

## Maerl in Cornwall

### 2012 Survey Report

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*Maerl is a free living calcified red seaweed which lives in shallow water and forms beds made up of masses of small irregularly branched nodules which can cover large areas in the right conditions. The living maerl sits on top of layers of dead maerl which builds up over time (centuries or millennia) to form the bed. These beds may be composed of more than one species of maerl, in Cornwall there are currently two known species – *Phymatolithon calcareum* and *Lithothamnion corallioides*. Maerl beds are a Biodiversity Action Plan (BAP) habitat and both maerl species are BAP species. This is because maerl is uncommon in England and plays an important role in providing a habitat for a large number of other species, mainly invertebrates and seaweeds, which live in amongst it and on it.*

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In Cornwall maerl has long been known to occur in the Fal Estuary, particularly the area of St Mawes Bank which is an extensive bed made up of both maerl species (Howell, 1968 and Rostron, 1985). The maerl there is protected under European law as a feature of the Fal and Helford Special Area of Conservation (SAC). A maerl bed in the Helford estuary was described in the 1980s (Rostron, 1987). Since then there have been anecdotal reports of maerl in the Helford from local divers, but it was not known how much live maerl there was and whether it formed a true bed. Through our surveys in 2012 we have confirmed the presence, extent and community composition of the maerl bed in the Helford. Seasearch divers have also surveyed the better known maerl bed within the Fal and found a previously unknown maerl bed in St Austell Bay.



*Brittlestars, Ophiocoma nigra and maerl in the newly discovered maerl bed in St Austell Bay.*

## Helford Estuary

Rostron (1987) first recorded maerl in the Helford estuary, describing 40%-80% cover of live maerl (*Lithothamnion corallioides*) at 3m below chart datum, covering a smaller area than the St Mawes Bank maerl bed. There were no estimates of the extent of the Helford maerl bed.

The first step in following up the old records of maerl in the Helford was to carry out a large scale search of the area. For this the Helford Marine Conservation Group (HMCG) teamed up with the Marine Institute of Plymouth University to conduct a boat based survey of the seabed habitats of the outer part of the Helford Estuary using an ROV (Remotely Operated Vehicle).



Richard Ticehurst controlling the ROV from the boat with skipper Chris Bean.



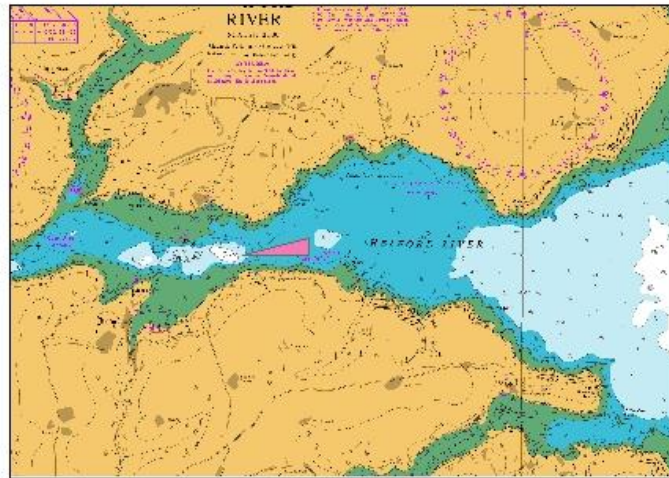
The ROV being operated by Richard Ticehurst and Tony Sutton.

The survey was conducted on 14th April 2012 by Richard Ticehurst (Plymouth University), Tony Sutton (HMCG), Chris Bean (local boat skipper) and Angie Gall, by deploying the VideoRay ROV from Chris Bean's boat, *Lady Hamilton*. The ROV allowed large areas of the seabed to be covered in the search for maerl and the habitats could be viewed in real time onboard the boat. At the end of a long day of searching (during which time a lot of information about other seabed habitats was recorded), the maerl showed up on the ROV, where the estuary narrows near Bosahan Point (Biotope map Appendix D).

This initial data showed a dense bed of maerl, but further investigation was needed to characterise the habitat and to map the extent of the maerl bed. On 7th May 2012 four Seasearch divers (Andy Grant, Richard Morton, Sue Morton and Angie Gall) dived the maerl bed to conduct a survey and take photographs. The bed was found to be quite extensive - running several hundred metres along the seabed in a strip running approximately east to west in direction at a depth of approximately 4m below chart datum. Details about the species present in the maerl bed and its extent were recorded.

