                                                                                                                                                   |
| Survey Finish Time       | 1800 hrs                                                                                                                                                                   |
| Survey Impediment(s)     | None                                                                                                                                                                       |
| <b>Survey Day 2:</b>     | <b>5<sup>th</sup> March 2026</b>                                                                                                                                           |
| Weather                  | Cloudy, light wind, single light shower, 10-12° C                                                                                                                          |
| Time of Low Water        | 13:51                                                                                                                                                                      |
| Height of Low Water      | 0.83m                                                                                                                                                                      |
| Survey Start Time        | 1000 hrs                                                                                                                                                                   |
| Survey Finish Time       | 1800 hrs                                                                                                                                                                   |
| Survey Impediment(s)     | None                                                                                                                                                                       |

## Appendix 3 – Images taken at target note locations during Carmarthenshire County Council Phase 1 survey, (Aubrey, 2026)

TN 2



TN 3



TN 4



TN 5



TN 6



TN 7





## Appendix 4 – Survey Data

| Station No. | Easting | Northing | Char_Spp                       | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                                                   | Sed_type         | Biotope                | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|--------------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|------------------------------------------------------------------------------------------------------------|------------------|------------------------|--------------------|-------------------|
| 65          | 244450  | 200300   | Polychaete indet               |                            | 1              | 2        | 1         | 2       | 3          | E                   | Muddy fine sand with sand binding green filamentous alga.                                                  | Muddy fine sand  | LS.LMu.MEst            |                    |                   |
| 66          | 244450  | 200250   | Eurydice                       |                            | 1              | 1        | 2         | 2       | 3          | E                   | Muddy fine sloping sand with mud in anoxic layers.                                                         | Muddy fine sand  | LS.LSa.MoSa.AmSco.Eur  |                    |                   |
| 67          | 244465  | 200201   | Eurydice                       |                            | 3              | 2        | 4         | 1       | 1          | A                   | Rippled, firm medium sand with ripples on edge of channel.                                                 | Medium sand      | LS.LSa.MoSSa.AmSco.Eur |                    |                   |
| 83          | 244500  | 200400   | Hediste, Scrobicularia juves   |                            | 2              | 2        | 2         | 2       | 4          | A                   | Rippled muddy fine sand at edge of channel.                                                                | Muddy fine sand  | LS.LMu.MEst.HedMacScr  |                    |                   |
| 84          | 244500  | 200350   | Eurydice, Polychaetes          |                            | 2              | 2        | 3         | 2       | 2          | A                   | Muddy fine sand on edge of aerated sand bank.                                                              | Muddy fine sand  | LS.LSa.MoSsa.AmSco.Eur |                    |                   |
| 85          | 244500  | 200300   | Eurydice, Nephtys, Polychaetes |                            | 2              | 2        | 3         | 2       | 2          | A                   | Rippled muddy fine sand.                                                                                   | Muddy fine sand  | LS.LSa.MoSsa.AmSco.Eur |                    |                   |
| 86          | 244500  | 200250   | Eurydice, Bathyporeia          |                            | 3              | 2        | 4         | 1       | 2          | A                   | Rippled muddy fine sand with a surface veneer of mud. Diatom films in damp areas. Sand bank near entrance. | Muddy fine sand  | LS.LSa.MoSsa.AmSco.Eur |                    |                   |
| 87          | 244500  | 200200   | Eurydice                       |                            | 3              | 3        | 4         | 1       | 1          | A                   | Rippled medium fine sand. Well                                                                             | Medium fine sand | LS.LSa.MoSsa.AmSco.Eur |                    |                   |

| Station No. | Easting | Northing | Char_Spp                                    | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|---------------------------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|---------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
|             |         |          |                                             |                            |                |          |           |         |            |                     | drained, aerated and soft.                              |                  |                       |                    |                   |
| 89          | 244500  | 200100   | Eurydice                                    |                            | 2              | 2        | 5         | 1       | 1          | A                   | Rippled medium sand. Aerated and well drained.          | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 90          | 244500  | 200050   | Eurydice                                    |                            | 2              | 2        | 5         | 1       | 1          | A                   | Rippled medium sand. Aerated and well drained.          | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 91          | 244500  | 200000   | Eurydice, Bathyporeia, Scolelepis           |                            | 2              | 2        | 5         | 1       | 1          | A                   | Rippled medium sand. Aerated and well drained.          | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 92          | 244500  | 199950   | Eurydice                                    |                            | 2              | 2        | 4         | 1       | 1          | A                   | Rippled medium sand. Firm and well drained.             | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 93          | 244500  | 199900   | Erydice, Bathyporeia, Scolelepis            |                            | 1              | 1        | 4         | 1       | 1          | A                   | Rippled, firm medium sand. Adjacent to channel.         | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 94          | 244515  | 199849   | Eurydice, Bathyporeia, Haustorius           |                            | 2              | 2        | 4         | 1       | 1          | E                   | Rippled medium sand adjacent to channel.                | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 95          | 244500  | 199800   | Eurydice, Haustorius, Polychaete spp (fine) |                            | 2              | 2        | 4         | 1       | 1          | E                   | Rippled medium sand adjacent to channel.                | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 96          | 244500  | 199750   | Eurydice                                    |                            | 2              | 2        | 5         | 1       | 1          | B                   | Rippled medium fine sand in sand waves.                 | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 98          | 244500  | 199650   | Haustorius                                  |                            | 4              | 2        | 5         | 1       | 1          | B                   | Rippled medium fine sand in sand waves.                 | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 105         | 244550  | 200300   | Hediste, Scrobicularia, Peringia            |                            | 2              | 4        | 1         | 1       | 4          | A                   | Mud. Abundant Hediste, Scrobicularia and feeding marks. | Mud              | LS.LMu.MEst.HedMacScr |                    |                   |

