www.seasearch.org.uk

Milford Haven

Seasearch and Native Oyster Surveys

2010 & 2011

The Milford Haven Waterway is a ria-estuary, an uncommon estuary type restricted in the UK to SW England & Wales. Milford Haven is the only example of its kind in Wales and the largest ria-estuary complex in the UK. The waterway is encompassed within the Pembrokeshire Marine SAC - a designation that recognises its unique and diverse marine species and habitats as being of European importance.

This is historically one of the best studied areas of sea around the UK; marine biological research work has been focused throughout the area since the production of the Dale Fort Marine Flora and Fauna in 1966. The presence of the Field Studies Council's Oil Pollution Research Centre from 1967 to 1999 helped ensure that Pembrokeshire firmly remained one of the prime sites for marine scientific research. Today the Milford Haven Waterway Environmental Surveillance Group and various visiting universities, colleges and others including Seasearch continue to study the waterway's marine environment.

The natural deep water harbour of the Milford Haven ria also provides opportunities for many diverse human activities; it is the reason why the port and its maritime industries can exist here. Milford Haven is the biggest port in Wales and the fifth busiest port in the UK. The presence of 2 oil refineries, an oil storage unit, and the Port of Pembroke Dock with its ro-ro Irish Ferry and Ministry of Defence (MOD) activity, all result in a considerable amount of shipping; 9981 movements were recorded in 2004. The current development of 2 LNG (liquid natural gas) terminals and potentially 2 power stations and a bio-diesel facility will increase shipping movements and usage of the port considerably. The waterway is also an important resource for the fishing industry and popular with recreational users. With its plethora of moorings and two existing marinas at Neyland and Milford (and proposed new marina development at Pembroke Dock), it acts as a gateway for many boat users to the rest of the Pembrokeshire coast.

Although the waterway has been well studied relative to other marine areas, the co-existence of its extremely varied species and habitats, combined with the diversity and intensity of human activity provide an important arena for monitoring potential impacts and change.

UK Biodiversity Action Plan (BAP) Recognising the decline in species and habitats, the UK Government has established a list of habitats and species in need of priority conservation action through its Biodiversity Action Plan (BAP). Through the BAP process, there is a UK-wide drive to conserve and enhance threatened species and habitats. The UK BAP list of habitats and species has contributed to a Welsh BAP list, which contains additional marine listings to better reflect the marine conservation need for basic information such as 'what is where?' and 'how much?' which is lacking for marine BAP habitats and species. Wales - http://www.biodiversitywales.org.uk.

Seasearch surveys undertaken in the Milford Haven waterway, which hosts many marine BAP habitats and species, provide valuable data on distribution, and possible early indications of change.

Native Oyster, *Ostrea edulis*

About 150 years ago Pembrokeshire supported a thriving oyster industry, however exploitation of the beds lead to the population almost collapsing. Today the Milford Haven waterway is the only known location for live oyster beds in Pembrokeshire and these beds are much reduced from historical levels. In 2002 a survey to assess the distribution and abundance of the native oyster in Milford Haven was completed for CCW by Emu Ltd. During 2010 and 2011 Seasearch surveyed a number of sites to record the current condition.

The slipper limpet, *Crepidula fornicata* is a non-native species that was first recorded in Milford Haven in the 1960s. It is typically found attached to shells and stones on soft substrata in the shallow sublittoral.

Slipper limpets are commonly found in curved chains for up to 12 animals stacked on each other. When they form dense congregations covering the seabed they leave little room for other species such as the native oyster.

Numbers of native oyster and abundance of slipper limpets were recorded in a two metre band along tapes either 10m or 30m depending on conditions. The data has not been included in this report as the native oyster is identified by the Countryside Council for Wales as sensitive data.

Tidal rapid reefs

Tidal rapids are a UK BAP habitat. The term 'tidal rapids' is used to cover a broad range of high-energy environments including deep tidal streams and tide• swept habitats, Wherever they occur, strong tidal streams result in characteristic marine communities rich in diversity, nourished by a constantly renewed food source brought in on each tide.

