HELFORD
VOLUNTARY MARINE
CONSERVATION AREA

A Survey of the Hexacoralline Anthozoans

(Sea Anemones & Corals)

of the Helford Estuary

Dr P. A. Gainey

1997

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NATURE

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A Report to the
Helford Voluntary Marine Conservation Area Group
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SUMMARY

The Helford Voluntary Marine Conservation Area was designated in 1987 and since then a series of surveys have been carried out to examine the fauna and flora present.

In this study which looked at the hexacoralline anthozoans (sea anemones and corals) no less than twenty species were found to occur within the HVMCA, many in considerable numbers. Two were of particular interest being rated as Nationally Scarce, *Isozoanthus sulcatus* (Ginger tiny) and *Aiptasia mutabilis* (Trumpet anemone)

List of sea anemones & corals found in the Helford Estuary - Post 1985

1.	*Cerianthus lloydii*	
2.	*Epizoanthus couchii*	Sandy creeplet
3.	* *Isozoanthus sulcatus*	Ginger tiny
4.	*Actinia equina*	Beadlet anemone
5.	*Actinia fragacea*	Strawberry anemone
6.	*Anemonia viridis*	Snakelocks, Snakelocked anemone or Opelet
7.	*Urticina felina*	Dahlia anemone
8.	*Bunodactis verrucosa*	Gem anemone
9.	*Anthopleura ballii*	
10.	* *Aiptasia mutabilis*	Trumpet anemone
11.	*Metridium senile*	Plumose anemone
12.	*Sagartia elegans* var. *miniata* & var. *venusta*	
13.	*Sagartia troglodytes* var. *decorata*	
14.	*Cereus pedunculatus*	Daisy anemone
15.	*Sagartiogeton undatus*	
16.	*Adamsia carciniopados*	Cloak anemone
17.	*Peachia cylindrica*	
18.	*Halcampa chrysanthellum*	
19.	*Corynactis viridis*	Jewel anemone
20.	*Caryophyllia smithii* var. *smithii*	Devonshire cup-coral

