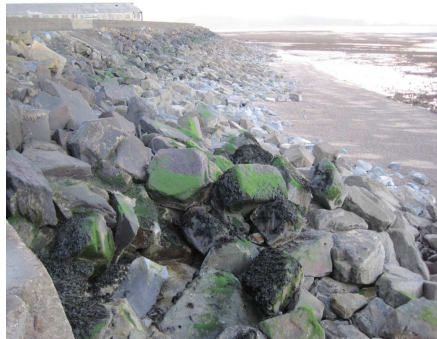
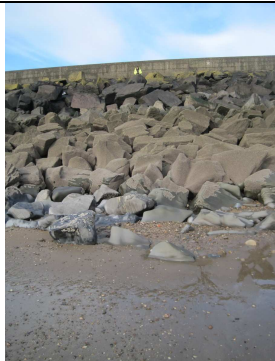


Appendix 8.2

Intertidal Biotope Survey Notes 2013

Table 1 Biotopes identified within the intertidal habitat between the River Tawe and River Neath on 14 January 2013 survey

Target Note	Biotope	Notes	Photos	
A	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.FLR.Eph.Ent – <i>Enteromorpha</i> spp. on freshwater-influenced and/or unstable upper eulittoral rock LR.LLR.F.Pel – <i>Pelvetia canaliculata</i> on sheltered littoral fringe rock LR.LLR.F.Fspi – <i>Fucus spiralis</i> on sheltered upper eulittoral rock LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i> , <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	Top of rocky shore dominated by lichen, with occasional barnacles and green algae patches observed lower down the rock. Two seaweeds zones of <i>Pelvetia canaliculata</i> and <i>Fucus spiralis</i> were observed at this point. Sandy beach extends from lower rock habitat out to low water.	 <i>Pelvetia canaliculata</i> and <i>Fucus spiralis</i>	 Rocky shore zones
B	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.FLR.Eph.Ent – <i>Enteromorpha</i> spp. on freshwater-influenced and/or unstable upper eulittoral rock LR.HLR.MusB.Cht.Cht - <i>Chthamalus</i> spp. on exposed upper eulittoral rock LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i> , <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	Again lichens dominate the top of the shore with barnacles and limpets below this. Small patches of <i>Enteromorpha</i> were also observed at the top of the rocky shore. By this point there was no evidence of <i>P. canaliculata</i> or <i>F. spiralis</i> seaweeds.	 Rocky shore zones	 <i>Enteromorpha</i>

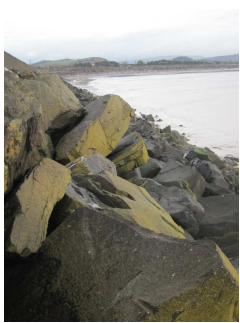
Tidal Lagoon Swansea Bay plc



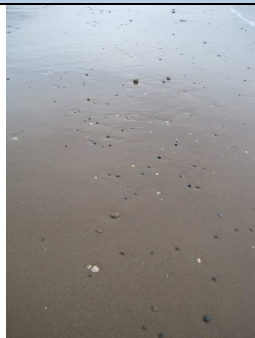
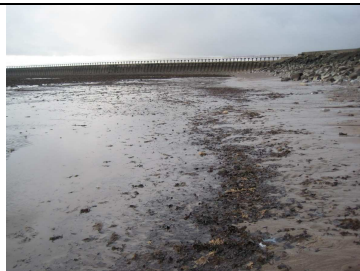
Target Note	Biotope	Notes	Photos
C	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.FLR.Eph.Ent – <i>Enteromorpha</i> spp. on freshwater-influenced and/or unstable upper eulittoral rock LR.HLR.MusB.Cht.Cht - <i>Chthamalus</i> spp. on exposed upper eulittoral rock LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i> , <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	Lichens dominate the top of the shore with a zone of barnacles and limpets below this.	 Barnacle and limpet zone  Barnacles
D	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.FLR.Eph.Ent – <i>Enteromorpha</i> spp. on freshwater-influenced and/or unstable upper eulittoral rock LR.HLR.MusB.Cht.Cht - <i>Chthamalus</i> spp. on exposed upper eulittoral rock LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i> , <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	This point is very similar to target note C with barnacles and lichens dominating the rocky shore. Here, however, small patches of mussels are present within the barnacles and limpet zone with very small patches of <i>Sabellaria alveolata</i> also present in the cracks in rocks above this area of mussels. Periwinkles and beadlet anemones were also observed here.	 Mussels, barnacles and limpets on lower rocky shore  <i>S. alveolata</i> in cracks in rock
E	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.FLR.Eph.Ent – <i>Enteromorpha</i> spp. on freshwater-influenced and/or unstable upper eulittoral rock LR.HLR.MusB.Cht.Cht - <i>Chthamalus</i> spp. on exposed upper eulittoral rock LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i> , <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral	Again very similar to target notes C and D, with barnacles and lichens dominate the rocky shore here with occasional patches of green <i>Enteromorpha</i> algae. No <i>P. canaliculata</i> or <i>F. spiralis</i> seaweeds, mussels or <i>S. alveolata</i> were observed here.	 