| Station No. | Easting | Northing | Char_Spp                                                       | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                          | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|----------------------------------------------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|-----------------------------------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 107         | 244550  | 200200   | Bathyporeia, Polychaete sp.                                    |                            | 2              | 3        | 3         | 2       | 1          | A                   | Muddy fine sand on top of sand bank. Aerated with surface mud patches.            | Muddy fine sand  | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 109         | 244550  | 200100   | Eurydice, Bathyporeia                                          |                            | 3              | 3        | 3         | 1       | 2          | A                   | Rippled medium fine sand with standing water.                                     | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 112         | 244550  | 199950   | Eurydice, Polychaete tubes                                     |                            | 2              | 1        | 3         | 1       | 1          | B                   | Rippled, firm medium fine sand near channel. Well drained.                        | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 113         | 244550  | 199900   | Eurydice, Scolelepis                                           |                            | 2              | 1        | 3         | 1       | 1          | B                   | Rippled, firm medium fine sand near channel. Well drained.                        | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 114         | 244550  | 199850   | Eurydice, Bathyporeia, Scolelepis, Polychaete spp              |                            | 2              | 1        | 2         | 1       | 1          | A                   | Slightly rippled medium fine sand near channel.                                   | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 118         | 244550  | 199650   | Barren                                                         |                            | 3              | 2        | 4         | 1       | 1          | B                   | Rippled fine sand adjacent to sand waves and channel.                             | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 119         | 244550  | 199600   | Eurydice                                                       |                            | 4              | 2        | 4         | 1       | 1          | B                   | Rippled fine sand on edge of sand waves.                                          | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 120         | 244550  | 199550   | Barren                                                         |                            | 4              | 2        | 5         | 1       | 1          | B                   | Rippled medium fine sand with sand waves.                                         | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 124         | 244600  | 200350   | Hediste, Scrobicularia, Peringia, Agarophyton vermiculophyllum |                            | 1              | 4        | 1         | 1       | 4          | A                   | Mud with with abundant burrows and siphon marks and Agarophyton vermiculophyllum. | Mud              | LS.LMu.MEst.HedMacScr |                    |                   |

| Station No. | Easting | Northing | Char_Spp                                                                       | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                                   | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|--------------------------------------------------------------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|--------------------------------------------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 125         | 244600  | 200300   | Hediste, Scrobicularia, Peringia, Arenicola (x1), Agarophyton vermiculophyllum |                            | 1              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks.                                                | Mud              | LS.LMu.MEst.HedMacScr |                    |                   |
| 126         | 244600  | 200250   | Hediste, Scrobicularia, Peringia                                               |                            | 1              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks.                                                | Mud              | LS.LMu.MEst.HedMacScr |                    |                   |
| 128         | 244600  | 200150   | Eurydice                                                                       |                            | 1              | 1        | 3         | 1       | 2          | N                   | Firm medium sand.                                                                          | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 132         | 244600  | 199950   | Eurydice                                                                       |                            | 2              | 2        | 3         | 1       | 1          | B                   | Rippled medium fine sand with standing water.                                              | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 134         | 244600  | 199850   | Eurydice                                                                       |                            | 1              | 1        | 3         | 1       | 1          | B                   | Flat, firm medium sand. Well drained adjacent to channel.                                  | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 135         | 244600  | 199800   | Barren                                                                         |                            | 2              | 2        | 4         | 1       | 1          | B                   | Rippled medium fine sand with standing water and adjacent to channel.                      | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 136         | 244600  | 199750   | Bathyporeia                                                                    |                            | 3              | 2        | 4         | 1       | 1          | B                   | Rippled medium fine sand with standing water. Adjacent to drainage channel and sand waves. | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 137         | 244600  | 199700   | Bathyporeia                                                                    |                            | 3              | 1        | 4         | 1       | 1          | B                   | Rippled medium fine sand with sand waves.                                                  | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 138         | 244600  | 199650   | Bathyporeia                                                                    |                            | 2              | 2        | 3         | 1       | 1          | B                   | Rippled fine sand with standing water and drainage channels.                               | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |

