

# **Terrestrial Ecology Technical Appendix 12.1 – 12.8 and 12.10**

## **12.0 Technical Appendix: Terrestrial Ecology**

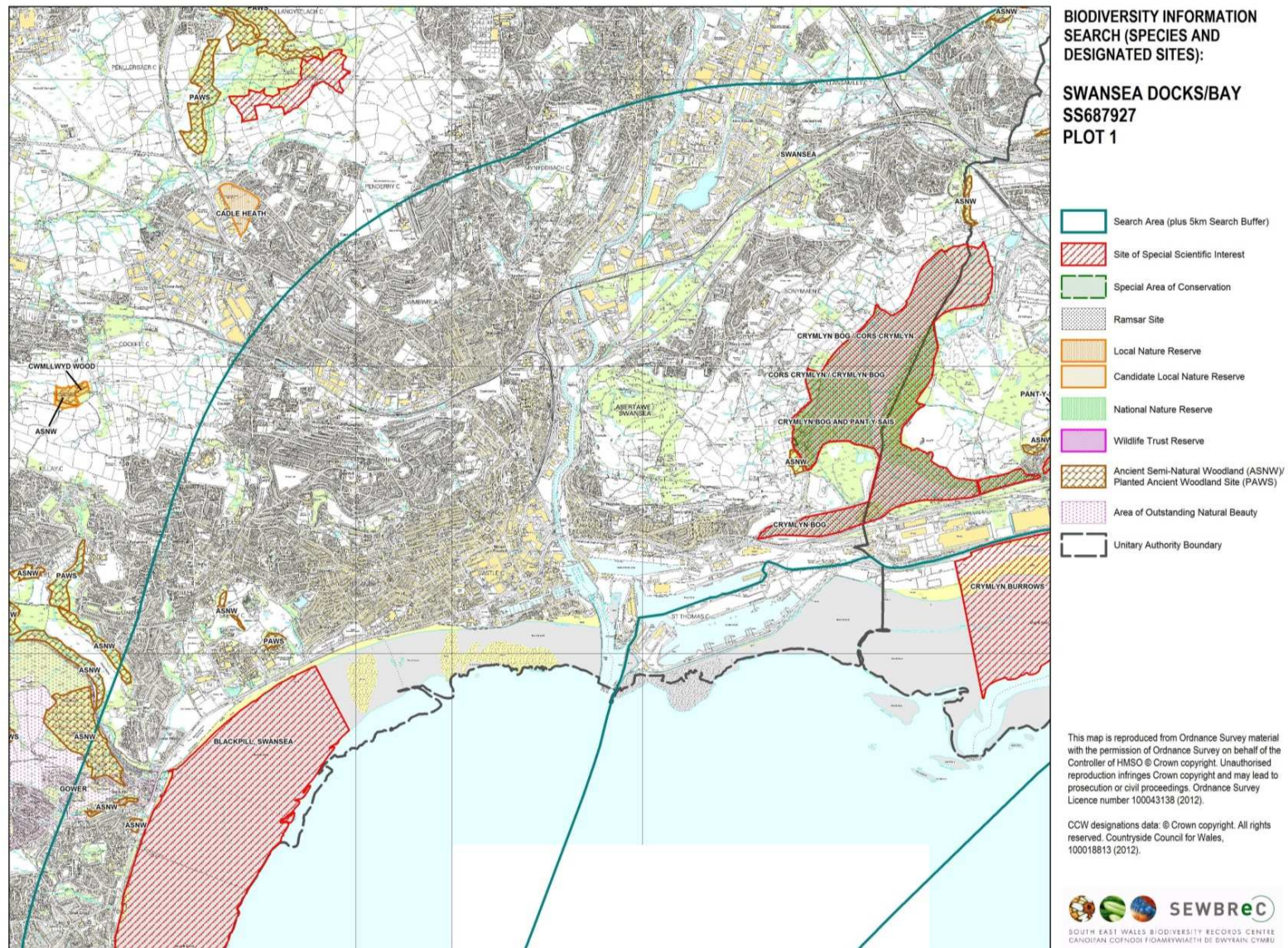
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12.0.0.1 This document of the Environmental Impact Assessment (EIA) provides background information referenced in Chapter 12: Terrestrial Ecology of the Environmental Statement (ES). Information relating to the following subject areas is included:

- 12.1: Desk study data (SEWBrEC)
- 12.2: Phase 1 Habitat Survey
- 12.3: Phase 2 Botany
- 12.4: Bats
- 12.5: Breeding Birds
- 12.6: Otters
- 12.7: Reptiles
- 12.8: Invertebrates
- 12.10: Citations for Designated Sites

### **12.1 Desk Study Data**

12.1.0.1 A formal data search for existing ecological information was commissioned from the South East Wales Biodiversity Records Centre (SEWBrEC) in November 2012. A search area within 2.5km of the Project was requested for protected or otherwise notable species and a 5km search area for designated sites. The DCO project boundary provided the basis for the search area.



**Figure 12.1.1 Biodiversity information search (species and designated sites): Swansea Docks/Bay. Plot 1.**



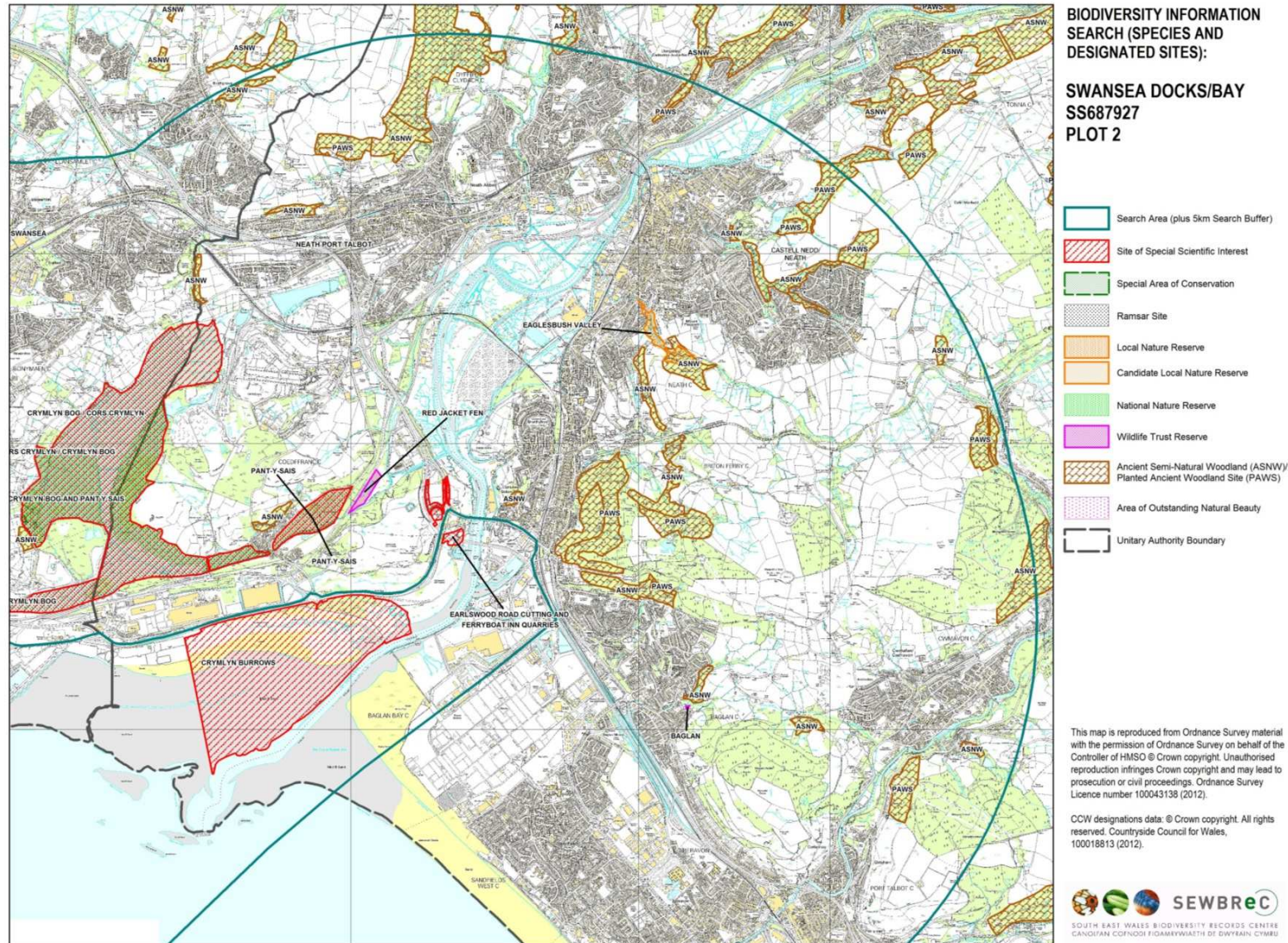
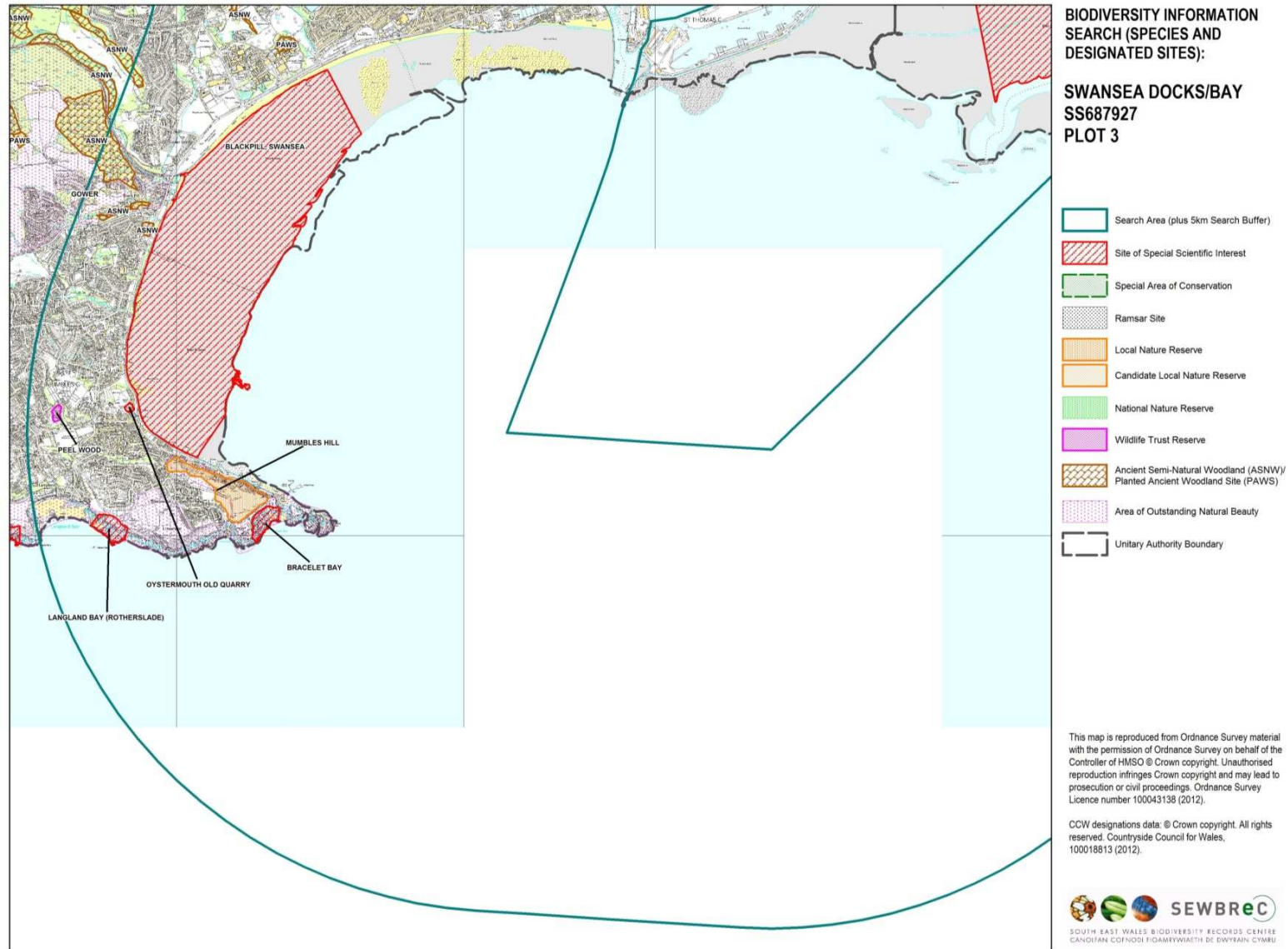
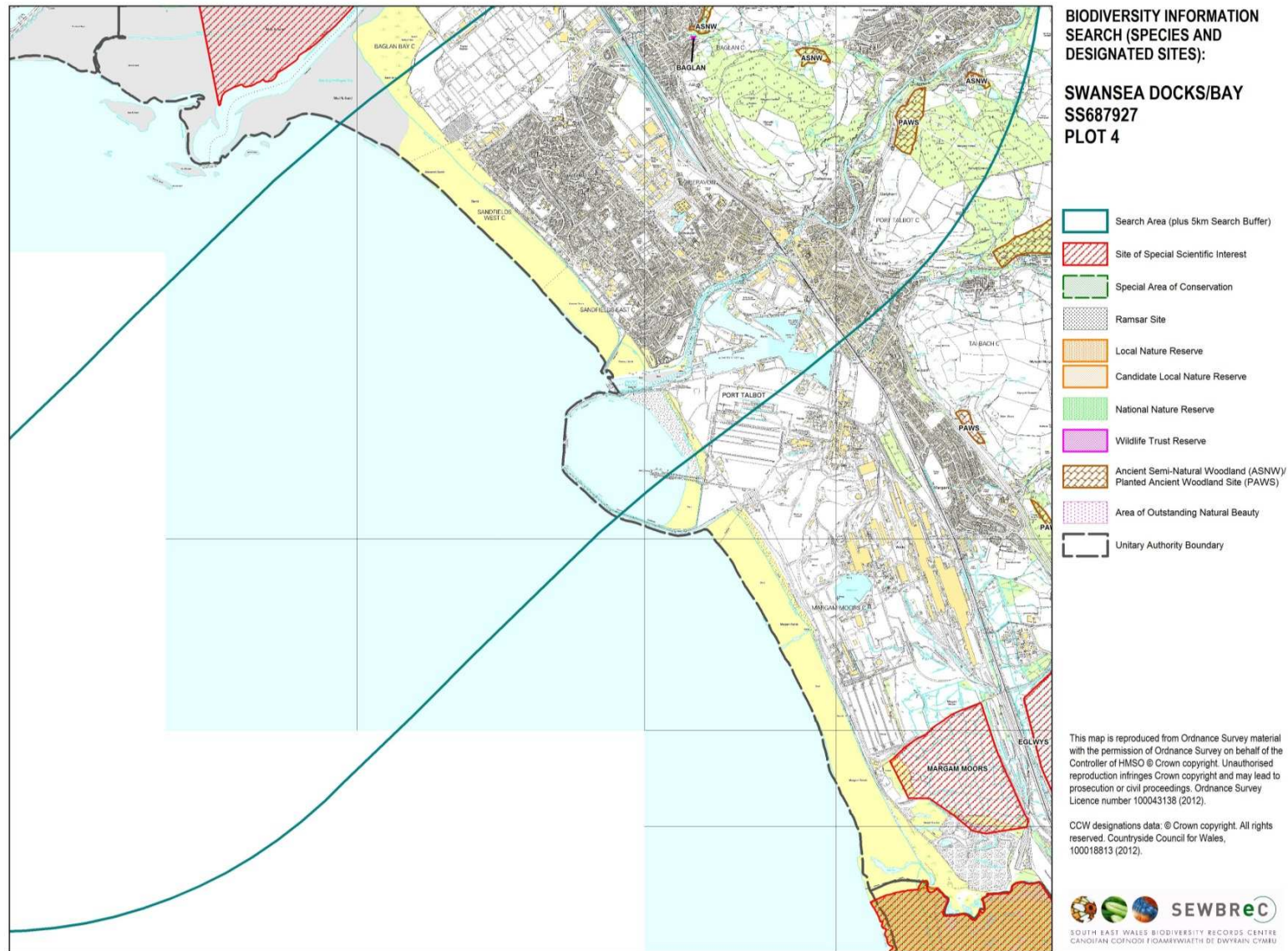


Figure 12.1.2 Biodiversity information search (species and designated sites): Swansea Docks/Bay. Plot 2.





**Figure 12.1.3 Biodiversity information search (species and designated sites): Swansea Docks/Bay. Plot 3.**



**Figure 12.1.4 Biodiversity information search (species and designated sites): Swansea Docks/Bay. Plot 4.**

## 12.2 Phase 1 Habitat Survey

12.2.0.1 An Extended Phase 1 Habitat Survey of the terrestrial elements of the Project was begun during site visits between 27<sup>th</sup> November 2012 and 9<sup>th</sup> January 2013. The results of the initial survey were updated following repeated visits to the site through the spring and summer of 2013. Standard habitat survey techniques were used (JNCC, 2010), with habitats and other features of ecological interest being mapped and described using target notes. Particular note was taken of protected and/or notable species (as well as the potential for them to occur) during site visits following the Institute of Environmental Assessment Guidelines (IEA, 1995).

12.2.0.2 Target notes and phase 1 habitat maps are provided below:

**Table 12.1 Phase 1 habitat survey target notes**

| Reference | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TN1       | Roadside embankment supporting Japanese Knotweed ( <i>Fallopia japonica</i> ) as well as Common Gorse ( <i>Ulex europaeus</i> ), Bramble ( <i>Rubus fruticosus</i> ), Butterfly-bush ( <i>Buddleja davidii</i> ) and tall herbs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| TN2       | Scrub dominated by Butterfly-bush and Bramble and including occasional plants of Japanese rose ( <i>Rosa rugosa</i> ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| TN3       | Concrete coastal defence wall largely devoid of vegetation on the seaward side but supporting Rock Sea-lavender ( <i>Limonium binervosum</i> ) and Sea-thrift ( <i>Armeria maritima</i> ) on the landward side. Immediately to the north of the sea wall compacted aggregate forms an area of hard-standing. During the winter months the hard-standing becomes waterlogged locally and supports a sward dominated by Stag's-horn Plantain ( <i>Plantago coronopus</i> ) and Rock Sea-lavender. Two muddy depressions within this area were found to support a colony of approximately eight plants of Oak-leaved Goosefoot ( <i>Chenopodium glaucum</i> ), a naturalised species known from very few sites in Wales.                                                                                                         |
| TN4       | Coastal grassland dominated Red Fescue ( <i>Festuca rubra</i> ) and largely enclosed within a concrete bund. Argentine Dock ( <i>Rumex frutescens</i> ), a non-native ruderal was discovered growing in the south-west corner of the plot. Parts of the northern and eastern fringes of the bund have become colonised by scrub vegetation dominated by Butterfly-bush and Bramble. A fox ( <i>Vulpes vulpes</i> ) den was found beneath Bramble during one of the early summer visits.                                                                                                                                                                                                                                                                                                                                       |
| TN5       | Derelict, modern steel-framed industrial building with a roof comprised of corrugated asbestos sheets. The fringes of the concrete yard have been colonised by cushions of Biting Stonecrop ( <i>Sedum acre</i> ) and occasionally Sand-hill Screw-moss ( <i>Syntrichia ruralis</i> subsp. <i>ruraliformis</i> ). Compacted aggregate and shallow depressions in the lee of the sea wall were found to support occasional saltmarsh species including Hard-grass ( <i>Parapholis strigosa</i> ), Common saltmarsh-grass ( <i>Puccinellia maritima</i> ) and Annual Sea-blight ( <i>Suaeda maritima</i> ).                                                                                                                                                                                                                     |
| TN6       | Semi-improved neutral grassland developing on an area of previously disturbed ground (a spoil mound partly hydro-seeded in 2002). The grass dominated sward was found to support patches of Common Bird's-foot-trefoil ( <i>Lotus corniculatus</i> ), Black Medick ( <i>Medicago lupulina</i> ), Restharrow ( <i>Ononis repens</i> ) and less frequently, Kidney Vetch ( <i>Anthyllis vulneraria</i> ). Towards the north of the plot a stony substrate was found to support plants of Fern-grass ( <i>Catapodium rigidum</i> ) and Yellow-wort ( <i>Blackstonia perfoliata</i> ) although the community became swamped by Black Medick by late summer. Butterfly-bush and willows have also begun to form stands at the northern edges. The habitat was considered suitable for reptiles but none were found during surveys. |
| TN7       | Jetty at the western end of Queens Dock frequented by Otter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |



| Reference | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TN8       | Pill box with a window providing Otters with potential coastal access through the sea wall. A tar spot found during a survey in April 2013 indicated that at least one Otter had visited this location. A colony of approximately thirty plants of Golden-samphire ( <i>Inula crithmoides</i> ) has colonised cracks in the concrete at the base of sea wall to the west of the pill box.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| TN9       | Brick-built industrial unit with an associated yard stacked full of miscellaneous materials including small boats and machinery.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| TN10      | Coastal grassland supporting Sharp Rush ( <i>Juncus acutus</i> ). The roadside grassland at this location was found to support Common Lizard ( <i>Zootoca vivipara</i> ) during reptile surveys in 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| TN11      | Quayside ground surfaced with an irregular coarse aggregate and sparse vegetation including seedlings of Butterfly-bush. A flock of twenty over-wintering Lapwing were recorded during a site visit (19/12/2012).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| TN12      | Coastal defences comprising rock armouring topped by a 2m concrete wall.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| TN13      | Grassland verge supporting Japanese Rose and occasional plants of Sharp Rush.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| TN14      | Area of hard-standing on the leeside of the sea wall supporting occasional tussocks of Long-bracted Sedge ( <i>Carex extensa</i> ) and Sea Couch ( <i>Elytrigia atherica</i> ). Plants of Rock Sea-lavender and very occasional Rock Samphire ( <i>Crithmum maritimum</i> ) are present within cracks of the sea wall.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| TN15      | Coastal grassland growing in the lee of the sea wall. The sward is dominated by Common Couch ( <i>Elytrigia repens</i> ) and Red Fescue with Restharrow and Yellow Rattle ( <i>Rhinanthus minor</i> ) present in less rank areas. Occasional sandy patches support Marram ( <i>Ammophila arenaria</i> ). Kidney Vetch is also present suggesting that the grassland may provide suitable habitat for Common Blue butterfly. Common Gorse scrub has become established along a significant length of the sea wall towards the north-east. In addition, three sections approximately 25-30m in length towards the north have been cleared and surfaced with compacted aggregate. The top-soil mounds from these areas support ruderals including Hedge Mustard ( <i>Sisymbrium officinale</i> ), Hoary Mustard ( <i>Hirschfeldia incana</i> ) and Wallflower Cabbage ( <i>Coincya monensis</i> ssp <i>cheiranthos</i> ). The habitat offers potential for breeding birds and invertebrates. Common Lizards were found to be present during reptile surveys in 2013. |
| TN16      | Former bunded pipe run now supporting stands of Common Reed ( <i>Phragmites australis</i> ) and developing scrub including Sea Buckthorn ( <i>Hippophae rhamnoides</i> ). Towards the north-east, brackish standing water supports sparse cover of Sea Club-rush ( <i>Bolboschoenus maritimus</i> ). However, much of this habitat has been modified by land remediation works in 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| TN17      | Disturbed and largely barren sandy ground resulting from remediation of the former BP tank farm. The area provides habitat suitable for ground nesting birds including Ringed Plover ( <i>Charadrius hiaticula</i> ). The area is likely to become colonised by opportunistic species including those associated with strandlines and sand dunes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| TN18      | Modified dune vegetation on a ridge of compacted aggregate above rock armouring formerly providing coastal protection for the BP tank farm. The vegetation includes some Marram and Red Fescue as well as opportunistic species such as Black Medick, Common Bird's-foot-trefoil and Intermediate Evening-primrose ( <i>Oenothera x fallax</i> ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| TN19      | Recently cleared ground formerly supporting a semi-improved coastal grassland community, tall herbs and Bramble. The ground has been colonised by ruderal species including Hoary Mustard and a recovering grassland community.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| TN20      | Derelict brown field land once housing a BP tank farm and associated buildings that is currently subject to remediation efforts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

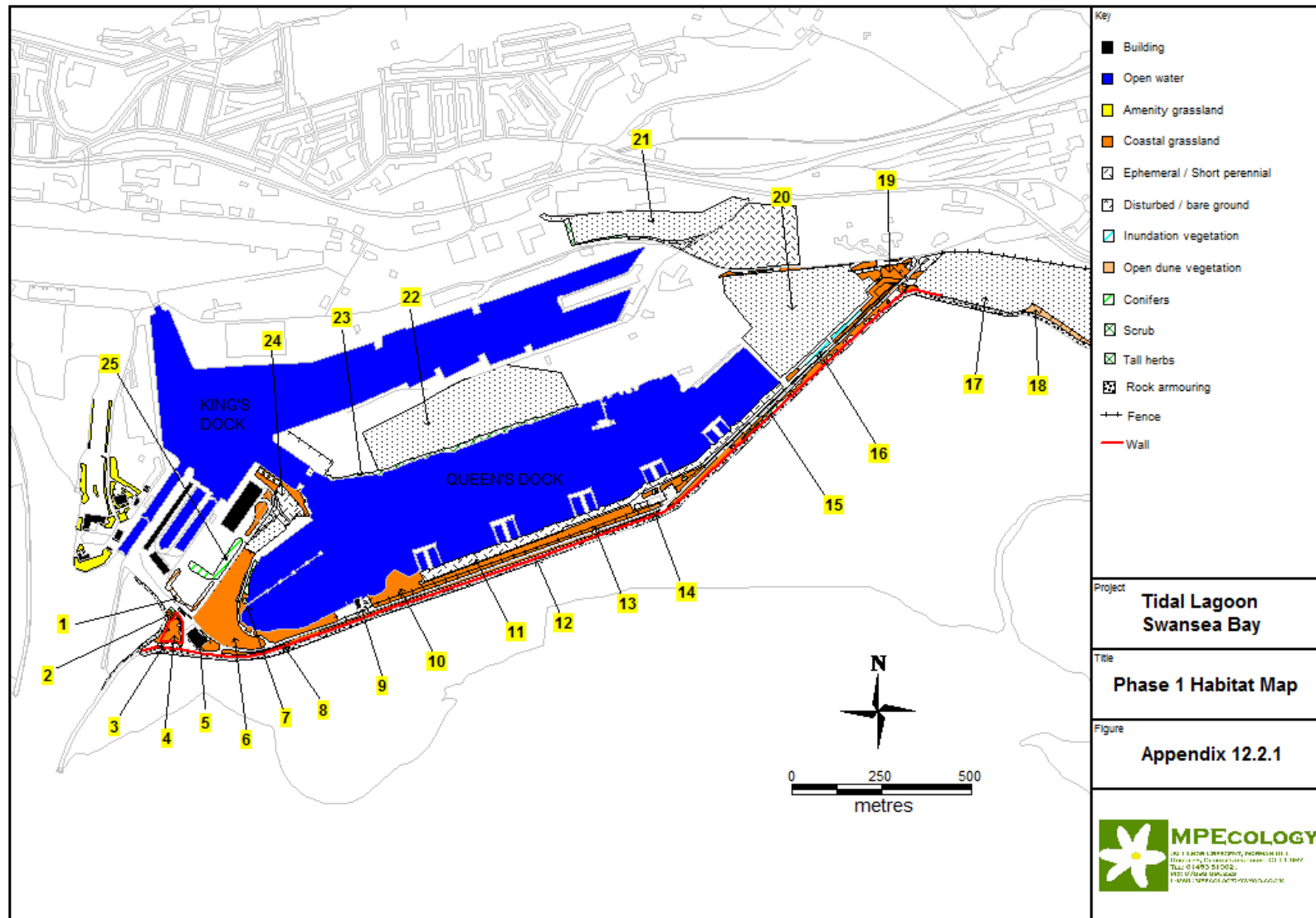


| Reference | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TN21      | Brown field land comprising a surface of coarse aggregate dotted with plants of Butterfly-bush. The area is known to support breeding Lapwing and Ringed Plover (two to three pairs of Lapwing ( <i>Vanellus vanellus</i> ) and one pair of Ringed Plover confirmed by surveys in 2013).                                                                                                                                                                                                                              |
| TN22      | Brown field land comprising a significant mound of spoil. The site is a working area and vegetation, consisting of ruderals, is only present at the periphery. The area appears likely to have supported breeding Lapwing and Ringed Plover (one pairs of Lapwing and one pair of Ringed Plover in 2013).                                                                                                                                                                                                             |
| TN23      | Northern edge of Queens Dock supporting a fringe of Japanese Knotweed which continues intermittently towards the east. Himalayan Balsam ( <i>Impatiens glandulifera</i> ) is also present locally.                                                                                                                                                                                                                                                                                                                    |
| TN24      | Derelict ground with abandoned shellfish or crustacean tanks. Areas between the tanks are surfaced with sand and gravel as well as sheets of black plastic. Ruderals and saplings of Gorse, Willow and Butterfly-bush have colonised. To the south lies an area of recently cleared ground. The area appears superficially suitable for reptiles and sections of black plastic sheeting were lifted during survey visits although no reptiles were found.                                                             |
| TN25      | Landscape screening comprising tall cover of Leyland Cypress ( <i>X Cupressocyparis leylandii</i> ).                                                                                                                                                                                                                                                                                                                                                                                                                  |
| TN26      | Swansea University Bay Campus under construction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| TN27      | Japanese Knotweed stands at the fringes of Crymlyn Burrows SSSI. This area is currently undergoing remediation / development as it forms the new entrance to the Swansea University Bay Campus.                                                                                                                                                                                                                                                                                                                       |
| TN28      | Location of a large stand of Dutch Rush ( <i>Equisetum hymale</i> ) at the northern boundary of Crymlyn Burrows SSSI. A stand of Sea Buckthorn is also present to the east.                                                                                                                                                                                                                                                                                                                                           |
| TN29      | Roadside grassland and NPTCBC Conservation Verge on the southern border of the A483 Fabian Way. The grassland is of varying quality, some areas supporting species-rich grassland and others an improved species-poor sward.                                                                                                                                                                                                                                                                                          |
| TN30      | Fixed dune grassland including a ridge which forms a transition zone between dune to the north and saltmarsh to the south. Historically, this part of Crymlyn Burrows has been used as a pipe route and only in recent years has disturbance discontinued. A track formerly used by motor vehicles is now used as a footpath by members of the public.                                                                                                                                                                |
| TN31      | A saltmarsh / dune slack transition zone dominated by Common reed.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| TN32      | Former dune slack colonised by Grey Willow ( <i>Salix cinerea</i> ) and Downy Birch ( <i>Betula pubescens</i> ) carr. A sparse ground flora of Glaucous Sedge ( <i>Carex flacca</i> ) and Bramble is present. Creeping Willow ( <i>Salix repens</i> ) persists in places at the woodland edge. Field Wormwood ( <i>Artemisia campestris</i> ) is present as one remaining spike.                                                                                                                                      |
| TN33      | Woodland habitat, wet towards the west but becoming increasingly dry towards the east. Alder ( <i>Alnus glutinosa</i> ) and Willow trees, within inundated ground, supporting a ground flora of Yellow Iris ( <i>Iris pseudacorus</i> ), Branched Bur-reed ( <i>Sparganium erectum</i> ) and Fool's-watercress ( <i>Apium nodiflorum</i> ) grades towards woodland with Oak ( <i>Quercus</i> sp) and Ash ( <i>Fraxinus excelsior</i> ) trees and a ground flora dominated by Bramble and Ivy ( <i>Hedera helix</i> ). |
| TN34      | Dune slack habitat dominated by Common Reed grading into saltmarsh. Towards the west, encroaching scrub gradually consumes the habitat. To the east, Sharp Rush and Sea Rush ( <i>Juncus maritimus</i> ) become more frequent as saline conditions increase.                                                                                                                                                                                                                                                          |