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Target Note	Biotope	Notes	Photos
	rock		Rocky shore zones Lichens at top of shore
F	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.LLR.F.Pel – <i>Pelvetia canaliculata</i> on sheltered littoral fringe rock LR.LLR.F.Fspi – <i>Fucus spiralis</i> on sheltered upper eulittoral rock LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i>, <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	Lichen dominates top of the rocky shore. Zones of <i>Pelvetia canaliculata</i> – channelled wrack seaweed and <i>Fucus spiralis</i> seaweed were re-observed here. Barnacles and limpets were present on the lower part of the rocky area.	  <i>Pelvetia canaliculata</i> – channelled wrack Lichen
G west	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.FLR.Eph.Ent – <i>Enteromorpha</i> spp. on freshwater-influenced and/or unstable upper eulittoral rock LR.LLR.F.Fspi – <i>Fucus spiralis</i> on sheltered upper eulittoral rock LR.HLR.MusB.Cht.Cht - <i>Chthamalus</i> spp. on exposed upper eulittoral rock LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i>, <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	Zones of <i>Enteromorpha</i> and <i>Fucus spiralis</i> seaweed begin from west of the outfall in a zone below the top lichen layer. No <i>Pelvetia canaliculata</i> – channelled wrack seaweed was recorded here. Barnacles and limpets become more dominant than in target note G east, in a zone below the seaweeds.	  <i>Fucus spiralis</i> seaweed Barnacles and limpets

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Target Note	Biotope	Notes	Photos
G east	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.HLR.MusB.Cht.Cht - <i>Chthamalus</i> spp. on exposed upper eulittoral rock LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i> , <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	Top of rocky shore dominated by lichen, with occasional barnacles and green algae patches observed lower down the rock. No evidence of seaweed in this stretch. Sandy beach extends from lower rock habitat out to low water.	 
Breakwater	LR.FLR.Eph.BLitX – Barnacles and <i>Littorina</i> spp. on unstable eulittoral mixed substrata	Breakwater down to mixed substrate with barnacles and periwinkles.	
Area between rocks and <i>S. alveolata</i> reef	LS.LCS.Sh.BarSh – Barren littoral shingle LS.LMu.MEst.HedMac – <i>Hediste diversicolor</i> and <i>Macoma balthica</i> in littoral sandy mud LS.LSa.MoSa.AmSco – <i>Amphipods</i> and <i>Scolecipis</i> spp. in littoral medium-fine sand	Progressing east to west the area between the rock and <i>S. alveolata</i> reef is composed of shingle then mud then sand.	 