## Location of Maerl Bed in the Helford River

Wider area- Helford River

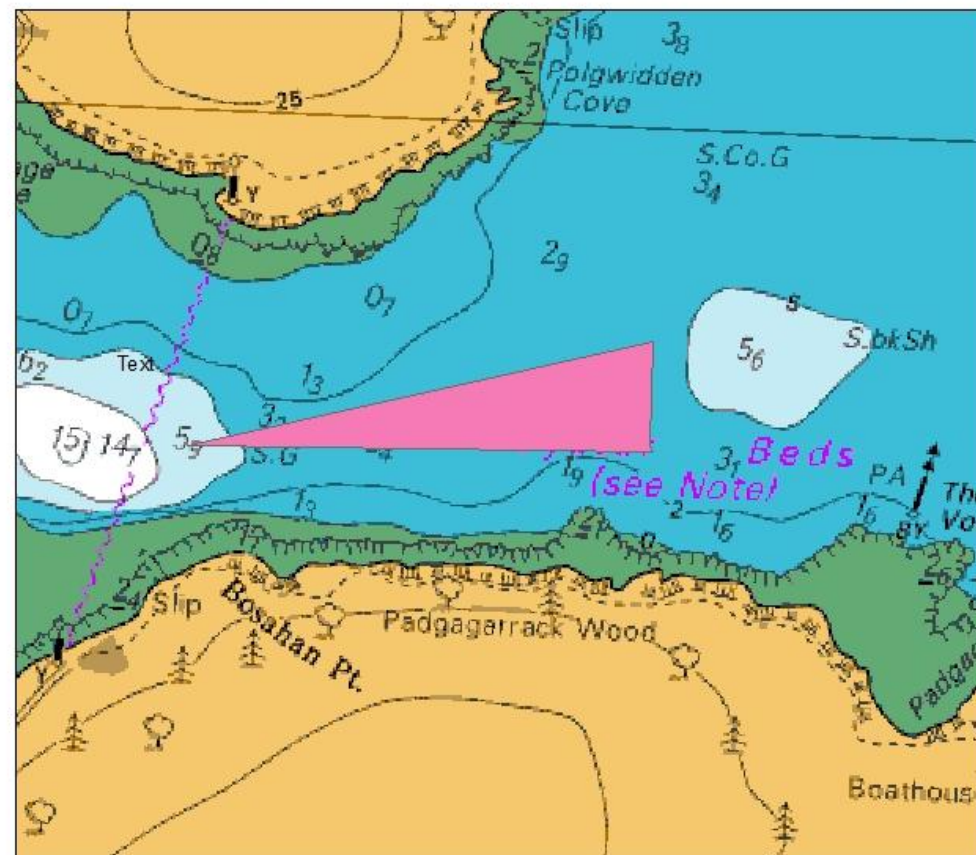


0 0.25 0.5 1 1.5 2 Kilometers

### Legend

 Likely extent of live maerl

Approximate location and estimated extent of maerl bed within Helford River



0 0.045 0.09 0.18 0.27 0.36 Kilometers

From the 13th to 23rd August 2012 the Joint Nature Conservation Committee (JNCC) scientific dive team were carrying out survey work in the Fal and Helford SAC and visited the Helford on three days to gather further information on the maerl habitat. Their team was led by Francis Bunker – a specialist in maerl and other seaweeds. JNCC conducted further mapping studies of the bed and a Phase 2 survey to record species associated with the maerl. They also recorded the fauna and flora from 5 quadrats using a standard methodology for maerl which is used elsewhere such as Milford Haven (see Bunker, 2010). The work carried out by JNCC is currently being written up and will be published as a Natural England Research Report.



Most of the Seasearch diving on maerl sites this year has been done from small inflatables and RIBs by Jane Morgan

The maerl site was visited again by Seasearch divers Lin Baldock, Keith Hiscock, Teresa Darbyshire, David Kipling, Sarah Bowen and Emily Priestley on 16<sup>th</sup> September 2012 as part of the Porcupine Marine Natural History Society field meeting. They carried out further surveys of the species present with a particular focus on worms and seaweeds (species list at Appendix A).

The character of this maerl bed is different to that of the maerl beds in the Fal. As Rostron (1987) identified, it is composed primarily of the maerl species *Lithothamnion corallioides*. It is in shallow water, approximately 4m below chart datum. The percentage of live maerl within the bed is high, averaging about 80% across the bed. It supports a high diversity of other seaweed species including the Biodiversity Action Plan (BAP) species *Cruoria cruoriaeformis* (a red seaweed) (F.Bunker, *pers comm.*), *Ostrea edulis* (native oyster) and *Edwardsia timida* (timid burrowing anemone). Also, the maerl species *L. corallioides* is a BAP species.