The rocky tide-swept habitats in Milford Haven and the Dau Cleddau estuary are listed as one of the key features of the reefs present in the Pembrokeshire Marine SAC and are considered of notable importance. High resolution multi-beam bathymetric survey results of the Haven showed a number of apparently rocky features that had not been previously identified.
Seasearch has been targeting these features since 2007 and 3 new sites were surveyed during 2010 and 2011.

Seasearch Site Locations 2010 and 2011

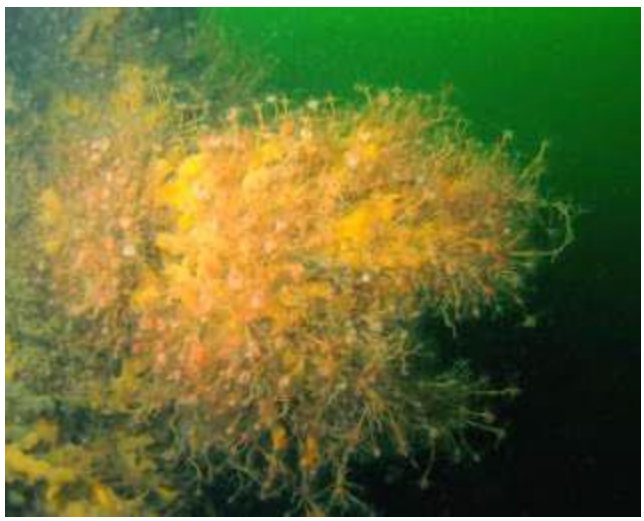
The map and local site names with coordinates have been removed from this redacted version of the report in line with CCW requirements in dealing with "sensitive species" which include the native oyster. A fully copy of the report is available from CCW under licence.

Site 1: A flat river bed of muddy shell gravel with an abundance of slipper limpets C. *fornicata* and occasional blue mussels, *Mytilus edulis*. In some areas ridges made up of pits of shells were found. Occasional pebbles and small boulders hosted sponges: mermaids glove, *Haliclona oculata* and breadcrumb *Halichondria panicea*, *H. bowerbanki* and spiky lace sponge, *Leucosolenia complicata*. Groups of horseman anemone, *Urticina eques* (below right) and dahlia anemone, *U. felina* were found, as were numerous gobies and shore crabs, *Carcinus maenas*.

Site 2: The main area of the river bed is a pebble plain with occasional boulders. A superabundance of slipper limpets was found forming a dense bed over the substrate. Small boulders provided the only opportunity for sponges and hydroids to attach to including *Suberites ficus*. Amongst the slipper limpet, C. *fornicata*, bed occasional records of the native oysters, O. *edulis* and horseman anemone, *U. eques* and dahlia anemone, *U. felina* were made.

Site 3: A rugged rocky reef with step faces up to 3 m height. The rocks were smothered in a super• abundance of breadcrumb sponge, *H. panicea* and mermaids glove, *H. oculata*, along with an abundance of the oaten pipe hydroid, *Tubularia indivisa*. Above and below the wall were cobble and pebble areas thickly carpeted in slipper limpets, C. *fornicata*. Dense coverings of hydroids were found including *Obelia* species and *Diadumene cincta* along with horseman anemone, *U. eques* and dahlia anemone, *U. felina*, the elegant anemone, *Sagartia elegans* and *S. troglodytes* and a diverse range of sea squirt species.

Site 4: A steep slope characterised by rock rubble encrusted in breadcrumb sponge *H. bowerbankii* leading down to a level mixed ground with large scoured boulders near the moorings. The mixed ground was highly mobile with very few sessile animals except for fried egg anemones, *Actinothoe sphyrodeta*. Patches of slipper limpets C. *fornicata* were present with occasional shredded carrot sponge, *A. fucorum* and sea orange, *Suberties ficus* attached. The moorings were made from concrete blocks and tyres, these were encrusted in finger bryozoan, *Alcyonidium diaphanum* and sea squirt *Diplosoma spongiforme*. Hydroids *Hydrallmania falcata* heavily encrusted the mooring rope along with occasional oaten pipe hydroids, *T. indivisa* (right).