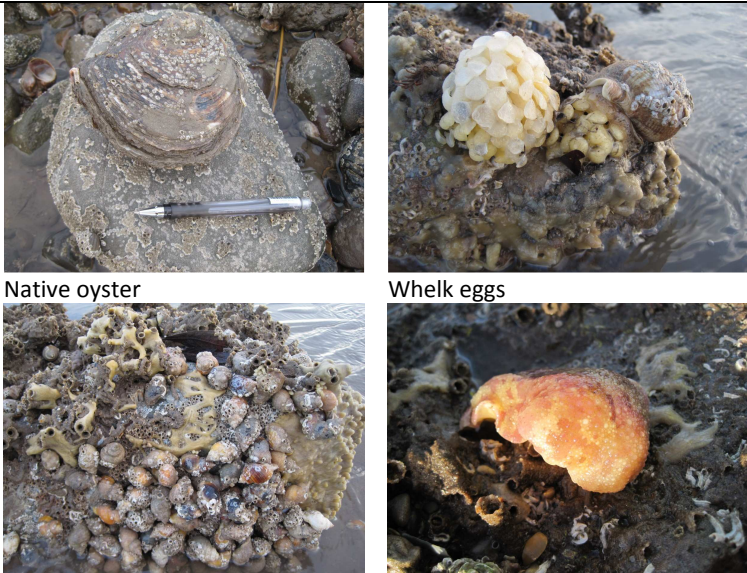
Tidal Lagoon Swansea Bay plc



Target Note	Biotope	Notes	Photos
<i>Sabellaria alveolata</i> reefs	LS.LBR.Sab.Salv – <i>Sabellaria alveolata</i> reefs on sand-abraded eulittoral rock	Extensive <i>S. alveolata</i> reefs were mapped.	  <i>S. alveolata</i> <i>S. alveolata</i> reef
<i>S. alveolata</i> boundary	LS.LBR.Sab.Salv – <i>Sabellaria alveolata</i> reefs on sand-abraded eulittoral rock	On the eastern edge of the <i>S. alveolata</i> reef there was a clearly defined boundary between the reef and sand. However, in other areas, particularly the western boundary it was less easy to clearly define the boundary of the reef from the mixed substrate. Sparse areas of <i>S. alveolata</i> were still present outside of the mapped boundary however the majority of the <i>S. alveolata</i> lay within the mapped boundary.	  Western boundary Eastern boundary  Southern boundary

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Target Note	Biotope	Notes	Photos
Pools	LR.FLR.Rkp.H - hydroids, ephemeral seaweeds and <i>Littorina littorea</i> in shallow eulittoral mixed substrata pools	Small standing pools were present throughout the <i>S. alveolata</i> habitat, only the largest of these pools were mapped. N.B. <i>Sabellaria</i> was still present within these pools	 <i>S. alveolata</i> reefs with pools
Species	N/A	A number of species of note were recorded within the <i>S. alveolata</i> reef including; two live Native Oyster, whelk and whelk eggs, sponges, periwinkles, the sea lemon sea slug and slipper limpets. In particular, large beds of slipper limpets were observed in the south-eastern corner of the <i>S. alveolata</i> reef.	 Native oyster Whelk eggs Sponges Sea lemon (<i>Archidoris pseudoargus</i>)

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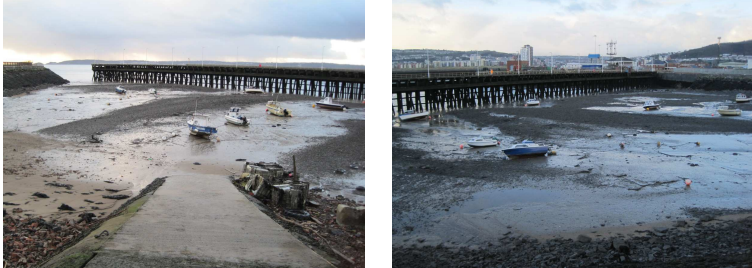
Target Note	Biotope	Notes	Photos
Harbour wall	LR.FLR.Lic.YG – yellow and grey lichens on supralittoral rock LR.FLR.Lic.Ver.Ver – <i>Verrucaria maura</i> on very exposed to very sheltered upper littoral fringe rock LR.FLR.Eph.Ent – <i>Enteromorpha</i> spp. on freshwater-influenced and/or unstable upper eulittoral rock LR.LLR.F.Pel – <i>Pelvetia canaliculata</i> on sheltered littoral fringe rock LR.LLR.F.Asc.FS – <i>Ascophyllum nodosum</i> on full salinity mid eulittoral rock. LR.HLR.MusB.Sem.Sem - <i>Semibalanus balanoides</i>, <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	Lichen, <i>Pelvetia canaliculata</i> and <i>Fucus spiralis</i> are all present in zones from the top of the harbour wall, however <i>Ascophyllum nodosum</i> dominates. Below this a zone of barnacles and limpets is also present.	 Zones on harbour wall
Harbour	LS.LMu.MEst.HedMac – <i>Hediste diversicolor</i> and <i>Macoma balthica</i> in littoral sandy mud LR.FLR.Eph.BLitX – Barnacles and <i>Littorina</i> spp. on unstable eulittoral mixed substrata LS.LCS.Sh.BarSh – Barren littoral shingle LS.LSa.MoSa.AmSco – <i>Amphipods</i> and <i>Scolecipis</i> spp. in littoral medium-fine sand	The sediments within the harbour consisted predominantly of mud or mixed substrata. A small area north of the slipway consisted of barren shingle whilst south of the slipway was medium to fine sand.	 Habitats within harbour