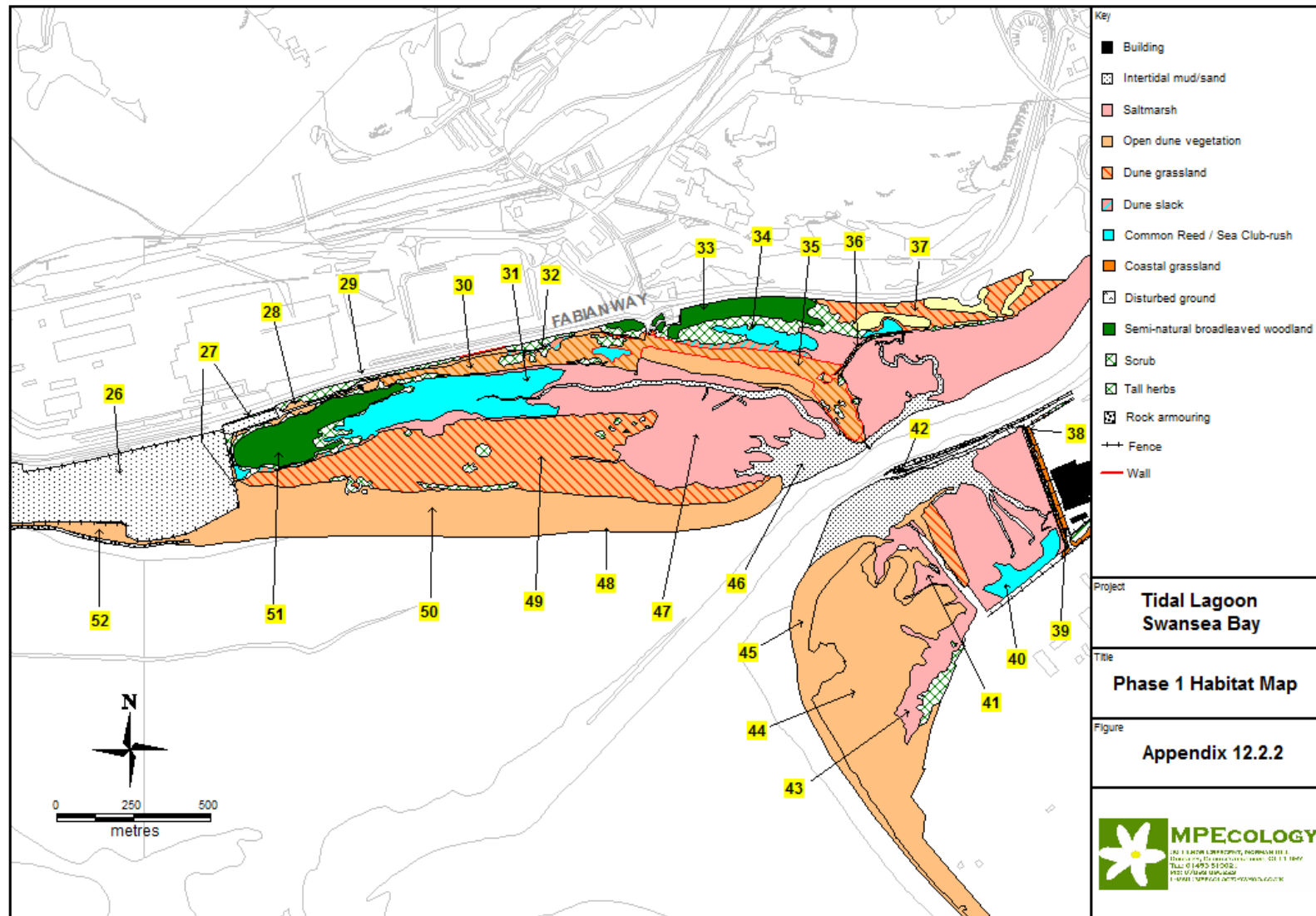
| Reference | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TN35      | Fixed dune grassland habitat and a metalled track providing access to the pipe bride at the south-eastern end of Crymlyn Burrows. The track is frequently used by dog walkers and to the south of the track in particular, local enrichment has created a sward dominated by Yorkshire-fog ( <i>Holcus lanatus</i> ), Cock's-foot ( <i>Dactylis glomerata</i> ), False Oat-grass ( <i>Arrhenatherum elatius</i> ), Couch ( <i>Elytrigia repens</i> ), Cow Parsley ( <i>Heracleum sphondylium</i> ) and Wild Parsnip ( <i>Pastinaca sativa</i> ). Stands of Soapwort ( <i>Saponaria officinalis</i> ) are also present. Away from the track a more typical species-rich dune grassland community is present.                                                                                                                            |
| TN36      | A former railway embankment cuts across saltmarsh habitat. The feature supports mesotrophic grassland dominated by False Oat-grass as well as developing scrub. Stands of Gorse, Grey Willow, Japanese Knotweed and Entire-leaved Cotoneaster ( <i>Cotoneaster integrifolius</i> ) are present. Sea Couch forms a transition zone where the base of the embankment meets the saltmarsh. Upper saltmarsh communities support Common Sea-lavender ( <i>Limonium vulgare</i> ), Golden-samphire and Sea-heath ( <i>Frankenia laevis</i> ). Additionally, plants of Curved Hard-grass ( <i>Parapholis incurva</i> ) also occur.                                                                                                                                                                                                            |
| TN37      | Golf course on fixed dune grassland. The golf greens are relatively improved in character whilst dune grassland communities persist at the fringes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| TN38      | A diverse grassland supporting Red Fescue, Wild Parsnip, Wild Carrot ( <i>Daucus carota</i> ), Ragwort ( <i>Senecio jacobaea</i> ), Kidney Vetch, Yarrow ( <i>Achillea millefolium</i> ), Oxeye Daisy ( <i>Leucanthemum vulgare</i> ), Common Cat's-ear ( <i>Hypochaeris radicata</i> ), Black Medick and Rough Hawkbit ( <i>Leontodon hispidus</i> ). Towards the north, Sand Sedge ( <i>Carex arenaria</i> ) becomes a more conspicuous component locally. Yellow Bartsia ( <i>Parentucellia viscosa</i> ) was confirmed at the northern edge of the grassland during site visits in 2013.                                                                                                                                                                                                                                           |
| TN39      | Disturbed ground supporting Common Cudweed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| TN41      | Saltmarsh habitat on compacted intertidal sand dominated by Common Saltmarsh-grass and Annual Sea-blight with patches of Purple Glasswort ( <i>Salicornia ramosissima</i> ) and plants of Spear-leaved Orache ( <i>Atriplex prostrata</i> ). Sand ouch ( <i>Elytrigia juncea</i> ) is also frequent at the edges.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| TN42      | Embankment supporting a mosaic of bare ground, ephemeral and short perennial species as well as maritime grassland. Grassland species included Red Fescue, Common Bird's-foot-trefoil, Tall Melilot ( <i>Melilotus altissimus</i> ), Creeping Bent ( <i>Agrostis stolonifera</i> ), Evening-primrose, Ribwort plantain ( <i>Plantago lanceolata</i> ), Kidney Vetch, Wild Parsnip, Common Polypody ( <i>Polypodium vulgare</i> ), Restharrow and Yellow Rattle. Sea Stock ( <i>Matthiola sinuata</i> ) formerly known from this location was not found although Basil-thyme ( <i>Clinopodium acinos</i> ) was discovered.                                                                                                                                                                                                              |
| TN43      | Saltmarsh / dune slack largely dominated by Sea Rush as well as Saltmarsh Rush ( <i>Juncus gerardii</i> ), Sea milkwort ( <i>Glaux maritima</i> ), Creeping Bent, Sea Club-rush and Parsley Water-dropwort ( <i>Oenanthe lachenalii</i> ). Common Reed is frequent locally. At the southern end of the feature a community dominated by Slender Spike-rush ( <i>Eleocharis uniglumis</i> ) is present. Other species include Marsh Pennywort ( <i>Hydrocotyle vulgaris</i> ), Distant Sedge ( <i>Carex distans</i> ) and Trifid Bur-marigold ( <i>Bidens tripartita</i> ). Yellow Bartsia was also recorded from the drier fringes of the habitat. Dotted Sedge ( <i>Carex punctata</i> ) a species of restricted UK distribution also occurs. A stand of Alder woodland has also developed towards the eastern edge of the saltmarsh. |
| TN44      | Semi-fixed dune grassland (SD7c) with tracks of bare sand created by motorcycle scrambling. Sand-hill Screw-moss and Wild Pansy ( <i>Viola tricolor</i> ssp <i>curtisii</i> ) are frequent within the dune grassland. Sea-holly ( <i>Eryngium maritimum</i> ) is a feature of bare sand associated with motorcycle tracks. Biting stonecrop is also frequent towards the north.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| TN45      | Strandline community supporting Sand Couch and foredune community dominated by Marram.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Reference | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TN46      | Intertidal mud and sand at the entrance to a creek that pushes a tongue of saltmarsh habitat to the rear of the Crymlyn dunes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| TN47      | Saltmarsh habitat largely dominated by Sea-purslane ( <i>Atriplex portulacoides</i> ) with localised patches of Red Fescue as well as a Sea Plantain ( <i>Plantago maritima</i> ), Sea Milkwort, Sea Aster ( <i>Aster tripolium</i> ) and Sea Arrowgrass ( <i>Triglochin maritimum</i> ). Upper saltmarsh communities support species including Sea-heath and Common Sea-lavender.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| TN48      | Strandline community dominated by Prickly Sandwort ( <i>Salsola kali</i> ), Sea Rocket ( <i>Cakile maritima</i> ), Sand Couch and Marram. Occasional plants of Sea Sandwort ( <i>Honckenia peploides</i> ) are also present. In addition to Spear-leaved Orache, Babington's Orache ( <i>Atriplex glabriuscula</i> ) and Grass-leaved Orache ( <i>Atriplex littoralis</i> ) were present at the eastern end of the dunes during a late summer visit (2013) and a single plant of Frosted Orache ( <i>Atriplex laciniata</i> ) towards the western end. Winter storms (2012/13) had eroded the dune front and this community has developed since then. Two plants (seedlings) of Sea Stock ( <i>Matthiola sinuata</i> ) were also discovered behind foredunes near the eastern tip of Crymlyn Burrows late in 2013. |
| TN49      | Fixed dune grassland habitat within a central area of Crymlyn Burrows. Lack of grazing and presence of grasses such as False Oat-grass suggest an affinity to the SD9a community of the NVC. Very locally, Common Heather ( <i>Calluna vulgaris</i> ) was also noted suggesting leaching to a more acidic status is ongoing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| TN50      | Open dune habitat dominated by Marram.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| TN51      | Wet woodland habitat dominated by Grey Willow, Alder, Downy Birch and Sycamore ( <i>Acer pseudoplatanus</i> ) at the location of a former dune slack. Bramble is dominant in the ground flora.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| TN52      | Semi-fixed dune grassland enclosed by a wall of rock armour.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |





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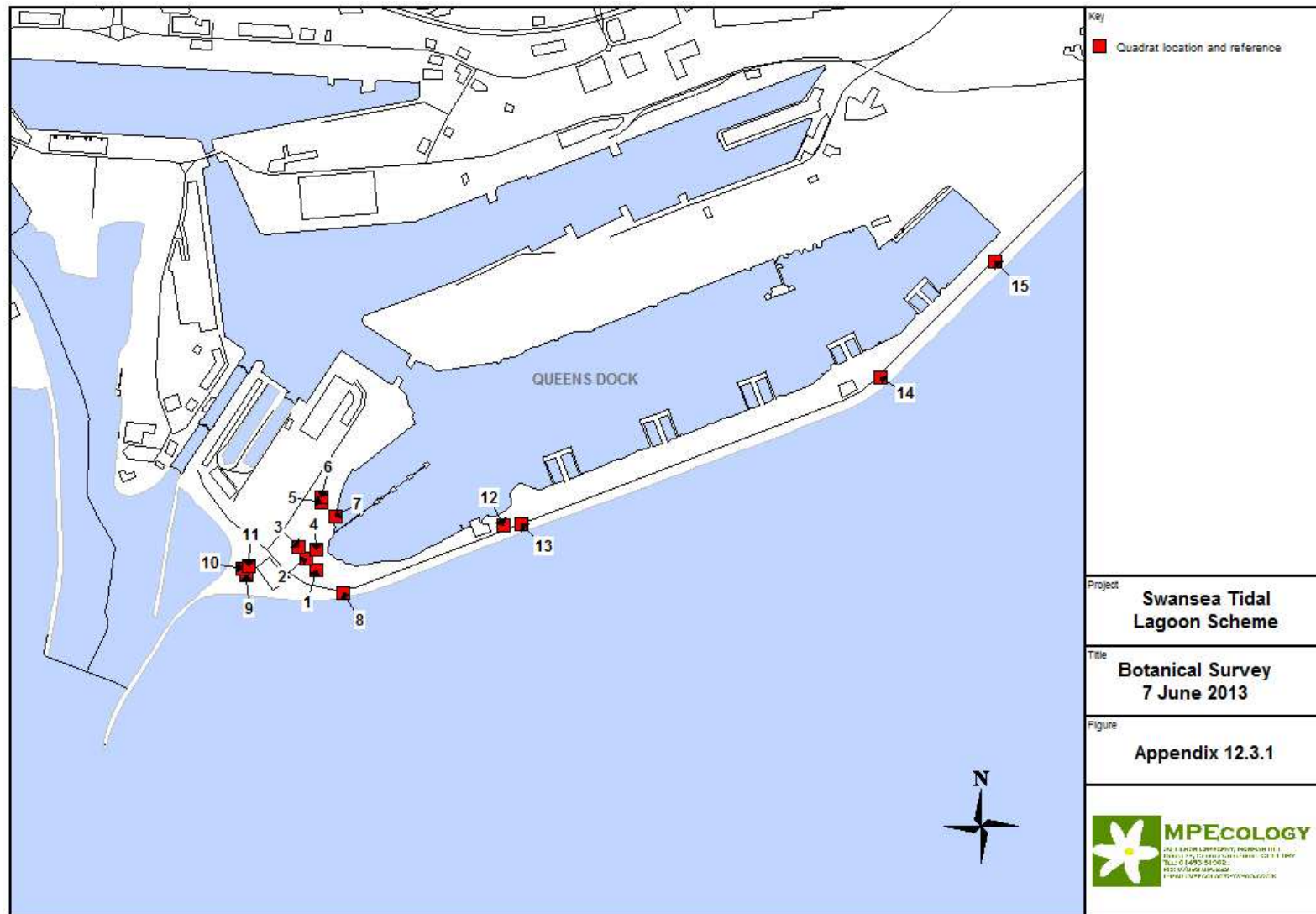


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### **12.3 Phase 2 Botanical Survey**

- 12.3.0.1 The assessment of plant communities found within the study area has built upon information gathered during the phase 1 habitat survey. Further description of plant communities has been undertaken by specifically sampling stands of vegetation (using 2m x 2m quadrats) and where possible, assigning these to defined communities of the National Vegetation Classification (Rodwell, 2000). Statistical analysis of quadrat data was undertaken using the Modular Analysis of Vegetation Information System (MAVIS) of the Centre for Ecology and Hydrology (CEH). Vegetation sampling was undertaken between June and August 2013.
- 12.3.0.2 Broad NVC mapping of coastal habitats associated with Swansea Bay was achieved through a rapid NVC mapping exercise whereby communities were characterised by spot sampling of communities, NVC community identification keys and use of aerial photography to help define boundaries. Additional published quadrat data for the western side of Crymlyn Burrows SSSI was accessed through the Environmental Statement (Volume 1 and Technical Appendices) for The Bay Science and Innovation Campus of Swansea University (URS, 2010).





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**Table 12.2 Coastal Grassland Community – Swansea Docks – Group 1**

| Species                          | Quadrat numbers |   |   |    |    |    |    |    |     |
|----------------------------------|-----------------|---|---|----|----|----|----|----|-----|
|                                  | 4               | 7 | 9 | 10 | 11 | 12 | 14 | 15 |     |
| <i>Festuca rubra</i>             | 9               | 5 | 9 | 9  | 9  | 8  | 9  | 6  | V   |
| <i>Holcus lanatus</i>            | 3               | 4 | 4 | 5  | 4  | 5  | 3  | 4  | V   |
| <i>Lotus corniculatus</i>        | 5               | 4 | 2 | 1  | 5  | 4  | 4  | 3  | V   |
| <i>Plantago lanceolata</i>       | 3               | 3 | 3 | 4  | 4  | 5  |    | 4  | V   |
| <i>Ononis repens</i>             | 4               | A | 4 |    |    | 6  | 5  | 4  | IV  |
| <i>Poa pratensis</i>             | 1               |   | 2 | 3  | A  |    | 2  | 3  | IV  |
| <i>Rubus fruticosus</i>          | 1               | 1 | 1 | 1  | 1  |    |    |    | IV  |
| <i>Dactylis glomerata</i>        | A               |   |   |    | 4  | 1  | 3  | 2  | III |
| <i>Rumex acetosa</i>             | A               | 2 | 2 | 1  | 2  |    |    |    | III |
| <i>Carex arenaria</i>            |                 | 2 |   | 5  |    | 3  |    |    | II  |
| <i>Cerastium fontanum</i>        |                 | 1 | A | A  | 1  | 2  |    | A  | II  |
| <i>Equisetum arvense</i>         | 2               |   |   |    |    |    |    | 6  | II  |
| <i>Hypochaeris radicata</i>      |                 | 1 |   | 1  |    | 1  |    |    | II  |
| <i>Pastanaca sativa</i>          |                 |   |   |    | 1  |    |    | 1  | II  |
| <i>Plantago maritima</i>         |                 | 5 |   |    |    | 3  |    |    | II  |
| <i>Rhinanthus minor</i>          |                 | 3 |   |    |    | A  |    | 2  | II  |
| <i>Ulex europaeus</i>            |                 | 4 |   |    |    |    |    | 2  | II  |
| <i>Vicia sativa</i>              | 4               |   |   |    | 4  |    |    |    | II  |
| <i>Achillea millefolium</i>      | A               |   |   |    |    | 2  |    |    | I   |
| <i>Agrostis capillaris</i>       |                 | 7 |   |    |    |    |    |    | I   |
| <i>Aira caryophylla</i>          |                 | 2 |   |    |    |    |    |    | I   |
| <i>Ammophila arenaria</i>        |                 |   |   |    |    |    |    | 3  | I   |
| <i>Anthyllis vulneraria</i>      |                 |   |   |    |    |    |    | 2  | I   |
| <i>Carex hirta</i>               | 2               |   |   |    |    |    |    |    | I   |
| <i>Carlina vulgaris</i>          |                 | A |   | A  |    |    |    | 1  | I   |
| <i>Centaurea nigra</i>           |                 |   |   | 2  |    |    |    |    | I   |
| <i>Dactylorhiza praetermissa</i> |                 |   |   |    |    |    |    | 3  | I   |
| <i>Elytrigia repens</i>          |                 |   |   |    |    |    | 4  |    | I   |
| <i>Linum catharticum</i>         |                 |   |   |    |    | 3  |    |    | I   |
| <i>Luzula campestris</i>         |                 | 2 |   |    |    |    |    |    | I   |
| <i>Rubus caesius</i>             |                 |   |   |    |    |    |    | 6  | I   |
| <i>Rumex crispus</i>             |                 |   | 2 |    |    |    |    |    | I   |
| <i>Senecio jacobaea</i>          |                 |   |   | A  |    |    |    | 2  | I   |
| <i>Trifolium dubium</i>          |                 |   |   | 2  |    |    |    |    | I   |
| <i>Aira praecox</i>              |                 |   |   | A  |    |    |    |    |     |
| <i>Cirsium arvense</i>           | A               |   |   |    |    |    |    |    |     |
| <i>Daucus carota</i>             |                 |   |   |    |    | A  | A  | A  |     |
| <i>Hypericum perforatum</i>      |                 |   |   |    |    |    |    | A  |     |
| <i>Pilosella officinarum</i>     |                 | A |   |    |    |    |    |    |     |
| <i>Trifolium pratense</i>        |                 |   |   | A  | A  |    |    |    |     |

12.3.0.3 Analysis by MAVIS considered the vegetation (established grassland on spoil) to have the greatest affinity to:

- i. SD8a *Festuca rubra*-*Galium verum* fixed dune grassland of the NVC (54.71%)
- ii. SD7c *Ammophila arenaria*-*Festuca rubra* semi-fixed dune community (52.38%)
- iii. SD8 *Festuca rubra*-*Galium verum* fixed dune grassland (51.45%)

**Table 12.3 Coastal Grassland Community – Swansea Docks – Group 2**

| Species                   | Quadrats |   |   |    |
|---------------------------|----------|---|---|----|
|                           | 1        | 2 | 3 |    |
| Agrostis stolonifera      | 4        | 4 | 5 | V  |
| Holcus lanatus            | 5        | 7 | 6 | V  |
| Medicago lupulina         | 5        | 6 | 2 | V  |
| Plantago coronopus        | 3        | 3 | 1 | V  |
| Poa annua                 | 3        | 3 | 2 | V  |
| Senecio jacobaea          | 2        | 1 | 1 | V  |
| Carex hirta               |          | 2 | 3 | IV |
| Festuca rubra             |          | 3 | 4 | IV |
| Leontodon hispidus        | 3        | 1 |   | IV |
| Lotus corniculatus        |          | 5 | 5 | IV |
| Oenothera sp              |          | 1 | 1 | IV |
| Plantago lanceolata       |          | 4 | 4 | IV |
| Sagina procumbens         | 2        | 1 |   | IV |
| Salix repens              | 4        | 1 |   | IV |
| Trifolium dubium          | 3        |   | 3 | IV |
| Trifolium repens          |          | 2 | 4 | IV |
| Achillea millefolium      |          |   | 1 | II |
| Homalothecium lutescens   |          |   | 3 | II |
| Buddleja davidii          | 1        |   |   | II |
| Cerastium fontanum        | 1        |   |   | II |
| Cirsium arvense           |          | 1 |   | II |
| Cirsium vulgare           | 1        |   |   | II |
| Dactylis glomerata        |          |   | 2 | II |
| Epilobium parviflorum     |          |   | 1 | II |
| Equisetum arvense         |          | 1 |   | II |
| Poa trivialis             |          |   | 3 | II |
| Rubus caesius             | 1        |   |   | II |
| Bellis perennis           |          | A |   |    |
| Dactylorhiza praetermissa | A        |   |   |    |

12.3.0.4 Analysis by MAVIS considered the vegetation (grassland established on spoil) to have the greatest affinity to:

- i. SD8a *Festuca rubra-Galium verum* fixed dune grassland of the NVC (54.71%)
- ii. SD8 *Festuca rubra-Galium verum* fixed dune grassland (51.45%)

**Table 12.4 Coastal Grassland Community – Swansea Docks – Group 3**

| Species              | Quadrats |    |     |
|----------------------|----------|----|-----|
|                      | 8        | 13 |     |
| Carex arenaria       | 3        | 3  | V   |
| Festuca rubra        | 9        | 9  | V   |
| Lotus corniculatus   | 3        | 5  | V   |
| Ononis repens        | 2        | 2  | V   |
| Plantago lanceolata  | 4        | 3  | V   |
| Plantago maritima    | 3        | 4  | V   |
| Dactylis glomerata   | 1        | A  | III |
| Elytrigia repens     | A        | 3  | III |
| Agrostis stolonifera | 4        |    | III |
| Holcus lanatus       |          | 3  | III |
| Trifolium repens     |          | 1  | III |
| Plantago coronopus   | A        |    |     |

12.3.0.5 Analysis by MAVIS considered the vegetation (road verge habitat in the lee of the sea wall) to have the greatest affinity to:

- a) MC11b *Festuca rubra-Daucus carota* maritime grassland, *Ononis repens* sub-community (53.19%)
- b) MC9a *Festuca rubra-Holcus lanatus* maritime grassland (52.06%)

**Table 12.5 Coastal Grassland Community – Group 4**

| Species                    | Quadrats |   |     |
|----------------------------|----------|---|-----|
|                            | 5        | 6 |     |
| Blackstonia perfoliata     | 1        | 3 | V   |
| Catapodium rigidum         | 3        | 2 | V   |
| Conyza sp.                 | 3        | 3 | V   |
| Holcus lanatus             | 4        | 4 | V   |
| Leontodon hispidus         | 2        | 2 | V   |
| Medicago lupulina          | 8        | 4 | V   |
| Veronica arvensis          | 2        | 1 | V   |
| Vulpia bromoides           | 1        | 4 | V   |
| Lotus corniculatus         | A        | 4 | III |
| Carex hirta                | 2        |   | III |
| Cirsium arvense            |          | 1 | III |
| Euphrasia sp.              | 3        |   | III |
| Festuca rubra              | 2        |   | III |
| Plantago major             |          | 1 | III |
| Prunella vulgaris          |          | 1 | III |
| Rumex crispus              | 1        |   | III |
| Sagina procumbens          |          | 1 | III |
| Taraxacum officinarum agg. | 1        |   | III |
| Trifolium dubium           |          | 4 | III |
| Trifolium repens           |          | 5 | III |
| Tussilago farfara          |          | 2 | III |
| Dactylis glomerata         | A        | A |     |
| Leucanthemum vulgare       |          | A |     |