Site 5: The diving team was divided into two groups, one of which dived the area between the boat moorings with the other targeting just outside of the moorings. It is speculated that the area within the moorings may have higher densities of native oysters, as these areas may not have the same intensity of 'oyster dredging' by fishing boats due to the difficulty of towing gear between the moorings. Interestingly native oysters, O. *edulis*, were recorded with an abundance rating of 'occasional' outside of the moorings but with 'frequent' within the moorings. An abundance of slipper limpets was found but lower densities to those at Site 2. Small boulders were found smothered in sponges and hydroids typical of the area. The finger bryozoan *A. diaphanum* was frequently found, often with the white hedgehog sea slug, *Acanthodoris pilosa*, and large sea lemon, *Archidoris psuedoargus*, were found in congregations with large egg masses.

Site 6: Mobile mixed substrate of pebbles and shell debris with some sparse sponges attached, breadcrumb sponge, *H. bowerbankii* and shredded carrot sponge, *A. fucorum*. Moorings made from tractor tyres acted as artificial reefs. These were covered in short animal turf of finger bryozoan, *A.diaphanum*, the sea squirt *Diplosoma listerianum* and hornwrack, *Flustra foliacea*. Some large native oysters, *O. edulis* were found in the vicinity of the moorings along with numerous empty shells and the slipper limpet, C. *fornicata* was notably rare at this site. Many bottom dwelling fish were present, including dragonet, *Callionymus lyra*, scorpion fish and black goby, *Gobius niger*.

Site 7: A steep silt covered rock wall from 8 m to 17m. The wall was dominated by sponges with a super abundance of the shredded carrot sponge, *A. fucorum* and an abundance of the mermaids glove, *H. oculata*. Hydroids included the antenna hydroids, *Nemertisia antennina* and *N. ramosa* and abundance of the finger bryozoan, *A. diaphanum* was recorded. A high diversity of sea squirt species was also found. Shell fragments, especially slipper limpets, were found in shallow crevices.

Site 8: An impressive drop off was found with a wall 5-8m high just outside of the mooring area. The wall was covered in sponges with a super abundance of the breadcrumb sponge, *H. panicea* and mermaids glove, *H. oculata* and goosebump sponge, *Dysidea fragilis* both common. Common too were the oaten pipe hydroid, *T. indivisa*, antenna hydroid, *N. antennina* and *N. ramosa*. The site was rich in nudibranchs with both *Tritonia lineata* and *Coryphella browni* recorded as frequent and a record of the nationally rare nudibranch *Trapania pallida*.


Coryphella browni


Breadcrumb sponge and anemones

Site 9: Steep rubble slope densely covered in shredded carrot sponge, *A. fucorum* (right) in concentrated patches along with *S. ficus* and other sponge species. Interlaced amongst the sponges were feathery hydroids *Kirchenpauria sp.* and feather stars, *A. bifida*, elegant anenomes, *S. elegans* and fried egg anemone, *A. sphyrodeta.* The remainder of the slope was covered in dense expanses of slipper limpet, C. *fornicata* leading down to a flat expanse. Occasional gooseberry sea squirts, *Dendrodoa grossularia* and *D. listerianum* were found, together with large specimens of sea orange, *S. ficus* and occasional native oysters, O. *edulis.*

Site 10: Gently sloping muddy expanse with sparse groups of hydroids, bryozoans and encrusting ascidians on small pebble and shell outcrops including *Hydractinia echinata, Kirchenpaueria sp* and *Serturella gayi.* Large numbers of black gobies, G. *niger,* hermit crabs, *Pagarus bernhardus* and small spider crabs.

Numerous holes and evidence of burrows raised up. In some areas muddy sediments with an abundance of slipper limpet, C. *fornicata* forming a dense bed with sea orange, *S. ficus*, fluted sea squirt, *Ascidiella aspersa* and red sea squirt, *Ascidia mentula* along with common whelks *Buccinum undatum.*

Slipper limpet bed and sea orange

Acknowledgements

Seasearch is a volunteer underwater survey project for recreational divers who wish to contribute to conserving the marine environment. All Seasearch data is entered into the Marine Recorder database and available on the JNCC National Biodiversity Network (NBN) website.

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Photos by David Kipling and Sarah Bowen except “Breadcrumb sponges and anemones” (site 8) by Emma Kenyon).

Financial support for Seasearch in Wales during 2010 and 2011 has been given by the Countryside Council for Wales.

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