Table 2 Biotopes identified within the intertidal habitat west of the River Tawe on 15 January 2013 survey

Target Note	Biotope	Notes	Photos
<i>Sabellaria alveolata</i> reefs	LS.LBR.Sab.Salv – <i>Sabellaria alveolata</i> reefs on sand-abraded eu littoral rock	Distinctive <i>S. alveolata</i> reefs were mapped. These reefs were less extensive than those mapped to the east of the River Tawe with large expanses of sand between reefs.	 <i>S. alveolata</i> at 7  <i>S. alveolata</i> 'v' at 9  <i>S. alveolata</i> at 10  <i>S. alveolata</i> at 13  <i>S. alveolata</i> at 16  <i>S. alveolata</i> at 18

Tidal Lagoon Swansea Bay plc



Target Note	Biotope	Notes	Photos
Piddocks	LR.HLR.FR.RPid – <i>Ceramium</i> sp. and piddocks on eulittoral fossilised peat LR.MLR.MusF.MytPid – <i>Mytilus edulis</i> and piddocks on eulittoral firm clay	Exposed clay with evidence of burrowing piddocks and fossilised peat with piddocks. A number of patches of exposed clay were also observed throughout the survey that were too small to map..	 Clay ridge at 1  Piddocks at 2  Piddocks at 6  Piddocks at 11  Piddocks at 12  Piddocks at 14

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Target Note	Biotope	Notes	Photos
Mixed substrate	LR.FLR.Eph.BLitX – Barnacles and <i>Littorina</i> spp. on unstable eulittoral mixed substrata	Extensive areas of mixed substrate were present with evidence of dead mussel shells and the odd small patches of <i>S. alveolata</i>	  Mixed substrate at 4 Mixed substrate at 5   Mixed substrate at 15 Mixed substrate at 17
Mussel beds	LS.LBR.LMus.Myt - <i>Mytilus edulis</i> beds on littoral sediments	Two small bands of living mussel beds were observed. A large number of slipper limpets were also present across this substrate.	  Mussels at 3 Mussels at 8

Table 3 Biotopes identified within the intertidal habitat north of Mumbles Head during the 28 and 29 May 2013 surveys

Target Note	Biotope	Notes	Photos
<i>Sabellaria alveolata</i> reefs	LS.LBR.Sab.Salv – <i>Sabellaria alveolata</i> reefs on sand-abraded eulittoral rock	Small distinct area of <i>S. alveolata</i> on mixed substrate of boulders and cobbles. Far less extensive than that mapped around River Tawe.	 <i>S. alveolata</i> at 19 (see Figure 8.13)
Peat exposures with evidence of burrowing piddocks	LR.HLR.FR.RPid – <i>Ceramium</i> sp. and piddocks on eulittoral fossilised peat	Fossilised peat with evidence of burrowing piddocks. Other areas of exposed peat were also observed around 'P' but no evidence of piddocks.	 Piddocks at 20  Piddocks at 20 

Tidal Lagoon Swansea Bay plc



Target Note	Biotope	Notes	Photos
Clay exposures – no evidence of piddocks		Small patches of exposed clay noted however no piddocks were observed.	 Exposed clay at 21
Mixed substrate	LR.FLR.Eph.BLitX – Barnacles and <i>Littorina</i> spp. on unstable eulittoral mixed substrata LR.LLR.F.Fves.X - <i>Fucus vesiculosus</i> on mid eulittoral mixed substrata	Extensive areas of mixed substrate were present with evidence of dead mussel shells and slipper limpet. Mixed substrates were dominated either by barnacles and periwinkles or the bladder wrack seaweed <i>F. vesiculosus</i> . 'MxS' represents an area of mixed substrate which was mapped as mussel beds in the 2001-2003 survey.	 Mixed substrate with barnacles and periwinkles at 22  Mixed substrate with barnacles and periwinkles at 25

Target Note	Biotope	Notes	Photos
			  Mixed substrate with bladder wrack at 23  Mixed substrate with bladder wrack at 26
Mussel beds	LS.LBR.LMus.Myt - <i>Mytilus edulis</i> beds on littoral sediments	Three small areas of living mussel beds were observed. 'M' represents the centre point of mussel bed as was observed in 2001-2003.	  Mussel bed at 24 Mussel bed at 24

Tidal Lagoon Swansea Bay plc

Target Note	Biotope	Notes	Photos
			 Mussel bed at 27
For target note location please see Figures 8.7 to 8.13			