| Station No. | Easting | Northing | Char_Spp                      | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                       | Sed_type    | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|-------------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|--------------------------------------------------------------------------------|-------------|-----------------------|--------------------|-------------------|
| 139         | 244600  | 199600   | Barren                        |                            | 2              | 2        | 3         | 1       | 1          | B                   | Rippled fine sand with standing water and drainage channels.                   | Fine sand   | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 140         | 244600  | 199550   | Barren                        |                            | 4              | 2        | 5         | 1       | 1          | B                   | Fine sand with sand waves.                                                     | Fine sand   | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 148         | 244650  | 200150   | Eurydice                      |                            | 1              | 1        | 3         | 1       | 1          | N                   | Flat, firm medium sand adjacent to rip rap.                                    | Medium sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 158         | 244650  | 199650   | Bathyporeia, Nephtys          |                            | 2              | 2        | 3         | 1       | 1          | N                   | Rippled fine sand with standing water and drainage channels.                   | Fine sand   | LS.LSa.FiSa.Po        |                    |                   |
| 159         | 244650  | 199600   | Barren                        |                            | 2              | 1        | 3         | 1       | 1          | N                   | Rippled, channelled firm sand.                                                 | Fine sand   | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 160         | 244650  | 199550   | Barren                        |                            | 2              | 2        | 4         | 1       | 1          | B                   | Rippled fine sand with drainage channels.                                      | Fine sand   | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 168         | 244701  | 200146   | Barren                        |                            | 1              | 1        | 3         | 1       | 1          | N                   | Flat, firm medium sand adjacent to rip rap.                                    | Medium sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 172         | 244717  | 199969   | Eurydice, Polychaete tubes    |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water. Positions shifted due to tide.          | Fine sand   | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 174         | 244700  | 199850   | Bathyporeia, Nephtys          |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled, thixotropic fine sand with standing water and surface organic debris. | Fine sand   | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 175         | 244700  | 199800   | Bathyporeia, Polychaete tubes |                            | 2              | 2        | 3         | 1       | 1          | B                   | Rippled fine sand adjacent to sand waves.                                      | Fine sand   | LS.LSa.MoSa.AmSco.Eur |                    |                   |



| Station No. | Easting | Northing | Char_Spp                | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                            | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|-------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|-------------------------------------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 176         | 244700  | 199750   | Nephtys                 |                            | 2              | 2        | 4         | 1       | 1          | B                   | Rippled fine sand with standing water and drainage channels adjacent to sand waves. | Fine sand        | LS.LSa.FiSa.Po        |                    |                   |
| 177         | 244700  | 199700   | Bathyporeia, Nephtys    |                            | 2              | 2        | 2         | 1       | 1          | B                   | Rippled fine sand adjacent to sand waves.                                           | Fine sand        | LS.LSa.FiSa.Po        |                    |                   |
| 178         | 244700  | 199650   | Nephtys                 |                            | 2              | 2        | 3         | 1       | 1          | B                   | Rippled fine sand with standing water and drainage channels.                        | Fine sand        | LS.LSa.FiSa.Po        |                    |                   |
| 179         | 244700  | 199600   | Barren                  |                            | 2              | 2        | 3         | 1       | 1          | B                   | Rippled fine sand with drainage channels.                                           | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 188         | 244748  | 200139   | Eurydice, Scolelepis    |                            | 1              | 2        | 3         | 1       | 1          | N                   | Flat, firm medium sand adjacent to rip rap.                                         | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 197         | 244750  | 199700   | Bathyporeia, Nephtys    |                            | 2              | 2        | 2         | 1       | 2          | N                   | Rippled muddy fine sand with standing water. Localised redox present.               | Muddy fine sand  | LS.LSa.FiSa.Po        |                    |                   |
| 198         | 244750  | 199650   | Bathyporeia             |                            | 2              | 2        | 3         | 1       | 1          | N                   | Rippled fine sand with standing water and drainage channels.                        | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 209         | 244800  | 200100   | Bathyporeia, Scolelepis |                            | 3              | 2        | 3         | 1       | 1          | N                   | Rippled medium fine sand with amphipods and burrows.                                | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |

| Station No. | Easting | Northing | Char_Spp                                          | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                              | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|---------------------------------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|-----------------------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 210         | 244800  | 200050   | Eurydice, Nephtys, Polychaete tubes               |                            | 2              | 2        | 3         | 1       | 1          | N                   | Rippled medium fine sand with standing water.                         | Medium fine sand | LS.LSa.FiSa.Po        |                    |                   |
| 214         | 244800  | 199850   | Eurydice                                          |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water and surface organic debris.     | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 215         | 244800  | 199800   | Bathyporeia                                       |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water and drainage channels.          | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 216         | 244800  | 199750   | Eurydice, Nephtys                                 |                            | 2              | 2        | 2         | 1       | 2          | N                   | Rippled muddy fine sand with standing water. Muddy layer @10cm.       | Muddy fine sand  | LS.LSa.FiSa.Po        |                    |                   |
| 217         | 244800  | 199700   | Eurydice, Bathyporeia, Nephtys                    |                            | 2              | 2        | 2         | 1       | 1          | N                   | Flat fine sand with standing water. Drainage channel slight rippling. | Fine sand        | LS.LSa.FiSa.Po        |                    |                   |
| 229         | 244850  | 200100   | Eurydice, Bathyporeia, Scolelepis                 |                            | 1              | 2        | 3         | 1       | 1          | N                   | Flat, firm medium sand adjacent to rip rap.                           | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 235         | 244850  | 199800   | Bathyporeia, Haustorius, Scolelepis, Macomangulus | Macomangulus x 2 in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled, thixotropic fine sand with standing water.                   | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    | 8                 |
| 249         | 244900  | 200091   | Eurydice                                          |                            | 1              | 1        | 3         | 1       | 1          | N                   | Flat, firm sloping medium sand.                                       | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 250         | 244900  | 200050   | Eurydice, Bathyporeia                             |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled, thixotropic fine sand with standing water.                   | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 251         | 244900  | 200000   | Eurydice, Nephtys, Polychaete tubes, Macomangulus | Macomangulus x 2 in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled, thixotropic fine                                             | Fine sand        | LS.LSa.FiSa.Po        |                    | 8                 |