Typical seaweeds found in the maerl bed are *Dictyota dichotoma*, *Gracilaria multipartita*, *Halarachnion ligulatum*, *Gracilaria gracilis*. Typical animals found living in the maerl bed are the worms *Megalomma vesiculosum* and *Myxicola infundibulum*, burrowing anemones including *Cerianthus lloydii* and *Cereus pedunculatus*, molluscs such as *Gibbula cineraria* and *Gibbula magus*. The current community living in the maerl bed appears to be similar to that described by Rostron in 1987.



Harbour crab *Liocarcinus depurator* in maerl.

The extent of the bed is estimated at approximately 2.2 hectares (+ / – 0.5ha), based on the transects undertaken by Seasearch. The length of the bed (east to west) was approximately 430m and the maximum width (north to south) was 100m. The bed seemed to be a long wedge shaped strip with its widest closest to the mouth of the estuary, however this needs to be confirmed by further surveys of the western end of the bed. Initial transects by Seasearch have been further refined by the work by JNCC who conducted more transects, recording the substrate at frequent intervals (Bunker, 2012).



*Maerl in the Helford by Richard Morton*



*Common starfish on maerl*

## St Mawes Bank, Fal Estuary

The maerl beds in the Fal have been surveyed previously as features of the Special Area of Conservation by other interest groups and individuals. In 2012 Seasearch was able to add to this data during a number of dives, including those during a training course on sea squirts led by Bernard Picton. 18 divers including photographer Rob Spray, surveyed the maerl and adjacent habitats at East Narrows close to the mouth of the Fal. The maerl bed was revisited by Seasearch in September during the Porcupine Marine Natural History Society field meeting and in November 2012 with a team of four divers, including photographer Jane Morgan (species list at Appendix B). Specific attention has been paid to the area of maerl that is currently within a recommended Reference Area (a type of Marine Protected Area). A separate, full Seasearch report of this site has been published and is available on the [Seasearch website](#).

The maerl beds in the Fal are under particular scrutiny at the moment due a proposed dredge to deepen the nearby shipping channel. Response to this proposal includes those voicing concerns over potential damage to this area of maerl through a number of possible causes, such as, silting and mechanical disturbance.



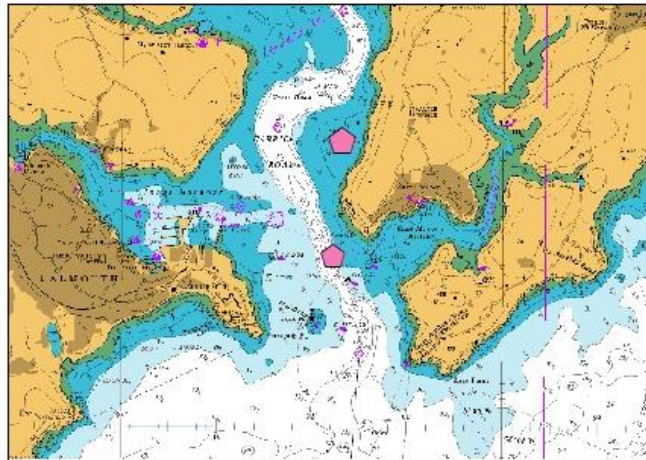
*A hermit crab *Pagurus prideaux* in maerl by Rob Spray*



