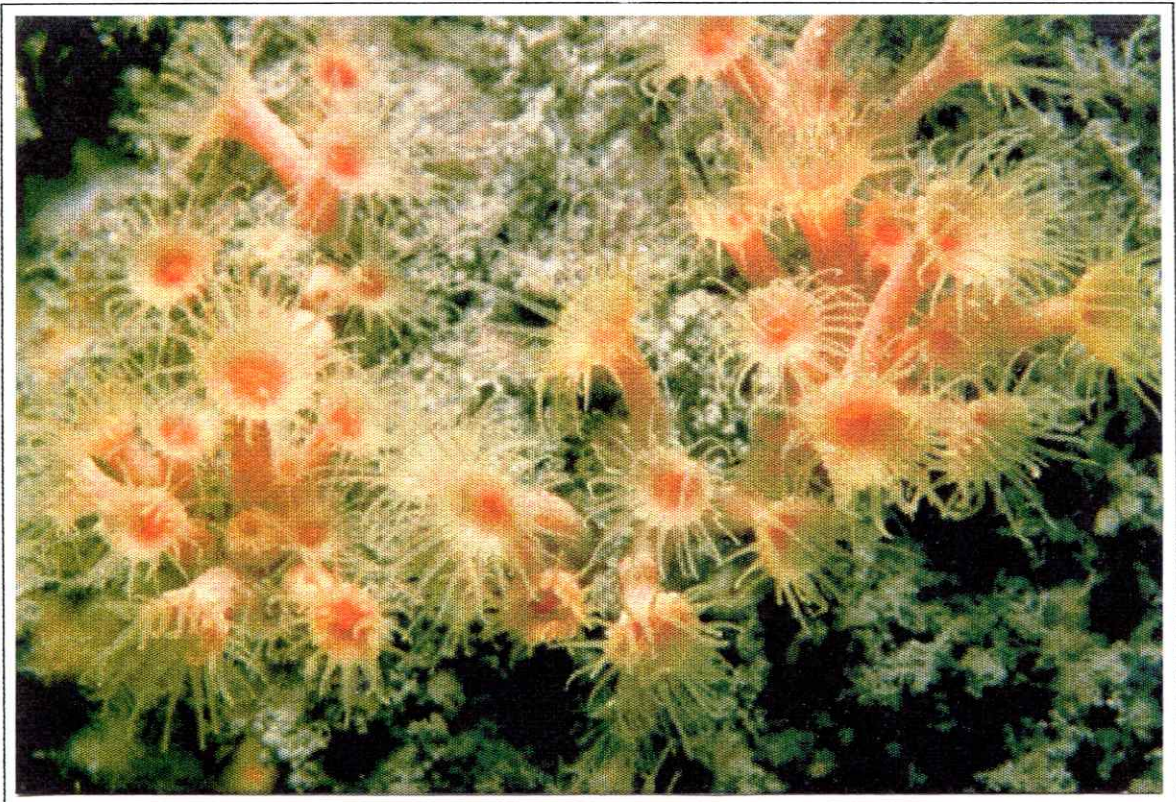


REPORT
OF THE
MARINE CONSERVATION SOCIETY
WORKING PARTY
TO THE
LUNDY MARINE NATURE RESERVE

3-10 JUNE 1995



Parazoanthus axinellae

Photograph: K. Northen

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SYNOPSIS

During a week long visit to Lundy from 3 - 10 June 1995, a party of 15 volunteer divers, all members of the Marine Conservation Society, undertook a number of sublittoral nature conservation orientated projects within the Marine Nature Reserve (MNR). The projects were decided upon in consultation with English Nature, the country agency responsible for the management of the MNR, and the warden, Emma Parkes.

The 15 divers were of mixed diving experience (though all were of sports diver grade or above) and of mixed marine biological expertise. The trip was organised as part working party and part holiday. Volunteers got the opportunity to learn certain survey techniques whilst making a positive contribution towards the effective management of the MNR. Sites visited were mostly off the island's east coast, though on one day diving took place off the south coast. Diving operations were carried out from one 4.5 m R.I.B., one 4.5 m Zodiac inflatable and two 4.0 m inflatable boats, all of which were loaned to the expedition. During the week, winds were light to moderate (force 2-5) from the north-west to north.