| Station No. | Easting | Northing | Char_Spp                                                  | Bivalve numbers per 0.25m2                             | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                     | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|-----------------------------------------------------------|--------------------------------------------------------|----------------|----------|-----------|---------|------------|---------------------|--------------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
|             |         |          |                                                           |                                                        |                |          |           |         |            |                     | sand with standing water.                                    |                  |                       |                    |                   |
| 252         | 244900  | 199950   | Eurydice, Nephtys, Polychaete tubes, Cerastoderma         | Cerastoderma x 3 in 0.25m2                             | 2              | 2        | 2         | 1       | 1          | N                   | Rippled, thixotropic fine sand with standing water.          | Fine sand        | LS.LSa.FiSa.Po        | 12                 |                   |
| 253         | 244900  | 199900   | Bathyporeia, Nephtys, Polychaete tubes                    |                                                        | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                       | Fine sand        | LS.LSa.FiSa.Po        |                    |                   |
| 254         | 244900  | 199850   | Lanice, Polychaete tubes, Macomangulus, Cerastoderma      | Cerastoderma x5 (3cm), Macomangulus x1 (2cm) in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water and drainage channels. | Fine sand        | LS.LSa.FiSa.Po        | 20                 | 4                 |
| 255         | 244900  | 199800   | Nephtys, Scolelepis                                       |                                                        | 2              | 1        | 2         | 1       | 1          | N                   | Rippled fine sand. Standing water nearby.                    | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 274         | 244950  | 199850   | Eurydice, Nephtys, Macomangulus                           | Macomangulus x1 in 0.25m2                              | 2              | 2        | 2         | 1       | 1          | N                   | Rippled, well drained fine sand.                             | Fine sand        | LS.LSa.FiSa.Po        |                    | 4                 |
| 288         | 245000  | 200150   | Eurydice                                                  |                                                        | 1              | 1        | 3         | 1       | 1          | N                   | Flat, firm medium sand.                                      | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 292         | 245000  | 199950   | Eurydice, Nephtys, Lanice, Polychaete tubes, Cerastoderma | Cerastoderma x1 in 0.25m2                              | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                       | Fine sand        | LS.LSa.FiSa.Po        | 4                  |                   |
| 293         | 245000  | 199900   | Bathyporeia, Nephtys                                      |                                                        | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                       | Fine sand        | LS.LSa.FiSa.Po        |                    |                   |
| 328         | 245100  | 200150   | Bathyporeia, Haustorius                                   |                                                        | 1              | 2        | 2         | 1       | 1          | N                   | Flat, firm medium fine sand.                                 | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 330         | 245100  | 200050   | Eurydice, Bathyporeia                                     |                                                        | 2              | 2        | 2         | 1       | 1          | N                   | Rippled medium fine sand with standing water.                | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 332         | 245100  | 199950   | Nephtys, Polychaete tubes                                 |                                                        | 2              | 2        | 3         | 1       | 1          | N                   | Rippled medium sand. Well drained.                           | Medium sand      | LS.LSa.FiSa.Po        |                    |                   |

| Station No. | Easting | Northing | Char_Spp                                        | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                     | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|-------------------------------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|----------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 368         | 245200  | 200150   | Eurydice, Bathyporeia                           |                            | 1              | 2        | 2         | 1       | 1          | N                   | Flat, medium fine sand.                      | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 370         | 245200  | 200050   | Eurydice, Bathyporeia, Nephtys                  |                            | 1              | 1        | 2         | 1       | 1          | N                   | Flat, firm medium fine sand.                 | Medium fine sand | LS.LSa.FiSa.Po        |                    |                   |
| 371         | 245200  | 200000   | Bathyporeia, Nephtys, Polychaete tubes          |                            | 2              | 2        | 3         | 1       | 1          | N                   | Rippled medium sand, well drained.           | Medium sand      | LS.LSa.FiSa.Po        |                    |                   |
| 408         | 245300  | 200150   | Eurydice, Bathyporeia                           |                            | 1              | 2        | 2         | 1       | 1          | N                   | Flat, medium fine sand.                      | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 410         | 245300  | 200050   | Scolecipis                                      |                            | 1              | 1        | 2         | 1       | 1          | N                   | Flat, firm medium sand, well drained.        | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 447         | 245400  | 200200   | Eurydice, Bathyporeia                           |                            | 1              | 2        | 3         | 1       | 1          | N                   | Flat medium sand, well drained.              | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 448         | 245400  | 200150   | Eurydice, Bathyporeia                           |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.       | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 450         | 245400  | 200050   | Nephtys, Polychaete tubes                       |                            | 1              | 1        | 2         | 1       | 1          | N                   | Firm medium sand. Well drained.              | Medium sand      | LS.LSa.FiSa.Po        |                    |                   |
| 451         | 245400  | 200000   | Scolecipis                                      |                            | 2              | 1        | 2         | 1       | 1          | N                   | Rippled medium sand.                         | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 452         | 245400  | 199950   | Eurydice, Scolecipis, Macomangulus              | Macomangulus x 1 in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled medium fine sand with standing water | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    | 4                 |
| 487         | 245500  | 200200   | Eurydice, Bathyporeia                           |                            | 1              | 1        | 2         | 1       | 1          | N                   | Flat, firm medium sand.                      | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 488         | 245500  | 200150   | Eurydice, Scolecipis                            |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand.                           | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 489         | 245500  | 200100   | Eurydice, Bathyporeia, Scolecipis               |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.       | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 490         | 245500  | 200050   | Eurydice, Bathyporeia, Scolecipis, Macomangulus | Macomangulus x 1 in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.       | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    | 4                 |