*The hydroid *Corymorpha nutans* in maerl by Richard Morton*

# Location of Seasearch maerl dives in Fal Estuary

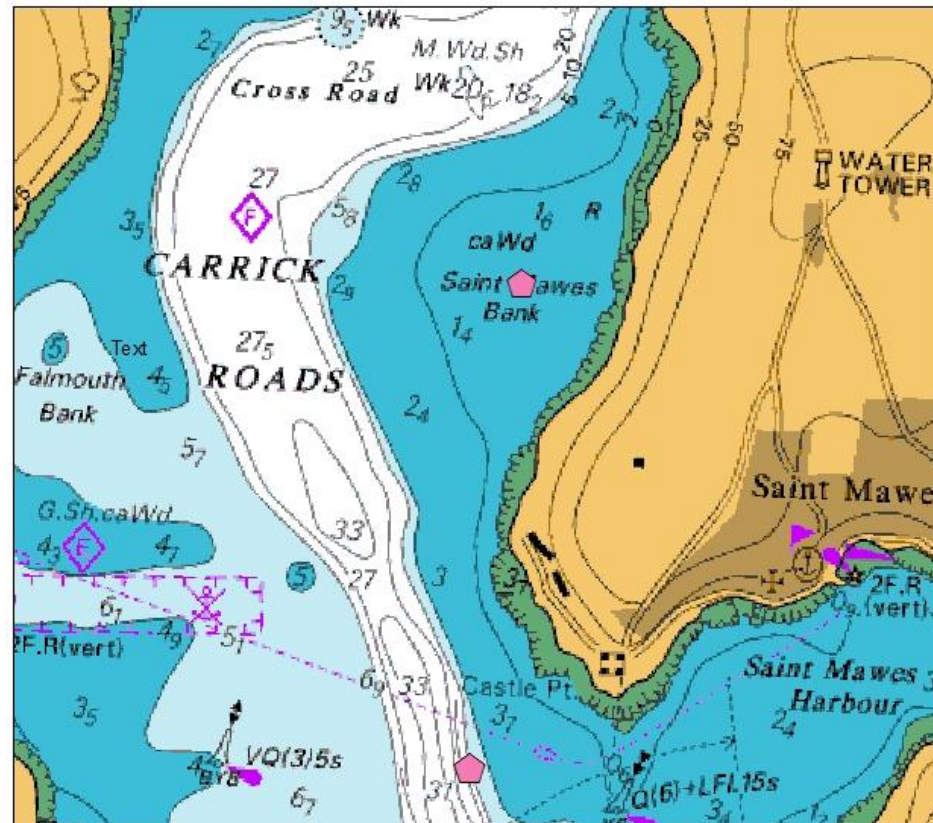
Wider area- Fal estuary



0 0.45 0.9 1.8 2.7 3.6  
Kilometers



Location of Seasearch dives



0 0.125 0.25 0.5 0.75 1  
Kilometers

## St Austell Bay

Seasearch divers Andy Grant, Richard Morton, Sue Morton and Angie Gall carried out an exploratory dive in St Austell Bay on 22<sup>nd</sup> July 2012.

The seabed appeared to be flat sediment on the depth finder but the first divers reported an extensive area of dense live maerl covered by a bed of brittlestars. In order to find out more about the extent of the bed a number of transects across the bed were conducted by divers. The edge of the bed was marked by the GPS on the boat by the divers signalling by sending up a Surface Marker Buoy. A further survey dive was conducted by the same team plus Paddy Maher on 18<sup>th</sup> August 2012 and more information was gathered on the extent of the bed.

The maerl bed appears to consist predominantly of what is thought to be *Lithothamnion corallioides* and is dense, live maerl, typically 60% to 90% cover. There are pebbles amongst the maerl and in places there are small (1m high) bedrock ridges protruding. The maerl bed has layers of dead maerl for at least 50cm beneath it. The seabed is level and is approximately 13m below chart datum. It is not known whether the maerl bed extends further up into shallow water and this is something that Seasearch will investigate in future dives.

The brittlestar bed has been present during both dives and is made up of the brittlestars *Ophiothrix fragilis* and *Ophiocoma nigra*. A very unusual anemone *Capnea sanguinea* was recorded in the sediment adjacent to the maerl. Unlike the Helford maerl bed there is very little other seaweed growing on the maerl bed, probably due to its greater depth which makes it a less suitable habitat for those species.

Information gathered during the dives has led to an extent mapping survey which is being carried out by Cornwall Inshore Fisheries and Conservation Authority on behalf of Natural England. This survey is using sidescan sonar and drop down video to look at the wider area of St Austell Bay to find out how far the bed extends across the bay. A report of the results will be published by Natural England.

The area currently has no legal protection and although there are no apparent threats at present, it is potentially vulnerable to damage from mobile fishing gear or sedimentation.



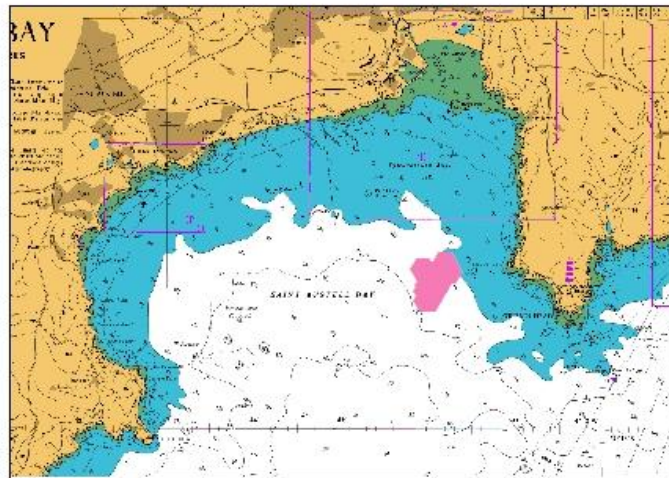
*Capnea sanguinea*, an unusual anemone, in St Austell Bay