* = Nationally scarce species

HELFORD VOLUNTARY MARINE CONSERVATION AREA

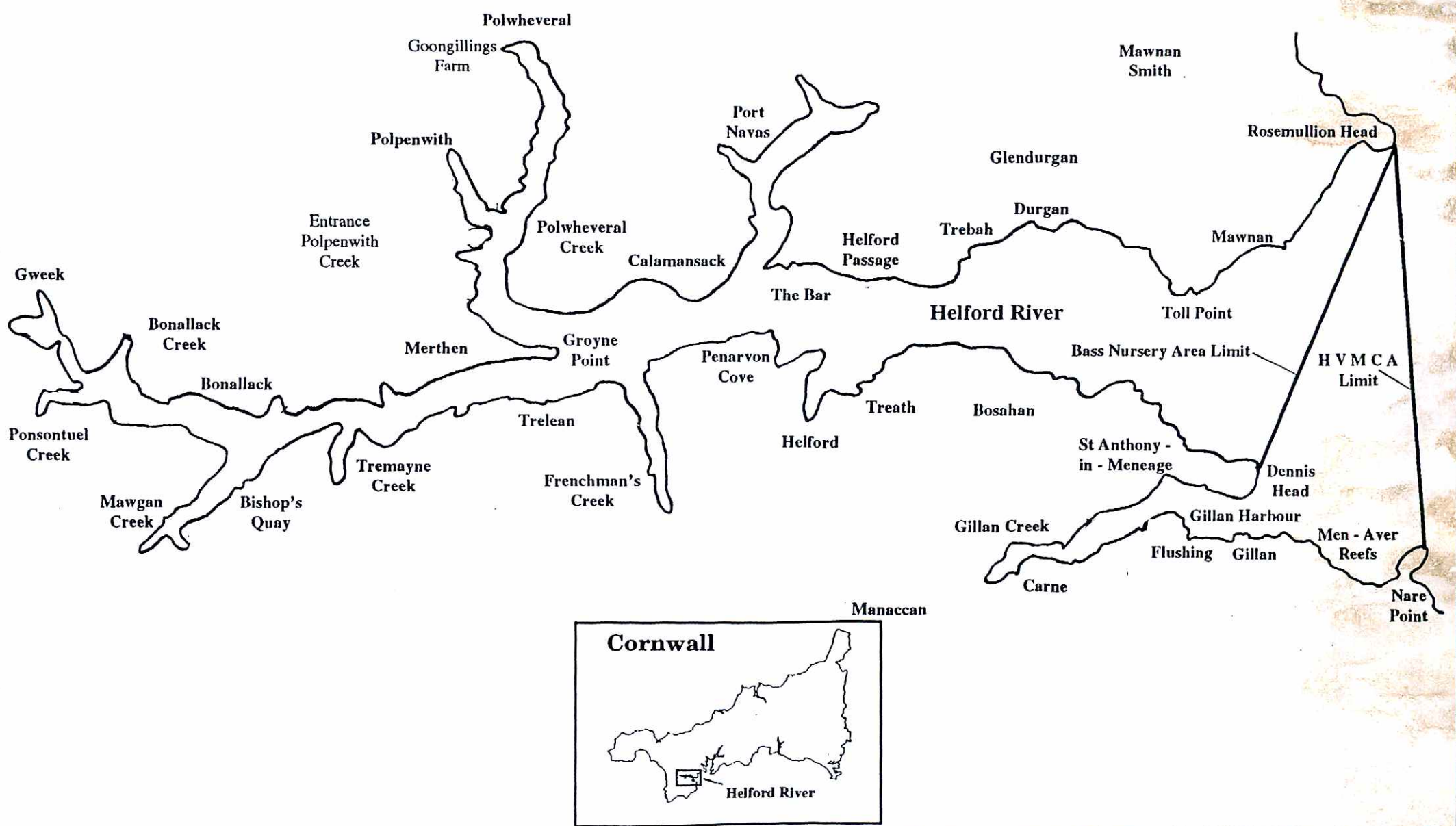


FIGURE 2
OUTLINE MAP OF THE