| Station No. | Easting | Northing | Char_Spp                                     | Bivalve numbers per 0.25m2                                | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                                   | Sed_type          | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|----------------------------------------------|-----------------------------------------------------------|----------------|----------|-----------|---------|------------|---------------------|--------------------------------------------------------------------------------------------|-------------------|-----------------------|--------------------|-------------------|
| 491         | 245500  | 200000   | Bathyporeia                                  |                                                           | 2              | 1        | 2         | 1       | 1          | N                   | Semi-rippled, well drained, medium fine firm sand.                                         | Medium fine sand  | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 492         | 245500  | 199950   | Eurydice, Bathyporeia, Nephtys, Cerastoderma | Cerastoderma x2 (1.1.5cm) per 0.25m2                      | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                                     | Fine sand         | LS.LSa.FiSa.Po        | 8                  |                   |
| 531         | 245600  | 200000   | Polychaete tubes                             |                                                           | 2              | 1        | 2         | 1       | 1          | N                   | Semi-rippled, firm medium sand. Well drained.                                              | Medium sand       | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 532         | 245600  | 199950   | Eurydice, Bathyporeia, Polychaete tubes      |                                                           | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                                     | Fine sand         | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 571         | 245700  | 200000   | Eurydice                                     |                                                           | 2              | 1        | 2         | 1       | 1          | N                   | Rippled medium sand. Well drained.                                                         | Medium sand       | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 572         | 245700  | 199950   | Eurydice, Macomangulus, Cerastoderma         | Macomangulus x1 (1.5cm), Cerastoderma x 1 (3cm) in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water. Above area of level aerated sand.                   | Fine sand         | LS.LSa.FiSa.Po        | 4                  | 4                 |
| 609         | 245800  | 200100   | Eurydice, Bathyporeia, Macomangulus          | Macomangulus x1 (1cm) in 0.25m                            | 2              | 2        | 3         | 1       | 1          | E                   | Rippled medium sand with standing water & large pool.                                      | Medium sand       | LS.LSa.MoSa.AmSco.Eur |                    | 4                 |
| 610         | 245800  | 200050   | Eurydice, Lanice, Scolelepis                 |                                                           | 2              | 1        | 2         | 1       | 1          | N                   | Rippled medium sand. Well drained.                                                         | Medium sand       | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 611         | 245800  | 200000   | Nephtys, Cerastoderma                        | Cerastoderma x 1 (3cm) in 0.25m2                          | 1              | 1        | 2         | 1       | 1          | N                   | Flat, firm medium fine sand.                                                               | Medium fine sand  | LS.LSa.FiSa.Po        | 4                  |                   |
| 647         | 245900  | 200200   | Barren                                       |                                                           | 3              | 1        | 2         | 5       | 2          | E                   | Mixed boulder, cobble, pebble and sand. Heavily sand scoured, almost barren. Rare mytilus. | Mixed hard ground | LS.LCS.Sh.BarSh       |                    |                   |

| Station No. | Easting | Northing | Char_Spp                                     | Bivalve numbers per 0.25m2                      | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                          | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|----------------------------------------------|-------------------------------------------------|----------------|----------|-----------|---------|------------|---------------------|-----------------------------------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 648         | 245900  | 200150   | Eurydice, Bathyporeia, Cerastoderma          | Cerastoderma x 1 (1-3cm) in 0.25m2              | 2              | 2        | 2         | 1       | 1          | N                   | Rippled, thixotropic fine sand with standing water and small invertebrate mounds. | Fine sand        | LS.LSa.MoSa.AmSco     | 4                  |                   |
| 649         | 245900  | 200100   | Eurydice, Bathyporeia, Nephtys, Cerastoderma | Cerastoderma x 3 (1cm) in 0.25m2                | 1              | 1        | 2         | 1       | 1          | N                   | Flat, firm medium sand.                                                           | Medium sand      | LS.LSa.FiSa.Po        | 12                 |                   |
| 650         | 245900  | 200050   | Nephtys, Cerastoderma                        | Cerastoderma x 2 (1-3cm), x 4 (1cm) in 0.25m2   | 2              | 1        | 2         | 1       | 1          | N                   | Rippled medium fine sand with standing water.                                     | Medium fine sand | LS.LSa.FiSa.Po        | 24                 |                   |
| 651         | 245900  | 200000   | Nephtys, Cerastoderma                        | Cerastoderma x 9 (1cm), x 1 (1-3cm) in 0.25m2   | 2              | 2        | 2         | 1       | 2          | N                   | Rippled fine sand with standing water                                             | Fine sand        | LS.LSa.MuSa.CerPo     | 40                 |                   |
| 688         | 246000  | 200150   | Eurydice, Bathyporeia                        |                                                 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                            | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 689         | 246000  | 200100   | Scolecipis, Nephtys, Cerastoderma            | Cerastoderma x 100 (1cm) in 0.25m2              | 2              | 2        | 2         | 1       | 2          | N                   | Rippled muddy fine sand with standing water.                                      | Muddy fine sand  | LS.LSa.MuSa.CerPo     | 400                |                   |
| 690         | 246000  | 200050   | Nephtys, Polychaete indet, Cerastoderma      | Cerastoderma x >1000(~1cm) in 0.25m2            | 2              | 2        | 2         | 1       | 2          | N                   | Rippled muddy fine sand with standing water.                                      | Muddy fine sand  | LS.LSa.MuSa.CerPo     | 4000               |                   |
| 691         | 246000  | 200000   | Nephtys, Cerastoderma                        | Cerastoderma x 69 (3cm), x 288 (~1cm) in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                            | Fine sand        | LS.LSa.MuSa.CerPo     | 1428               |                   |
| 707         | 246050  | 200200   | Eurydice, Bathyporeia                        |                                                 | 1              | 1        | 2         | 1       | 1          | N                   | Flat, firm medium sand overlying cobbles.                                         | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 708         | 246050  | 200150   | Eurydice, Bathyporeia, Nephtys               |                                                 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled medium fine sand with standing water.                                     | Medium fine sand | LS.LSa.FiSa.Po        |                    |                   |