Projects undertaken by the group included recording the distribution of sea fans *Eunicella verrucosa*, searches for red band fish *Cepola rubescens*, photographic monitoring of the MV 'Robert', 3-D mapping of Gannets' Rock pinnacle and *SEASEARCH* surveys. Marine biological surveys of the island's two protected wrecks (the Gull Rock wreck site and the 'Iona II' wreck) were undertaken after permission was granted by the Department of National Heritage for all members of the expedition to dive on these wrecks. In addition, a littoral project involved the mapping of the brown alga *Bifurcaria bifurcata* in a rock pool to the south of South Light. The expedition was also used as an opportunity to position two temperature data loggers at subtidal sites, one on the wreck of the MV 'Robert' and one on a mooring chain in the Landing Bay.



The resident of the exhaust pipe in the chimney stack, wreck of the MV 'Robert'.
Photograph by K. Northen

CONTENTS

1. INTRODUCTION	5
2. PREPARATION	6
2.1 LOGISTICS	6
2.2 PERSONNEL	7
2.3 PROJECTS	8
2.4 FUNDING	8
3. RESULTS	9
3.1 Marine biological survey of the 'Gull Rock' protected wreck site	9
3.2 Marine biological survey of the 'Iona II' protected wreck site	17
3.3 Distribution of sea fans <i>Eunicella verrucosa</i> off the east coast & counts of the nudibranch <i>Tritonia nilsodhneri</i> on sea fans	20
3.4 Searches for the red band fish <i>Cepola rubescens</i>	25
3.5 Photographic monitoring of the wreck of the M.V. 'Robert'	28
3.6 SEASEARCH surveys	32
3.7 Monitoring the cover of the alga <i>Bifurcaria bifurcata</i> in a rockpool	36
3.8 3-D mapping of the seabed in the area of Gannet's Rock	37
4. GENERAL CONCLUSIONS	40
5. RECORD OF DAILY ACTIVITIES	41
6. BUDGET	44
7. ACKNOWLEDGEMENTS	45
8. REFERENCES	45
APPENDIX 1	47
APPENDIX 2	48
APPENDIX 3	49
APPENDIX 4	50

1. INTRODUCTION

The waters around the island of Lundy in the Bristol Channel still remain England's only statutory Marine Nature Reserve (MNR), even though the legislation to establish such reserves has been in existence for thirteen years. The Reserve was declared by the Nature Conservancy Council (NCC) in November 1986, though there had been a voluntary marine nature reserve around the island since 1973, it being also the first such voluntary reserve in the country. The MNR has been managed since 1991 (post-NCC) by English Nature, in co-operation with the Devon Sea Fisheries Committee (responsible for making byelaws relating to fishing and to fisheries) and the Landmark Trust (who lease the island from the National Trust).

A large number of both littoral and sublittoral marine biological studies have been undertaken within the MNR over the years. Photographic monitoring transects of sublittoral habitats and species present off the island's east coast were established in 1984 and these were revisited at annual intervals until 1988, followed by one further visit in 1990 (see Fowler & Pilley 1992 for a summary of these studies). The monitoring sites had not been purposefully revisited (i.e. with a dedicated team of divers) since 1990, though a re-assessment was made of the sites six weeks after our visit (see Munro 1995).

The objectives of this MCS working party were to undertake a number of tasks that could be carried out by volunteer divers, as a contribution towards the management of the MNR. These tasks did not tie-in directly to the previous monitoring studies, although they were related, and are set out below.

1. *Marine biological survey of the Gull Rock protected wreck site.* A comprehensive survey of the marine communities present at this site to be undertaken, together with information on habitats (especially the partially buried limestone cannonballs) and species of note.
2. *Marine biological survey of the 'Iona II' protected wreck site.* A comprehensive survey of the marine communities present on the remains of this iron and wooden paddlesteamer to be undertaken.
3. *Distribution of sea fans Eunicella verrucosa off the east coast and counts of the nudibranch Tritonia nilsodhneri on sea fans.* The presence of sea fans to be noted at a number of sites along the east coast and their density measured. Numbers of the nudibranch *T. nilsodhneri* present on the sea fans to be counted.
4. *Searches for the red band fish Cepola rubescens.* A number of swim searches to be made looking for both individual fish and their burrows in areas where they have been seen before, i.e. in Gannets' Bay and the area between Gull Rock and the Quarries.
5. *Photographic monitoring of the wreck of the MV 'Robert'.* To repeat viewpoint photographs of parts of this wreck in order to provide a comparison with similar photographs taken in 1990.
6. *SEARESEARCH surveys.* A number of general surveys to be undertaken by dive pairs in selected areas in order to assist with filling in gaps in the mapping of the MNR's sublittoral habitats.
7. *Monitoring of the cover of the alga Bifurcaria bifurcata in a rock pool.* A repeat of a survey first undertaken in 1984 to be carried out in a shallow upper shore rock pool near Mermaid's Pool, to the south of the South Light.
8. *3-D mapping of the seabed in the area of Gannet's Rock.* To attempt to interpret the seabed in the area of Gannet's Rock, using sketches made during dives and echo soundings from the surface along transects.