HELFORD ESTUARY SHOWING
THE LOCATON OF THE SURVEY SITES

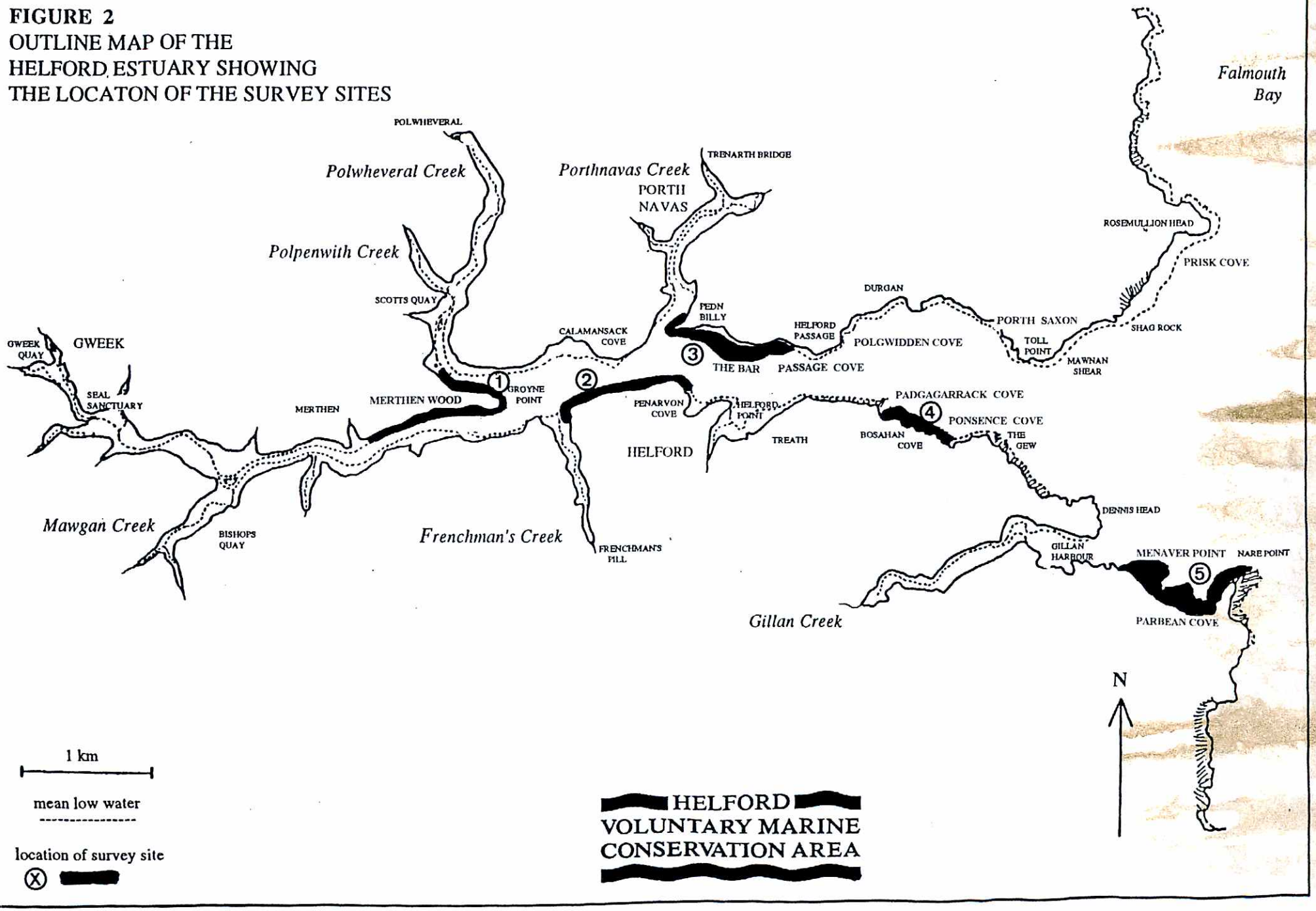
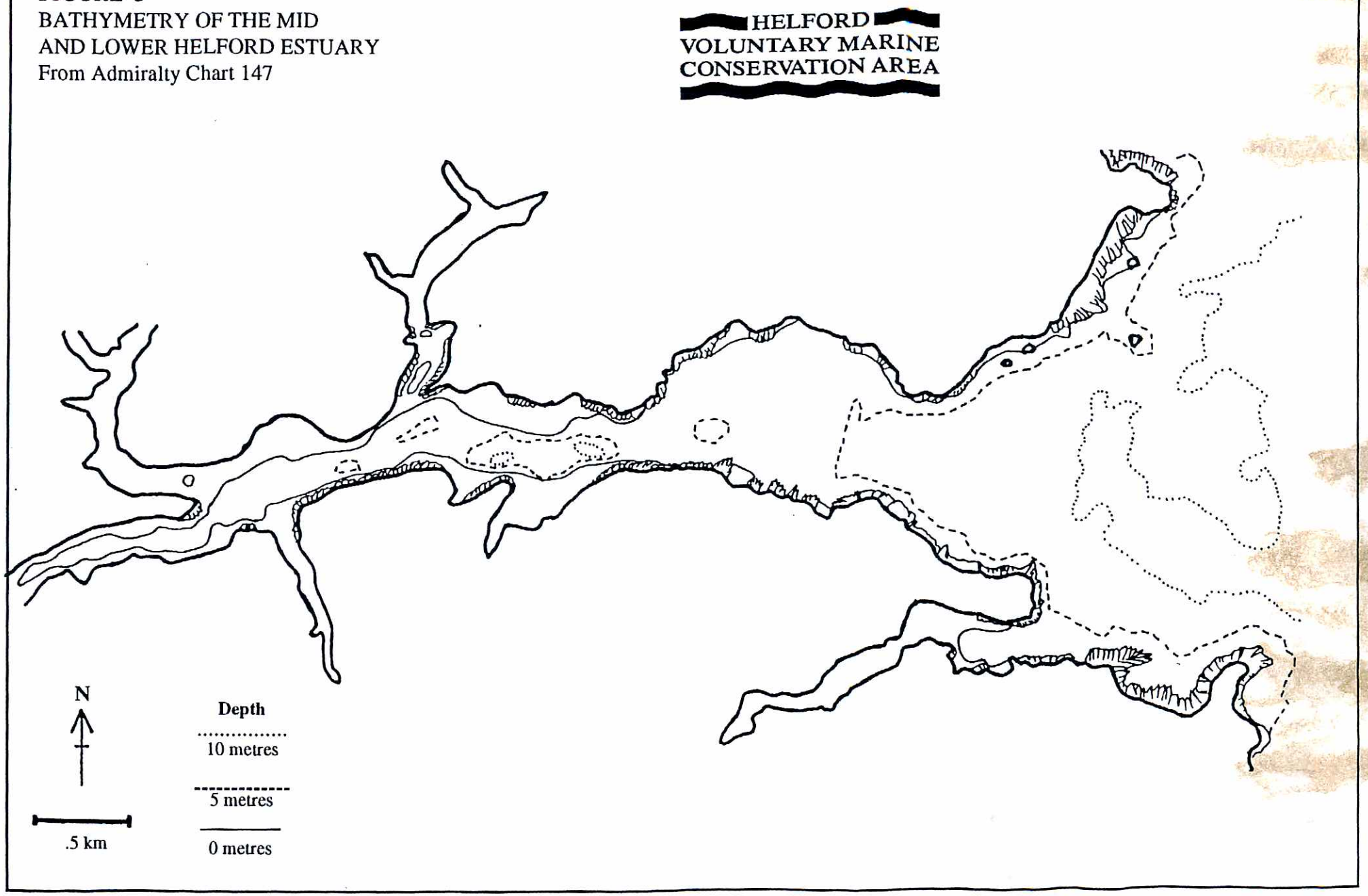