| Station No. | Easting | Northing | Char_Spp                                | Bivalve numbers per 0.25m2            | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                     | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|-----------------------------------------|---------------------------------------|----------------|----------|-----------|---------|------------|---------------------|--------------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 709         | 246050  | 200100   | Nephtys, Cerastoderma                   | Cerastoderma x 45 in 0.25m2           | 2              | 2        | 2         | 1       | 3          | N                   | Rippled fine sand with standing water.                       | Fine sand        | LS.LSA.MuSa.CerPo     | 180                |                   |
| 710         | 246050  | 200050   | Polychaete indet, Cerastoderma          | Cerastoderma x 20 (3cm), x 222 (~1cm) | 2              | 2        | 2         | 1       | 3          | N                   | Rippled fine sand with standing water                        | Fine sand        | LS.LSA.MuSa.CerPo     | 968                |                   |
| 372a        | 245201  | 199889   | Eurydice, Bathyporeia                   |                                       | 2              | 2        | 2         | 1       | 2          | N                   | Rippled fine sand.                                           | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 532a        | 245598  | 199904   | Bathyporeia, Scolelepis                 |                                       | 2              | 3        | 3         | 1       | 1          | N                   | Rippled medium sand. Aerated and well drained.               | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 412a        | 245306  | 199899   | Eurydice, Nephtys                       |                                       | 2              | 2        | 2         | 1       | 2          | N                   | Rippled fine sand with standing water and drainage channels. | Fine sand        | LS.LSa.FiSa.Po        |                    |                   |
| 452a        | 245407  | 199898   | Eurydice, Nephtys                       |                                       | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                       | Fine sand        | LS.LSa.FiSa.Po        |                    |                   |
| 611a        | 245801  | 199947   | Nephtys, Cerastoderma                   | Cerastoderma x 23 in 0.25m2           | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                       | Fine sand        | LS.LSA.MuSa.CerPo     | 92                 |                   |
| 651a        | 245905  | 199954   | Nephtys, Cerastoderma                   | Cerastoderma >250 (~1cm) in 0.25m2    | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                       | Fine sand        | LS.LSA.MuSa.CerPo     | 1000               |                   |
| 691a        | 246006  | 199946   | Nephtys, Polychaete indet, Cerastoderma | Cerastoderma >1000 (~1cm) in 0.25m2   | 2              | 2        | 2         | 1       | 2          | A                   | Rippled fine sand.                                           | Fine sand        | LS.LSA.MuSa.CerPo     | 4000               |                   |
| 90a         | 244483  | 200052   | Eurydice, Bathyporeia, Scolelepis       |                                       | 2              | 2        | 4         | 1       | 1          | E                   | Rippled, firm medium sand in channel.                        | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 99          | 244506  | 199550   | Barren                                  |                                       | 4              | 2        | 5         | 1       | 1          | B                   | Rippled medium fine sand with sand waves.                    | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 100         | 244450  | 199649   | Nephtys                                 |                                       | 4              | 1        | 5         | 1       | 1          | B                   | Rippled medium fine sand with sand waves.                    | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |

| Station No. | Easting | Northing | Char_Spp                              | Bivalve numbers per 0.25m2                                   | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                     | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|---------------------------------------|--------------------------------------------------------------|----------------|----------|-----------|---------|------------|---------------------|------------------------------------------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 101         | 244436  | 199714   | Barren                                |                                                              | 4              | 2        | 5         | 1       | 1          | B                   | Rippled medium fine sand with sand waves, adjacent to main drainage channel. | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 102         | 244441  | 199760   | Nephtys                               |                                                              | 1              | 1        | 3         | 1       | 1          | B                   | Flat, firm medium fine sand with sand waves                                  | Medium fine sand | LS.LSa.FiSa.Po        |                    |                   |
| 103         | 244440  | 199804   | Bathyporeia, Scolelepis, Macomangulus | Macomangulus x 1 in 0.25m2                                   | 2              | 1        | 3         | 1       | 1          | B                   | Rippled medium fine sand. North of sand waves.                               | Medium fine sand | LS.LSa.FiSa.Po        |                    | 4                 |
| 332a        | 245103  | 199888   | Bathyporeia, Nephtys, Cerastoderma    | Cerastoderma x 3 (2cm) in 0.25m2                             | 1              | 1        | 2         | 1       | 1          | N                   | Flat, firm fine sand, well drained.                                          | Fine sand        | LS.LSa.FiSa.Po        | 12                 |                   |
| 712         | 245709  | 199907   | Nephtys, Cerastoderma, Macomangulus   | Cerastoderma x 30 (~1cm), Macomangulus x 1 (1.5cm) in 0.25m2 | 1              | 2        | 2         | 1       | 1          | N                   | Flat fine sand with draining water.                                          | Fine sand        | LS.LSa.MuSa.CerPo     | 120                | 4                 |
| 719         | 246106  | 199938   | Nephtys, Cerastoderma                 | Cerastoderma x 40 in 0.25m2                                  | 2              | 2        | 2         | 1       | 2          | N                   | Rippled fine sand with standing water                                        | Fine sand        | LS.LSa.MuSa.CerPo     | 160                |                   |
| 718         | 246102  | 199999   | Nephtys, Cerastoderma                 | Cerastoderma x 546 (~1cm), x 100 (1-3cm) in 0.25m2           | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                       | Fine sand        | LS.LSa.MuSa.CerPo     | 2584               |                   |
| 715         | 246103  | 200100   | Nephtys, Cerastoderma                 | Cerastoderma x 50 in 0.25m2                                  | 2              | 2        | 2         | 1       | 2          | N                   | Rippled fine sand with standing water                                        | Fine sand        | LS.LSa.MuSa.CerPo     | 200                |                   |
| 714         | 246104  | 200151   | Polychaete indet, Cerastoderma        | Cerastoderma x 20 (1-3cm), x 50 (~1cm)                       | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                       | Fine sand        | LS.LSa.MuSa.CerPo     | 280                |                   |
| 713         | 246104  | 200200   | Eurydice, Bathyporeia                 |                                                              | 1              | 1        | 2         | 1       | 1          | N                   | Flat medium sand with drainage channels. Well drained.                       | Medium sand      | LS.LSa.MoSa.AmSco.Eur |                    |                   |