12.3.0.6 Analysis by MAVIS considered the vegetation (poorly vegetated ground on spoil) to have the greatest affinity to:

- i. MG7e *Lolio-Plantaginion* leys and related grasslands (32.3%)
- ii. OV23 *Lolium perenne-Dactylis glomerata* community (31.98%)

**Table 12.6 Coastal Foredune Community – Swansea Bay – Group 5**

| Species                         | Quadrats  |           |           | Constancy |
|---------------------------------|-----------|-----------|-----------|-----------|
|                                 | 16        | 21        | 22        |           |
|                                 | 23-Aug-13 | 23-Aug-13 | 23-Aug-13 |           |
| Ammophila arenaria              | 8         | 3         | 8         | V         |
| Bare sand                       | 5         | 7         | 6         | V         |
| Cakile maritima                 |           | 1         |           | II        |
| Cirsium arvense                 | 1         |           |           | II        |
| Coimcy monensis ssp cheiranthos | 1         |           |           | II        |
| Elytrigia juncea                |           | 7         |           | II        |
| Eryngium maritimum              | 1         |           | 1         | II        |
| Hypochaeris radicata            | 2         |           |           | II        |
| Oenothera sp                    | 3         |           |           | II        |
| Orobancha minor                 | 1         |           |           | II        |
| Picris hieracioides             | 1         |           |           | II        |
| Taraxacum officinale agg        | 1         |           |           | II        |
| NVC Analysis                    | SD6e      | SD6a      | SD6d      |           |
| %                               | 31.98     | 75.09     | 60.61     |           |

12.3.0.7 Analysis by MAVIS considered the vegetation to have the greatest affinity to:

- a) SD6a *Ammophila arenaria* mobile dune, *Elytrigia juncea* sub-community (50%)
- b) SD6d *Ammophila arenaria* mobile dune, typical sub-community (49.5%)





**Table 12.7 Coastal Dune Community – Swansea Bay – Group 6**

|                                                      | Quadrats  |           |           |           |           |           |           |           |           |           |           |           | Constancy |
|------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                                      | 17        | 18        | 19        | 20        | 23        | 30        | 31        | 36        | 47        | 49        | 50        | 51        |           |
| Species                                              | 23-Aug-13 | 23-Aug-13 | 23-Aug-13 | 23-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 05-Jul-13 | 05-Jul-13 | 05-Jul-13 | 31-Aug-13 |           |
| <i>Ononis repens</i>                                 | 6         | 4         | 4         | 5         | 5         | 6         | 5         | 5         | 7         | 6         | 6         | 6         | V         |
| <i>Festuca rubra</i>                                 | 7         | 7         |           |           | 7         | 8         | 8         |           | 6         | 8         | 4         | 8         | IV        |
| <i>Ammophila arenaria</i>                            | 7         | 5         | 7         | 5         |           | 3         |           | 5         |           |           | 4         | 2         | IV        |
| <i>Taraxacum officinale</i> agg                      | 2         | 1         | 2         | 2         | 1         |           |           | 1         | 1         | 1         |           |           | IV        |
| <i>Carex arenaria</i>                                |           |           |           |           | 6         | 3         | 3         | 4         | 4         | 3         |           | 5         | III       |
| <i>Oenothera</i> sp                                  | 1         |           | 1         | 3         | 1         |           |           | 3         | 1         |           | 1         |           | III       |
| <i>Rubus caesius</i>                                 | 4         | 6         | 2         |           | 4         |           |           |           | 1         |           | 1         | 6         | III       |
| <i>Syntrichia ruralis</i> ssp<br><i>ruraliformis</i> |           |           | 6         | 8         | 3         | 2         |           |           | 3         | 3         | 2         |           | III       |
| <i>Orobancha minor</i>                               | 2         |           | 1         | 2         |           | 2         |           |           |           | 2         | 1         |           | III       |
| <i>Plantago lanceolata</i>                           |           | 3         |           |           | 1         |           | 5         |           | 1         | 1         |           | 4         | III       |
| <i>Eryngium maritimum</i>                            | 1         | 1         | 3         | 1         |           |           |           |           |           |           | 1         |           | III       |
| <i>Hypochaeris radicata</i>                          | 3         |           |           | 3         | 1         | 2         | 3         |           |           |           |           |           | III       |
| <i>Poa pratensis</i>                                 |           |           |           |           | 3         |           | 3         |           |           | 3         | 3         | 2         | III       |
| <i>Senecio jacobaea</i>                              |           |           | 4         | 2         |           |           |           | 1         |           | 1         | 1         |           | III       |
| <i>Anthyllis vulneraria</i>                          |           | 1         |           |           |           |           |           |           |           | 6         | 5         | 2         | II        |
| <i>Pilosella officinarum</i>                         |           |           |           |           |           | 3         | 1         |           |           |           | 5         | 3         | II        |
| <i>Arrhenatherum elatius</i>                         |           |           |           |           |           | 1         | 2         |           |           | 1         |           |           | II        |
| <i>Holcus lanatus</i>                                |           |           |           |           |           |           |           |           |           | 1         | 3         | 2         | II        |
| <i>Homalothecium lutescens</i>                       |           |           | 3         | 4         |           |           |           |           | 4         |           |           |           | II        |
| <i>Leontodon hispidus</i>                            |           |           |           |           |           | 2         | 1         |           | 2         |           |           |           | II        |
| <i>Vulpia fasciculata</i>                            |           |           |           | 2         |           |           |           | 3         |           |           | 1         |           | II        |
| <i>Calystegia soldanella</i>                         |           |           |           |           |           | 1         |           | 4         |           |           |           |           | I         |
| <i>Conyza canadensis</i>                             |           |           | 2         | 2         |           |           |           |           |           |           |           |           | I         |
| <i>Crepis capillaris</i>                             |           |           |           |           | 2         | 3         |           |           |           |           |           |           | I         |
| <i>Daucus carota</i>                                 | 2         |           |           |           |           |           |           | 3         |           |           |           |           | I         |
| <i>Euphorbia paralias</i>                            |           |           |           |           |           |           |           | 2         | 2         |           |           |           | I         |
| <i>Euphrasia officinalis</i> agg                     |           |           |           |           |           |           | 4         |           |           |           |           | 2         | I         |
| <i>Lotus corniculatus</i>                            |           |           |           |           |           |           | 3         |           |           |           | 4         |           | I         |
| <i>Pastanaca sativa</i>                              |           |           |           |           |           |           |           |           | 1         | 1         |           |           | I         |
| <i>Rhytidadelphus squarrosus</i>                     |           |           |           |           |           |           | 4         |           |           |           |           | 3         | I         |
| <i>Rumex acetosa</i>                                 |           |           |           |           |           |           |           |           |           | 1         |           | 1         | I         |
| <i>Viola tricolor</i>                                |           | 1         |           | 3         |           |           |           |           |           |           |           |           | I         |
| <i>Agrostis stolonifera</i>                          |           |           |           |           | 1         |           |           |           |           |           |           |           | I         |
| <i>Campylopus introflexus</i>                        |           |           |           |           |           |           | 3         |           |           |           |           |           | I         |
| <i>Centaureum erythraea</i>                          |           |           |           |           |           |           |           |           |           |           | 1         |           | I         |
| <i>Cerastium fontanum</i>                            |           |           |           |           |           |           |           |           | 3         |           |           |           | I         |
| <i>Eltrigia repens</i>                               |           |           |           |           |           |           |           |           | 1         |           |           |           | I         |
| <i>Erigeron acer</i>                                 |           |           |           | 1         |           |           |           |           |           |           |           |           | I         |

|                        | Quadrats  |           |           |           |           |           |           |           |           |           |           |           | Constancy |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                        | 17        | 18        | 19        | 20        | 23        | 30        | 31        | 36        | 47        | 49        | 50        | 51        |           |
| Species                | 23-Aug-13 | 23-Aug-13 | 23-Aug-13 | 23-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 05-Jul-13 | 05-Jul-13 | 05-Jul-13 | 31-Aug-13 |           |
| Erodium cicutarium     |           |           |           |           | 3         |           |           |           |           |           |           |           |           |
| Galium verum           |           |           |           |           | 1         |           |           |           |           |           |           |           |           |
| Geranium molle         |           |           |           |           | 2         |           |           |           |           |           |           |           |           |
| Hypericum perforatum   |           |           |           |           |           |           |           |           |           |           |           | 1         |           |
| Hypnum cupressiforme   |           |           |           |           |           | 3         |           |           |           |           |           |           |           |
| Leontodon autumnalis   |           |           |           |           |           |           |           |           |           | 1         |           |           |           |
| Lotus pedunculatus     |           |           |           |           |           |           |           |           |           |           |           | 3         |           |
| Luzula campestris      |           |           |           |           | 3         |           |           |           |           |           |           |           |           |
| Medicago lupulina      |           |           |           |           |           |           |           |           | 5         |           |           |           |           |
| Phleum arenarium       |           |           |           |           |           |           |           |           |           |           | 1         |           |           |
| Picris hieracioides    |           |           |           |           |           |           |           |           |           |           | 1         |           |           |
| Polypodium interjectum |           |           |           |           |           | 1         |           |           |           |           |           |           |           |
| Sedum acre             |           |           |           |           |           |           | 2         |           |           |           |           |           |           |
| Solidago virgaurea     |           |           |           |           |           |           |           |           |           | 1         |           |           |           |
| Tragopogon pratensis   |           |           |           |           |           |           |           |           |           |           | 1         |           |           |
| Viola canina           |           |           |           |           |           |           |           |           |           |           |           | 3         |           |
| NVC Analysis           | SD7c      | SD7c      | SD7c      | SD7c      | SD7       | SD7c      | SD7c      | SD7c      | SD7       | SD7c      | SD7c      | SD7c      |           |
| %                      | 47.28     | 51.01     | 38.42     | 40        | 45.23     | 43.01     | 43.66     | 42.77     | 34.98     | 43.08     | 41.98     | 44.62     |           |

12.3.0.8 Analysis by MAVIS considered the vegetation to have the greatest affinity to:

- i. SD7c *Ammophila arenaria-Festuca rubra* semi-fixed dune, typical sub-community (69.1%)

**Table 12.8 Coastal Dune Community – Swansea Bay – Group 7**

| Quadrat               | 38        |
|-----------------------|-----------|
|                       | 24-Aug-13 |
| Species               |           |
| Agrostis capillaris   | 5         |
| Anthoxanthum odoratum | 4         |
| Arrhenatherum elatius | 4         |
| Bare sand             | 4         |
| Carex arenaria        | 6         |
| Centaureum erythraea  | 1         |
| Festuca rubra         | 4         |
| Galium verum          | 6         |
| Hypochaeris radicata  | 2         |
| Lotus corniculatus    | 1         |
| Ononis repens         | 4         |
| Plantago lanceolata   | 4         |
| Quercus sp seedling   | 1         |
| Rubus caesius         | 1         |
| Thymus polytrichus    | 6         |
| Trifolium repens      | 4         |
| NVC Analysis          | SD8a      |
| %                     | 46.21     |

12.3.0.9 Analysis by MAVIS considered the vegetation to have the greatest affinity to:

- a) SD8a *Festuca rubra*-*Galium verum* fixed dune grassland, typical sub-community

**Table 12.9 Coastal Dune Community – Swansea Bay – Group 8**

|                          | Quadrats  |           |           |           |           |           |           | Constancy |
|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                          | 24        | 26        | 28        | 29        | 33        | 34        | 37        |           |
| Species                  | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 |           |
| Arrhenatherum elatius    | 2         | 2         | 6         | 4         | 4         | 3         | 3         | V         |
| Festuca rubra            | 8         | 8         | 8         | 7         |           | 7         | 5         | V         |
| Poa pratensis            | 3         | 2         | 1         | 3         |           | 3         | 1         | V         |
| Rubus caesius            | 4         | 5         | 5         | 5         | 4         | 5         |           | V         |
| Pastanaca sativa         |           | 1         | 1         | 4         | 1         | 3         |           | IV        |
| Plantago lanceolata      | 4         | 5         | 2         | 5         |           |           | 4         | IV        |
| Holcus lanatus           | 4         | 4         |           | 4         |           | 3         |           | III       |
| Ononis repens            | 4         | 6         |           | 2         |           |           | 4         | III       |
| Agrostis capillaris      | 2         | 3         |           |           |           |           | 5         | III       |
| Anthoxanthum odoratum    |           | 4         |           |           |           | 2         | 8         | III       |
| Dactylis glomerata       | 2         |           | 4         | 3         |           |           |           | III       |
| Galium verum             | 6         |           | 3         |           |           |           | 6         | III       |
| Pseudoscleropodium purum | 3         |           |           |           |           | 4         | 3         | III       |
| Carex arenaria           | 3         |           |           |           |           |           | 4         | II        |
| Chamerion angustifolium  |           |           |           |           | 3         | 1         |           | II        |
| Hypochaeris radicata     | 2         | 1         |           |           |           |           |           | II        |
| Lotus corniculatus       |           | 3         |           |           |           | 2         |           | II        |
| Oenathera sp             | 1         |           |           |           | 1         |           |           | II        |
| Picris hieracioides      |           |           |           |           | 3         | 1         |           | II        |
| Polypodium interjectum   |           |           |           |           | 2         | 5         |           | II        |
| Saponaria officinalis    |           |           | 2         | 2         |           |           |           | II        |
| Taraxacum officinale agg | 2         |           |           |           |           | 1         |           | II        |
| Achillea millefolium     |           | 3         |           |           |           |           |           | I         |
| Ammophila arenaria       |           |           |           |           | 6         |           |           | I         |
| Anthyllis vulneraria     |           |           |           |           |           | 2         |           | I         |
| Crepis capillaris        | 1         |           |           |           |           |           |           | I         |
| Echium vulgare           | 1         |           |           |           |           |           |           | I         |
| Eltrigia repens          |           |           | 1         |           |           |           |           | I         |
| Epilobium montanum       |           |           |           |           | 1         |           |           | I         |
| Equisetum arvense        |           |           | 1         |           |           |           |           | I         |
| Erigeron acer            |           |           |           |           | 2         |           |           | I         |
| Erodium cicutarium       | 1         |           |           |           |           |           |           | I         |
| Eupatorium cannabinum    |           |           |           |           | 1         |           |           | I         |
| Heracleum sphondylium    |           |           |           |           | 1         |           |           | I         |
| Homalothecium lutescens  |           |           |           |           | 4         |           |           | I         |



|                              | Quadrats  |           |           |           |           |           |           | Constancy |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                              | 24        | 26        | 28        | 29        | 33        | 34        | 37        |           |
| Species                      | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 | 24-Aug-13 |           |
| <i>Luzula campestris</i>     | 3         |           |           |           |           |           |           | I         |
| <i>Phleum arenarium</i>      | 1         |           |           |           |           |           |           | I         |
| <i>Pilosella officinarum</i> |           | 1         |           |           |           |           |           | I         |
| <i>Rhinanthus minor</i>      |           |           |           | 4         |           |           |           | I         |
| <i>Rumex acetosella</i>      |           |           |           |           |           |           | 2         | I         |
| <i>Senecio jacobaea</i>      |           |           |           | 1         |           |           |           | I         |
| <i>Solidago virgaurea</i>    |           |           |           |           |           | 1         |           | I         |
| <i>Trifolium arvense</i>     |           | 3         |           |           |           |           |           | I         |
| NVC Analysis                 | SD9a      | SD9a      | SD9a      | SD9a      | SD9a      | SD9a      | SD9a      |           |
| %                            | 44.53     | 44.17     | 43.84     | 46.14     | 22.09     | 33.74     | 49.32     |           |

12.3.0.10 Analysis by MAVIS considered the vegetation to have the greatest affinity to:

- SD9a *Ammophila arenaria-Arrhenatherum elatius* dune grassland, typical sub-community (57.8%)
- SD7c *Ammophila arenaria-Festuca rubra* semi-fixed dune, typical sub-community (55.44%)
- SD9 *Ammophila arenaria-Arrhenatherum elatius* dune grassland (54.84%)

**Table 12.10 Coastal Dune Community – Swansea Bay – Group 9**

|                                 | Quadrats  |           |
|---------------------------------|-----------|-----------|
|                                 | 32        | 35        |
| Species                         | 24-Aug-13 | 24-Aug-13 |
| <i>Agrostis stolonifera</i>     | 3         |           |
| <i>Calliergonella cuspidata</i> | 5         |           |
| <i>Calystegia soldanella</i>    |           | 1         |
| <i>Carex arenaria</i>           |           | 7         |
| <i>Eleocharis uniglumis</i>     | 5         |           |
| <i>Festuca rubra</i>            |           | 8         |
| <i>Holcus lanatus</i>           |           | 3         |
| <i>Juncus maritimus</i>         | 5         |           |
| <i>Leontodon autumnalis</i>     |           | 1         |
| <i>Lotus corniculatus</i>       |           | 4         |
| <i>Mentha aquatica</i>          | 2         |           |
| <i>Ononis repens</i>            |           | 4         |
| <i>Pastinaca sativa</i>         |           | 2         |
| <i>Phragmites australis</i>     | 8         |           |
| <i>Poa pratensis</i>            |           | 3         |
| <i>Pulicaria dysenterica</i>    | 4         |           |
| <i>Rubus caesius</i>            | 1         |           |
| <i>Vicia cracca</i>             | 1         |           |
| NVC Analysis                    | SD15d     | SD16a     |
| %                               | 36.31     | 44.64     |

12.3.0.11 Analysis by MAVIS considered the vegetation of Quadrat 32 had the greatest affinity to:

- SD15d *Salix repens-Calliergonella cuspidatum* dune-slack, *Holcus lanatus-Angelica sylvestris* sub-community.

12.3.0.12 Analysis indicated that Quadrat 35 had the greatest affinity to:

- SD16a *Salix repens-holcus lanatus* dune-slack, *Ononis repens* sub-community

**Table 12.11 Maritime Community – Swansea Bay – Group 10**

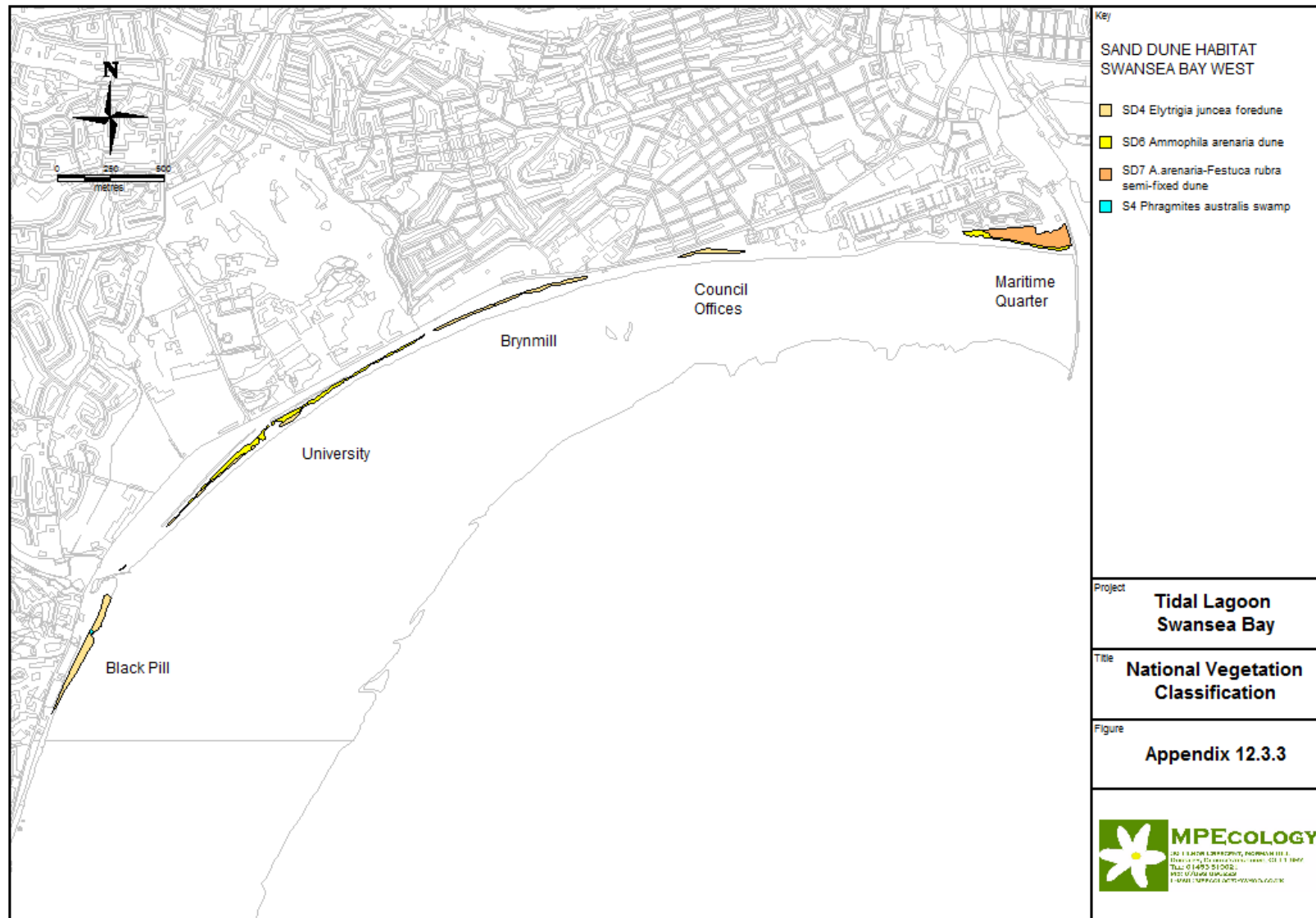
| Species                        | Quadrats |      |       |       |       |
|--------------------------------|----------|------|-------|-------|-------|
|                                | 27       | 44   | 45    | 46    | 48    |
| <i>Achillea millefolium</i>    |          | 3    | 2     | 2     |       |
| <i>Agrostis capillaris</i>     |          |      |       | 4     | 4     |
| <i>Agrostis stolonifera</i>    | 3        | 4    | 2     |       |       |
| <i>Anacamptis pyramidalis</i>  |          | 1    |       |       |       |
| <i>Anthoxanthum odoratum</i>   | 4        |      |       |       |       |
| <i>Anthyllis vulneraria</i>    |          |      | 6     | 3     |       |
| <i>Calystegia soldanella</i>   | 5        |      |       |       |       |
| <i>Carex arenaria</i>          |          |      |       | 7     |       |
| <i>Cerastium fontanum</i>      | 1        |      | 1     |       |       |
| <i>Crepis capillaris</i>       |          |      | 1     |       |       |
| <i>Dactylis glomerata</i>      |          | 1    |       | 1     | 1     |
| <i>Daucus carota</i>           |          |      | 1     |       |       |
| <i>Eltrigia repens</i>         |          |      |       |       | 1     |
| <i>Festuca rubra</i>           | 8        | 5    | 5     | 6     | 5     |
| <i>Holcus lanatus</i>          |          | 3    | 1     | 2     | 3     |
| <i>Homalothecium lutescens</i> |          | 4    |       |       |       |
| <i>Hypochaeris radicata</i>    | 1        |      |       |       |       |
| <i>Leontodon autumnalis</i>    |          | 1    |       |       |       |
| <i>Leontodon hispidus</i>      |          | 2    |       |       | 2     |
| <i>Leucanthemum vulgare</i>    |          | 4    | 1     |       |       |
| <i>Lotus corniculatus</i>      | 4        | 4    | 5     |       | 4     |
| <i>Medicago lupulina</i>       |          | 8    | 5     |       | 7     |
| <i>Melilotus altissimus</i>    |          |      |       |       | 1     |
| <i>Oenothera sp</i>            |          | 1    | 1     |       |       |
| <i>Ononis repens</i>           | 2        |      |       |       | 4     |
| <i>Pastanaca sativa</i>        |          | 3    | 1     | 1     | 1     |
| <i>Plantago coronopus</i>      | 3        |      |       |       |       |
| <i>Plantago lanceolata</i>     | 6        | 4    | 5     | 4     | 3     |
| <i>Polypodium interjectum</i>  | 1        |      |       |       |       |
| <i>Rhinanthus minor</i>        |          |      |       |       | 6     |
| <i>Rubus caesius</i>           | 4        |      |       |       |       |
| <i>Senecio jacobaea</i>        |          |      |       | 4     |       |
| <i>Trifolium arvense</i>       | 1        |      | 1     |       |       |
| <i>Trifolium campestre</i>     |          |      | 2     |       |       |
| <i>Trifolium repens</i>        |          | 2    |       |       | 4     |
| <i>Vicia sativa</i>            |          |      | 1     | 1     |       |
| NVC Analysis                   | MC10     | MC9c | MC9c  | MC9b  | MC11b |
| %                              | 44.14    | 44.5 | 36.97 | 42.96 | 39.29 |

12.3.0.13 Analysis by MAVIS considered quadrats to have the greatest affinity to:

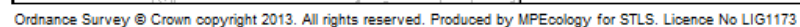
- Quadrat 44 & 45 - MC9c *Festuca rubra*-*Holcus lanatus* maritime grassland, *Achillea millefolium* sub-community (36.97 & 44.5%);
- Quadrat 46 - MC9b *Festuca rubra*-*Holcus lanatus* maritime grassland, *Dactylis glomerata* sub-community (39.29%);
- Quadrat 27 – MC10 *Festuca rubra*-*Plantago spp* maritime grassland (44.14%);
- Quadrat 48 – MC11b *Festuca rubra*-*Daucus carota ssp gummifer* maritime grassland, *Ononis repens* sub-community (42.96%).