FIGURE 3
BATHYMETRY OF THE MID
AND LOWER HELFORD ESTUARY
From Admiralty Chart 147



1. Introduction

1.1. Background

The Helford estuary is a drowned valley system or ria on the northern edge of the Lizard Peninsula in south Cornwall. The mouth of the estuary lies at approximately 50^0.5.5'N and 5^0 5'W. The estuary extends some 10km. inland from this seaward entrance. Along its course there are a number of relatively short creeks which are steep sided and densely wooded (Figure 1).

The Helford estuary has long been recognised as having a high diversity of marine animal and plant life. Records of the fauna and flora go back many years to the 19th century. Such diversity may be attributed to the numerous marine habitats, the warm, shallow, sheltered and unpolluted water together with a minimal freshwater input.

Following intertidal surveys of the British coastline which were commissioned by the Nature Conservancy Council, the Helford estuary was rated as an Internationally Important Site of Marine Interest (Powell et al., 1978).

In 1996 the importance of the Helford and Fal complex was further highlighted when this area was selected for designation as a marine Special Area of Conservation under the European Habitats Directive.

1.2 Previous Marine Biological Studies

Records of the flora and fauna collected in the Helford estuary are mentioned in Cocks (1849) and also in Tregelles (1885, 1896). Between 1899 and 1901, Professor James Clark kept records of marine life, including the Helford estuary, which were published in *The Victoria History of the Counties of England: Cornwall* (1906). Clark also included further records in *The Zoologist* of 1907-1909.

More recently Holme & Turk (1986) compiled a list of biological records of the fauna from the Helford which was derived from pre - 1910 publications. During 1949, G.M. Spooner and N.A. Holme (Marine Biological Association, Plymouth) carried out intertidal and offshore surveys in the estuary (Spooner & Holme, 1986).

In 1986 Covey & Hocking (1987) carried out a survey of the Helford for the Helford River Steering Group. Also at that time the Oil Pollution Research Unit (O.P.R.U.) carried out a survey of the Helford as part of the Survey of Harbours, Rias and Estuaries in Southern Britain (Rostron, 1987). Although this latter was a fairly comprehensive report, the sea anemones and corals received only modest attention, furthermore, many important sites were missed. The present report gives a much more detailed and specific treatment of this group.