Additionally, two temperature data loggers were positioned on the wreck of the MV 'Robert' and on a mooring chain in the Landing Bay.

The week was advertised as being a 'working holiday', so as well as dives involving certain conservation tasks, there were to be a number of 'fun' dives, where individuals could take

photographs or simply enjoy the scenery (there's usually precious little time to do this on 'work' dives!). Participants were all members of the Marine Conservation Society and each made a contribution towards the cost of the expedition. Costs were kept low by generous grants from English Nature and the Lundy Field Society (see section 2.4).

2. PREPARATION

2.1 Logistics

With accommodation for large groups on Lundy being at a premium, it was important to make a reservation for 'The Quarters' well in advance. In addition, the Landmark Trust expected full payment for the rent of the property three months in advance. Consequently, expedition members were asked to make their contributions in good time. A place in the party was secured by paying a deposit of £55 by the end of February 1995, the remainder of an individual's contribution (£80) being due on 15th May 1995.



Loading up the boats prior to the day's diving. Photograph by K. Northen

Following discussions with members of English Nature's Maritime team, based in Peterborough, a number of tasks were agreed upon which the expedition could undertake (see section 2.3). The group was also asked to position two temperature data loggers on behalf of English Nature. The sites chosen for these were (i) on the wreck of the MV 'Robert', at a depth of approximately 23 m below chart datum; and (ii) at the base of a mooring chain in the Landing Bay, at a depth of approximately 2 m below chart datum (bcd).

It was hoped that the MNR warden would have received delivery of a new R.I.B. by the time of our visit to the island, but this was not to be. This left us with the task of tracking down a sufficient number of boats to cope with a group of 14 divers. The Marine Nature Conservation

Review team, of the Joint Nature Conservation Committee in Peterborough kindly agreed to lend us their 4.5 m Zodiac inflatable plus trailer (on the condition that it would be adequately insured); and SE MCS agreed to lend us their small 3.5 m inflatable. Philip Robertson was planning to take over two boats (a 4.5 m R.I.B and a 3.5 m inflatable) to the island the week after our stay and, upon hearing of our plight, kindly agreed to take them over a week earlier and allow us use of them.

Permission was sought (and later granted) from the Department of National Heritage for each member of the group to dive on the two protected wreck sites of the 'Gull Rock' site and the 'Iona II' off the island's east coast. An application was made via the licensee, John Heath, to undertake biological surveys of both of these sites.

The Quarters accommodation is self-catering and we were obliged to order all of our food through the island's shop. The shop manager requires food orders to be made two weeks in advance which allows the necessary provisions to be sent over to the island in time. Leona Shepherd kindly organised a full daily menu for the group and ordered goods and foodstuffs as appropriate.

2.2 Personnel

The following individuals made up the expedition party. Names were taken on a first come - first served basis, assuming the minimum dive qualification of Sports Diver was met.