| Station No. | Easting | Northing | Char_Spp                                                     | Bivalve numbers per 0.25m2   | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                    | Sed_type    | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|--------------------------------------------------------------|------------------------------|----------------|----------|-----------|---------|------------|---------------------|---------------------------------------------|-------------|-----------------------|--------------------|-------------------|
| 716         | 246103  | 200047   | Nephtys, Cerastoderma                                        | Cerastoderma x 500 in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.      | Fine sand   | LS.LSa.MuSa.CerPo     | 2000               |                   |
| 209a        | 244807  | 200136   | Barren                                                       |                              | 1              | 1        | 3         | 1       | 1          | N                   | Flat, firm medium sand adjacent to rip rap. | Medium sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 55          | 244569  | 200296   | Hediste, Scrobicularia, Peringia, Gracilaria vermiculophylla |                              | 2              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 56          | 244611  | 200299   | Hediste, Scrobicularia, Peringia                             |                              | 2              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 57          | 244605  | 200344   | Hediste, Scrobicularia, Peringia, Gracilaria vermiculophylla |                              | 2              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 58          | 244628  | 200348   | Hediste, Scrobicularia, Peringia, Gracilaria vermiculophylla |                              | 2              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 59          | 244634  | 200364   | Hediste, Scrobicularia, Peringia                             |                              | 2              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 60          | 244623  | 200368   | Hediste, Scrobicularia, Peringia, Gracilaria vermiculophylla |                              | 2              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 52          | 244605  | 200374   | Hediste, Scrobicularia, Peringia, Gracilaria vermiculophylla |                              | 1              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 61          | 244587  | 200376   | Hediste, Scrobicularia, Peringia                             |                              | 2              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 62          | 244572  | 200386   | Hediste, Scrobicularia, Peringia                             |                              | 2              | 4        | 1         | 1       | 4          | A                   | Mud with abundant burrows and siphon marks. | Mud         | LS.LMu.MEst.HedMacScr |                    |                   |
| 466a        | 245461  | 200223   | Talitrus                                                     |                              | 1              | 2        | 3         | 1       | 1          | N                   | Lower edge of LS.LSa.St.Tal                 | Medium sand | LS.LSa.St.Tal         |                    |                   |

| Station No. | Easting | Northing | Char_Spp                                | Bivalve numbers per 0.25m2                      | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                                                                   | Sed_type          | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|-----------------------------------------|-------------------------------------------------|----------------|----------|-----------|---------|------------|---------------------|--------------------------------------------------------------------------------------------|-------------------|-----------------------|--------------------|-------------------|
| 486a        | 245524  | 200234   | Talitrus                                |                                                 | 1              | 2        | 3         | 1       | 1          | N                   | Lower edge of LS.LSa.St.Tal                                                                | Medium sand       | LS.LSa.St.Tal         |                    |                   |
| 606         | 245827  | 200218   | Talitrus                                |                                                 | 1              | 2        | 3         | 1       | 1          | N                   | Lower edge of LS.LSa.St.Tal                                                                | Medium sand       | LS.LSa.St.Tal         |                    |                   |
| 586         | 245772  | 200218   | Talitrus                                |                                                 | 1              | 2        | 3         | 1       | 1          | N                   | Lower edge of LS.LSa.St.Tal                                                                | Medium sand       | LS.LSa.St.Tal         |                    |                   |
| 566         | 245722  | 200218   | Talitrus                                |                                                 | 1              | 2        | 3         | 1       | 1          | N                   | Lower edge of LS.LSa.St.Tal                                                                | Medium sand       | LS.LSa.St.Tal         |                    |                   |
| 526a        | 245612  | 200226   | Talitrus                                |                                                 | 1              | 2        | 3         | 1       | 1          | N                   | Lower edge of LS.LSa.St.Tal                                                                | Medium sand       | LS.LSa.St.Tal         |                    |                   |
| 648a        | 245900  | 200166   | Mytilus                                 | Mytilus approx 1-10 in 100m2                    | 4              | 1        | 2         | 5       | 2          | E                   | Mixed boulder, cobble, pebble and sand. Heavily sand scoured, almost barren. Rare mytilus. | Mixed hard ground | LS.LCS.Sh.BarSh       |                    |                   |
| 711         | 246050  | 200000   | Nephtys, Polychaete indet, Cerastoderma | Cerastoderma x 85 (3cm), x 449 (~1cm) in 0.25m2 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water                                                      | Fine sand         | LS.LSa.MuSa.CerPo     | 2136               |                   |
| 212         | 244800  | 199950   | Eurydice, Polychaete tubes              |                                                 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                                     | Fine sand         | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 130         | 244600  | 200050   | Eurydice, Bathyporeia, Polychaete tube  |                                                 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                                     | Fine sand         | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 170         | 244700  | 200050   | Eurydice, Polychaete tubes              |                                                 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.                                                     | Fine sand         | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 149         | 244650  | 200100   | Eurydice, Bathyporeia, Scolelepis       |                                                 | 3              | 3        | 3         | 1       | 2          | N                   | Rippled medium fine sand with standing water.                                              | Medium fine sand  | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 527         | 245600  | 200200   | Eurydice, Bathyporeia                   |                                                 | 1              | 1        | 2         | 1       | 1          | N                   | Flat, firm medium sand.                                                                    | Medium sand       | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 528         | 245600  | 200150   | Eurydice, Bathyporeia                   |                                                 | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand.                                                                         | Fine sand         | LS.LSa.MoSa.AmSco.Eur |                    |                   |