2. Survey details

2.1. Dates

2.1.1. Intertidal survey

The survey was conducted between August and November 1996 and consisted of several intertidal surveys which were carried out at times of extreme low water spring tides.

2.1.2. Diving and dredging survey

Scuba diving and dredging surveys were carried out during the period 1985 to 1990.

2.2. Sites

2.2.1. Intertidal survey sites 1996

Site 1 Scout hut in Polwheveral Creek - Groyne Point - Merthen Quay
(O.S. grid ref. SW 7366266 - 732261)

Site 2 Entrance of Frenchman's Pill - Penarvon Cove
(O.S. grid ref. SW 747263 - 756265)

Site 3 Pedn Billy - The Bar - Passage Cove
(O.S. grid ref. SW 756270 - 763268)

Site 4 Padgagarrack Cove - Bosahan Cove - Ponsence Cove
(O.S. grid ref. SW 773264 - 777262)

Site 5 Men-aver Point - Parbean Cove - Nare Point
(O.S. grid ref. SW 793254 - 800253)

(See Fig.2)

2.2.2. Scuba diving and dredging sites 1985-1990

Small scale investigations were carried out at many sites covering a range of habitats between Treath/Helford Passage Cove (SW 767264/764268) and Rosemullion Head/Nare Point (SW 797277/800253)

(See Fig.1)

3. Techniques used for intertidal survey 1996

3.1. Quadrats

A 1 metre square quadrat, divided into a 10 x 10 grid, was randomly sited, using random number tables, within the study area. The average abundance for species from ten such quadrats was recorded.

3.2. Abundance scales

The abundance scale used was that for small colonial and crustose species;

Abundant - large confluent colonies with more than 50% cover.

Common - many small or a few large patches with 10% - 50% cover.

Frequent - scattered patches, less than 10% coverage overall.

Occasional - scattered small patches less then 1% coverage overall.

Rare - widely scattered very small patches or individuals.

During the period 1985 - 1990 the author carried out a relatively extensive sublittoral survey of the seaward half of the estuary using diving and dredging techniques. The results of this survey are also included in this report.

4. Results of Intertidal survey

4.1. Site 1 (Polwheveral Creek-Groyne Point-Merthen Quay)

4.1.1. Substratum

The substratum varied from agglutinous, silty mud to shale and shingle interspersed with varying amounts of mud. The muddier areas, especially prominent further up Polwheveral Creek, towards the scout hut from Groyne Point and also eastwards towards Merthen Quay, contained few anemones.

4.1.2. Species

Cereus pedunculatus was frequently recorded. The area immediately at and on either side of Groyne Point was relatively rich in marine life, including anemones. High densities of anemones were recorded here from the mid-high to the mid-low tide levels. Up to 150 anemones per m^2 were found buried in the mud between the shale and shingle.

Cereus pedunculatus was abundant in places and *Sagartia troglodytes* was common. *Sagartiogeton undatus* was frequent to common. This habitat also contained *Hymeniacidon perleve* (sponge), *Styela clava*, *Clavelina lepadiformis* and *Ascidiella aspersa* (ascidians), *Crepidula fornicata*, *Tapes rhomboides*, *Ostrea* , *Cerastoderma edule* and *Mytilus edulis* (molluscs), *Fucus vesiculosus*, *Fucus ceranoides*, *Ascophyllum nodosum* and *Ulva lactuca* (algae), *Neoamphitrite figulus* and *Sabella pavonina* (annelids). Hermit crabs occupying periwinkle shells covered with the hydroid *Hydractinia echinata* were occasionally found. Towards low water the shale/mud habitat was progressively replaced by mud with a resulting loss of species diversity.

4.2 Site 2. (Frenchman's Pill entrance - Penarvon)

4.2.1. Substratum

The substratum in this area was very similar to that of the previous site. Agglutinous, silty mud on the lower shore with shale/shingle/mud from the mid to upper shore.