Brittlestars *Ophiothrix fragilis* on maerl in St Austell Bay

## Location of Maerl records from St Austell Bay

Wider area- St Austell Bay



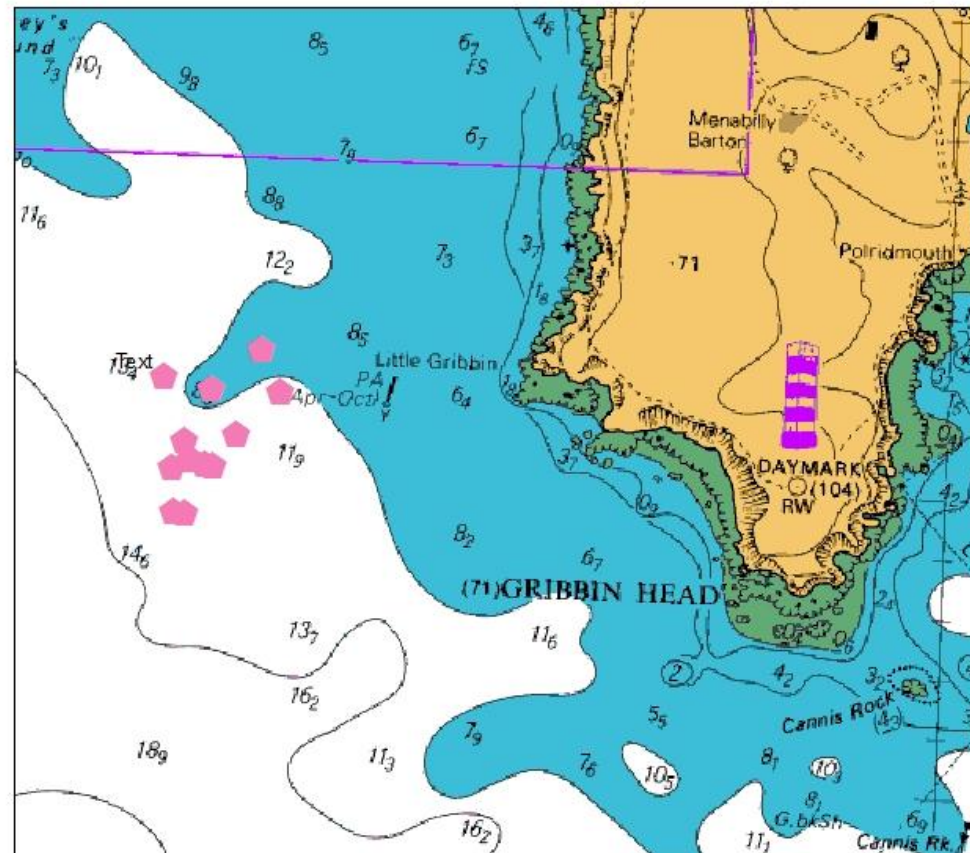
0 0.5 1 2 3 4  
Kilometers



### Legend

◆ Maerl records

Gribbin Head and location of known maerl bed



0 0.15 0.3 0.6 0.9 1.2  
Kilometers



## References

**Bunker, F.StP., D.** (2011). Monitoring of a Maerl Bed in the Milford Haven Waterway, Pembrokeshire, 2010. CCW Contract Science Report No. 979. A report to the Countryside Council for Wales by *MarineSeen*, Pembrokeshire 145pp + iii.

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**Howell, B.R.** (1968). Survey of the St Mawes (Vilt) Bank of the Fal Estuary 26<sup>th</sup>-28<sup>th</sup> August, 1968. Report number 124.

**Perrins, J., Bunker, F. And Bishop, G.** (1995) A comparison of the maerl beds of the Fal Estuary between 1982 and 1992. A joint report to the National Rivers Authority and English Nature.

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**Rostron, D.** (1985). Surveys of harbours, rias and estuaries in southern Britain: Falmouth. (Contractor: Field Studies Council Oil Pollution Research Unit, Pembroke.) (FSC Report, No. FSC/OPRU/49/85.)