**Table 12.12 Fabian Way Conservation Verge – Group 11**

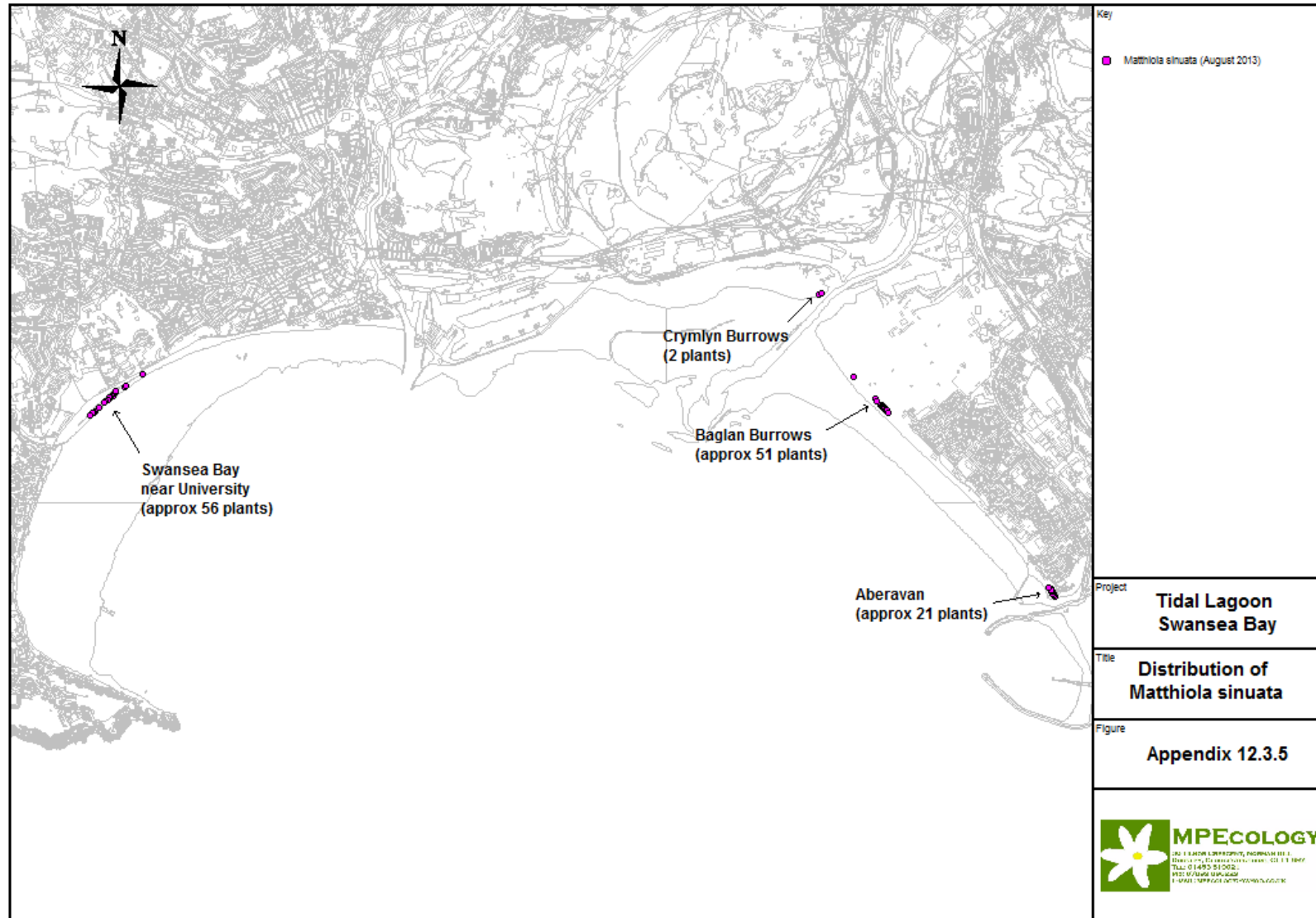
|                                  | Quadrat |       |       |       |       | Constancy |
|----------------------------------|---------|-------|-------|-------|-------|-----------|
|                                  | 39      | 40    | 41    | 42    | 43    |           |
| <b>Species</b>                   |         |       |       |       |       |           |
| <i>Anthoxanthum odoratum</i>     | 3       | 1     | 4     | 3     | 5     | V         |
| <i>Arrhenatherum elatius</i>     | 3       | 6     | 2     | 2     | 1     | V         |
| <i>Dactylis glomerata</i>        | 2       | 4     | 3     | 1     | 2     | V         |
| <i>Holcus lanatus</i>            | 4       | 6     | 5     | 8     | 6     | V         |
| <i>Plantago lanceolata</i>       | 3       | 5     | 6     | 3     | 2     | V         |
| <i>Centaurea nigra</i>           | 1       | 1     | 7     |       | 4     | IV        |
| <i>Lathyrus pratensis</i>        | 1       | 2     | 4     | 1     |       | IV        |
| <i>Lolium perenne</i>            | 7       | 2     | 3     | 4     |       | IV        |
| <i>Poa trivialis</i>             | 3       | 4     | 1     | 2     |       | IV        |
| <i>Ranunculus repens</i>         | 2       | 3     | 2     | 6     |       | IV        |
| <i>Festuca rubra</i>             |         |       | 4     | 3     | 7     | III       |
| <i>Taraxacum officinale agg</i>  |         | 3     | 2     | 2     |       | III       |
| <i>Trifolium pratense</i>        | 2       |       | 5     |       | 1     | III       |
| <i>Trifolium repens</i>          | 2       |       | 3     | 4     |       | III       |
| <i>Achillea millefolium</i>      |         |       | 1     |       | 1     | II        |
| <i>Agrostis capillaris</i>       |         |       |       | 1     | 3     | II        |
| <i>Cerastium fontanum</i>        |         |       | 1     |       | 1     | II        |
| <i>Cynosurus cristatus</i>       | 6       |       | 1     |       |       | II        |
| <i>Equisetum arvense</i>         |         |       | 3     | 2     |       | II        |
| <i>Leucanthemum vulgare</i>      |         |       | 3     |       | 3     | II        |
| <i>Lotus corniculatus</i>        | 1       |       |       |       | 5     | II        |
| <i>Pastanaca sativa</i>          |         |       | 2     |       | 2     | II        |
| <i>Ranunculus acris</i>          | 3       | 5     |       |       |       | II        |
| <i>Rumex acetosa</i>             |         | 1     | 1     |       |       | II        |
| <i>Agrostis stolonifera</i>      |         |       |       | 3     |       | I         |
| <i>Carex flacca</i>              |         |       |       | 5     |       | I         |
| <i>Carex hirta</i>               | 2       |       |       |       |       | I         |
| <i>Eltrigia repens</i>           |         | 1     |       |       |       | I         |
| <i>Hypericum perforatum</i>      |         |       |       |       | 1     | I         |
| <i>Hypochaeris radicata</i>      |         |       |       |       | 1     | I         |
| <i>Juncus articulatus</i>        | 2       |       |       |       |       | I         |
| <i>Lotus pedunculatus</i>        |         |       |       | 5     |       | I         |
| <i>Ononis repens</i>             |         |       |       |       | 4     | I         |
| <i>Potentilla reptans</i>        | 4       |       |       |       |       | I         |
| <i>Prunella vulgaris</i>         |         |       |       |       | 1     | I         |
| <i>Rhytidadelphus squarrosus</i> |         |       |       |       | 3     | I         |
| <i>Senecio jacobaea</i>          |         | 1     |       |       |       | I         |
| NVC Analysis                     | MG5a    | MG1c  | MG6b  | MG7e  | MG5a  |           |
| %                                | 52.82   | 51.99 | 58.42 | 53.32 | 52.06 |           |



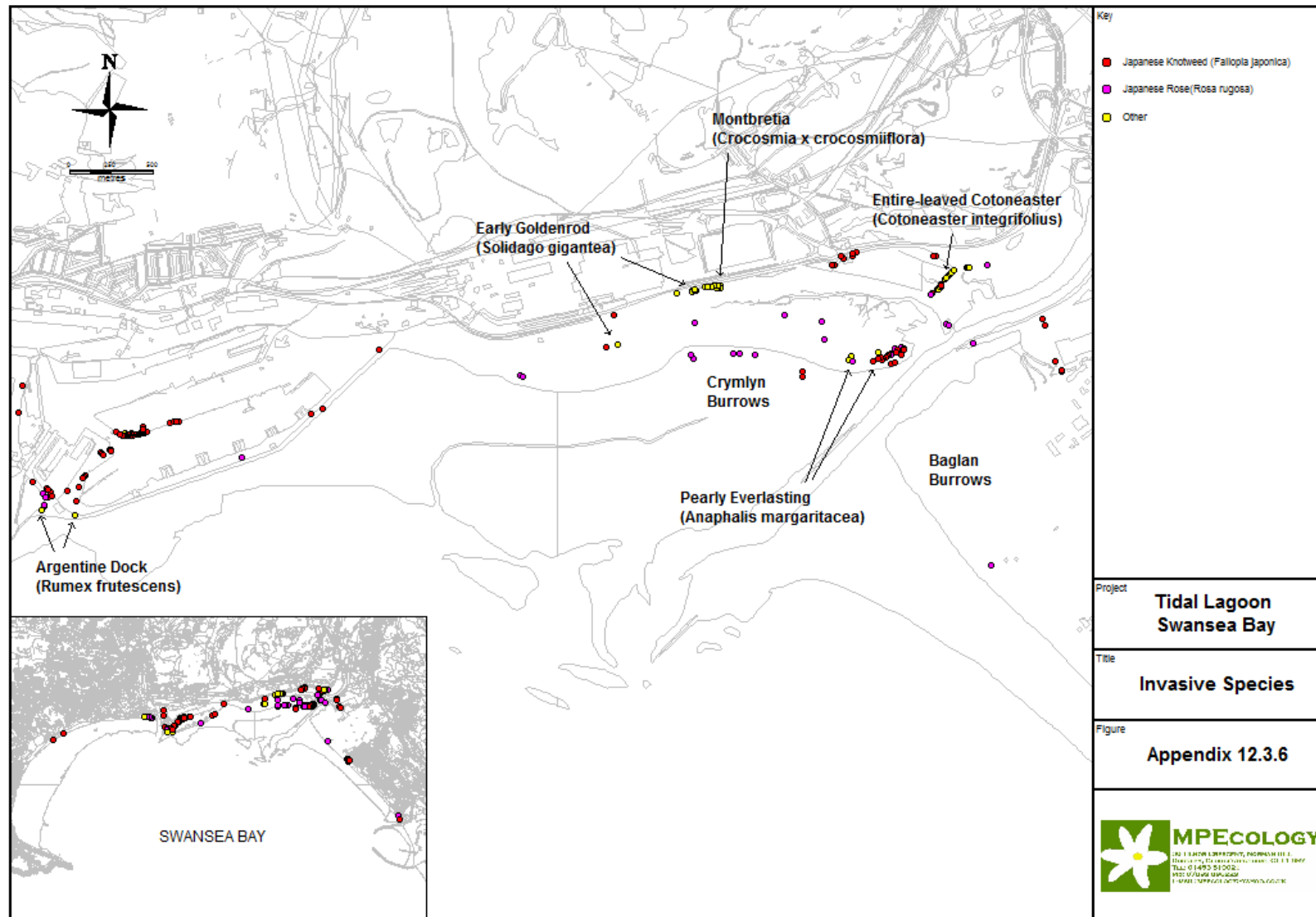
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## 12.4 Bat Survey

12.4.0.1 The open and exposed character of coastal habitats present within the study area did not appear to favour bats although existing records provided some evidence of bat foraging activity. Following good practice guidelines of the Bat Conservation Trust (Hundt, 2012), three surveys of two to three hours duration were undertaken along a defined transect route between spring and autumn. A single surveyor (accompanied for reasons of health and safety) carried out each survey armed with a Pettersson D240x time expansion detector and Edirol R-09HR digital MP3 sound recorder. Further information was gained by deploying two static detectors (Anabat SD1 and SD2 frequency division detectors) at points along the sea wall during the first two survey visits. In addition, an automated bat detector (Anabat SD1 frequency division detector) was deployed for a minimum of four consecutive nights to coincide with each visit.

### Visit 1

**Table 12.13 16<sup>th</sup> May 2013 - Summary of Results**

| <u>Summary</u>                                              | 16 May 13<br>(2050-2254hrs) | Transect<br>(Pettersson D240x & Edirol<br>R-09HR) | Point B<br>NGR SS672918<br>(Anabat SD1) | Point C<br>NGR SS683922<br>(Anabat SD2) |
|-------------------------------------------------------------|-----------------------------|---------------------------------------------------|-----------------------------------------|-----------------------------------------|
| Sunset                                                      | 2103hrs                     |                                                   |                                         |                                         |
| First bat recorded                                          |                             | 2230hrs (CP)                                      | 2209hrs (CP)                            | 2154hrs (CP)                            |
| High tide                                                   | 2304hrs                     |                                                   |                                         |                                         |
| Temperature (minimum)                                       | 7°C / dry                   |                                                   |                                         |                                         |
|                                                             |                             |                                                   |                                         |                                         |
| <u>Bat passes</u>                                           |                             |                                                   |                                         |                                         |
| <i>Pipistrellus pipistrellus</i><br>Common Pipistrelle (CP) |                             | 37                                                | 22                                      | 45                                      |
| <i>Pipistrellus pygmaeus</i><br>Soprano Pipistrelle (SP)    |                             | -                                                 | 8                                       | 30                                      |
| Total                                                       |                             | 37                                                | 30                                      | 75                                      |

N.B. Static detectors were deployed at Points B and C for the duration of the bat transect (2050-2250hrs). The detector at Point B was then redeployed at Point A (from the 16 to 20<sup>th</sup> May 2013).

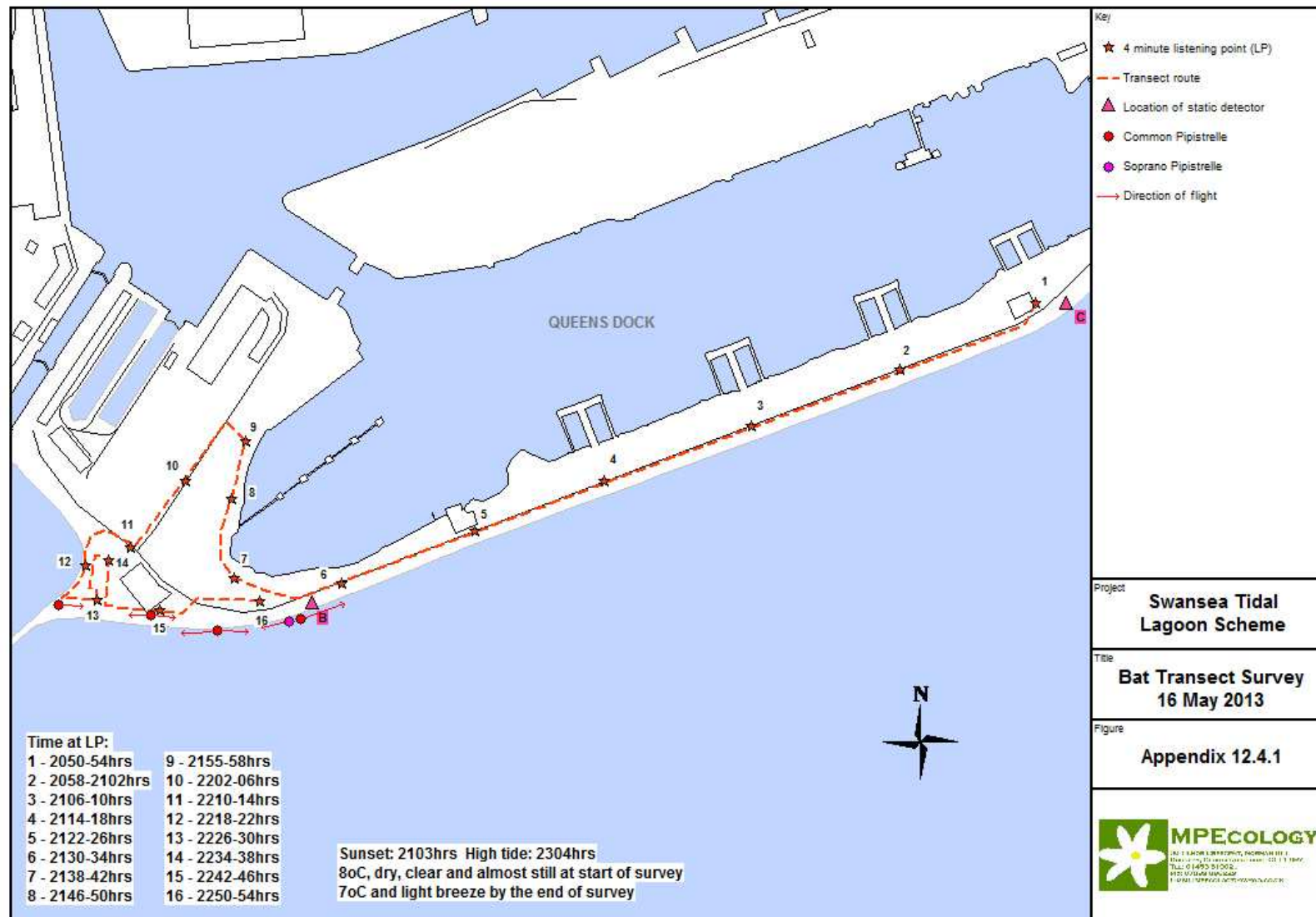
**Table 12.14 Transcript of Transect Results**

| LP    | Time (hrs) | Passes | Bat record | Note                                                        |
|-------|------------|--------|------------|-------------------------------------------------------------|
| 12-13 | 2230       | 1      | CP         | Flying west to east                                         |
| 14-15 | 2241-42    | 4      | CP         | Foraging over grassland near sea wall                       |
| 15    | 2242-46    | 12     | CP         | Almost constant foraging activity at LP15                   |
| 15-16 | 2246-47    | 4      | CP         | Foraging activity at LP15                                   |
|       | 2247-50    | 3      | CP         | Intermittent passes near sea wall                           |
| 16    | 2250-54    | 10     | CP         | Foraging activity along rock armour on seaward side of wall |
|       | 2250-54    | 3      | SP         | Intermittent passes near sea wall                           |

N.B. The transect survey was carried out by one surveyor (with a health and safety buddy) using a handheld Pettersson D240x time expansion detector with calls digitally recorded using an Edirol R-09HR MP3 device. All calls were analysed using Batsound.

**Table 12.15 Static Detector Results at Point A**

| NGR: SS669918                                            | 16-17 May 13 | 17-18 May 13 | 18-19 May 13 | 19-20 May 13 |
|----------------------------------------------------------|--------------|--------------|--------------|--------------|
| Sunset                                                   | 2103hrs      | 2105hrs      | 2106hrs      | 2108hrs      |
| First bat recorded                                       | 2318hrs (CP) | 2253hrs (CP) | 0010hrs (CP) | 0053hrs (CP) |
| Sunrise                                                  | 0520hrs      | 0519hrs      | 0518hrs      | 0516hrs      |
| Last bat recorded                                        | 2325hrs (CP) | 2300hrs (CP) | 0030hrs (CP) | 0334hrs (CP) |
| Temperature (minimum)                                    | 7°C / dry    | 9°C / dry    | 9°C / dry    | 9°C / dry    |
|                                                          |              |              |              |              |
| <u>Bat passes</u> (Anabat SD1 records)                   |              |              |              |              |
| <i>Pipistrellus pipistrellus</i> Common Pipistrelle (CP) | 5            | 2            | 2            | 2            |
| Total                                                    | 5            | 2            | 2            | 2            |



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**Visit 2****Table 12.16 5<sup>th</sup> July 2013 - Summary of Results**

|                                                          | 5 Jul 13   | Transect<br>(Pettersson D240x &<br>Edirol R-09HR) | Point B<br>NGR SS672918<br>(Anabat SD1) | Point C<br>NGR SS683922<br>(Anabat SD2) |
|----------------------------------------------------------|------------|---------------------------------------------------|-----------------------------------------|-----------------------------------------|
| Sunset                                                   | 2135hrs    |                                                   |                                         |                                         |
| First bat recorded                                       |            | 2237hrs (CP)                                      | 2251hrs (CP)                            | 2241hrs (CP)                            |
| High tide                                                | 1730hrs    |                                                   |                                         |                                         |
| Temperature (minimum)                                    | 13°C / dry |                                                   |                                         |                                         |
|                                                          |            |                                                   |                                         |                                         |
| <u>Bat passes</u>                                        |            |                                                   |                                         |                                         |
| <i>Pipistrellus pipistrellus</i> Common Pipistrelle (CP) |            | 24                                                | 66                                      | 23                                      |
| <i>Pipistrellus pygmaeus</i> Soprano Pipistrelle (SP)    |            | 6                                                 | 55                                      | 9                                       |
| Total                                                    |            | 30                                                | 121                                     | 32                                      |

N.B. Static detectors were deployed at Points B and C for the duration of the bat transect (2130-2356hrs). The detector at Point B was then redeployed but suffered a technical failure. The detector was redeployed at Point D between the 6 and 12<sup>th</sup> August 2013.

**Table 12.17 Transcript of Transect Results**

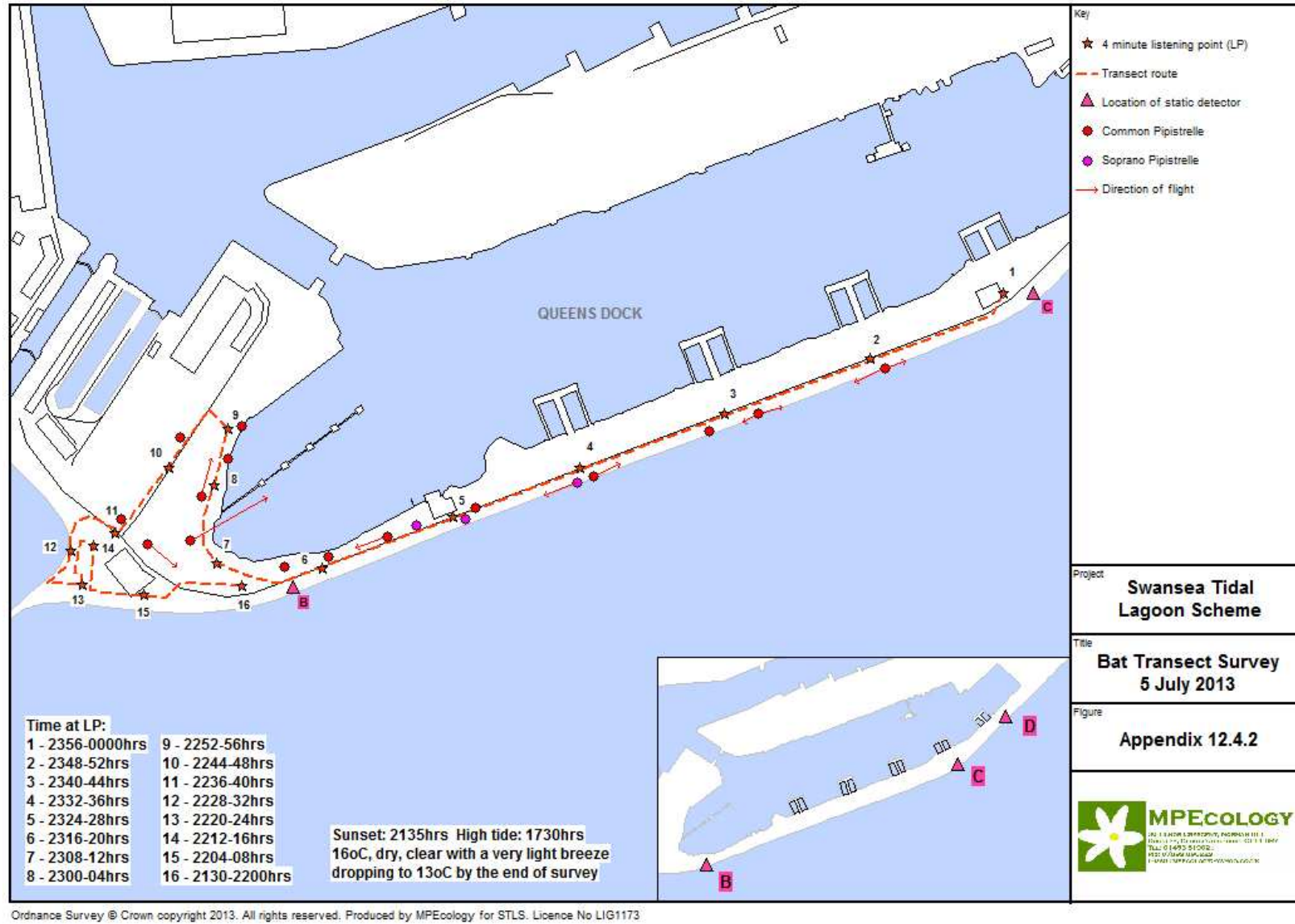
| LP  | Time (hrs) | Passes | Bat record | Note                                               |
|-----|------------|--------|------------|----------------------------------------------------|
| 11  | 2237       | 1      | CP         | Not seen                                           |
|     | 2238       | 1      | CP         | Flying towards south-east                          |
| 10  | 2247       | 2      | CP         | Foraging alongside Leyland cypress hedge           |
| 9   | 2253       | 1      | CP         | Not seen                                           |
| 8   | 2302       | 1      | CP         | Foraging along track towards north                 |
|     | 2303       | 1      | CP         | Not seen                                           |
| 8-7 | 2305       | 1      | CP         | Flying from west to east into dock along jetty     |
| 7-6 | 2315       | 1      | CP         | Not seen                                           |
| 6   | 2318       | 1      | CP         | Not seen                                           |
|     | 2320       | 1      | CP         | Not seen                                           |
| 6-5 | 2321       | 2      | CP         | Foraging over grassland between dock and dock road |
|     | 2323       | 1 & 1  | CP & SP    | Not seen                                           |
| 5   | 2324       | 1 & 1  | CP & SP    | Not seen                                           |

| LP  | Time (hrs) | Passes | Bat record | Note     |
|-----|------------|--------|------------|----------|
| 4   | 2332       | 1 & 2  | CP & SP    | Not seen |
|     | 2334       | 1      | SP         | Not seen |
|     | 2335       | 1      | SP         | Not seen |
| 4-3 | 2339       | 3      | CP         | Not seen |
| 3   | 2340       | 2      | CP         | Not seen |
|     | 2344       | 2      | CP         | Not seen |
| 2   | 2352       | 1      | CP         | Not seen |

**Table 12.18 Static Detector Results at Point D**

| NGR: SS686924                                               | 6-7 Aug 13        | 7-8 Aug 13        | 8-9 Aug 13        | 9-10 Aug 13       | 10-11 Aug 13      | 11-12 Aug 13      |
|-------------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sunset                                                      | 2055hrs           | 2054hrs           | 2052hrs           | 2050hrs           | 2048hrs           | 2046hrs           |
| First bat recorded                                          | 2147hrs (SP)      | 2144hrs (SP)      | 0343hrs (CP)      | 2140hrs (SP)      | 2303hrs (CP)      | 2136hrs (CP)      |
| Sunrise                                                     | 0548hrs           | 0550hrs           | 0552hrs           | 0553hrs           | 0555hrs           | 0556hrs           |
| Last bat recorded                                           | 0427hrs (SP)      | 0340hrs (SP)      | 0406hrs (CP)      | 0450hrs (SP)      | 0504hrs (CP)      | 0438hrs (CP)      |
| High tide                                                   | 1912hrs / 0730hrs | 1946hrs / 0803hrs | 2019hrs / 0837hrs | 2053hrs / 0910hrs | 2126hrs / 0944hrs | 2202hrs / 1022hrs |
| Temperature (minimum)                                       | 11°C / dry        | 15°C / rain       | 16°C / rain       | 15°C / dry        | 15°C / dry        | 15°C / dry        |
|                                                             |                   |                   |                   |                   |                   |                   |
| <u>Bat passes</u><br>(Anabat SD1 records)                   |                   |                   |                   |                   |                   |                   |
| <i>Pipistrellus pipistrellus</i><br>Common Pipistrelle (CP) | 111               | 70                | 6                 | 425               | 244               | 188               |
| <i>Pipistrellus pygmaeus</i><br>Soprano Pipistrelle (SP)    | 80                | 36                | -                 | 74                | 21                | 11                |
| <i>Nyctalus noctula</i><br>Noctule                          | 3                 | -                 | -                 | -                 | -                 | -                 |
| Total                                                       | 194               | 106               | 6                 | 499               | 265               | 199               |

N.B. The static detector (Anabat SD1) was deployed at Points D using a 10m microphone extension cable. The microphone was positioned on top of the sea wall facing south (out to sea / above the rock armour).