4.2.2. Species

Once again *Cereus pedunculatus* was common to abundant in places. *Sagartia troglodytes* was frequent whereas *Sagartiogeton undatus* was only occasionally found. Also present at two places attached to the larger stones on the lower shore was *Metridium senile*.

4.3 Site 3. (Pedn Bill - The Bar - Passage Cove)

4.3.1. Substratum

The substratum at Pedn Billy, just inside the mouth of Port Navas Creek, consisted of fine muddy silt interspersed with medium to large stones. There was a significant tidal flow at this point.

4.3.2. Species

This was a species rich area and included several species of sea-squirt, *Styela clava*, *Clavelina lepadiformis*, *Morchellium argus* and *Ascidiella aspersa*. *Sabella pavonina* was also prominent. *Cereus pedunculatus* was common, however, *Sagartia troglodytes* and *Sagartiogeton undatus* were only occasionally found. Sublittorally, just below low water mark, several fine colonies of *Metridium senile* could be seen attached to the larger stones.

The southern edge of The Bar (SW 757269 - 760267) consisted of a stable fine sand/mud substratum with some *Lanice conchilega* and *Chaetopterus variopedatus* (annelids). The anemones *Sagartiogeton undatus* and *Cereus pedunculatus* were occasionally found. Slightly to the north-east (SW 761268) was an area of coarse to fine sand mixed with some mud. *Cereus pedunculatus* was common to abundant and *Sagartiogeton undatus* frequent to common. Other species included *Sabella pavonina*, *Myxicola infundibulum*, *Lanice conchilega* and *Echinocardium cordatum*.

4.4. Site 4. (Padgagarrack Cove - Bosahan Cove - Ponsence Cove)

4.4.1. Substratum

This area consisted of a rocky shoreline interspersed with sandy coves. Of particular interest here were the overhangs and rock crevices exposed at low water.

4.4.2. Species

The bases of the overhangs between Padgagarrack and Bosahan Coves and also between Bosahan and Ponsence Coves had small colonies of *Corynactis viridis*. (Interestingly Pamela E Tompsett also found this anemone on the same day, in the same type of habitat on the opposite, north side of the Helford River at Durgan.)

Small numbers of *Metridium senile* were also found attached to the overhangs at low water. Generally distributed and reasonably common along this stretch of coast line were *Actinia equina*, *Actinia fragacea* and *Anemonia viridis*.

Far less common and situated in rock crevices or under stones in rock pools, were *Bunodactis verrucosa* and *Urticina felina*. *Sagartiogeton undatus* was also found in places, attached to rock overhangs at low water mark.

4.5. Site 5 (Men-aver-Point - Parbean Cove - Nare Point)

4.5.1. Substratum

A rocky shore line where, in places, the rocks were bisected by fine sandy inlets especially on the lower shore. This area contained a rich diversity of plant and animal life.

4.5.2. Species

Rock pools, rocks and rock crevices contained *Anemonia viridis*, *Bunodactis verrucosa*, *Actinia equina*, *Actinia fragacea* and *Urticina felina*. Small numbers of *Cereus pedunculatus* were observed buried in the sand/mud

Of particular interest here was the presence of small numbers of *Aiptasia mutabilis* in rock pools at extreme low water (SW 794254 & 799253). *Sagartia elegans* var. *miniata* was also found in one rock pool in this area.

5. Results of Scuba diving/Dredging 1985-90

5.1. Sites

During this period the author dived extensively and carried out numerous, small scale, dredging operations using an Agassiz trawl and bucket dredge in the estuary. The area covered was between Treath/Passage Cove (SW 767264/764268) and Rosemullion Head/Nare Point (SW 797277/800253). The following represents a summary of the hexacoralline anthozoans recorded on the wide variety of sublittoral habits present.