This report was produced for Seasearch by Angie Gall.

Many thanks to all those who have been involved in learning about the maerl this year: Richard Ticehurst, Chris Bean, Tony Sutton, Andy Grant, Sue Morton, Richard Morton, Paddy Maher, Bernard Picton, Emily Priestley, Lin Baldock, Keith Hiscock, Teresa Darbyshire, David Kipling, Sarah Bowen, Nick Owen, Francis Bunker and the JNCC divers and other Seasearch divers who surveyed the recommended Reference Area in the Fal. Thank you to Plymouth University for the loan of the ROV and to ERCCIS for help with mapping.

Photos by Angie Gall except where labelled otherwise.

## Appendix A – Helford maerl species list

List of species recorded on several Seasearch dives by a number of recorders.

<i>Acrosorium venulosum</i>	<i>Cryptopleura ramosa?</i>	<i>Liocarcinus depurator</i>	<i>Pholoe</i> sp.
<i>Anemonia viridis</i>	<i>Dictyota dichotoma</i>	<i>Lithothamnion corallioides</i>	<i>Phyllodoce mucosa</i>
<i>Aonides oxycephala</i>	<i>Euclymene droebachensis</i>	<i>Macrochaeta clavicornis</i>	<i>Polyclinum aurantium</i>
<i>Aplidium punctum</i>	<i>Euclymene oerstedii</i>	<i>Mediomastus fragilis</i>	<i>Pomatoschistus pictus</i>
<i>Asparagopsis armata</i>	<i>Eupolymnia nebulosa</i>	<i>Megalomma vesiculosum</i>	<i>Pomatoschistus</i> sp.
<i>Asterias rubens</i>	<i>Exogone hebes</i>	<i>Melinna palmata</i>	<i>Prionospio fallax</i>
<i>Branchiomma vesiculosum</i>	<i>Facelina auriculata</i>	<i>Myriochele oculata</i>	<i>Pseudopolydora pulchra</i>
<i>Broggiartella byssoides</i>	<i>Flabelligera affinis</i>	<i>Myxicola infundibulum</i>	<i>Raja clavata</i>
<i>Calliactis parasitica</i>	<i>Gibbula cineraria</i>	<i>Myxicola infundibulum</i>	<i>Sabella pavonina</i>
<i>Callionymus lyra</i>	<i>Gibbula magus</i>	<i>Nebalia herbstii</i>	<i>Saccharina latissima</i>
<i>Cancer pagurus</i>	<i>Glycera tridactyla</i>	<i>Necora puber</i>	<i>Scalibregma celticum</i>
<i>Caulleriella alata</i>	<i>Gobiusculus flavescens</i>	<i>Nematonereis unicornis</i>	<i>Sphaerosyllis taylori</i>
<i>Cereus pedunculatus</i>	<i>Griffithsia corallinoides</i>	<i>Nephtys kersivalensis</i>	<i>Spirobis</i> sp.
<i>Cerianthus lloydii</i>	<i>Halarachnion ligulata</i>	<i>Notomastus</i> sp.	<i>Stenogramme interrupta</i>
<i>Chaetozone gibber</i>	<i>Harmothoe antilopes</i>	<i>Ophiodromus flexuosus</i>	<i>Sthenelais boa</i>
<i>Chondria dasyphylla</i>	<i>Harmothoe spinifera</i>	<i>Ophiothrix fragilis</i>	<i>Styela clava</i>
<i>Ciona intestinalis</i>	<i>Harmothoinae</i> sp.	<i>Pagurus bernhardus</i>	<i>Suberites ficus</i>
<i>Codium</i> sp.	<i>Hydractinia echinata</i>	<i>Parapionosyllis minuta</i>	<i>Syllidia armata</i>
<i>Corella eumyota</i>	<i>Inachus</i> sp.	<i>Pecten maximus</i>	<i>Syngnathus acus</i>
<i>Crepidula fornicata</i>	<i>Leucosolenia</i> sp.	<i>Perophora japonica</i>	<i>Terebellides stroemi</i>
			<i>Ulva lactuca</i>

## Appendix B – Fal maerl species list

List of species recorded on several Seasearch dives by a number of recorders. Includes species from rock substrate within the vicinity of the maerl bed.