| Station No. | Easting | Northing | Char_Spp                          | Bivalve numbers per 0.25m2 | Surface Relief | Firmness | Stability | Sorting | Dark Layer | Accretion / Erosion | Comments                                      | Sed_type         | Biotope               | No. cockles per m2 | no. tellin per m2 |
|-------------|---------|----------|-----------------------------------|----------------------------|----------------|----------|-----------|---------|------------|---------------------|-----------------------------------------------|------------------|-----------------------|--------------------|-------------------|
| 529         | 245600  | 200100   | Eurydice, Bathyporeia, Scolelepis |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water         | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 530         | 245600  | 200050   | Eurydice, Bathyporeia, Scolelepis |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.        | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 568         | 245700  | 200150   | Eurydice, Bathyporeia             |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand.                            | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 608         | 245800  | 200150   | Eurydice, Bathyporeia             |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water         | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 569         | 245700  | 200100   | Eurydice, Bathyporeia, Scolelepis |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water.        | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 570         | 245700  | 200050   | Eurydice, Scolelepis              |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled medium fine sand.                     | Medium fine sand | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 290         | 245000  | 200050   | Eurydice, Bathyporeia             |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled fine sand with standing water         | Fine sand        | LS.LSa.MoSa.AmSco.Eur |                    |                   |
| 412         | 245300  | 199950   | Eurydice, Nephtys                 |                            | 2              | 2        | 2         | 1       | 1          | N                   | Rippled medium fine sand with standing water. | Medium fine sand | LS.LSa.FiSa.Po        |                    |                   |

## Appendix 5 – Species and Biotopes Recorded

### Species associated with sediment biotopes:

Scolecopsis sp.  
Nephtys sp.  
Arenicola marina  
Lanice conchilega  
Polychaeta (indet.)

Bathyporeia sp.  
Haustorius arenarius  
Amphipoda (indet)  
Eurydice pulchra

Cerastoderma edule  
Macomangulus tenuis  
Mytilus edulis  
Acteon tornatilis

Green algae (indet.)  
*Agarophyton vermiculophyllum*

### Sediment Biotopes recorded:

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| LS.LSa.St.Tal         | Talitrids on the upper shore and strand-line                |
| LS.LSa.MoSa.BarSa     | Barren littoral coarse sand                                 |
| LS.LCS.Sh.BarSh       | Barren littoral shingle                                     |
| LS.LSa.MoSa.AmSco     | Amphipods and Scolecopsis spp. in littoral medium-fine sand |
| LS.LSa.MoSa.AmSco.Eur | Eurydice pulchra in littoral mobile sand                    |
| LS.LSa.FiSa.Po        | Polychaetes in littoral fine sand                           |
| LS.LSa.MuSa.CerPo     | Cerastoderma edule and polychaetes in littoral muddy sand   |
| LS.LMu.MEst.HedMacScr | Polychaete/bivalve-dominated mid estuarine mud shores       |
| LS.LMu.Mest           | Polychaete/bivalve-dominated mid estuarine mud shores       |
| LS.LMu.UEst           | polychaete/oligochaete-dominated upper estuarine mud        |

## Appendix 6 – Examples of Site Imagery



*View of top of shore at eastern edge of Burry Port East Beach, 2026*



*View of sandy beach at eastern edge of Burry Port East Beach, 2026*



*Example of cockles recorded in sediment in buffer zone at east end of Burry Port East Beach.*



*Green algae on mud surface inside the Outer Harbour.*



*Soft mud with non-native red alga *Agarophyton vermiculophyllum* on mud surface.*



*Mobile sand waves at extreme low water to the south of the Approach Channel.*



*Macromangulus tenuis (thin tellin).*



*Medium sand at top of shore at east end of Burry Port East Beach.*



*Aerated medium sand inside the Outer Harbour.*