3-10 June	NAME		ADDRESS	DIVING QUALIFICATIONS	BOAT HANDLING
1	Carol Aldridge	CA	Maidenhead, Berkshire	BSAC Sports Diver	
2	Paul Biggin	PB	Kingswood, Hertfordshire	BSAC Dive Leader	
3	Cath Downie	CD	Peterborough, Cambridgeshire	PADI Rescue	
4	Tony Hunt	TH	West Hoathly, West Sussex	SAA Dive Supervisor	
5	Robert Irving	RI	Coldwaltham, West Sussex	BSAC Advanced	✓
6	Chris McTernan	CM	Wimbledon, London SW19	BSAC Sports Diver	
7	Kevin Morgan	KM	Worcester Park, Surrey	BSAC Dive Leader	
8	David Moss	DM	Heywood, Lancashire	BSAC Advanced	✓
9	David Newton	DN	Abingdon, Oxfordshire	BSAC Dive Leader	
10	Kate Northen	KN	Peterborough, Cambridgeshire	BSAC Advanced	✓
11	Clive Pearce	CP	Hatch End, Middlesex	BSAC Dive Leader	
12	Leona Shepherd	LS	Wimbledon, London SW19	BSAC Dive Leader	
13	Val Shepherd	VS	Balham, London SW11	BSAC Advanced	✓
3-7 June					
14	Rohan Holt	RH	Llanddoged, Gwynedd	BSAC 1st Class	✓
7-10 June					
15	Mary Hamilton	MH	Irthlingborough, Northamptonshire	BSAC Dive Leader	
3-10 June					
	Philip Robertson*	PS	Marine archaeologist	Assisted with boat-handling	
	John Heath*	JH	Appledore SAC	Assisted with the re-location of the Gull Rock site	
	Emma Parkes*	EP	Lundy Warden		

* Accompanying divers

Table A. List of individuals who took part in MCS expedition to Lundy 1995.

2.3 Projects

Table B sets out the range of projects which were agreed with English Nature and Emma Parkes (the MNR warden) prior to our departure. Various other domestic responsibilities are also included, indicating the 'division of labour' amongst the group. Only one of the projects (No. 8) was not attempted as there were no pots set around the island during our visit.

In addition to personal dive gear, the following equipment was used:-

- 2x 50 m underwater measuring tapes (lent by Philip Robertson)
- 2x 25 m of buoy lines + buoys
- 3x shot line weights made from concrete
- Hand-held GPS position-fixing unit (lent by the Sussex SEASEARCH project)
- 3 hand-held VHF radios

No	Project/Responsibility	i/c
1	Mapping the extent of sea fans <i>Eunicella verrucosa</i> off the east coast.	David N (Cath)
2	Counts of the nudibranch <i>Tritonia nilsodhneri</i> on sea fans. Assessing size & condition of sea fans.	Paul (Clive)
3	Searches for the red band fish <i>Cepola rubescens</i> and/or their burrows in Gannets Bay and Halfway Wall Bay.	Tony (Carol)
4	Completion of the MNR's seabed habitat map: gaps in deeper water near the reserve boundary.	Chris (Kevin)
5	3-D representation of the Gannet's Rock pinnacle for interpretative purposes.	Robert
6	Viewpoint photography on the wreck of the MV 'Robert' off the east coast.	Val (Chris)
7	% cover of <i>Bifurcaria bifurcata</i> in rockpool close to Mermaid's Pool (South Light), first (& only previously) undertaken in 1984.	Mary
8	Assessing damage to fragile organisms from potting activity (mostly off S, W & N coasts).	Kate
9	Biological survey of the Gull Rock protected wreck site.	Rohan
10	Biological survey of the 'Iona II' protected wreck site.	David M
11	Food supervision: organising menu, ordering food, organising cook roster.	Leona
12	Diving supervision: completion of daily dive logs.	Rohan/Kate
13	Day-to-day diary of events.	Clive
14	Re-fuelling boats; boat-watch roster .	Kevin (Paul)
15	Organising compressor roster.	Carol
	Cooking & compressing.	All
16	Report editing.	Robert /Kate

Table B. Projects and responsibilities for the expedition.

2.4 Funding

Personal contributions provided the bulk of funding for the expedition (see section 6). In addition, grant applications were made to English Nature (awarding £500) and the Lundy Field Society (awarding £200). These awards were made on the condition that appropriate reports of the expedition were provided to each organisation.

3. RESULTS

3.1 Marine biological survey of the "Gull Rock" protected wreck site

Co-ordinator: Rohan H F Holt

Introduction

The wreck site lies a few hundred metres offshore east of Gull Rock half way along the east side of Lundy Island. It was first discovered by John Shaw in 1968, lost for a few years, then rediscovered again, after much searching, in 1983. The few scattered artefacts found at the wreck site are, to most, easily overlooked as they are heavily encrusted in marine growth and mostly embedded in the muddy shell gravel at the base of a rocky slope. The artefacts include the remains of iron cannon and breach and cannon balls carved from solid limestone. The name and age of the vessel, if indeed a ship actually sank at this site, are unknown, but the period in history when such weaponry was used suggests that they might have originated in the 15th to 16th Century. The site is of obvious historic interest and for this reason was designated a protected wreck site by the Department of Transport on 14 March 1990. This now means that the site and the wildlife on the seabed remain largely undisturbed by fishing and lobster potting activities and divers may only visit the area with permission from the Department of National Heritage.