Adamsia carciniopados	Diaphorodoris luteocincta var reticulata	Hemimycale collumella	Pagurus prideaux
Aglaophenia sp.	Dictyota cf spiralis	Heterosiphonia japonica	Pecten maximus
Alcyonium digitatum	Dictyota dichotoma	Homarus gammarus	Pholoe sp.
Anemonia viridis	Doris sticta	Hymeniacion kitchingi	Phymatolithon calcareum
Anomia sp.	Doto fragilis	Hypoglossum hypoglossoides	Pink encrusting algae
Aonides oxycephala	Doto pinnatifida	Inachus dorsettensis	Polycirrus aurantiacus
Asciidiella aspersa	Doto tuberculata	Janolus cristatus	Pomatoceros sp.
Asterias rubens	Dysidea fragilis	Labrus mixtus	Pomatoschistus pictus
Bonnemaisionia asparagoides	Edwardsia claparedii	Liocarcinus depurator	Pomatoschistus spp
Brania limbata	Epizoanthus couchii	Lomanotus genei	Praxiella affinis
Broggiartella byssoides	Erythroglossum laciniatum	Macropodia sp.	Prionospio fallax
Bugula sp.	Euclymene	Mediomastus fragilis	Prosthecereus vittatus
Calliactis parasitica	droebachensis	Megalomma vesiculosum	Pseudopolydora pulchra
Calliblepharis ciliata	Euclymene oerstedii	Megatrema anglicum	Raspalia ramosa
	Eupolymnia nebulosa	Monticellina	Rhodophycota indet
Callionymus reticulatus	Exogone hebes	dorsobranchialis	Rhodophyllis divaricata
Caryophyllia smithii	Exogone naidina	Myxicola infundibulum	Sabella pavonina
Caulleriella alata	Exogone verugera	Myxicola sarsii	Sagartia troglodytes
Cellaria sp.	Flabellina lineata	Necora puber	Scalibregma celticum
Cereus pedunculatus	Gibbula cineraria	Nematonereis unicornis	Scyliorhinus canicula
Cerianthus lloydii	Gobius gasteveni	Nemertesia antennina	Sphaerosyllis taylori
Corymorpha nutans	Gobiusculus flavescens	Neopentadactyla mixta	Spinachia spinachia
Crepidula fornicata	Halarachnion ligulatum	Nephtys kersivalensis	Suberites ficus
Crisia sp.	Halecium halecinum	Notomastus sp.	Syllidia armata
Ctenolabrus rupestris	Harmothoe antilopes	Ophiodromus flexuosus	Tharyx killariensis
Diaphorodoris luteocincta var alba	Harmothoe spinifera	Pagurus bernhardus	Ulva sp.
			Zeugopterus sp.

## Appendix C – St Austell Bay maerl species list

List of species recorded on several Seasearch dives by a number of recorders. Includes species from rock substrate within the vicinity of the maerl bed.

<i>Aequipecten opercularis</i>	<i>Capnea sanguinea</i>	<i>Lanice conchilega</i>	<i>Polymastia penicillus</i>
<i>Alcyonium digitatum</i>	<i>Cereus pedunculatus</i>	<i>Lissoclinum perforatum</i>	<i>Pomatoceros</i> sp.
		? <i>Lithothamnion</i>	
<i>Anemonia viridis</i>	<i>Ciona intestinalis</i>	<i>corallioides</i>	<i>Raspailia ramosa</i>
	Dark red encrusting		
<i>Antedon bifida</i>	algae	<i>Marthasterias glacialis</i>	<i>Sabella pavonina</i>
<i>Anthopleura ballii</i>	<i>Delesseria sanguinea</i>	<i>Necora puber</i>	<i>Sagartia elegans</i>
<i>Aplidium pallidum</i>	<i>Didemnidae</i> indet	<i>Nemertesia antennina</i>	<i>Scyliorhinus canicula</i>
<i>Aplysia</i> sp.	<i>Dilsea carnosa</i>	<i>Neopentadactyla mixta</i>	<i>Sepia officinalis</i>
<i>Archidoris pseudoargus</i>	<i>Esperiopsis fucorum</i>	<i>Obelia</i> sp.	<i>Sidnyum elegans</i>
<i>Ascidia mentula</i>	<i>Halichondria panicea</i>	<i>Ophiocoma nigra</i>	<i>Stelligera stuposa</i>
<i>Asterias rubens</i>	<i>Haliclona oculata</i>	<i>Ophiothrix fragilis</i>	<i>Tethya citrina</i>
<i>Astropecten irregularis</i>	<i>Haliclona viscosa</i>	<i>Pagurus bernhardus</i>	<i>Urticina felina</i>
<i>Botryllus schlosseri</i>	<i>Hemimycale columella</i>	<i>Pecten maximus</i>	
<i>Bugula flabellata</i>	<i>Henricia</i> sp.	<i>Pentapora foliacea</i>	
<i>Caliblepharis ciliata</i>	<i>Heterosiphonia plumosa</i>	Pink encrusting algae	
<i>Cancer pagurus</i>	<i>Holothuria forskali</i>	<i>Polyclinidae</i> indet.	