**Visit 3****Table 12.19 3<sup>rd</sup> September 2013 - Summary of Results**

|                                                          | 3 Sep 13   | Transect<br>(Pettersson D240x & Ediol R-09HR) |
|----------------------------------------------------------|------------|-----------------------------------------------|
| Sunset                                                   | 1958hrs    |                                               |
| First bat recorded                                       |            | 2057hrs (CP)                                  |
| High tide                                                | 1810hrs    |                                               |
| Temperature (minimum)                                    | 12°C / dry |                                               |
|                                                          |            |                                               |
| <u>Bat passes</u>                                        |            |                                               |
| <i>Pipistrellus pipistrellus</i> Common Pipistrelle (CP) |            | 105                                           |
| <i>Pipistrellus pygmaeus</i> Soprano Pipistrelle (SP)    |            | 23                                            |
| Total                                                    |            |                                               |

**Table 12.20 Transcript of Transect Results**

| LP   | Time (hrs) | Passes  | Bat record      | Note                                                                                      |
|------|------------|---------|-----------------|-------------------------------------------------------------------------------------------|
| 4-5  | 2057       | 1       | CP              | Foraging above rock armour on the seaward side of the sea wall                            |
| 5    | 2058       | 1       | CP              | Not seen                                                                                  |
|      | 2059       | 1       | CP              | Crossing over sea wall and flying west then crossing back                                 |
|      | 2100       | 1       | CP              | Crossing over sea wall and flying west then crossing back (foraging circuits along coast) |
|      | 2101       | 1       | CP              | Not seen                                                                                  |
| 5-6  | 2104       | 1       | CP              | Crossing over sea wall and flying west then crossing back                                 |
|      | 2105       | 1       | CP              | Crossing over sea wall and flying west then crossing back                                 |
| 6    | 2106       | 1       | CP              | Crossing over sea wall and flying west then crossing back                                 |
| 7    | 2117       | 1       | CP              | Not seen                                                                                  |
| 7-8  | 2119       | 1       | SP              | Not seen                                                                                  |
|      | 2120       | 3       | CP              | Foraging along track                                                                      |
| 8    | 2121-25    | 9       | CP              | Foraging along track                                                                      |
| 9    | 2128       | 2 & 1   | CP & SP         | Foraging circuits from dock track toward west                                             |
|      | 2129       | 1 & 1   | CP & SP         | Foraging circuits from dock track toward west                                             |
|      | 2132       | 2       | CP              | Foraging circuits from dock track toward west                                             |
| 9-10 | 2132-36    | 40 & 13 | CP x 3 & SP x 2 | Foraging at edge of security lighting / Leyland cypress hedge                             |
| 10   | 2136-40    | 10 & 4  | CP & SP         | Foraging along Leyland cypress hedge                                                      |

| LP    | Time (hrs) | Passes | Bat record  | Note                                  |
|-------|------------|--------|-------------|---------------------------------------|
| 10-11 | 2141       | 1      | CP          | Not seen                              |
|       | 2143       | 2      | CP          | Not seen                              |
| 11    | 2144-48    | 7      | CP          | Foraging at corner of vegetated mound |
| 11-12 | 2149       | 1      | CP          | Not seen                              |
|       | 2150       | 1      | CP          | Not seen                              |
| 13    | 2203       | 1      | CP          | Not seen                              |
| 14-15 | 2212       | 2      | CP          | Not seen                              |
|       | 2213       | 4      | CP x 2      | Not seen                              |
| 15    | 2214-17    | 4 & 1  | CP & SP     | Not seen                              |
| 16    | 2222-26    | 6 & 2  | CP x 2 & SP | Not seen                              |

**Table 12.21 Static Detector Results at Point D**

| NGR: SS686924                                            | 3-4 Sep 13        | 4-5 Sep 13        | 5-6 Sep 13        | 6-7 Sep 13        |
|----------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|
| Sunset                                                   | 1958hrs           | 1955hrs           | 1953hrs           | 1951hrs           |
| First bat recorded                                       | 2049hrs (CP)      | 2045hrs (CP)      | 2100hrs (CP)      | 2039hrs (CP)      |
| Sunrise                                                  | 0633hrs           | 0635hrs           | 0636hrs           | 0638hrs           |
| Last bat recorded                                        | 0036hrs (CP)      | 0210hrs (CP)      | 0405hrs (N)       | 0323hrs (SP)      |
| High tide                                                | 1810hrs / 0630hrs | 1846hrs / 0704hrs | 1920hrs / 0738hrs | 1953hrs / 0811hrs |
| Temperature (minimum)                                    | 12°C / dry        | 13.5°C / dry      | 10.5°C / rain     | 10.5°C / dry      |
| <u>Bat passes</u><br>(Anabat SD1 records)                |                   |                   |                   |                   |
| <i>Pipistrellus pipistrellus</i> Common Pipistrelle (CP) | 38                | 71                | 14                | 117               |
| <i>Pipistrellus pygmaeus</i> Soprano Pipistrelle (SP)    | 28                | 16                | 2                 | 15                |
| <i>Pipistrellus nathusii</i> Nathusius Pipistrelle (NP)  | 2                 | 1                 | 3                 | -                 |
| <i>Nyctalus noctula</i> Noctule (N)                      | 1                 | 1                 | 2                 | -                 |
| <i>Myotis sp</i>                                         | 2                 | -                 | -                 | -                 |
| Total                                                    | 71                | 89                | 21                | 132               |





## 12.5 Breeding Bird Survey

- 12.5.0.1 The Breeding Bird Survey followed a standard methodology utilising a combination of defined transects routes supplemented by mapping of birds seen or heard using Common Bird Census (CBC) codes of the British Trust for Ornithology (BTO) (Marchant, 1983). Three survey visits during the bird breeding season (March-July/August) were planned. The initial visit, usually begun in March, was delayed until late April due to unseasonably cold weather in March and early April 2013. A second visit was undertaken in late May and a third visit in late June 2013.
- 12.5.0.2 The visits were undertaken in suitable weather conditions, between the hours of 6am and 8-9am, when birds are most active. The surveyor noted the singing or calling of birds, repeated territorial calls, territorial aggression, displaying, adults carrying food or nesting material, juvenile birds and family groups, on a field map using standard BTO codes.
- 12.5.0.3 The following table provides a summary of bird species recorded during site visits including dedicated breeding bird surveys carried out on the 26<sup>th</sup> April 2013, 23<sup>rd</sup> May 2013 and 11<sup>th</sup> June 2013. The breeding bird surveys focused on land within the docks estate as well as land in the vicinity of the proposed cable route to the south of Fabian Way and coastal fringe near Baglan Power Station. Potential impact to breeding birds along the cable route would be avoided by seasonal timing and mapping therefore focuses on land within the docks estate.

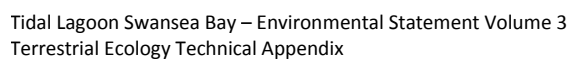
**Table 12.22 Summary of bird species recorded during site visits**

| Code | Species                                                    | April 2013 | May 2013 | June 2013 | Status                     | Location                                                                                         | Notes          |
|------|------------------------------------------------------------|------------|----------|-----------|----------------------------|--------------------------------------------------------------------------------------------------|----------------|
| B    | Blackbird<br>( <i>Turdus merula</i> )                      | ✓          | ✓        | ✓         | RSPB: Green                | Frequent with docks in areas of cover                                                            | Breeding       |
| BC   | Blackcap<br>( <i>Sylvia atricapilla</i> )                  |            | ✓        |           | RSPB: Green                | Noted from scrub habitat at the northern edge of Crymlyn Burrows                                 | Breeding       |
| BF   | Bullfinch<br>( <i>Pyrrhula pyrrhula</i> )                  |            | ✓        |           | S42 species<br>RSPB: Amber | A pair noted on one occasion at the northern fringes of the docks estate adjacent to Fabian Way. |                |
| BH   | Black-headed Gull<br>( <i>Chroicocephalus ridibundus</i> ) |            |          |           | S42 species<br>RSPB: Amber | Queens Dock                                                                                      | Flyover record |
| BZ   | Buzzard<br>( <i>Buteo buteo</i> )                          | ✓          | ✓        |           | RSPB: Green                | Individuals occasionally noted within docks estate                                               | Flyover record |
| C    | Carrion Crow<br>( <i>Corvus corone</i> )                   | ✓          | ✓        | ✓         | RSPB: Green                | Forages within docks estate                                                                      |                |
| CH   | Chaffinch<br>( <i>Fringilla coelebs</i> )                  | ✓          | ✓        | ✓         | RSPB: Green                | Breeding at northern edge of Crymlyn Burrows, occasionally noted within Swansea Docks            |                |

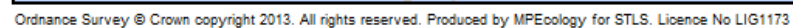
| Code | Species                                             | April 2013 | May 2013 | June 2013 | Status                     | Location                                                                                       | Notes          |
|------|-----------------------------------------------------|------------|----------|-----------|----------------------------|------------------------------------------------------------------------------------------------|----------------|
| CC   | Chiffchaff<br>( <i>Phylloscopus collybita</i> )     |            |          | ✓         | RSPB: Green                | Noted from scrub habitat                                                                       |                |
| CS   | Common Sandpiper<br>( <i>Actitis hypoleucos</i> )   | ✓          |          |           | RSPB: Amber                | Western end of Queens / Kings Dock                                                             | Flyover record |
| CA   | Cormorant<br>( <i>Phalacrocorax carbo</i> )         | ✓          | ✓        | ✓         | RSPB: Green                | Roosts on buoys / jetty within Queens Dock.                                                    |                |
| D    | Dunnock<br>( <i>Prunella modularis</i> )            | ✓          | ✓        | ✓         | RSPB: Amber                | Common in areas of cover                                                                       | Breeding       |
| GA   | Gadwall<br>( <i>Anas strepera</i> )                 |            |          | ✓         | RSPB: Amber                | Noted from coastline, south-west of Queens Dock                                                |                |
| GC   | Goldcrest<br>( <i>Regulus regulus</i> )             | ✓          |          |           | RSPB: Green                | Noted from northern edge of Crymlyn Burrows                                                    |                |
| GO   | Goldfinch<br>( <i>Carduelis carduelis</i> )         | ✓          | ✓        | ✓         | RSPB: Green                | Frequent records, mostly of birds in flight. Probable breeding at northern edge of Queens Dock | Breeding       |
| GE   | Green Sandpiper<br>( <i>Tringa ochropus</i> )       |            |          |           | RSPB: Amber                | Incidental record from Queens Dock (5 <sup>th</sup> July 2013)                                 | Flyover record |
| GK   | Greenshank<br>( <i>Tringa nebularia</i> )           |            |          |           | RSPB: Green                | Incidental record (31 <sup>st</sup> August 2013) at eastern end of Crymlyn Burrows             | Flyover record |
| GR   | Greenfinch<br>( <i>Chloris chloris</i> )            | ✓          | ✓        | ✓         | RSPB: Green                | One pair probably bred in cover at western end of Queens Dock                                  | Breeding       |
| GW   | Garden Warbler<br>( <i>Sylvia borin</i> )           |            |          | ✓         | RSPB: Green                | Noted from the northern edge of Crymlyn Burrows                                                |                |
| HG   | Herring Gull<br>( <i>Larus argentatus</i> )         | ✓          | ✓        | ✓         | S42 species<br>RSPB: Red   | Roosts on buoys / jetty within Queens Dock. At least one pair bred within Queens Dock in 2013. | Breeding       |
| JD   | Jackdaw<br>( <i>Corvus monedula</i> )               | ✓          | ✓        | ✓         | RSPB: Green                | Low numbers frequent within the docks estate                                                   |                |
| K    | Kestrel<br>( <i>Falco tinnunculus</i> )             |            |          | ✓         | S42 species<br>RSPB: Amber | Noted from Baglan Power Station                                                                |                |
| LB   | Lesser Black-backed Gull<br>( <i>Larus fuscus</i> ) |            |          |           | RSPB: Amber                | Docks estate                                                                                   | Flyover record |

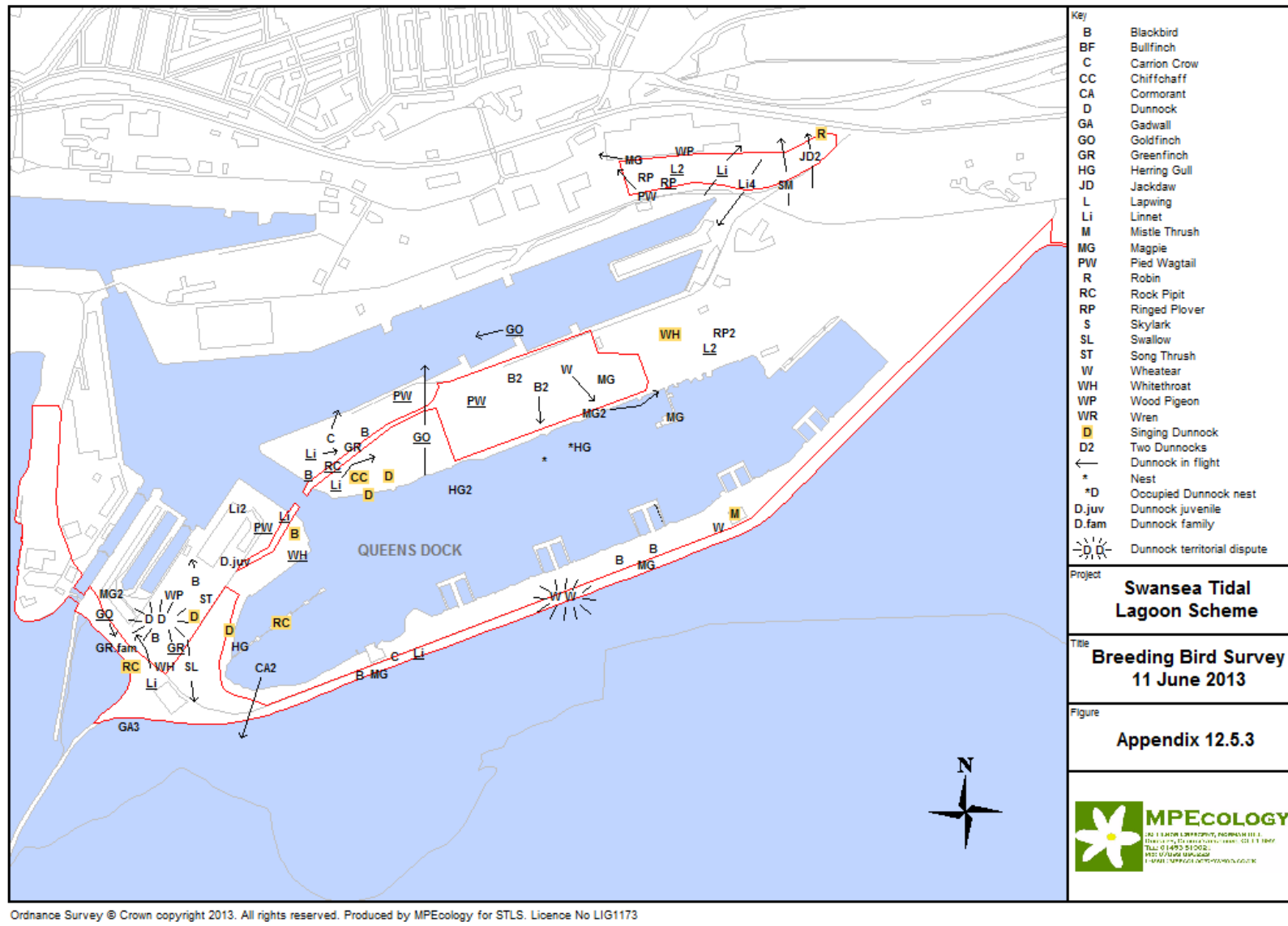
| Code | Species                                          | April<br>2013 | May<br>2013 | June<br>2013 | Status                     | Location                                                                                                                                  | Notes          |
|------|--------------------------------------------------|---------------|-------------|--------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| L    | Lapwing<br>( <i>Vanellus vanellus</i> )          | ✓             | ✓           | ✓            | S42 species<br>RSPB: Red   | Overwintering flock recorded from the docks estate. Two to three pairs likely to have attempted to breed within the docks estate in 2013. | Breeding       |
| Li   | Linnet<br>( <i>Carduelis cannabina</i> )         | ✓             | ✓           | ✓            | S42 species<br>RSPB: Red   | Frequent in cover within the docks estate and neighbouring Crymlyn Burrows                                                                | Breeding       |
| MG   | Magpie<br>( <i>Pica pica</i> )                   | ✓             | ✓           | ✓            | RSPB: Green                | Frequently noted foraging within the docks estate                                                                                         |                |
| MA   | Mallard<br>( <i>Anas platyrhynchos</i> )         | ✓             |             |              | RSPB: Amber                | Noted from Kings Dock                                                                                                                     |                |
| MP   | Meadow Pipit<br>( <i>Anthus pratensis</i> )      |               | ✓           | ✓            | RSPB: Amber                | Noted from Crymlyn Burrows                                                                                                                |                |
| M    | Mistle Thrush<br>( <i>Turdus viscivorus</i> )    |               |             | ✓            | RSPB: Amber                | Noted from southern edge of Queens Dock                                                                                                   |                |
| PW   | Pied Wagtail<br>( <i>Motacilla alba</i> )        |               |             |              | RSPB: Green                | Frequently noted from the docks estate                                                                                                    |                |
| RP   | Ringed Plover<br>( <i>Charadrius hiaticula</i> ) | ✓             | ✓           | ✓            | S42 species<br>RSPB: Amber | One to two pairs likely to have attempted to breed within the docks estate in 2013.                                                       | Breeding       |
| R    | Robin<br>( <i>Erithacus rubecula</i> )           | ✓             | ✓           | ✓            | RSPB: Green                | Noted from areas of cover within the docks estate and Crymlyn Burrows                                                                     | Breeding       |
| RC   | Rock Pipit<br>( <i>Anthus petrosus</i> )         | ✓             | ✓           | ✓            | RSPB: Green                | Noted at the edges of Queens Dock and from locations along the sea wall. Probable breeding at the western end of the docks estate.        | Breeding       |
| SM   | Sand Martin<br>( <i>Riparia riparia</i> )        | ✓             |             | ✓            | RSPB: Amber                |                                                                                                                                           | Flyover record |
| S    | Skylark<br>( <i>Alauda arvensis</i> )            | ✓             | ✓           | ✓            | S42 species<br>RSPB: Red   | Breeding with Cymlyn Burrows and one record from grassland at the western end of Queens Dock                                              | Breeding       |

| Code | Species                                             | April<br>2013 | May<br>2013 | June<br>2013 | Status                   | Location                                                                                | Notes           |
|------|-----------------------------------------------------|---------------|-------------|--------------|--------------------------|-----------------------------------------------------------------------------------------|-----------------|
| ST   | Song Thrush<br>( <i>Turdus philomelos</i> )         | ✓             | ✓           | ✓            | S42 species<br>RSPB: Red | Noted from cover at western end of Queens Dock, Crymlyn Burrows and Baglan              | Breeding        |
| SL   | Swallow<br>( <i>Hirundo rustica</i> )               | ✓             | ✓           | ✓            | RSPB: Amber              |                                                                                         | Flyover records |
| W    | Wheatear<br>( <i>Oenanthe oenathe</i> )             | ✓             | ✓           | ✓            | RSPB: Amber              | Noted from docks estate including the southern edges of Queens Dock. Possible breeding. |                 |
| WH   | Whitethroat<br>( <i>Sylvia communis</i> )           | ✓             | ✓           | ✓            | RSPB: Amber              | Noted from cover in docks estate as well as Crymlyn Burrows                             | Breeding        |
| WP   | Wood Pigeon<br>( <i>Columba palumbus</i> )          | ✓             | ✓           | ✓            | RSPB: Green              | Noted foraging within docks estate                                                      |                 |
| WR   | Wren<br>( <i>Troglodytes troglodytes</i> )          | ✓             | ✓           | ✓            | RSPB: Green              | Noted from cover at northern side of Crymlyn Burrows                                    | Breeding        |
| WW   | Willow Warbler<br>( <i>Phylloscopus trochilus</i> ) | ✓             | ✓           | ✓            | RSPB: Amber              | Noted from cover at northern side of Crymlyn Burrows                                    | Breeding        |
| YW   | Yellow Wagtail<br>( <i>Motacilla flava</i> )        |               |             |              | S42 species<br>RSPB: Red | Incidental record (31 <sup>st</sup> August 2013) at eastern end of Crymlyn Burrows      | Flyover record  |



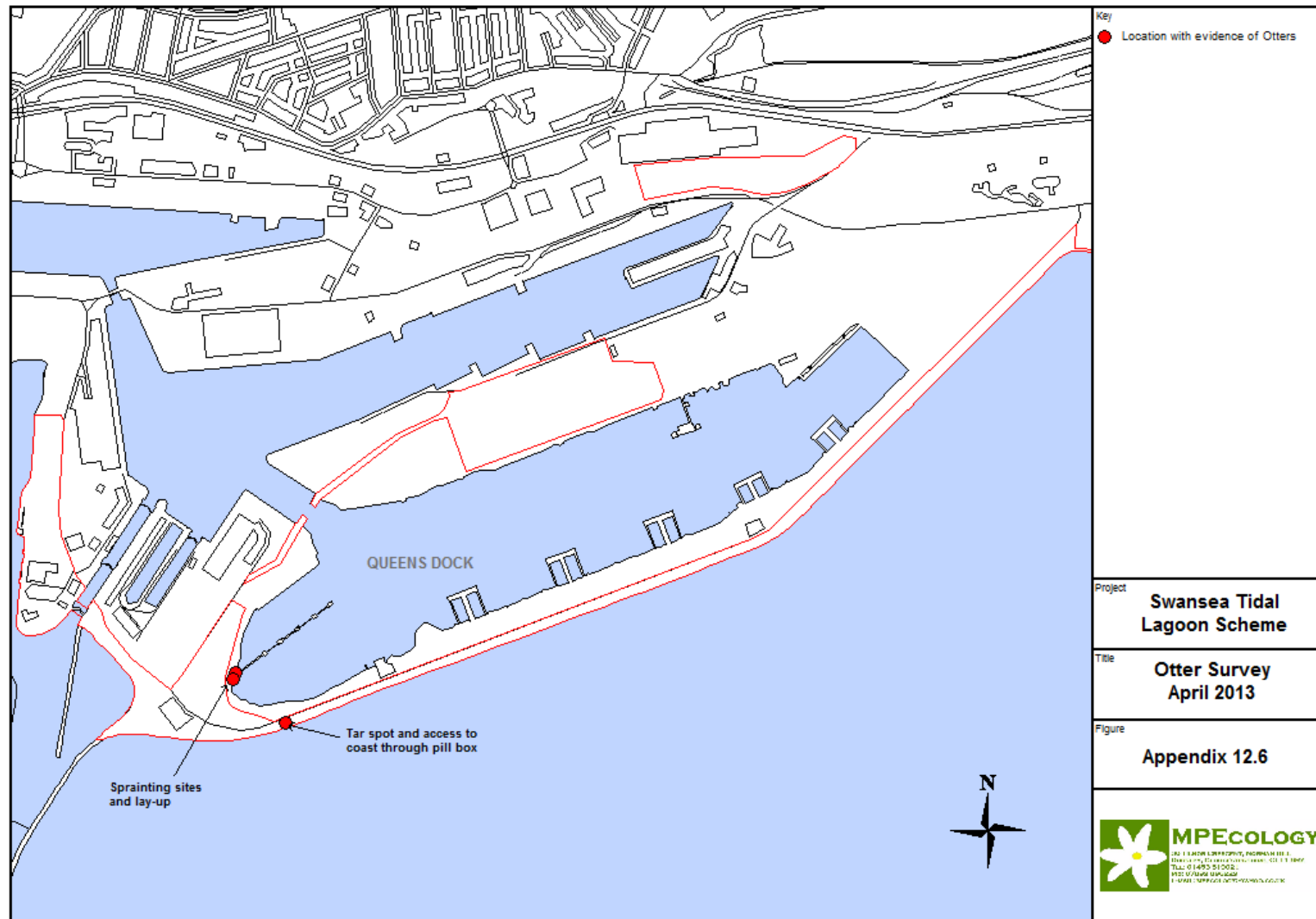






## **12.6 Otter Survey**

- 12.6.0.1 Otters are wide-ranging animals and the existence of local records from the River Neath, River Tawe and Tennant Canal was considered to increase the likelihood that Otters visited habitat associated with Swansea Docks and its immediate coastline. A survey targeting areas of the study area providing potential cover for Otters at locations more likely to be subject to disturbance during scheme construction and operation was therefore undertaken.
- 12.6.0.2 The survey effort was concentrated along the seawall and at the south-western end of the Queen's Dock during a site visit undertaken on the 11th April 2013. A search for spraint, footprints, or feeding signs was carried out. In addition, a location at the western end of Queens Dock provided an opportunity to deploy a trail camera within an area considered suitable for Otters and deployment was carried out between the 11th and 19th April 2013. Sprainting sites identified during the April visit were checked for continued signs of activity in July 2013 and a second trail camera deployment was carried out between the 3rd and 13th September 2013.



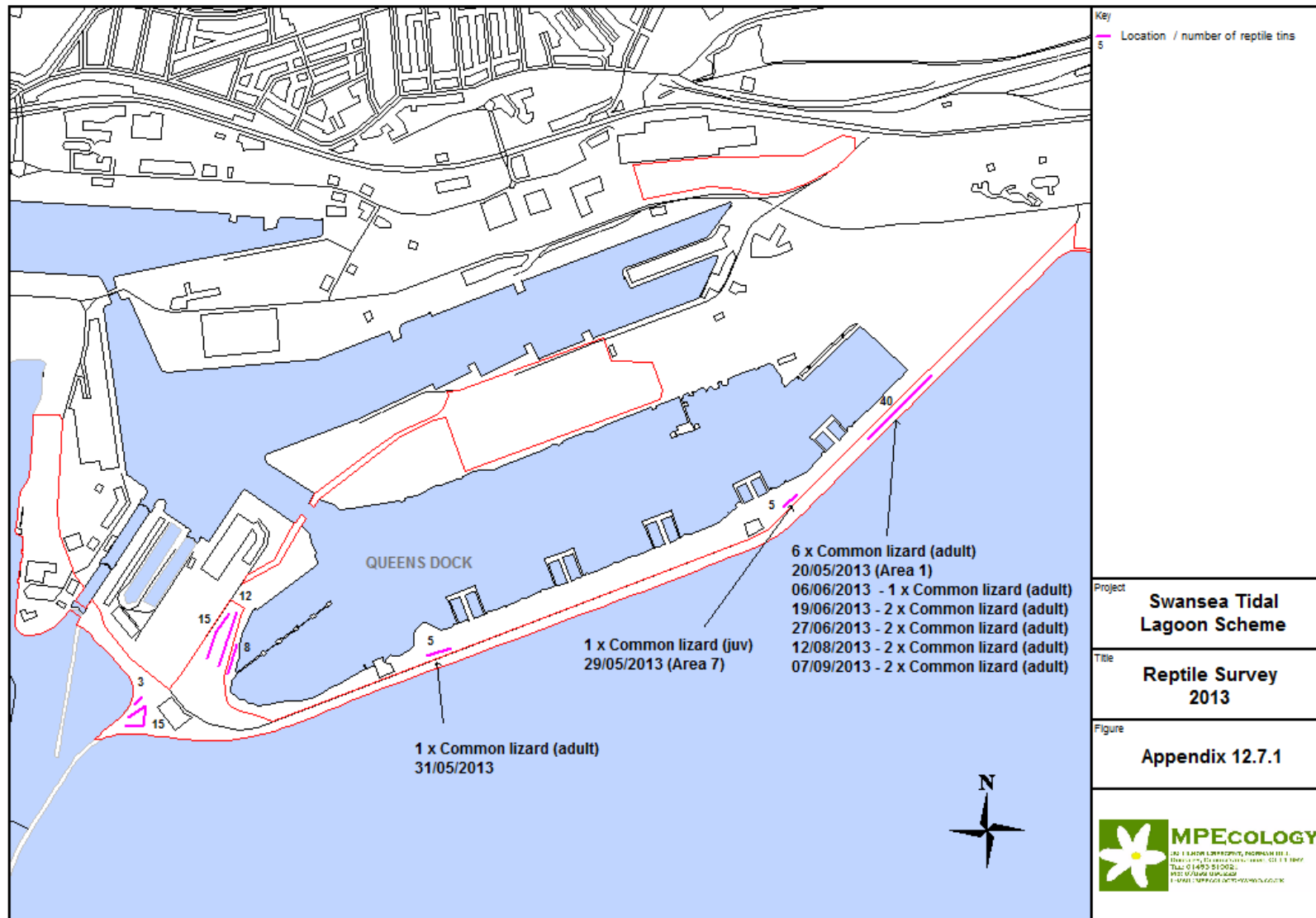
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## 12.7 Reptile Survey

- 12.7.0.1 Existing records and surveys associated with the Swansea University Bay Campus (Atkins, 2012) identified the presence of reptiles at the northern and eastern end of Swansea docks. Survey effort for reptiles focused on grassland habitat to the south and west of Queens Dock where an absence of records existed.
- 12.7.0.2 A series of artificial refugia (or 'tins') were deployed at potentially suitable reptile basking sites. The tins consisted of 50 x 50cm squares of heavy-duty roofing felt.
- 12.7.0.3 The surveys followed guidelines outlined in the Herpetofauna Workers Manual (Gent & Gibson, 1998). A series of visits (11) were carried out between April and September, at times of day and during weather conditions considered likely to favour detection of basking animals (intermittent sunshine in early morning or late afternoon with ambient temperature between 10 and 17°C). Each visit involved checking beneath refugia, as well as visual searches for any reptiles basking in the open.

**Table 12.23 Summary of reptile survey**

| Visit | Date       | Time    | Weather conditions                          | Notes                                    |
|-------|------------|---------|---------------------------------------------|------------------------------------------|
|       | 11/04/2013 |         |                                             | 81 tins deployed                         |
| 1     | 19/04/2013 | 1100hrs | 11°C, clear and sunny with light wind       | No reptiles                              |
| 2     | 02/05/2013 | 0930hrs | 12°C, clear and sunny with slight breeze    | No reptiles –additional 25 tins deployed |
| 3     | 16/05/2013 | 1015hrs | 10°C, sunny with some cloud                 | No reptiles                              |
| 4     | 20/05/2013 | 0900hrs | 10°C, Overcast with slight breeze           | 6 lizards (4 adult, 2 juvenile). Area1.  |
| 5     | 29/05/2013 | 1500hrs | 15°C, sunny with some cloud                 | 1 lizard (juv). Area 7.                  |
| 6     | 31/05/2013 | 0915hrs | 15°C, clear and sunny with slight breeze    | 1 lizard (adult). Area 1.                |
| 7     | 06/06/2013 | 0915hrs | 15°C, clear and sunny with slight breeze    | 2 lizards (adult). Area 1 (grassy)       |
| 8     | 19/06/2013 | 0900hrs | 17°C clear and sunny with slight breeze     | 2 lizards area 1                         |
| 9     | 27/06/2013 | 0930hrs | 13°C, Mostly overcast with intermittent sun | 2 lizards Area 1                         |
| 10    | 12/08/2013 | 1000hrs | 16°C, intermittent cloud                    | 2 lizards Area 1                         |
| 11    | 07/09/2013 | 1030hrs | 16°C, intermittent sun and light wind       | 2 lizards Area 1                         |



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## 12.8 Invertebrate Survey

- 12.8.0.1 The invertebrate survey focused on investigating habitat associated with the Docks Estate largely comprising brown-field land supporting areas of hard-standing as well as grassland habitat and small areas of scrub. This area has not been accessible to members of the public and lacked existing invertebrate records. Two-intensive moth-trapping visits were undertaken in July and early August 2013. Incidental invertebrate records were also taken during botany and reptile survey visits.
- 12.8.0.2 Towards the eastern end of the Project area, invertebrate surveys undertaken for the Swansea University Bay Science Campus (URS, 2010) as well as other surveys targeted at strandline species (Bolchover, 2009) provide records for disturbed ground and sand dune habitat associated with Crymlyn Burrows SSSI. Further investigation of the strandline invertebrate assemblage at Crymlyn Burrows was carried out during a survey undertaken on the 30th August 2013.