5.2. Species

The area offshore of Site 5. (Men-aver Point to Nare Point) had large numbers of the nationally scarce, south-western species *Aiptasia mutabilis*. Here it was found attached to the stipes of kelp and also to rock. This anemone was also present at Prisk Cove (SW 795275) where it is found sublittorally in a depth of 0-5 metres. It had also been seen sublittorally near the Gew (SW 782262), the Ponsence Cove area (SW 776263) and off Parson's Beach/Mawnan Shear (SW 787270).

Caryophyllia smithii var. *smithii* had also been recorded in very small numbers near Nare Point (c.f. Rostron 1987), Rosemullion Head (SW797277) and August Rock (SW795271).

Isozoanthus sulcatus (Ginger tiny) had been observed in small numbers on silty, horizontal rock ledges, in shallow water amongst the kelp between Bosahan and Ponsence Coves.

Corynactis viridis, which occurred only rarely at extreme low water mark, was relatively abundant offshore. Known sites included August Rock (SW 757271), several places between Mawnan Shear (SW 785267) and Rosemullion Head (SW 797277), Dennis Head (SW 789256) and Nare Point (SW 799253).

Cerianthus lloydii has been recorded, sometimes in large numbers, at various sites - in an area where there were patches of maerl (SW 766266), amongst *Zostera* (SW 768265 & 779269) and in muddy conditions around grid reference point SW 757266.

Anthopleura ballii, an uncommon southern and western species was recorded attached to a stone buried in sand at low water, Prisk Cove (SW 793274). Rostron (1987) had also recorded this species from August Rock nearby.

Epizoanthus couchii was fairly common in places. It occurred sublittorally in rock crevices and on overhangs off Men-aver Point (SW 793254), Dennis Head (SW 789257) and Ponsence Cove (SW 777263).

Sagartia elegans var. *miniata* was found in a rock pool at low water mark at Men-aver Point. *Sagartia elegans* var.*venusta*, the most easily recognisable variety with its orange disc and white tentacles, was not common in the estuary. It had, however, been recorded from vertical and overhanging bedrock at Polgwiddden Cove (SW 769270), Bosahan Cove (SW 775263), Dennis Head (SW 789257) and Prisk Cove (SW 797277).

Dredge samples had provided evidence for the presence of *Halcampa chysanthellum* (2 specimens) in mud/sand substratum offshore off Parbean Cove (grid ref. approximately SW 778269) and Porth Saxon (grid ref. approximately SW 778269) Other burrowing species present included *Peachia cylindrica*, several specimens, in mud/sand with some stone (grid ref. approximately SW 786264) and in sand, near The Crook (SW 791255).

Finally *Adamsia carciniopados* was trawled up on several occasions. In all about 10 specimens were collected. In each case the anemone was attached to shells occupied by the hermit crab *Eupagurus prideauxi* (c.f. Spooner & Holme 1986). All of the specimens were collected near to the mouth of the estuary (from between SW 795256 - 792265) on muddy sand with some stone.

6. Discussion

Of the 63 species of hexacoralline anthozoa described by Manuel (1981) 20 have been recorded, in recent times, in the Helford Estuary. Of these, two, *Aiptasia mutabilis* (Trumpet anemone) and *Isozoanthus sulcatus* (Ginger tiny) are considered by Sanderson (1996) to be nationally scarce. The former species was found to be quite frequent in the estuary especially towards the estuary mouth. *Aiptasia mutabilis* is a local and uncommon species in Britain where it is only recorded from Cornwall, Devon, Dorset and the Bristol Channel. *Isozoanthus sulcatus* has been identified, but its abundance is impossible to assess, on account of its small size and cryptic nature. *Isozoanthus sulcatus* also has a restricted British distribution, being recorded from the South Devon, South Wales and the South Cornish coastlines.

Anthopleura ballii and *Epizoanthus couchii* are both relatively scarce, southern and western species. *Actinia fragacea* is also a rather local species which seems to be confined to the English Channel and south-west Britain.

The three anemones, *Cereus pedunculatus*, *Sagartia troglodytes* and *Sagartiogeton undatus*, occur in large numbers in the estuary. All three of these are known to be typical estuarine species. There were particularly large populations of these anemones on the shale/shingle/mud habitat found around Groyne Point and also between Frenchman's Pill and Penarvon Cove. These were the dominant anemone species in the uppermost, more muddy, parts of the estuary.