Appendix D – Helford biotope map produced by ERCCIS

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for Cornwall and the Isles of Scilly**

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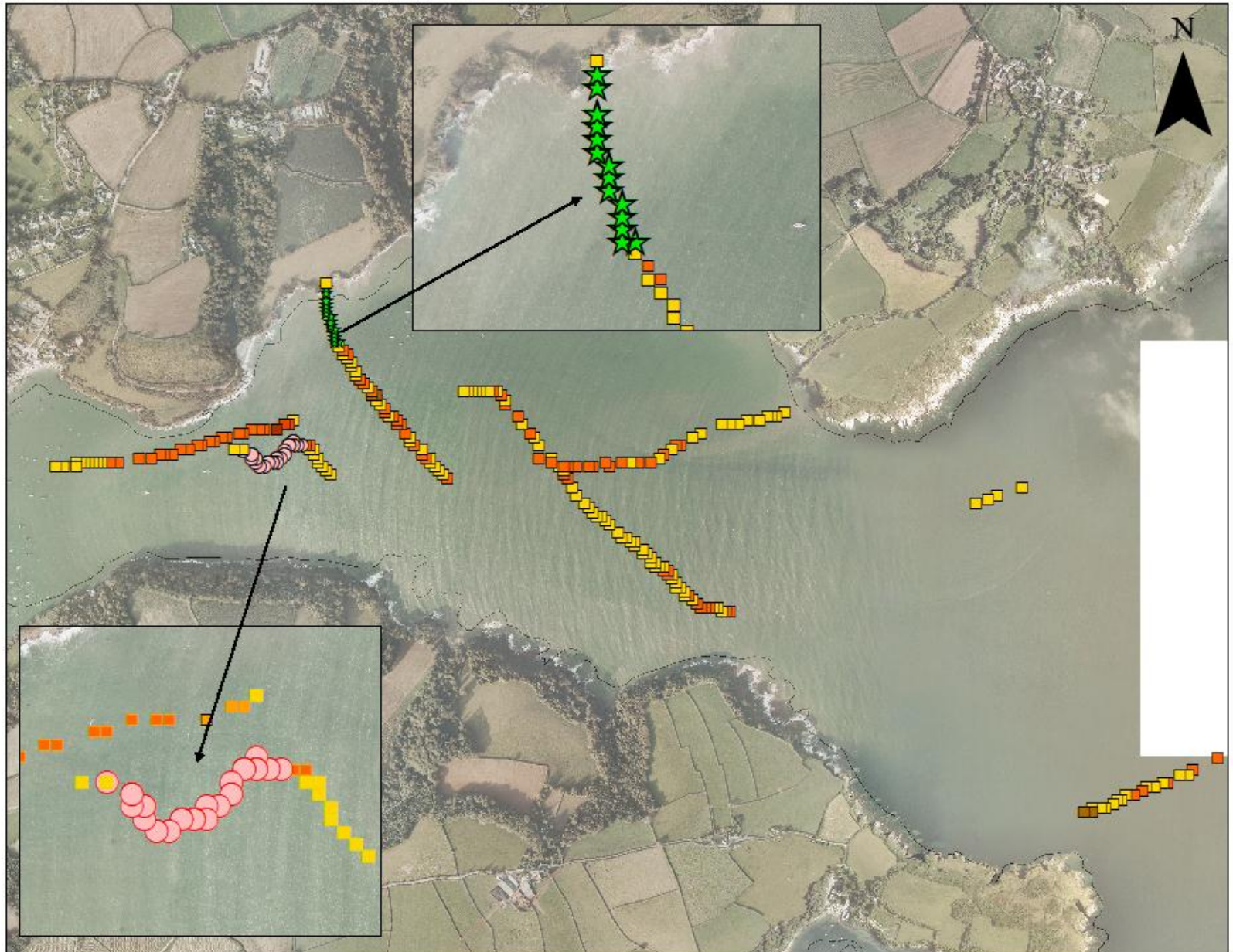


ERCCIS

**Biotope mapping of Helford using Remote Operated Vehicle (ROV).  
Undertaken by the Helford Marine Conservation Group in  
conjunction with Plymouth University.**



Cornwall



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