**Table 12.24 Summary of invertebrate survey**

| <u>Taxon</u>                                    | <u>Date</u> | <u>No.</u> | <u>Status</u> | <u>Site Name</u>                   | <u>Grid ref</u> | <u>Recorder</u>         |
|-------------------------------------------------|-------------|------------|---------------|------------------------------------|-----------------|-------------------------|
| <b>Isopoda (woodlice)</b>                       |             |            |               |                                    |                 |                         |
| <i>Armadillidium album</i>                      | 31-Aug-13   | 4          | None          | Crymlyn strandline & foredunes     | SS720927        | B. Stewart & M. Pickard |
| <i>Armadillidium album</i>                      | 31-Aug-13   | 5          | None          | Crymlyn strandline & foredunes     | SS714926        | M. Pickard              |
| <i>Armadillidium album</i>                      | 31-Aug-13   | 2          | None          | Crymlyn strandline & foredunes     | SS700925        | M. Pickard              |
|                                                 |             |            |               |                                    |                 |                         |
| <b>Opiliones (harvestmen)</b>                   |             |            |               |                                    |                 |                         |
| <i>Phalangium opilio</i>                        | 06-Aug-13   | 3          | None          | Queen's Dock West (1)              | SS671920        | Barry Stewart           |
| <i>Phalangium opilio</i>                        | 06-Aug-13   | 2          | None          | Swansea Docks - eastern breakwater | SS669918        | Barry Stewart           |
| <i>Phalangium opilio</i>                        | 31-Aug-13   | 3          | None          | Crymlyn strandline & foredunes     | SS720927        | B. Stewart & M. Pickard |
| <i>Leiobunum blackwalli</i>                     | 06-Aug-13   | 1          | None          | Queen's Dock West (2)              | SS671919        | Barry Stewart           |
|                                                 |             |            |               |                                    |                 |                         |
| <b>Orthoptera (grasshoppers &amp; crickets)</b> |             |            |               |                                    |                 |                         |
| <i>Chorthippus brunneus</i>                     | 16-Jul-13   | 1          | None          | Crymlyn Burrows – golf course      | SS722933        | M. Pickard              |
| <i>Chorthippus brunneus</i>                     | 31-Aug-13   | 1          | None          | Crymlyn Burrows                    | SS712932        | B. Stewart & M. Pickard |
| <i>Chorthippus brunneus</i>                     | 31-Aug-13   | 1          | None          | Crymlyn strandline & foredunes     | SS720927        | Barry Stewart           |
|                                                 |             |            |               |                                    |                 |                         |

| <u>Taxon</u>                                 | <u>Date</u> | <u>No.</u> | <u>Status</u> | <u>Site Name</u>               | <u>Grid ref</u> | <u>Recorder</u>         |
|----------------------------------------------|-------------|------------|---------------|--------------------------------|-----------------|-------------------------|
| <b>Hemiptera (true bugs)</b>                 |             |            |               |                                |                 |                         |
| <i>Lygus maritimus</i>                       | 31-Aug-13   | 3          | Local         | Crymlyn strandline & foredunes | SS720927        | B. Stewart & M. Pickard |
|                                              |             |            |               |                                |                 |                         |
| <b>Trichoptera (caddis-flies)</b>            |             |            |               |                                |                 |                         |
| <i>Glyptotendipes pallidus</i>               | 06-Aug-13   | 1          | None          | Queen's Dock West (2)          | SS671919        | Barry Stewart           |
| <i>Anabolia nervosa</i>                      | 05-Jul-13   | 1          | None          | Queen's Dock South             | SS683922        | Barry Stewart           |
| <i>Limnephilus auricula</i>                  | 05-Jul-13   | 1          | None          | Queen's Dock South             | SS683922        | Barry Stewart           |
| <i>Potamophylax latipennis</i>               | 05-Jul-13   | 1          | None          | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Athripsodes albifrons</i>                 | 05-Jul-13   | 2          | None          | Queen's Dock South             | SS683922        | Barry Stewart           |
| <i>Leptocerus tineiformis</i>                | 05-Jul-13   | 2          | None          | Queen's Dock South             | SS683922        | Barry Stewart           |
|                                              |             |            |               |                                |                 |                         |
| <b>Lepidoptera (moths &amp; butterflies)</b> |             |            |               |                                |                 |                         |
| <i>Hepialus humuli</i>                       | 05-Jul-13   | 1          | Common / S42  | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Zygaena filipendulae</i>                  | 05-Jul-13   | 100        | Common        | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Zygaena filipendulae</i>                  | 06-Aug-13   | 50         | Common        | Queen's Dock West (1)          | SS671920        | Barry Stewart           |
| <i>Zygaena filipendulae</i>                  | 31-Aug-13   | 2          | Common        | Crymlyn strandline & foredunes | SS720927        | Barry Stewart           |
| <i>Aspilapteryx tringipennella</i>           | 06-Aug-13   | 1          | Common        | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Aspilapteryx tringipennella</i>           | 06-Aug-13   | 1          | Common        | Queen's Dock West (2)          | SS671919        | Barry Stewart           |
| <i>Yponomeuta rorella</i>                    | 06-Aug-13   | 1          | Local         | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Yponomeuta rorella</i>                    | 06-Aug-13   | 1          | Local         | Queen's Dock West (2)          | SS671919        | Barry Stewart           |
| <i>Plutella xylostella</i>                   | 05-Jul-13   | 3          | Migrant       | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Plutella xylostella</i>                   | 06-Aug-13   | 3          | Migrant       | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Hofmannophila pseudospretella</i>         | 05-Jul-13   | 1          | Common        | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Endrosis sarcitrella</i>                  | 05-Jul-13   | 1          | Common        | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Depressaria heraclei</i>                  | 05-Jul-13   | 1          | Common        | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Agonopterix arenella</i>                  | 06-Aug-13   | 1          | Common        | Queen's Dock West (2)          | SS671919        | Barry Stewart           |

| <u>Taxon</u>                           | <u>Date</u>      | <u>No.</u> | <u>Status</u>              | <u>Site Name</u>             | <u>Grid ref</u> | <u>Recorder</u>      |
|----------------------------------------|------------------|------------|----------------------------|------------------------------|-----------------|----------------------|
| <i>Agonopterix nervosa</i>             | 06-Aug-13        | 1          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Agonopterix nervosa</i>             | 06-Aug-13        | 2          | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <b><i>Monochroa cytisella</i></b>      | <b>06-Aug-13</b> | <b>1</b>   | <b>Local</b>               | <b>Queen's Dock West (2)</b> | <b>SS671919</b> | <b>Barry Stewart</b> |
| <b><i>Apodia bifractella</i></b>       | <b>06-Aug-13</b> | <b>2</b>   | <b>Local</b>               | <b>Queen's Dock West (1)</b> | <b>SS670919</b> | <b>Barry Stewart</b> |
| <b><i>Apodia bifractella</i></b>       | <b>06-Aug-13</b> | <b>1</b>   | <b>Local</b>               | <b>Queen's Dock West (2)</b> | <b>SS671919</b> | <b>Barry Stewart</b> |
| <b><i>Bryotropha desertella</i></b>    | <b>06-Aug-13</b> | <b>2</b>   | <b>Nationally Scarce B</b> | <b>Queen's Dock West (1)</b> | <b>SS670919</b> | <b>Barry Stewart</b> |
| <i>Bryotropha terrella</i>             | 05-Jul-13        | 2          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Mirificarma mulinella</i>           | 06-Aug-13        | 5          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Mirificarma mulinella</i>           | 06-Aug-13        | 4          | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Scrobipalpa costella</i>            | 06-Aug-13        | 1          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <b><i>Aproaerema anthyllidella</i></b> | <b>05-Jul-13</b> | <b>0</b>   | <b>Local</b>               | <b>Queen's Dock South</b>    | <b>SS683922</b> | <b>Barry Stewart</b> |
| <b><i>Aproaerema anthyllidella</i></b> | <b>06-Aug-13</b> | <b>15</b>  | <b>Local</b>               | <b>Queen's Dock West (1)</b> | <b>SS670919</b> | <b>Barry Stewart</b> |
| <b><i>Aproaerema anthyllidella</i></b> | <b>06-Aug-13</b> | <b>10</b>  | <b>Local</b>               | <b>Queen's Dock West (2)</b> | <b>SS671919</b> | <b>Barry Stewart</b> |
| <b><i>Anarsia spartiella</i></b>       | <b>05-Jul-13</b> | <b>1</b>   | <b>Local</b>               | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b> |
| <i>Blastobasis adustella</i>           | 05-Jul-13        | 1          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Blastobasis adustella</i>           | 06-Aug-13        | 7          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Blastobasis adustella</i>           | 06-Aug-13        | 4          | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Blastobasis lacticolella</i>        | 05-Jul-13        | 2          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Mompha subbistrigella</i>           | 06-Aug-13        | 1          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Agapeta hamana</i>                  | 05-Jul-13        | 2          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Agapeta hamana</i>                  | 06-Aug-13        | 3          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Agapeta hamana</i>                  | 06-Aug-13        | 2          | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Agapeta zoegana</i>                 | 06-Aug-13        | 1          | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Eupoecilia angustana</i>            | 05-Jul-13        | 1          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Cochylis dubitana</i>               | 06-Aug-13        | 2          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Epiphyas postvittana</i>            | 05-Jul-13        | 1          | Common                     | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Epiphyas postvittana</i>            | 05-Jul-13        | 1          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |

| <u>Taxon</u>                      | <u>Date</u>      | <u>No.</u> | <u>Status</u> | <u>Site Name</u>             | <u>Grid ref</u> | <u>Recorder</u>      |
|-----------------------------------|------------------|------------|---------------|------------------------------|-----------------|----------------------|
| <i>Epiphyas postvittana</i>       | 06-Aug-13        | 5          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Epiphyas postvittana</i>       | 06-Aug-13        | 3          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Cnephasia stephensiana</i>     | 06-Aug-13        | 1          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Endothenia gentianaeana</i>    | 06-Aug-13        | 1          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Endothenia marginana</i>       | 06-Aug-13        | 10         | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Epinotia rubiginosana</i>      | 05-Jul-13        | 3          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Epiblema uddmanniana</i>       | 05-Jul-13        | 3          | Common        | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Epiblema uddmanniana</i>       | 05-Jul-13        | 9          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Eucosma campoliliana</i>       | 05-Jul-13        | 2          | Common        | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Eucosma campoliliana</i>       | 05-Jul-13        | 1          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Eucosma campoliliana</i>       | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Eucosma cana</i>               | 05-Jul-13        | 15         | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Lathronympha strigana</i>      | 06-Aug-13        | 2          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Lathronympha strigana</i>      | 06-Aug-13        | 8          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Cydia splendana</i>            | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Cydia splendana</i>            | 06-Aug-13        | 2          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Chrysoteuchia culmella</i>     | 05-Jul-13        | 15         | Common        | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Chrysoteuchia culmella</i>     | 05-Jul-13        | 50         | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Crambus lathoniellus</i>       | 05-Jul-13        | 1          | Common        | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Crambus lathoniellus</i>       | 05-Jul-13        | 7          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Crambus lathoniellus</i>       | 05-Jul-13        | 4          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Crambus perlella</i>           | 05-Jul-13        | 4          | Common        | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Crambus perlella</i>           | 05-Jul-13        | 15         | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Crambus perlella</i>           | 05-Jul-13        | 5          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Crambus perlella</i>           | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <b><i>Agriphila selasella</i></b> | <b>06-Aug-13</b> | <b>2</b>   | <b>Local</b>  | <b>Queen's Dock West (1)</b> | <b>SS670919</b> | <b>Barry Stewart</b> |
| <i>Agriphila straminella</i>      | 05-Jul-13        | 1          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Agriphila straminella</i>      | 06-Aug-13        | 3          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |

| <u>Taxon</u>                      | <u>Date</u>      | <u>No.</u> | <u>Status</u> | <u>Site Name</u>             | <u>Grid ref</u> | <u>Recorder</u>      |
|-----------------------------------|------------------|------------|---------------|------------------------------|-----------------|----------------------|
| <i>Agriphila straminella</i>      | 06-Aug-13        | 1          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Agriphila tristella</i>        | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Agriphila tristella</i>        | 06-Aug-13        | 1          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Agriphila inquinatella</i>     | 06-Aug-13        | 1          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Acentria ephemerella</i>       | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Scoparia pyralella</i>         | 05-Jul-13        | 4          | Common        | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Scoparia pyralella</i>         | 05-Jul-13        | 6          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Scoparia ambigualis</i>        | 05-Jul-13        | 1          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <b><i>Eudonia pallida</i></b>     | <b>05-Jul-13</b> | <b>2</b>   | <b>Local</b>  | <b>Queen's Dock South</b>    | <b>SS683922</b> | <b>Barry Stewart</b> |
| <b><i>Eudonia pallida</i></b>     | <b>05-Jul-13</b> | <b>1</b>   | <b>Local</b>  | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b> |
| <b><i>Eudonia pallida</i></b>     | <b>05-Jul-13</b> | <b>20</b>  | <b>Local</b>  | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b> |
| <i>Eudonia angustea</i>           | 05-Jul-13        | 2          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Eudonia mercurella</i>         | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Eudonia mercurella</i>         | 06-Aug-13        | 1          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Evergestis forficalis</i>      | 05-Jul-13        | 1          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Eurrhpara hortulata</i>        | 05-Jul-13        | 2          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Phlyctaenia coronata</i>       | 05-Jul-13        | 1          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <b><i>Opsibotys fuscalis</i></b>  | <b>05-Jul-13</b> | <b>1</b>   | <b>Local</b>  | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b> |
| <i>Udea prunalis</i>              | 06-Aug-13        | 1          | Common        | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Pleuroptya ruralis</i>         | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Pleuroptya ruralis</i>         | 06-Aug-13        | 2          | Common        | Queen's Dock West (1)        | SS671920        | Barry Stewart        |
| <i>Homoeosoma sinuella</i>        | 05-Jul-13        | 1          | Common        | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Phycitodes binaevella</i>      | 05-Jul-13        | 1          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <b><i>Phycitodes saxicola</i></b> | <b>06-Aug-13</b> | <b>2</b>   | <b>Local</b>  | <b>Queen's Dock West (1)</b> | <b>SS670919</b> | <b>Barry Stewart</b> |
| <i>Amblyptilia acanthadactyla</i> | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Platyptilia pallidactyla</i>   | 05-Jul-13        | 3          | Common        | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Platyptilia pallidactyla</i>   | 05-Jul-13        | 2          | Common        | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Adaina microdactyla</i>        | 06-Aug-13        | 1          | Common        | Queen's Dock West (1)        | SS671920        | Barry Stewart        |

| <u>Taxon</u>                        | <u>Date</u>      | <u>No.</u> | <u>Status</u> | <u>Site Name</u>                          | <u>Grid ref</u> | <u>Recorder</u>                       |
|-------------------------------------|------------------|------------|---------------|-------------------------------------------|-----------------|---------------------------------------|
| <i>Colias croceus</i>               | 31-Aug-13        | 1          | Migrant       | Crymlyn Burrows                           | SS716927        | Barry Stewart                         |
| <i>Argynnis aglaja</i>              | 05-Jul-13        | 15         | None          | Crymlyn Burrows                           | SS706928        | M. Pickard                            |
| <i>Pieris brassicae</i>             | 31-Aug-13        | 5          | None          | Crymlyn strandline & foredunes            | SS720927        | B. Stewart & M. Pickard               |
| <i>Pieris brassicae</i>             | 31-Aug-13        | 5          | None          | Crymlyn strandline & foredunes            | SS720927        | B. Stewart & M. Pickard               |
| <i>Pieris brassicae</i>             | 31-Aug-13        | 2          | None          | Crymlyn strandline & foredunes            | SS720927        | Barry Stewart                         |
| <i>Pieris rapae</i>                 | 31-Aug-13        | 4          | None          | Crymlyn strandline & foredunes            | SS720927        | B. Stewart & M. Pickard               |
| <i>Pieris rapae</i>                 | 31-Aug-13        | 3          | None          | Crymlyn Burrows                           | SS714933        | Barry Stewart                         |
| <i>Pieris rapae</i>                 | 31-Aug-13        | 2          | None          | Crymlyn Burrows                           | SS713932        | Barry Stewart                         |
| <i>Pieris napi</i>                  | 06-Aug-13        | 1          | None          | Queen's Dock West (1)                     | SS671920        | Barry Stewart                         |
| <i>Lycaena phlaeas</i>              | 31-Aug-13        | 1          | None          | Crymlyn Burrows                           | SS709931        | Barry Stewart                         |
| <i>Polyommatus icarus</i>           | 31-Aug-13        | 2          | None          | Crymlyn Burrows                           | SS712932        | B. Stewart & M. Pickard               |
| <i>Polyommatus icarus</i>           | 31-Aug-13        | 1          | None          | Crymlyn Burrows                           | SS719927        | B. Stewart & M. Pickard               |
| <i>Polyommatus icarus</i>           | 31-Aug-13        | 2          | None          | Crymlyn strandline & foredunes            | SS720927        | B. Stewart & M. Pickard               |
| <i>Polyommatus icarus</i>           | 31-Aug-13        | 3          | None          | Crymlyn strandline & foredunes            | SS720927        | Barry Stewart                         |
| <i>Polyommatus icarus</i>           | 31-Aug-13        | 4          | None          | Crymlyn Burrows                           | SS714933        | Barry Stewart                         |
| <i>Vanessa cardui</i>               | 31-Aug-13        | 1          | Migrant       | Crymlyn Burrows                           | SS714933        | Barry Stewart                         |
| <i>Polygonia c-album</i>            | 31-Aug-13        | 1          | None          | Crymlyn Burrows                           | SS714933        | Barry Stewart                         |
| <i>Polyommastus icarus</i>          | 07-Jun-13        | 8          | None          | Queens Dock                               | SS671919        | M. Pickard & Rebecca Smith            |
| <i>Pararge aegeria</i>              | 31-Aug-13        | 1          | None          | Crymlyn Burrows                           | SS712932        | B. Stewart & M. Pickard               |
| <i>Maniola jurtina</i>              | 05-Jul-13        | 3          | None          | Queen's Dock West (3)                     | SS671918        | Barry Stewart                         |
| <i>Maniola jurtina</i>              | 06-Aug-13        | 1          | None          | Queen's Dock West (2)                     | SS671919        | Barry Stewart                         |
| <i>Maniola jurtina</i>              | 31-Aug-13        | 3          | None          | Crymlyn Burrows                           | SS712932        | B. Stewart & M. Pickard               |
| <i>Maniola jurtina</i>              | 31-Aug-13        | 7          | None          | Crymlyn strandline & foredunes            | SS720927        | Barry Stewart                         |
| <i>Maniola jurtina</i>              | 31-Aug-13        | 6          | None          | Crymlyn Burrows                           | SS714933        | Barry Stewart                         |
| <b><i>Cupido minimus</i></b>        | <b>07-Jun-13</b> | <b>1</b>   | <b>S42</b>    | <b>Queens Dock</b>                        | <b>SS671919</b> | <b>M. Pickard</b>                     |
| <b><i>Cupido minimus</i></b>        | <b>16-Jul-13</b> | <b>1</b>   | <b>S42</b>    | <b>Crymlyn Burrows – golf course</b>      | <b>SS722933</b> | <b>M. Pickard</b>                     |
| <b><i>Coenonympha pamphilus</i></b> | <b>07-Jun-13</b> | <b>10</b>  | <b>S42</b>    | <b>Queens Dock</b>                        | <b>SS671919</b> | <b>M. Pickard &amp; Rebecca Smith</b> |
| <b><i>Coenonympha pamphilus</i></b> | <b>31-Aug-13</b> | <b>1</b>   | <b>S42</b>    | <b>Crymlyn strandline &amp; foredunes</b> | <b>SS720927</b> | <b>Barry Stewart</b>                  |



| <u>Taxon</u>                               | <u>Date</u>      | <u>No.</u> | <u>Status</u>       | <u>Site Name</u>               | <u>Grid ref</u> | <u>Recorder</u>      |
|--------------------------------------------|------------------|------------|---------------------|--------------------------------|-----------------|----------------------|
| <b><i>Coenonympha pamphilus</i></b>        | <b>31-Aug-13</b> | <b>2</b>   | <b>S42</b>          | <b>Crymlyn Burrows</b>         | <b>SS714933</b> | <b>Barry Stewart</b> |
| <i>Macrothylacia rubi</i>                  | 31-Aug-13        | 1          | Common              | Crymlyn strandline & foredunes | SS720927        | Barry Stewart        |
| <i>Habrosyne pyritoides</i>                | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <i>Ochropacha duplaris</i>                 | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <i>Idaea aversata</i>                      | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <b><i>Xanthorhoe ferrugata</i></b>         | <b>06-Aug-13</b> | <b>1</b>   | <b>Common / S42</b> | <b>Queen's Dock West (2)</b>   | <b>SS671919</b> | <b>Barry Stewart</b> |
| <i>Epirrhoe alternata</i>                  | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <i>Epirrhoe alternata</i>                  | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)          | SS670919        | Barry Stewart        |
| <i>Epirrhoe alternata</i>                  | 06-Aug-13        | 1          | Common              | Queen's Dock West (2)          | SS671919        | Barry Stewart        |
| <i>Camptogramma bilineata</i>              | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <i>Camptogramma bilineata</i>              | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <i>Camptogramma bilineata</i>              | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)          | SS671920        | Barry Stewart        |
| <i>Horisme tersata</i>                     | 06-Aug-13        | 1          | Common              | Queen's Dock West (2)          | SS671919        | Barry Stewart        |
| <b><i>Perizoma albulata</i></b>            | <b>05-Jul-13</b> | <b>2</b>   | <b>Local / S42</b>  | <b>Queen's Dock West (3)</b>   | <b>SS671918</b> | <b>Barry Stewart</b> |
| <i>Perizoma flavofasciata</i>              | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <i>Eupithecia centaureata</i>              | 05-Jul-13        | 2          | Common              | Queen's Dock South             | SS683922        | Barry Stewart        |
| <i>Eupithecia centaureata</i>              | 05-Jul-13        | 6          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <i>Eupithecia centaureata</i>              | 06-Aug-13        | 6          | Common              | Queen's Dock West (1)          | SS670919        | Barry Stewart        |
| <i>Eupithecia centaureata</i>              | 06-Aug-13        | 3          | Common              | Queen's Dock West (2)          | SS671919        | Barry Stewart        |
| <i>Eupithecia absinthiata</i>              | 05-Jul-13        | 2          | Common              | Queen's Dock South             | SS683922        | Barry Stewart        |
| <i>Eupithecia absinthiata</i>              | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <i>Eupithecia vulgata</i>                  | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)          | SS671918        | Barry Stewart        |
| <b><i>Eupithecia virgaureata</i></b>       | <b>05-Jul-13</b> | <b>1</b>   | <b>Local</b>        | <b>Queen's Dock South</b>      | <b>SS683922</b> | <b>Barry Stewart</b> |
| <b><i>Eupithecia virgaureata</i></b>       | <b>05-Jul-13</b> | <b>1</b>   | <b>Local</b>        | <b>Queen's Dock West (3)</b>   | <b>SS671918</b> | <b>Barry Stewart</b> |
| <i>Chloroclystis v-ata</i>                 | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)          | SS670919        | Barry Stewart        |
| <i>Chloroclystis v-ata</i>                 | 06-Aug-13        | 1          | Common              | Queen's Dock West (2)          | SS671919        | Barry Stewart        |
| <b><i>Chiasmia clathrata clathrata</i></b> | <b>05-Jul-13</b> | <b>1</b>   | <b>Common / S42</b> | <b>Queen's Dock West (3)</b>   | <b>SS671918</b> | <b>Barry Stewart</b> |
| <b><i>Chiasmia clathrata clathrata</i></b> | <b>06-Aug-13</b> | <b>1</b>   | <b>Common / S42</b> | <b>Queen's Dock West (1)</b>   | <b>SS670919</b> | <b>Barry Stewart</b> |

## Tidal Lagoon Swansea Bay plc



| <u>Taxon</u>                       | <u>Date</u>      | <u>No.</u> | <u>Status</u>       | <u>Site Name</u>             | <u>Grid ref</u> | <u>Recorder</u>      |
|------------------------------------|------------------|------------|---------------------|------------------------------|-----------------|----------------------|
| <i>Opisthograptis luteolata</i>    | 05-Jul-13        | 1          | Common              | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Opisthograptis luteolata</i>    | 06-Aug-13        | 2          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Biston betularia</i>            | 05-Jul-13        | 1          | Common              | Queen's Dock South           | SS683922        | Barry Stewart        |
| <i>Biston betularia</i>            | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Peribatodes rhomboidaria</i>    | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Peribatodes rhomboidaria</i>    | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Peribatodes rhomboidaria</i>    | 06-Aug-13        | 2          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <b><i>Cleorodes lichenaria</i></b> | <b>05-Jul-13</b> | <b>1</b>   | <b>Local</b>        | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b> |
| <i>Cabera exanthemata</i>          | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Cabera exanthemata</i>          | 06-Aug-13        | 3          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Smerinthus ocellata</i>         | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Deilephila elpenor</i>          | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Phalera bucephala</i>           | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Phalera bucephala</i>           | 31-Aug-13        | 5          | Common              | Crymlyn Burrows              | SS713932        | Barry Stewart        |
| <i>Furcula furcula</i>             | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Furcula furcula</i>             | 06-Aug-13        | 2          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Notodonta dromedarius</i>       | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Notodonta ziczac</i>            | 06-Aug-13        | 1          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Pheosia tremula</i>             | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Pterostoma palpina</i>          | 06-Aug-13        | 1          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Eilema griseola</i>             | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Eilema griseola</i>             | 06-Aug-13        | 1          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Spilosoma lubricipeda</i>       | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Phragmatobia fuliginosa</i>     | 06-Aug-13        | 6          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Phragmatobia fuliginosa</i>     | 06-Aug-13        | 4          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Tyria jacobaeae</i>             | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Tyria jacobaeae</i>             | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <b><i>Euxoa tritici</i></b>        | <b>06-Aug-13</b> | <b>2</b>   | <b>Common / S42</b> | <b>Queen's Dock West (1)</b> | <b>SS670919</b> | <b>Barry Stewart</b> |

| <u>Taxon</u>                        | <u>Date</u>      | <u>No.</u> | <u>Status</u>       | <u>Site Name</u>             | <u>Grid ref</u> | <u>Recorder</u>         |
|-------------------------------------|------------------|------------|---------------------|------------------------------|-----------------|-------------------------|
| <b><i>Euxoa tritici</i></b>         | <b>06-Aug-13</b> | <b>1</b>   | <b>Common / S42</b> | <b>Queen's Dock West (2)</b> | <b>SS671919</b> | <b>Barry Stewart</b>    |
| <i>Agrotis exclamationis</i>        | 05-Jul-13        | 3          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <i>Agrotis ipsilon</i>              | 06-Aug-13        | 2          | Migrant             | Queen's Dock West (1)        | SS671920        | Barry Stewart           |
| <i>Axylia putris</i>                | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <i>Ochropleura plecta</i>           | 05-Jul-13        | 3          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <i>Ochropleura plecta</i>           | 06-Aug-13        | 3          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart           |
| <i>Ochropleura plecta</i>           | 06-Aug-13        | 2          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart           |
| <i>Noctua pronuba</i>               | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <i>Noctua pronuba</i>               | 06-Aug-13        | 8          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart           |
| <i>Noctua pronuba</i>               | 06-Aug-13        | 5          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart           |
| <i>Noctua comes</i>                 | 06-Aug-13        | 10         | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart           |
| <i>Noctua comes</i>                 | 06-Aug-13        | 6          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart           |
| <i>Noctua janthe</i>                | 06-Aug-13        | 4          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart           |
| <i>Noctua janthe</i>                | 06-Aug-13        | 3          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart           |
| <i>Noctua interjecta caliginosa</i> | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart           |
| <i>Xestia c-nigrum</i>              | 05-Jul-13        | 4          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <i>Xestia c-nigrum</i>              | 06-Aug-13        | 1          | Common              | Queen's Dock West (1)        | SS670919        | Barry Stewart           |
| <i>Discestra trifolii</i>           | 31-Aug-13        | 20         | Common              | Crymlyn Burrows              | SS720928        | B. Stewart & M. Pickard |
| <b><i>Melanchra persicariae</i></b> | <b>06-Aug-13</b> | <b>1</b>   | <b>Common / S42</b> | <b>Queen's Dock West (2)</b> | <b>SS671919</b> | <b>Barry Stewart</b>    |
| <i>Lacanobia thalassina</i>         | 05-Jul-13        | 1          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <b><i>Lacanobia suasa</i></b>       | <b>05-Jul-13</b> | <b>1</b>   | <b>Local</b>        | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b>    |
| <i>Lacanobia oleracea</i>           | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <i>Lacanobia oleracea</i>           | 06-Aug-13        | 1          | Common              | Queen's Dock West (2)        | SS671919        | Barry Stewart           |
| <i>Hadena bicruris</i>              | 05-Jul-13        | 2          | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <i>Mythimna ferrago</i>             | 05-Jul-13        | 4          | Common              | Queen's Dock South           | SS683922        | Barry Stewart           |
| <i>Mythimna ferrago</i>             | 05-Jul-13        | 15         | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |
| <i>Mythimna impura</i>              | 05-Jul-13        | 5          | Common              | Queen's Dock South           | SS683922        | Barry Stewart           |
| <i>Mythimna impura</i>              | 05-Jul-13        | 12         | Common              | Queen's Dock West (3)        | SS671918        | Barry Stewart           |