Survey method

The wreck site was visited on three occasions (5, 6 and 9 June 1995) by a total of 4 people during the 1995 Marine Conservation Society expedition to Lundy, with the aim of carrying out a survey of the conspicuous marine flora and fauna on and around the protected wreck site. SCUBA diving methods, developed for the Nature Conservancy Council's (now the Joint Nature Conservation Committee) Marine Nature Conservation Review programme (Hiscock 1990), were used to record conspicuous animals and plants on the seabed using semi-quantitative scales of abundance (Superabundant; Abundant; Common; Frequent; Occasional; Rare) from each habitat encountered during the dive. Plants and animals not recognised underwater were collected for identification and later returned back to the site.

Results and descriptions of biotopes

Three distinct habitats and associated communities (= biotopes) were surveyed in the vicinity of the wreck site. See Figure 1 for sketch of the layout of the site.

Biotope 1. Circalittoral bedrock and artificial substrata (iron cannon) with a sponge, hydroid and bryozoan turf at 13 - 26 m bcd (below chart datum).

This included the slightly silty bedrock slope leading down to the wreck site and the various iron cannon and breach. Most of the rocky surfaces were covered by a dense turf of erect bryozoans including *Cellaria fistulosa*, *Bugula plumosa*, *Bugula flabellata* and *Crisia eburnea* and hydroids including *Nemertesia antennina*, *Halecium halecinum*, *Aglaophenia pluma* and *Aglaophenia tubulifera* with a rich variety of other species amongst it. There was a wide variety of sponges including the larger, more easily recognisable species such as *Stelligera stuposa*, *Stelligera rigida*, *Raspailia ramosa*, *Raspailia hispida*, *Axinella infundibuliformis*, *Axinella polypoides*, *Axinella damicornis* and many encrusting species, some not identified. Other fauna amongst the turf included dead man's fingers *Alcyonium digitatum*, red sea fingers