Above Groyne Point, towards Gweek, the abundance of anemones decreased markedly due, presumably, to the very muddy nature of the substratum. Only scattered specimens of *Cereus pedunculatus* could be found between Groyne Point and Merthen Quay.

In addition to the sea anemones and corals reported and discussed above it should be mentioned that two other anthozoan species have been recorded from the Helford estuary. They are *Diadumene cincta* and *Calliactis parasitica* (Parasitic anemone). The former species was once recorded from The Bar (Site 3.), however, it has not now been seen for some years. Cocks (1849) records *Calliactis parasitica* as 'not uncommon' in the Helford River. Once again there have been no records of this species since that time.

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APPENDIX I - SPECIES LISTS

List of sea anemones & corals found in the Helford Estuary - Post 1985

1. *Cerianthus lloydii*
2. *Epizoanthus couchii*.....Sandy creeplet
3. **Isozoanthus sulcatus*.....Ginger tiny
4. *Actinia equina*.....Beadlet anemone
5. *Actinia fragacea*.....Strawberry anemone
6. *Anemonia viridis*.....Snakelocks, Snakelocked anemone or Opelet
7. *Urticina felina*.....Dahlia anemone
8. *Bunodactis verrucosa*.....Gem anemone
9. *Anthopleura ballii*
10. **Aiptasia mutabilis*.....Trumpet anemone
11. *Metridium senile*.....Plumose anemone
12. *Sagartia elegans* var. *miniata* & var. *venusta*
13. *Sagartia troglodytes* var. *decorata*
14. *Cereus pedunculatus*.....Daisy anemone
15. *Sagartiogeton undatus*
16. *Adamsia carciniopados*.....Cloak anemone
17. *Peachia cylindrica*
18. *Halcampa chrysanthellum*
19. *Corynactis viridis*.....Jewel anemone
20. *Caryophyllia smithii* var. *smithii*.....Devonshire cup-coral

* = Nationally scarce species

Other species of flora and fauna mentioned in the text

Algae

Ascophyllum nodosum..... Knotted or Egg Wrack
Fucus ceranoides..... Horned Wrack
Fucus vesiculosus..... Bladder Wrack
Ulva lactuca..... Sea Lettuce

Sponge

Hymeniacidon perleve

Annelids

Neoamphitrite figulus
Sabella pavonina..... Peacock worm

Molluscs

Cerastoderma edule..... Common cockle
Crepidula fornicata..... Slipper Limpet
Mytilus edulis..... Common mussel
Ostrea edulis..... Flat Oyster
Tapes rhomboides..... Banded Carpet Shell

Ascidians or Sea squirts

Ascidiella aspersa
Clavelina lepadiformis
Styela clava

Hermit crabs occupying periwinkle shells covered with the hydroid *Hydractinia echinata* were occasionally found.

APPENDIX II - PHOTOGRAPHS

No.1 - The Bar on the north side of the Helford. Looking west towards Calamansac Point and Woods. Fine sand/mud with many *Lanice conchilega* projecting from surface.

No.2 - *Cereus pedunculatus* (Daisy anemone) on left, with two specimens of *Sagartiogeton undatus* on the right. All three specimens attached to stone and collected from low water mark on The Bar.

No.3. - Looking west towards Merthen Quay from Groyne Point. Showing shale/shingle/mud habitat at mid-tide level and more silty mud towards low tide mark.

No.4. - *Cereus pedunculatus* (Daisy anemone), attached to stone, collected from Groyne Point.

No.5. - Looking north-west from Groyne Point towards the scout hut in Polwheveral Creek showing rich shale/shingle/mud habitat about mid-tide level.

No. 6. - *Sagartia troglodytes*, attached to stone, collected from Groyne Point.

No.7. - *Sagartiogeton undatus* in contracted state, attached to stone, collected from Groyne Point.

No.8. - *Peachia cylindrica*, partly contracted, in muddy sand substratum.