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|---------------------------------------|------------------|------------|----------------------------|------------------------------|-----------------|----------------------|
| <i>Mythimna pallens</i>               | 06-Aug-13        | 1          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <b><i>Mythimna comma</i></b>          | <b>05-Jul-13</b> | <b>1</b>   | <b>Common / S42</b>        | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b> |
| <b><i>Cucullia asteris</i></b>        | <b>31-Aug-13</b> | <b>3</b>   | <b>Nationally Scarce B</b> | <b>Crymlyn Burrows</b>       | <b>SS713932</b> | <b>Barry Stewart</b> |
| <i>Phlogophora meticulosa</i>         | 06-Aug-13        | 1          | Common                     | Queen's Dock West (1)        | SS671920        | Barry Stewart        |
| <i>Cosmia trapezina</i>               | 06-Aug-13        | 1          | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Apamea monoglypha</i>              | 05-Jul-13        | 12         | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Apamea monoglypha</i>              | 06-Aug-13        | 15         | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Apamea monoglypha</i>              | 06-Aug-13        | 12         | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <i>Apamea crenata</i>                 | 05-Jul-13        | 1          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Apamea crenata</i>                 | 06-Aug-13        | 1          | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <b><i>Apamea furva britannica</i></b> | <b>05-Jul-13</b> | <b>1</b>   | <b>Local</b>               | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b> |
| <b><i>Apamea remissa</i></b>          | <b>05-Jul-13</b> | <b>30</b>  | <b>Common / S42</b>        | <b>Queen's Dock West (3)</b> | <b>SS671918</b> | <b>Barry Stewart</b> |
| <i>Oligia fasciuncula</i>             | 05-Jul-13        | 3          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Mesoligia furuncula</i>            | 05-Jul-13        | 1          | Common                     | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Mesoligia furuncula</i>            | 06-Aug-13        | 25         | Common                     | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Mesoligia furuncula</i>            | 06-Aug-13        | 15         | Common                     | Queen's Dock West (1)        | SS671920        | Barry Stewart        |
| <i>Mesoligia furuncula</i>            | 06-Aug-13        | 20         | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <b><i>Mesoligia literosa</i></b>      | <b>06-Aug-13</b> | <b>7</b>   | <b>Common / S42</b>        | <b>Queen's Dock West (1)</b> | <b>SS670919</b> | <b>Barry Stewart</b> |
| <b><i>Mesoligia literosa</i></b>      | <b>06-Aug-13</b> | <b>2</b>   | <b>Common / S42</b>        | <b>Queen's Dock West (2)</b> | <b>SS671919</b> | <b>Barry Stewart</b> |
| <i>Amphipoea oculatea</i>             | 06-Aug-13        | 1          | Common                     | Queen's Dock West (2)        | SS671919        | Barry Stewart        |
| <b><i>Celaena leucostigma</i></b>     | <b>06-Aug-13</b> | <b>1</b>   | <b>Local</b>               | <b>Queen's Dock West (2)</b> | <b>SS671919</b> | <b>Barry Stewart</b> |
| <b><i>Coenobia rufa</i></b>           | <b>06-Aug-13</b> | <b>1</b>   | <b>Local</b>               | <b>Queen's Dock West (2)</b> | <b>SS671919</b> | <b>Barry Stewart</b> |
| <i>Hoplodrina alsines</i>             | 05-Jul-13        | 1          | Common / S42               | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Hoplodrina blanda</i>              | 05-Jul-13        | 1          | Common / S42               | Queen's Dock West (3)        | SS671918        | Barry Stewart        |
| <i>Hoplodrina blanda</i>              | 06-Aug-13        | 1          | Common / S42               | Queen's Dock West (1)        | SS670919        | Barry Stewart        |
| <i>Hoplodrina blanda</i>              | 06-Aug-13        | 1          | Common / S42               | Queen's Dock West (2)        | SS671919        | Barry Stewart        |

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|-----------------------------------|-------------|------------|---------------|--------------------------------|-----------------|-------------------------|
| <i>Pyrrhia umbra</i>              | 05-Jul-13   | 3          | Local         | Queen's Dock South             | SS683922        | Barry Stewart           |
| <i>Pyrrhia umbra</i>              | 05-Jul-13   | 4          | Local         | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Pyrrhia umbra</i>              | 06-Aug-13   | 1          | Local         | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Diachrysia chrysitis</i>       | 05-Jul-13   | 1          | Common        | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Plusia festucae</i>            | 05-Jul-13   | 1          | Common        | Queen's Dock South             | SS683922        | Barry Stewart           |
| <i>Autographa gamma</i>           | 06-Aug-13   | 4          | Migrant       | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Autographa gamma</i>           | 06-Aug-13   | 2          | Migrant       | Queen's Dock West (2)          | SS671919        | Barry Stewart           |
| <i>Autographa gamma</i>           | 31-Aug-13   | 2          | Migrant       | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Abrostola tripartita</i>       | 05-Jul-13   | 3          | Common        | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Scoliopteryx libatrix</i>      | 06-Aug-13   | 1          | Common        | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Rivula sericealis</i>          | 05-Jul-13   | 1          | Common        | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Bactra lancealana/lacteana</i> | 05-Jul-13   | 1          | None          | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Bactra lancealana/lacteana</i> | 06-Aug-13   | 1          | None          | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Bactra lancealana/lacteana</i> | 06-Aug-13   | 1          | None          | Queen's Dock West (2)          | SS671919        | Barry Stewart           |
| <i>Oligia strigilis</i> agg.      | 05-Jul-13   | 7          | None          | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Mesapamea secalis</i> agg.     | 06-Aug-13   | 15         | None          | Queen's Dock West (1)          | SS671920        | Barry Stewart           |
| <i>Mesapamea secalis</i> agg.     | 06-Aug-13   | 30         | None          | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Mesapamea secalis</i> agg.     | 06-Aug-13   | 20         | None          | Queen's Dock West (2)          | SS671919        | Barry Stewart           |
|                                   |             |            |               |                                |                 |                         |
| <b>Coleoptera (beetles)</b>       |             |            |               |                                |                 |                         |
| <i>Agrypnus murinus</i>           | 07-Jun-13   | 2          | None          | Queens Dock                    | SS671919        | M. Pickard              |
| <i>Dyschirius thoracicus</i>      | 31-Aug-13   | 1          | ?             | Crymlyn Burrows                | SS720928        | B. Stewart & M. Pickard |
| <i>Broscus cephalotes</i>         | 31-Aug-13   | 25         | ?             | Crymlyn strandline & foredunes | SS720927        | B. Stewart & M. Pickard |
| <i>Necrodes littoralis</i>        | 06-Aug-13   | 1          | None          | Queen's Dock West (2)          | SS671919        | Barry Stewart           |
| <i>Coccinella septempunctata</i>  | 05-Jul-13   | 30         | None          | Queen's Dock West (3)          | SS671918        | Barry Stewart           |
| <i>Aegialia arenaria</i>          | 31-Aug-13   | 2          | None          | Crymlyn strandline & foredunes | SS712926        | M. Pickard              |
|                                   |             |            |               |                                |                 |                         |
| <b>Diptera (true flies)</b>       |             |            |               |                                |                 |                         |

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|------------------------------------|-------------|------------|---------------|--------------------------------|-----------------|-------------------------|
| <i>Microchrysa polita</i>          | 06-Aug-13   | 2          | None          | Queen's Dock West (1)          | SS670919        | Barry Stewart           |
| <i>Microchrysa polita</i>          | 06-Aug-13   | 4          | None          | Queen's Dock West (2)          | SS671919        | Barry Stewart           |
| <i>Philonicus albiceps</i>         | 31-Aug-13   | 1          | ?             | Crymlyn strandline & foredunes | SS720927        | B. Stewart & M. Pickard |
| <i>Platycheirus albimanus</i>      | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Episyrphus balteatus</i>        | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS714933        | Barry Stewart           |
| <i>Episyrphus balteatus</i>        | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Eupeodes corollae</i>           | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Scaeva pyrastris</i>            | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS714933        | Barry Stewart           |
| <i>Sphaerophoria interrupta</i>    | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Syrphus ribesii</i>             | 31-Aug-13   | 0          | None          | Crymlyn strandline & foredunes | SS720927        | B. Stewart & M. Pickard |
| <i>Syrphus vitripennis</i>         | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Cheilosia pagana</i>            | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Rhingia campestris</i>          | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Neosciasia podagrica</i>        | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Eristalis arbustorum</i>        | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Eristalis intricaria</i>        | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Eristalis pertinax</i>          | 31-Aug-13   | 0          | None          | Crymlyn strandline & foredunes | SS720927        | Barry Stewart           |
| <i>Eristalis pertinax</i>          | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS714933        | Barry Stewart           |
| <i>Eristalis pertinax</i>          | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Eristalis tenax</i>             | 31-Aug-13   | 2          | None          | Crymlyn strandline & foredunes | SS720927        | B. Stewart & M. Pickard |
| <i>Eristalis tenax</i>             | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Helophilus pendulus</i>         | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Sericomyia silentis</i>         | 31-Aug-13   | 1          | None          | Crymlyn Burrows                | SS712932        | B. Stewart & M. Pickard |
| <i>Sericomyia silentis</i>         | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Volucella bombylans</i>         | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Syrpitta pipiens</i>            | 31-Aug-13   | 0          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
|                                    |             |            |               |                                |                 |                         |
| <b>Hymenoptera (ants, bees and</b> |             |            |               |                                |                 |                         |



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|----------------------------------|-------------|------------|---------------|--------------------------------|-----------------|-------------------------|
| <b>wasps)</b>                    |             |            |               |                                |                 |                         |
| <i>Bombus humilis</i>            | 31-Aug-13   | 1          | S42           | Crymlyn Burrows                | SS712932        | B. Stewart & M. Pickard |
| <i>Bombus humilis</i>            | 31-Aug-13   | 4          | S42           | Crymlyn strandline & foredunes | SS720927        | Barry Stewart           |
| <i>Bombus humilis</i>            | 31-Aug-13   | 1          | S42           | Crymlyn Burrows                | SS714933        | Barry Stewart           |
| <i>Bombus jonellus</i>           | 31-Aug-13   | 1          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Bombus lapidarius</i>         | 31-Aug-13   | 1          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Bombus lucorum sens. lat.</i> | 31-Aug-13   | 1          | None          | Crymlyn Burrows                | SS712932        | B. Stewart & M. Pickard |
| <i>Bombus pascuorum</i>          | 31-Aug-13   | 2          | None          | Crymlyn Burrows                | SS712932        | B. Stewart & M. Pickard |
| <i>Bombus pascuorum</i>          | 31-Aug-13   | 1          | None          | Crymlyn Burrows                | SS714933        | Barry Stewart           |
| <i>Bombus pascuorum</i>          | 31-Aug-13   | 1          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Bombus ruderarius</i>         | 31-Aug-13   | 1          | S42           | Crymlyn Burrows                | SS712932        | B. Stewart & M. Pickard |
| <i>Bombus terrestris</i>         | 31-Aug-13   | 1          | None          | Crymlyn strandline & foredunes | SS720927        | Barry Stewart           |
| <i>Bombus terrestris</i>         | 31-Aug-13   | 1          | None          | Crymlyn Burrows                | SS714933        | Barry Stewart           |
| <i>Bombus terrestris</i>         | 31-Aug-13   | 1          | None          | Crymlyn Burrows                | SS713932        | Barry Stewart           |
| <i>Bombus lapidarius</i>         | 07-Sep-13   | 1          | None          | Queens Dock                    | SS671919        | M. Pickard              |
| <i>Bombus pascuorum</i>          | 07-Sep-13   | 1          | None          | Queens Dock                    | SS671919        | M. Pickard              |
| <i>Ammophila sabulosa</i>        | 31-Aug-13   | 1          | None          | Crymlyn strandline & foredunes | SS700926        | M. Pickard              |
|                                  |             |            |               |                                |                 |                         |
| <b>Araneae (spiders)</b>         |             |            |               |                                |                 |                         |
| <i>Larinioides cornutus</i>      | 31-Aug-13   | 1          | None          | Crymlyn strandline & foredunes | SS719926        | M. Pickard              |
| <i>Arctosa perita</i>            | 31-Aug-13   | 1          | None          | Crymlyn strandline & foredunes | SS719926        | M. Pickard              |
| <i>Araneus diadematus</i>        | 07-Sep-13   | 1          | None          | Queens Dock                    | SS671919        | M. Pickard              |

N.B. Survey effort on the 05/07/2013 (2130 to 0200hrs) = 2 x 125w traps & 1 x 400w trap, 06/08/2013 (2130 to 0200hrs) = 1 x 400w trap, and 31/08/2013 = Hand searching (6hrs).

### Review of Habitat Preferences / Food Plants of Section 42 / Localised Species

12.8.0.3 The following table presents Section 42 species as well as species of local distribution identified during the surveys including notes on habitat preferences and foodplants.

**Table 12.25 Section 42 species and species of local distribution**

| Butterflies                                            | Status | Habitat / Foodplant Preferences                                                                                                                                                                                                              |
|--------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Coenonympha pamphilus</i><br>Small Heath            | S42    | A species of open habitats where larvae feed on grasses.                                                                                                                                                                                     |
| <i>Cupido minimus</i><br>Small Blue                    | S42    | A species of open, particularly calcareous habitats, supporting its larval foodplant, Kidney Vetch ( <i>Anthyllis vulneraria</i> ).                                                                                                          |
| <i>Hipparchia semele</i><br>Grayling                   | S42    | A species of dry sheltered sites including heaths, coastal grasslands and sand dunes where its larvae feed on grasses.                                                                                                                       |
| <i>Erynnis tages</i><br>Dingy Skipper                  | S42    | A species of warm open grasslands supporting its principal foodplants, Common Bird's-foot-trefoil ( <i>Lotus corniculatus</i> ), Greater Bird's-foot-trefoil ( <i>Lotus pedunculatus</i> ) or Horseshoe Vetch ( <i>Hippocrepis comosa</i> ). |
| Moths                                                  |        |                                                                                                                                                                                                                                              |
| <i>Agriphila selasella</i><br>Pale-streak Grass-veneer | Local  | Often associated with coastal habitats, the larvae feed on grasses.                                                                                                                                                                          |
| <i>Anarsia spartiella</i><br>Small Crest               | Local  | Largely a coastal species in Wales, the larvae feed on Gorse ( <i>Ulex</i> spp), Broom ( <i>Cytisus</i> spp) and Dyer's Greenweed ( <i>Genista tinctoria</i> ).                                                                              |
| <i>Apamea furva</i><br><i>britannica</i><br>Confused   | Local  | A species favouring rocky coastlines and limestone hills. The larvae feed on the roots and stem bases of meadow grasses ( <i>Poa</i> spp.)                                                                                                   |
| <i>Apamea remissa</i><br>Dusky Brocade                 | S42    | A relatively common species frequenting a range of habitats including woodland, dry pastures and marshes where the larvae feed on grasses.                                                                                                   |
| <i>Apodia bifractella</i><br>Dark Fleabane Neb         | Local  | A secretive species, larvae feeding on the seedheads of Common Fleabane ( <i>Pulicaria dysenterica</i> ), Ploughman's Spikenard ( <i>Inula conyzae</i> ) and Sea Aster ( <i>Aster tripolium</i> ).                                           |
| <i>Approaerema anthyllidella</i><br>Vetch Sober        | Local  | A relatively common species of dunes, dry grassland and rough pasture supporting its principal foodplant, Kidney Vetch ( <i>Anthyllis vulneraria</i> ). Other foodplants can include Restharrow ( <i>Ononis repens</i> ) and clovers.        |
| <i>Bryotropha desertella</i>                           | Nb     | A species associated with sand dunes where its larvae feed on mosses.                                                                                                                                                                        |

|                                                 |       |                                                                                                                                                  |
|-------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Desert Groundling                               |       |                                                                                                                                                  |
| <i>Celaena leucostigma leucostigma</i> Crescent | Local | A species of marshy woodland and moorland where the larvae feed on species such as Yellow Flag ( <i>Iris pseudacorus</i> ).                      |
| <i>Chiasmia clathrata</i> Latticed Heath        | S42   | A widely distributed species of open habitats including waste ground where larvae feed on clovers and Lucerne ( <i>Medicago sativa</i> ).        |
| <i>Cleorodes lichenaria</i> Brussels Lace       | Local | A fairly common species in South Wales where it is associated with woodland, its larvae feeding on lichens.                                      |
| <i>Coenobia rufa</i> Small Rufous               | Local | A species of fens, marshes and bogs where its larvae feed on the stems of rushes ( <i>Juncus</i> spp)                                            |
| <i>Eudonia pallida</i> Marsh Grey               | Local | A species of damp habitats including fens and marshes where its larvae are believed to feed on mosses or lichens.                                |
| <i>Eupithecia virgaureata</i> Goldenrod Pug     | Local | A species of northern and western Britain with larvae feeding on Goldenrod ( <i>Solidago virgaurea</i> ) and Ragwort ( <i>Senecio jacobaea</i> ) |
| <i>Euxoa tritici</i> White-line Dart            | S42   | A widely distributed species of sand-hills and heathland.                                                                                        |
| <i>Hepialus humuli</i> Ghost Moth               | S42   | A relatively common species with larvae feeding on the roots of grasses and small plants.                                                        |
| <i>Hoplodrina blanda</i> Rustic                 | S42   | A relatively common species with larvae feeding on docks ( <i>Rumex</i> spp) and plantains ( <i>Plantago</i> spp).                               |
| <i>Lacanobia suasa</i> Dog's Tooth              | Local | A lowland species of river valleys, estuaries and saltmarshes where its larvae feed on docks and plantains.                                      |
| <i>Melanchra persicariae</i> Dot Moth           | S42   | A common species of suburban habitats with larvae feeding on a range of garden and native plants.                                                |
| <i>Mesoligia literosa</i> Rosy Minor            | S42   | Fairly common in coastal habitats where larvae feed on grasses.                                                                                  |
| <i>Monochroa cytisella</i> Bracken Neb          | Local | A widespread species with a foodplant of Bracken ( <i>Pteridium aquilinum</i> ).                                                                 |
| <i>Mythimna comma</i> Shoulder-striped Wainscot | S42   | Fairly common species with grasses, particularly Cock's-foot ( <i>Dactylis glomerata</i> ) a favoured foodplant.                                 |

|                                                             |       |                                                                                                                                                         |
|-------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Opsibotys fuscalis</i><br>Cinereous Pearl                | Local | An uncommon grassland species with Yellow Rattle ( <i>Rhinanthus minor</i> ) and Common Cow-wheat ( <i>Melampyrum pratense</i> ) the larval foodplants. |
| <i>Perizoma albulata</i><br>Grass Rivulet                   | S42   | A species of open grassy areas where its larvae feed on the seeds of Yellow Rattle.                                                                     |
| <i>Phycitodes saxicola</i><br>Small Clouded Knot-horn       | Local | A generally widespread species associated with coastal habitats where its larvae feed on the flowerheads of the Compositae.                             |
| <i>Pyrrhia umbra</i><br>Bordered Sallow                     | Local | A coastal species where the larvae feed on the flowerheads and seeds of Restharrow.                                                                     |
| <i>Scotopteryx chenopodiata</i><br>Shaded Broad-bar         | S42   | A fairly widespread and common species with foodplants including clovers and vetches.                                                                   |
| <i>Xanthorhoe ferrugata</i><br>Dark-barred Twin-spot Carpet | S42   | A fairly common grassland species with larvae feeding on variety of low growing plants.                                                                 |
| <i>Yponomeuta rorrella</i><br>Willow Ermine                 | Local | A relatively local species with a coastal bias, willows forming the larval foodplant.                                                                   |

\*Summarised from information provided by [www.ukmoths.org.uk](http://www.ukmoths.org.uk)

## **12.10 Citations for Designated Sites**

Crymlyn Bog SAC

Crymlyn Bog Ramsar

Crymlyn Bog SSSI

Kenfig SAC

Pant y Sais SSSI

Crymlyn Burrows SSSI

Blackpill SSSI

# NATURA 2000

## STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)  
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)  
AND  
FOR SPECIAL AREAS OF CONSERVATION (SAC)

### 1. Site identification:

1.1 Type  1.2 Site code

1.3 Compilation date  1.4 Update

#### 1.5 Relationship with other Natura 2000 sites

|                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

1.6 Respondent(s)

1.7 Site name

#### 1.8 Site indication and designation classification dates

|                                       |        |
|---------------------------------------|--------|
| date site proposed as eligible as SCI | 199506 |
| date confirmed as SCI                 | 200412 |
| date site classified as SPA           |        |
| date site designated as SAC           | 200412 |

### 2. Site location:

#### 2.1 Site centre location

| longitude  | latitude   |
|------------|------------|
| 03 53 18 W | 51 38 11 N |

2.2 Site area (ha)  2.3 Site length (km)

#### 2.5 Administrative region

| NUTS code | Region name    | % cover |
|-----------|----------------|---------|
| UK924     | West Glamorgan | 100.00% |

#### 2.6 Biogeographic region

☐  
Alpine

☒  
Atlantic

☐  
Boreal

☐  
Continental

☐  
Macaronesia

☐  
Mediterranean

### 3. Ecological information:

#### 3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

| Annex I habitat                   | % cover | Representativity | Relative surface | Conservation status | Global assessment |
|-----------------------------------|---------|------------------|------------------|---------------------|-------------------|
| Transition mires and quaking bogs | 2.7     | B                | C                | B                   | B                 |



|                                                                                                                                                   |      |   |   |   |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------|---|---|---|----------|
| Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>                                                       | 20   | A | B | B | <b>B</b> |
| Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) | 2.49 | C | C | B | <b>C</b> |

### 3.2 Annex II species

| Population   |          |           |        |       | Site assessment |              |           |        |
|--------------|----------|-----------|--------|-------|-----------------|--------------|-----------|--------|
| Species name | Resident | Migratory |        |       | Population      | Conservation | Isolation | Global |
|              |          | Breed     | Winter | Stage |                 |              |           |        |
|              |          |           |        |       |                 |              |           |        |

## 4. Site description

### 4.1 General site character

| Habitat classes                                                                                | % cover     |
|------------------------------------------------------------------------------------------------|-------------|
| Marine areas. Sea inlets                                                                       |             |
| Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)            |             |
| Salt marshes. Salt pastures. Salt steppes                                                      |             |
| Coastal sand dunes. Sand beaches. Machair                                                      |             |
| Shingle. Sea cliffs. Islets                                                                    |             |
| Inland water bodies (standing water, running water)                                            | 1.6         |
| Bogs. Marshes. Water fringed vegetation. Fens                                                  | 86.0        |
| Heath. Scrub. Maquis and garrigue. Phygrana                                                    | 0.6         |
| Dry grassland. Steppes                                                                         |             |
| Humid grassland. Mesophile grassland                                                           | 3.5         |
| Alpine and sub-alpine grassland                                                                |             |
| Improved grassland                                                                             |             |
| Other arable land                                                                              |             |
| Broad-leaved deciduous woodland                                                                | 8.3         |
| Coniferous woodland                                                                            |             |
| Evergreen woodland                                                                             |             |
| Mixed woodland                                                                                 |             |
| Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas) |             |
| Inland rocks. Scree. Sands. Permanent snow and ice                                             |             |
| Other land (including towns, villages, roads, waste places, mines, industrial sites)           |             |
| <b>Total habitat cover</b>                                                                     | <b>100%</b> |

### 4.1 Other site characteristics

#### Soil & geology:

Clay, Peat, Sandstone

#### Geomorphology & landscape:

Lowland, Valley

### 4.2 Quality and importance

Transition mires and quaking bogs

- for which this is considered to be one of the best areas in the United Kingdom.

Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*

- which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares.

- for which this is considered to be one of the best areas in the United Kingdom.

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

- for which the area is considered to support a significant presence.

### 4.3 Vulnerability

In recent years scrub has encroached at the expense of fen vegetation due to lack of appropriate management. This seral succession is now being addressed by scrub-cutting and stump treatment as set out in the NNR management plan.

The flora and fauna of the site is susceptible to changes in water quality, influenced by surrounding industrial effluent sources such as oil, pulverised fuel ash and iron-rich mine adit discharge. Monitoring is in place to provide a check on ongoing discharges. The current dominance and ongoing spread of relatively species-poor *Phragmites australis* reedswamp, will require further management at the site.

Since the announcement in late 1997 of the closure of the BP Llandarcy Oil Refinery a number of studies have been completed to further assess the site's hydrological characteristics and the influence of historic hydrocarbon contamination. The water-balance of the site is critical to future management and the function of the site's internal waterway (the Glan y Wern Canal) is being considered with a view to its restoration. A comprehensive hydrological study by the Environment Agency and CCW commenced in October 2002.

## 5. Site protection status and relation with CORINE biotopes:

### 5.1 Designation types at national and regional level

| Code             | % cover |
|------------------|---------|
| UK01 (NNR)       | 44.0    |
| UK00 (N/A)       | 8.4     |
| UK04 (SSSI/ASSI) | 91.6    |

# Information Sheet on Ramsar Wetlands (RIS)

*Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8<sup>th</sup> Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9<sup>th</sup> Conference of the Contracting Parties (2005).*

## Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

---

## 1. Name and address of the compiler of this form:

### Joint Nature Conservation Committee

Monkstone House

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Peterborough

Cambridgeshire PE1 1JY

UK

Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948

Email: [RIS@JNCC.gov.uk](mailto:RIS@JNCC.gov.uk)

FOR OFFICE USE ONLY.

DD MM YY

|  |  |  |
|--|--|--|
|  |  |  |
|--|--|--|

Designation date

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|--|--|--|--|--|--|

Site Reference Number

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## 2. Date this sheet was completed/updated:

Designated: 08 June 1993

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## 3. Country:

UK (Wales)

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## 4. Name of the Ramsar site:

Crymlyn Bog

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## 5. Designation of new Ramsar site or update of existing site:

**This RIS is for:** Updated information on an existing Ramsar site

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## 6. For RIS updates only, changes to the site since its designation or earlier update:

### a) Site boundary and area:

**\*\* Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

**b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:**

**7. Map of site included:**

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

**a) A map of the site, with clearly delineated boundaries, is included as:**

- i) **hard copy** (required for inclusion of site in the Ramsar List): yes ✓ -or- no ☐;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) Yes
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** yes ✓ -or- no ☐;

**b) Describe briefly the type of boundary delineation applied:**

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

**8. Geographical coordinates (latitude/longitude):**

51 38 08 N 03 53 16 W

**9. General location:**

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Swansea

Crymlyn Bog lies within a south Wales industrial and urban landscape between Swansea and Neath, 1 km inland of the coast.

**Administrative region:** Abertawe/ Swansea; Castell-Nedd a Porth Talbot/ Neath and Port Talbot

**10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 264.18**

Min. 7  
Max. 9  
Mean 8

**12. General overview of the site:**

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Crymlyn Bog comprises a floodplain-valley mire located within a lowland coastal context and is the most extensive wetland of its type in Wales. The mire features a complex mosaic of vegetation types, supporting examples of swamp, tall herb fen, fen meadow and carr communities. The site supports an exceptionally wide range of rich and poor fen communities, some of which bear a close floristic affinity to certain floodplain mires in East Anglia. The presence of significant areas of saw sedge *Cladium mariscus* swamp is notable in extensive stands of this uncommon vegetation type, occurring at only three other sites in Wales. Crymlyn Bog is part of a larger inter-estuarine complex which includes the adjacent Pant y Sais fen.

**13. Ramsar Criteria:**

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2, 3

**14. Justification for the application of each Criterion listed in 13 above:**

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

Largest example of valley floodplain topogenous mire in South Wales, and one of the largest surviving fens in the west of Britain. Very few other sites are known to support a comparable complexity and diversity of vegetation. Habitats Directive Annex I features present on the SAC include:

- H7140 Transition mires and quaking bogs
- H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*
- H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*

#### Ramsar criterion 2

Supports a substantial population of the nationally-rare slender cotton-grass *Eriophorum gracile*, and a rich invertebrate fauna including many rare and highly localised species.

#### Ramsar criterion 3

The site supports 199 vascular plant species including 17 regionally-uncommon and one nationally-rare.

See Sections 21/22 for details of noteworthy species

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### 15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

#### a) biogeographic region:

Atlantic

#### b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

---

### 16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

|                                   |                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil & geology                    | mud, clay, peat, nutrient-poor                                                                                                                                                                                                                                                                                                                          |
| Geomorphology and landscape       | lowland, floodplain, pools                                                                                                                                                                                                                                                                                                                              |
| Nutrient status                   | eutrophic, highly eutrophic, mesotrophic, oligotrophic                                                                                                                                                                                                                                                                                                  |
| pH                                | acidic, alkaline, strongly acidic                                                                                                                                                                                                                                                                                                                       |
| Salinity                          | fresh                                                                                                                                                                                                                                                                                                                                                   |
| Soil                              | mainly organic                                                                                                                                                                                                                                                                                                                                          |
| Water permanence                  | usually permanent                                                                                                                                                                                                                                                                                                                                       |
| Summary of main climatic features | Annual averages (Cardiff, 1971–2000)<br>( <a href="http://www.metoffice.com/climate/uk/averages/19712000/sites/cardiff.html">www.metoffice.com/climate/uk/averages/19712000/sites/cardiff.html</a> )<br>Max. daily temperature: 14.3° C<br>Min. daily temperature: 6.8° C<br>Days of air frost: 33.0<br>Rainfall: 1111.7 mm<br>Hrs. of sunshine: 1518.0 |

**General description of the Physical Features:**

No information available

**17. Physical features of the catchment area:**

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Crymlyn Bog has been described as a natural oasis in a densely industrial landscape. The bog at Crymlyn is surrounded by a major oil refinery, a waste disposal tip and large housing estates. Earlier, industries used its water to establish a transport system, and the remains of a 19th century canal network are still evident today.

The bog is the most extensive area of lowland fen in Wales, and it lies in the flood plain of the Neath river estuary. The plants here are more typical of East Anglia. The habitats include swamps, meadows, tall reed beds, and waterlogged scrub, mainly of willow, where the wetter areas merge with woodland.

**18. Hydrological values:**

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known, Water supply

**19. Wetland types:**

Human-made wetland, Inland wetland

| Code  | Name                                         | % Area |
|-------|----------------------------------------------|--------|
| U     | Peatlands (including peat bogs swamps, fens) | 79.9   |
| W     | Shrub-dominated wetlands                     | 9.8    |
| Other | Other                                        | 9.2    |
| 9     | Canals and drainage channels                 | 0.7    |
| Tp    | Freshwater marshes / pools: permanent        | 0.4    |

**20. General ecological features:**

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

This site embraces the more acid range of variation of the Calcareous fens with *Cladium mariscus* habitat type and is relatively species-poor. It is one of the largest sites for *Cladium* spp in south Wales. There are large stands of *Cladium* spp, with transitions to a highly distinctive suite of tall-herb fen communities, often dominated to varying degrees by *Phragmites australis*. The area is also important for the occurrence of a substantial population of the nationally-rare cotton-grass *Eriophorum gracile*.

Plant communities grade from *Sphagnum* dominated poor fen with *Narthecium ossifragum* and *Utricularia vulgaris* to more eutrophic associations with *Typha angustifolia*, *Typha latifolia*, *Cladium mariscus* and *Carex elata*. *Molinia caerulea* is dominant in drier areas, with stands of pure *Phragmites australis* reedswamp where conditions are wettest. Willow-birch and alder carr woodland with *Carex paniculata* occur on the eastern margins.

The site supports an exceptionally wide range of rich- and poor-fen communities, some of which bear a close floristic resemblance to certain floodplain mires in East Anglia, including S2 *Cladium mariscus* swamp and sedge-beds, and *Cladio-molinietum* communities which are in the central part of the bog.



A key feature concerns the presence of tall herb fen communities transitional between swamp and fen, with sedge beds dominated by *Cladium mariscus* being of particular importance.

Also of international significance is the Transition Mire and Quaking Bog community, characterised by the presence of *Carex rostrata*, *Menyanthes trifoliata*, *Carex limosa* and supporting good stands of the nationally important *Eriophorum gracile*.

Ecosystem services

## 21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

### Nationally important species occurring on the site.

#### Higher Plants.

*Eriophorum gracile*.

## 22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

#### Birds

### Species Information

#### Nationally important species occurring on the site.

#### Invertebrates.

The more significant wetland rarities at Crymlyn Bog include:

*Dolomedes plantarius*

*Crossocerus vagabundus* (Panzer) Hymenoptera, Sphecidae

*Pteromicra leucopeza* (Meigen) Diptera, Sciomyzidae

*Cephalops perspicuus* (de Meijere) Diptera, Pipunculidae

*Gyrinus suffriani* (Scriba 1855) Coleoptera, Gyrinidae

*The nationally scarce hornet robberfly Asilus crabroniformis occurs on the drier grassland slopes bordering the fen*

## 23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

*Aesthetic*

*Archaeological/historical site*

*Environmental education/ interpretation*

*Livestock grazing*

*Non-consumptive recreation*

*Scientific research*

*Sport fishing*

**b)** Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?  
No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

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#### 24. Land tenure/ownership:

| Ownership category                 | On-site | Off-site |
|------------------------------------|---------|----------|
| Local authority, municipality etc. | +       | +        |
| Private                            | +       |          |
| Public/communal                    | +       |          |

---

#### 25. Current land (including water) use:

| Activity                     | On-site | Off-site |
|------------------------------|---------|----------|
| Nature conservation          | +       | +        |
| Tourism                      | +       | +        |
| Recreation                   | +       | +        |
| Current scientific research  | +       | +        |
| Fishing: recreational/sport  | +       | +        |
| Fishing: subsistence         | +       | +        |
| Livestock watering hole/pond | +       | +        |
| Grazing (unspecified)        | +       | +        |
| Rough or shifting grazing    | +       | +        |
| Industrial water supply      | +       | +        |
| Industry                     |         | +        |
| Flood control                | +       | +        |
| Oil/gas production           |         | +        |
| Transport route              |         | +        |
| Urban development            |         | +        |

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**26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:**

Explanation of reporting category:

1. Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.
2. Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.

NA = Not Applicable because no factors have been reported.

| Adverse Factor Category | Reporting Category | Description of the problem (Newly reported Factors only) | On-Site | Off-Site | Major Impact? |
|-------------------------|--------------------|----------------------------------------------------------|---------|----------|---------------|
| Eutrophication          | 1                  |                                                          | +       |          |               |
|                         |                    |                                                          |         |          |               |

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Is the site subject to adverse ecological change? NO

**27. Conservation measures taken:**

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

| Conservation measure                                  | On-site | Off-site |
|-------------------------------------------------------|---------|----------|
| Site/ Area of Special Scientific Interest (SSSI/ASSI) | +       | +        |
| National Nature Reserve (NNR)                         | +       |          |
| Site management statement/plan implemented            | +       |          |
| Other                                                 | +       |          |
| Special Area of Conservation (SAC)                    | +       | +        |
| Management plan in preparation                        | +       |          |

**b) Describe any other current management practices:**

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

**28. Conservation measures proposed but not yet implemented:**

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

**29. Current scientific research and facilities:**

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

**Environment.**

*A review of the hydrological processes at Crymlyn Bog NNR was completed by the Environmental Consultancy at the University of Sheffield, on contract to CCW in March 1998. Following the announcement by BP/Mobil Llandarcy in November 1997 of the closure of the oil refinery over the next two years, CCW and the Environment Agency continue to work closely with BP and their consultants regarding the implementation of a comprehensive risk-based strategy to the long-term amelioration of the refinery site and its redevelopment for housing. This includes associated pollutant influences on the adjacent Crymlyn Bog. During 2004 CCW and the Environment Agency worked jointly on a detailed hydrological and nutrient assessment of the site to ascertain the overall nutrient loading on sensitive mire communities (Headley 2004). These studies will also inform CCW's long term aspirations for the restoration of historical water channels. It is proposed to continue with a water quality monitoring programme and further studies will be undertaken in 2005 to inform restoration work on a relict canal and the Crymlyn Brook. A presentation of this recent research was given to the British Hydrological Society in 2004.*

#### **Flora.**

*Annual census of slender cotton-grass Eriophorum gracile.*

(no longer current)

Preliminary survey for lichens and bryophytes of the wet woodlands

#### **Fauna.**

Monitoring of hornet robberfly, survey for additional populations of the fen raft spider, and moth-trapping.

Bird ringing.

### **30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:**

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Used by visiting university groups for studies on entomology, peat stratigraphy and fenland communities, used by local school groups for studies relevant to the National Curriculum. Crymlyn Visitors Centre is used for school groups and talks. It houses a permanent exhibition and is a focal point for field study groups. Meetings and guided walks, focused on the visitors centre. Annual open days. Long-term partnership with Swansea Environment Centre as educational providers and recent Community Liaison work undertaken through the British Trust for Conservation Volunteers (BTCV) (no longer current). Pant y Sais fen is a Local Nature Reserve and is also used by school groups via boardwalk access.

### **31. Current recreation and tourism:**

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities.

All low-key: walking, dog walking, birdwatching, sport/recreational fishing in relict canal.

#### **Facilities provided.**

Car parking, nature trails and interpretative leaflets. There are themed open days, guided walks, on-site interpretative information, and disabled access at Pany-y-Sais.

#### **Seasonality.**

Year-round access and use. There is summer wardening April-September.

### **32. Jurisdiction:**

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Countryside Division, Welsh Assembly Government, Cathays Park, Cardiff, CF1 3NQ

### 33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Safeguard Officer, International Designations, Countryside Council for Wales, Maes-y-Ffynnon, Penrhosgarnedd, Bangor, Gwynedd, LL57 2DW

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### 34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

#### Site-relevant references

- Barber, KE & Hughes, PDH (1995) *Palaeoecology and radiocarbon dating of peat deposits at Crymlyn Bog National Nature Reserve, south Wales*. Report for the Countryside Council for Wales. (Contractor: University of Southampton)
- Dumayne-Peaty, L (1998) *Holocene palaeoecology and development of Crymlyn Bog NNR, south Wales. Final report to British Petroleum and Countryside Council for Wales*
- Fowles, A (1994) *Invertebrates of Wales: a review of important sites and species*. Joint Nature Conservation Committee, Peterborough
- Headley, AD (2004) Substratum enrichment at Crymlyn Bog cSAC, south Wales: an analysis of current and future impacts with particular reference to SAC feature fen communities. *CCW Contract Science Report*, No. 652
- Headley, AD (2005) Investigations of canal sediment and peat chemistry at Crymlyn Bog NNR, south Wales. *CCW Contract Science Report*, No. 721
- Headley, AD, Wheeler, BD & Baker, AJM (1992) The impact of man on the vegetation of Crymlyn Bog. In: *Peatland ecosystems and Man: an impact assessment*, ed. by OM Bragg, PD Hulme, HAP Ingram & RA Robertson, 257-261. University of Dundee, Department of Biological Sciences
- Hughes, PDM & Dumayne-Peaty, L (2002) Testing theories of mire development using multiple successions at Crymlyn Bog, West Glamorgan, south Wales, UK. *Journal of Ecology*, 90(3), 456-471
- Jones, PS, Stevens, DP, Blackstock, TH, Burrows, CR & Howe, EA (eds.) (2003) *Priority habitats of Wales: a technical guide*. Countryside Council for Wales, Bangor
- McLeod, CR, Yeo, M, Brown, AE, Burn, AJ, Hopkins, JJ & Way, SF (eds.) (2004) *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Joint Nature Conservation Committee, Peterborough. [www.jncc.gov.uk/SACselection](http://www.jncc.gov.uk/SACselection)
- Robertson, J (2000) Reserve focus – Crymlyn Bog NNR, Glamorgan. *British Wildlife*, 12(1), 22-27
- Rosen, D & Dumayne-Peaty, L (2001) Human impact on the vegetation of south Wales during late historical times: palynological and palaeoenvironmental results from Crymlyn Bog NNR, West Glamorgan, Wales, UK. *The Holocene* 11(1), 11-23
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**CYNGOR CEFN GWLAD CYMRU  
COUNTRYSIDE COUNCIL FOR WALES**

SITE OF SPECIAL SCIENTIFIC INTEREST: CITATION

**SWANSEA AND NEATH PORT TALBOT      CORS CRYMLYN/CRYMLYN BOG**

**Date of Notification:** 1975, 1983, 1985, 1997, 2003

**National Grid Reference:** SS695945

**OS Maps:** 1:50,000 Sheet number: 159 and 170  
1:10,000 Sheet number: SS 69 SE, SS 69 NE  
SS 79 SW, SS 79 NW

**Site Area:** 279.9 ha

**Description:**

Crymlyn Bog is of special interest for its fen (topogenous mire) communities, wet woodland, associated invertebrate assemblages, a substantial population of the nationally rare slender cotton grass *Eriophorum gracile* and a population of the nationally scarce hornet robberfly *Asilus crabroniformis*. It is the most extensive area of lowland fen in South Wales and is situated 3.5 km east of central Swansea within a landscape heavily influenced by past and present industrial activities.

The site is part of a larger inter-estuarine complex including Pant-y-Sais SSSI and the Neath flood plain. Crymlyn Bog owes its form to glacial erosion, followed by a series of Boreal marine incursions, giving rise to sequences of clay and peat. The main fen area which developed on these deposits lies between 5 - 7 m above sea level.

Recent studies of preserved plant remains in the peat have revealed a complex and unusual pattern of vegetation change extending back over 7,000 years. Some parts of the site at least demonstrate that a classic succession took place from open reedswamp through fen and fen carr to rain-fed bog, with the latter persisting for over 1,000 years before reverting to fen. This reversion from bog back to fen is highly unusual and took place at about 1,000 AD, possibly as a result of increased runoff from the site catchment.

The site comprises of a complex mosaic of vegetation types, including communities of both rich and poor fen, swamp, alder carr and acidic grassland. Unusually some of the plant species and communities are more characteristic of East Anglian fens.

Several sources of water and differing patterns of flow have created complex environmental gradients resulting in a wide range of fenland communities. These range from *Sphagnum*-dominated poor-fen, with bog asphodel *Narthecium ossifragum* and greater bladderwort *Utricularia vulgaris*, through others with bottle sedge *Carex rostrata*, marsh cinquefoil *Potentilla palustris* and bog bean *Menyanthes trifoliata*, to more eutrophic and taller associations with lesser bulrush *Typha angustifolia*, bulrush *Typha latifolia*, great fen-sedge *Cladium mariscus*, tufted-sedge *Carex elata* and common reed *Phragmites australis*. Purple moor-grass *Molinia caerulea*

becomes dominant in drier areas, with pure *Phragmites* reedswamp where conditions are wettest. The eastern margin bears greater tussock-sedge *Carex paniculata*, and alder carr woodland.

Plant species of particular interest include the nationally rare slender cottongrass *Eriophorum gracile*, whilst tufted sedge, bog-sedge *Carex limosa*, dioecious sedge *Carex dioica*, cyperus sedge *Carex pseudocyperus*, saw sedge, greater spearwort *Ranunculus lingua*, least bur-reed *Sparganium natans*, lesser water-plantain *Baldellia ranunculoides*, slender spike-rush *Eleocharis uniglumis* and black bog rush *Schoenus nigricans* are close to the limit of their British geographical range and/or of limited distribution locally. The royal fern *Osmunda regalis* occurs in several communities and is particularly well represented on this site.

Carr woodland is a rare habitat and this site contains one of the largest areas of alder carr in Wales, characterised by species such as alder *Alnus glutinosa*, alder buckthorn *Frangula alnus*, grey willow *Salix cineria* and downy birch *Betula pubescens*.

Crymlyn Bog is also of national importance for invertebrates, supporting several rare and nationally scarce species. These include the water beetle *Limnoxenus niger*, the crane fly *Pilaria nigropunctata* and the jumping spider *Marpissa radiata*. Open waterways and marginal flushes support the scarce blue-tailed damselfly *Ischnura pumilio* and the variable damselfly *Coenagrion pulchellum*.

Also of note is the hornet robber fly *Asilus crabroniformis*, a declining species nationally, occurring in the traditionally grazed pastures bordering the fen.

There are sizeable breeding populations of reed warbler *Acrocephalus scirpaceus* and sedge warbler *Acrocephalus schoenobaenus* associated with the denser areas of *Phragmites*.

### **Remarks:**

Slender cottongrass *Eriophorum gracile* is listed on Schedule 8 of the Wildlife and Countryside Act.

Cors Crymlyn/Crymlyn bog SSSI is part of Cors Crymlyn/Crymlyn Bog candidate Special Area of Conservation, being host to the following habitats listed in Annex I of the EC Habitats Directive: (Directive 92/43/EEC on the Conservation of Natural habitats and of Wild Fauna and Flora).

‘Calcareous fen with *Cladium mariscus* and species of the *Caricion davallianae*’,  
‘Transition mires and quaking bogs’,  
‘Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion*, *Alnion incanae* and *salicion alvae*)’.

The majority of the SSSI area is also designated as a Wetland of International Importance under Ramsar Convention



# NATURA 2000

## STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)  
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)  
AND  
FOR SPECIAL AREAS OF CONSERVATION (SAC)

### 1. Site identification:

1.1 Type  1.2 Site code

1.3 Compilation date  1.4 Update

#### 1.5 Relationship with other Natura 2000 sites

|                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

1.6 Respondent(s)

1.7 Site name

#### 1.8 Site indication and designation classification dates

|                                       |        |
|---------------------------------------|--------|
| date site proposed as eligible as SCI | 199506 |
| date confirmed as SCI                 | 200412 |
| date site classified as SPA           |        |
| date site designated as SAC           | 200412 |

### 2. Site location:

#### 2.1 Site centre location

| longitude  | latitude   |
|------------|------------|
| 03 44 41 W | 51 31 06 N |

2.2 Site area (ha)  2.3 Site length (km)

#### 2.5 Administrative region

| NUTS code | Region name   | % cover |
|-----------|---------------|---------|
| UK922     | Mid Glamorgan | 100.00% |

#### 2.6 Biogeographic region

☐ Alpine
 ☒ Atlantic
 ☐ Boreal
 ☐ Continental
 ☐ Macaronesia
 ☐ Mediterranean

### 3. Ecological information:

#### 3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

| Annex I habitat                                            | % cover | Representativity | Relative surface | Conservation status | Global assessment |
|------------------------------------------------------------|---------|------------------|------------------|---------------------|-------------------|
| Mudflats and sandflats not covered by seawater at low tide | 19.01   | D                |                  |                     |                   |

|                                                                                                                                                   |       |   |   |   |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------|---|---|---|----------|
| <i>Spartina</i> swards ( <i>Spartinion maritima</i> )                                                                                             | 0.01  | D |   |   |          |
| Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> )                                                                                 | 1.7   | C | C | B | <b>C</b> |
| Embryonic shifting dunes                                                                                                                          | 0.1   | D |   |   |          |
| Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")                                                                 | 3.8   | D |   |   |          |
| Fixed dunes with herbaceous vegetation ("grey dunes")                                                                                             | 45.12 | B | B | B | <b>B</b> |
| Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> )                                                                                      | 0.05  | D |   |   |          |
| Dunes with <i>Hippophae rhamnoides</i>                                                                                                            | 5.1   | D |   |   |          |
| Dunes with <i>Salix repens</i> ssp. <i>argentea</i> ( <i>Salicion arenariae</i> )                                                                 | 0.4   | A | C | A | <b>A</b> |
| Humid dune slacks                                                                                                                                 | 11.21 | A | B | A | <b>A</b> |
| Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp.                                                                        | 2.4   | B | B | B | <b>B</b> |
| Semi-natural dry grasslands and scrubland facies: on calcareous substrates ( <i>Festuco-Brometalia</i> )                                          | 0.1   | D |   |   |          |
| Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) | 0.1   | D |   |   |          |

### 3.2 Annex II species

| Species name                    | Population  |           |        |       | Site assessment |              |           |          |
|---------------------------------|-------------|-----------|--------|-------|-----------------|--------------|-----------|----------|
|                                 | Resident    | Migratory |        |       | Population      | Conservation | Isolation | Global   |
|                                 |             | Breed     | Winter | Stage |                 |              |           |          |
| <i>Triturus cristatus</i>       | Present     | -         | -      | -     | D               |              |           |          |
| <i>Rhinolophus hipposideros</i> | Present     | -         | -      | -     | D               |              |           |          |
| <i>Petalophyllum ralfsii</i>    | Present     | -         | -      | -     | A               | B            | C         | <b>B</b> |
| <i>Liparis loeselii</i>         | 1001-10,000 | -         | -      | -     | A               | A            | A         | <b>A</b> |

## 4. Site description

### 4.1 General site character

| Habitat classes                                                                                | % cover     |
|------------------------------------------------------------------------------------------------|-------------|
| Marine areas. Sea inlets                                                                       |             |
| Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)            | 19.0        |
| Salt marshes. Salt pastures. Salt steppes                                                      | 1.0         |
| Coastal sand dunes. Sand beaches. Machair                                                      | 63.0        |
| Shingle. Sea cliffs. Islets                                                                    | 4.0         |
| Inland water bodies (standing water, running water)                                            | 2.5         |
| Bogs. Marshes. Water fringed vegetation. Fens                                                  | 0.5         |
| Heath. Scrub. Maquis and garrigue. Phygrana                                                    | 7.5         |
| Dry grassland. Steppes                                                                         |             |
| Humid grassland. Mesophile grassland                                                           |             |
| Alpine and sub-alpine grassland                                                                |             |
| Improved grassland                                                                             |             |
| Other arable land                                                                              |             |
| Broad-leaved deciduous woodland                                                                | 2.5         |
| Coniferous woodland                                                                            |             |
| Evergreen woodland                                                                             |             |
| Mixed woodland                                                                                 |             |
| Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas) |             |
| Inland rocks. Scree. Sands. Permanent snow and ice                                             |             |
| Other land (including towns, villages, roads, waste places, mines, industrial sites)           |             |
| <b>Total habitat cover</b>                                                                     | <b>100%</b> |

## 4.1 Other site characteristics

### Soil & geology:

Basic, Limestone, Sand

### Geomorphology & landscape:

Coastal, Estuary, Intertidal sediments (including sandflat/mudflat), Lowland, Open coast (including bay)

## 4.2 Quality and importance

Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

- for which the area is considered to support a significant presence.

Fixed dunes with herbaceous vegetation ("grey dunes")

- for which this is considered to be one of the best areas in the United Kingdom.

Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*)

- which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares.

- for which this is considered to be one of the best areas in the United Kingdom.

Humid dune slacks

- for which this is considered to be one of the best areas in the United Kingdom.

Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.

- for which this is considered to be one of the best areas in the United Kingdom.

*Petalophyllum ralfsii*

- for which this is considered to be one of the best areas in the United Kingdom.

*Liparis loeselii*

- for which this is one of only three known outstanding localities in the United Kingdom.

- which is known from 15 or fewer 10 x 10 km squares in the United Kingdom.

## 4.3 Vulnerability

Natural successional changes within the dune systems are detrimental to the plant communities of the dune grassland and humid dune slacks as well as to *Liparis loeselii* and *Petalophyllum ralfsii*, which are species of early successional changes. Kenfig National Nature Reserve (NNR) has been grazed by sheep in recent years, and grazing is currently under review. Selected dune slacks are mown in order to provide appropriate conditions for the maintenance of these species and the vegetation.

At Merthyr Mawr NNR, the main focus of ongoing management is the control of *Hippophae rhamnoides*, which is an introduced species here. This will benefit the two main SAC features represented on this component of the site - dune grassland and *Petalophyllum ralfsii*. Merthyr Mawr is grazed by rabbits, and it is intended to introduce grazing by domestic animals.

Maintenance of the hydrological regime of both dune systems is essential, as the dune slacks and Kenfig Pool are believed to be fed in part by groundwater.

## 5. Site protection status and relation with CORINE biotopes:

### 5.1 Designation types at national and regional level

| Code             | % cover |
|------------------|---------|
| UK01 (NNR)       | 69.8    |
| UK04 (SSSI/ASSI) | 100.0   |

**CYNGOR CEFN GWLAD CYMRU  
COUNTRYSIDE COUNCIL FOR WALES**

**SITE OF SPECIAL SCIENTIFIC INTEREST CITATION**

**NEATH PORT TALBOT**

**PANT-Y-SAIS**

**Date of Notification:** 1979, 1983

**National Grid Reference:** SS 716942

**O.S. Maps:** 1:50,000 Sheet number: 170  
1:25,000 Sheet number: SS 79

**Site Area:** 19.5 ha

**Description:**

Predominantly an area of lowland fen located in a narrow valley which was a former course of the River Neath. The site supports a range of fenland communities including *Sphagnum* and bryophyte dominated areas of poorer fen vegetation, *Molinia caerulea* communities, swamp areas with abundant *Typha latifolia* and *Typha angustifolia*, and developing fen carr. Formerly part of the same hydrological system as Crymlyn Bog.

The Tennant Canal section acts as a refuge for aquatic plants, including *Butomus umbellatus* which is rare in the county.

**CYNGOR CEFN GWLAD CYMRU  
COUNTRYSIDE COUNCIL FOR WALES**

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

**NEATH PORT TALBOT**

**CRYMLYN BURROWS**

**Date of Notification:** 1987

**National Grid Reference:** SS 712927

**O.S. Maps:** 1:50,000 Sheet number: 170  
1:25,000 Sheet number: SS 69, SS 79

**Site Area:** 243.5 ha

**Description:**

One of the last remaining sections of the Swansea Bay Coastline which has remained substantially unmodified by industrial development. Over the past one hundred and fifty years, parallel sand dune ridges have developed at right angles to the River Neath and these are continuing to accumulate at the present time. Salt water is able to gain access to the system at high tide via the river channel, with the result that the dunes are interspersed by tongues of saltmarsh. These grade westwards into wet dune slacks and carr woodland.

Several plant species with local distribution occur within the site including rock sea lavender *Limonium binervosum*, dittander *Lepidium latifolium*, rock hutchinsia *Hornungia petraea*, round leaved wintergreen *Pyrola rotundifolia*, dutch rush *Equisetum hyemale* and the variegated horsetail *Equisetum variegatum*. The rare fen orchid *Liparis loeselii* is found occasionally within the slacks, whilst the sea stock *Matthiola sinuata* which was re-recorded in 1964 following its earlier disappearance, is widespread along the strandline and in the dunes.

The rare strandline beetle *Eurynebria complanata* has been recorded from the site.

This part of the Neath estuary is also used by part of the population of small waders overwintering in Swansea Bay.

**CYNGOR CEFN GWLAD CYMRU  
COUNTRYSIDE COUNCIL FOR WALES**

**SITE OF SPECIAL SCIENTIFIC INTEREST CITATION**

**SWANSEA**

**BLACKPILL, SWANSEA**

**Date of Notification:** 1984

**National Grid reference:** SS623878 to SS 621907

**O.S. Maps:** 1:50,000 Sheet number: 159  
1:25,000 Sheet number: SS 68, SS 69

**Site Area:** 467.4 ha

**Description:**

Swansea Bay provides an overwintering and passage site for a larger number of waders. Although forming part of a complex which includes the Gwendraeth, Burry and Severn Estuaries, it supports significant proportions of some species in its own right.

Counts for Ringed Plover and Sanderling exceed 1% of both British and Western European populations, making the Bay of international importance in this respect.

Other species, such as Oystercatcher, Grey Plover, Bar-tailed Godwit, Knot and Dunlin are all of local significance.

The topography and seasonal remoteness of the foreshore at low tide are important for the maintenance of the scientific interest, while suitable roosting spots, outside of the SSSI, are necessary on the highest tides.

**Remarks:**

Part of Bird Sanctuary declared under Protection of Birds Act 1954.