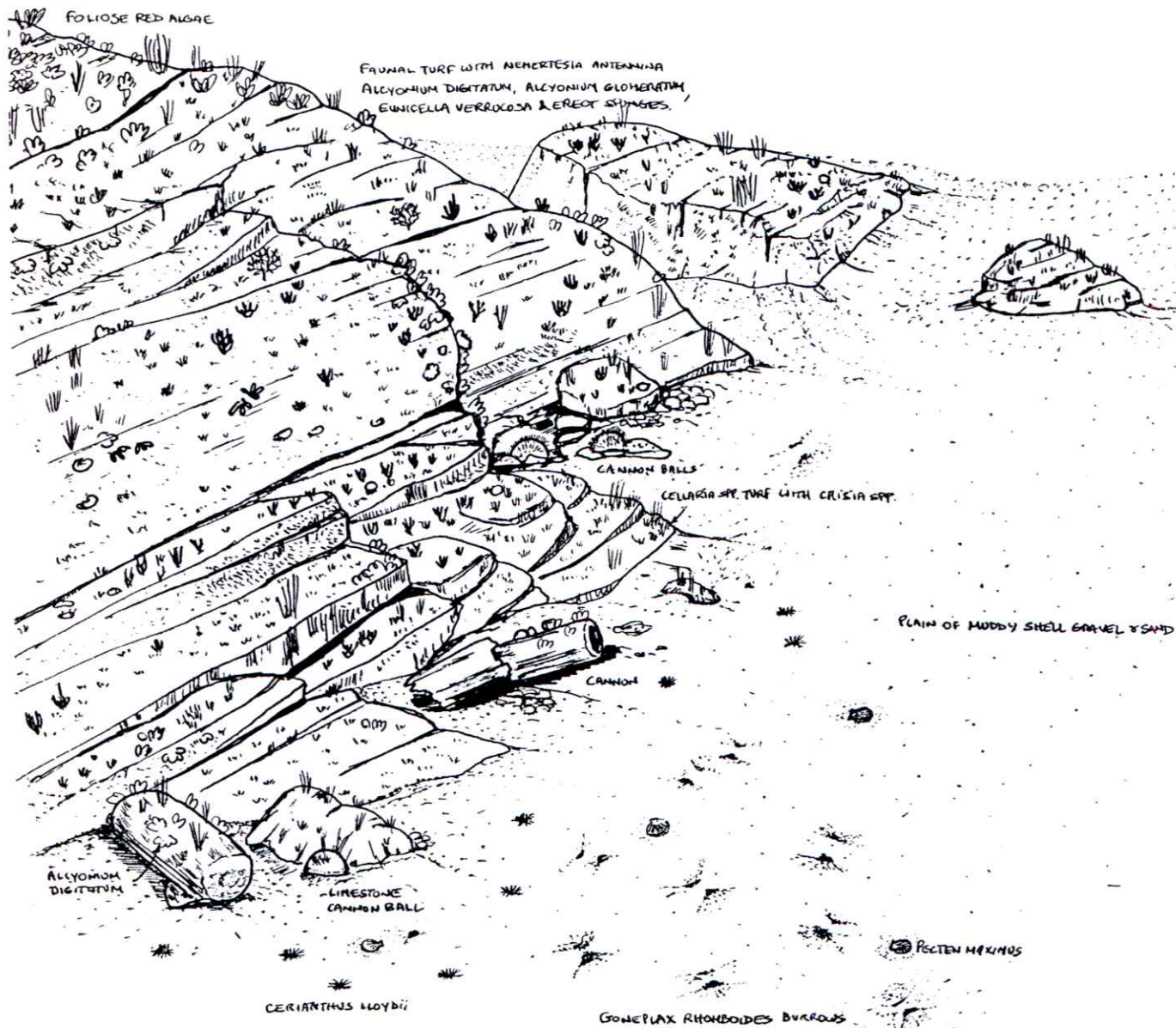


Figure 1. GULL ROCK WRECK SITE

Figure 1. Illustration of the 'Gull Rock' wreck site by R. Holt

Alcyonium glomeratum, pink seafan *Eunicella verrucosa*, star anemones *Epizoanthus couchii*, *Isozoanthus sulcatus* and *Parazoanthus axinellae*, jewel anemones *Corynactis viridis*, cup corals *Caryophyllia smithii*, the anemone *Aiptasia mutabilis*, sea squirts including *Ascidia mentula*, the light bulb sea squirt *Clavelina lepadiformis* and the baked bean sea squirt *Stolonica socialis*.

Nudibranchs were common on the hydroids and bryozoans. Of note were the relatively large numbers of *Doto* spp., the small but strikingly colourful *Diaphrodoris luteocincta* and several very large (> 7 cm) *Lomanotus genei* all of one colour morph - red-brown bodies with bright yellow extremities. Large echinoderms including the spiny starfish *Marthasterias glacialis*, the common urchin *Echinus esculentus* and the sea cucumbers *Holothuria forskali* (cotton spinner) and *Pawsonia saxicola* were found throughout this habitat.

Most of this habitat was in deeper water than the lower limit of red algae (i.e. lower circalittoral) although a small area of upper circalittoral was surveyed at the top of the slope above the wreck site. Here the red algae included *Cryptopleura ramosa*, *Plocamium cartilagineum* and encrusting coralline algae.

Only a proportion of the species mentioned above occurred on the wreckage and none of them were found exclusively on the iron wreckage. The most conspicuous species on the cannon included the sponge *Ciocalypta penicillus*, dead man's fingers *Alcyonium digitatum*, cowries *Trivia arctica*, bryozoans *Cellaria fistulosa* and *Bugula flabellata* and the sea squirt *Clavelina lepadiformis*. A number of fish were recorded from around the site, including territorial/benthic species such as conger eel *Conger conger*, snake pipefish *Entelurus aequoreus* and large numbers of cuckoo wrasse *Labrus mixtus*, including one large male who seemed to have claimed the barrel of one of the cannon as part of his territory!

A total of 114 species were recorded in this biotope (see species list in Table 1).

Biotope 2. Circalittoral limestone in the form of cannonballs with *Phoronis hippocrepia*, *Cliona celata* and *Hiatella arctica* at 23 m bcd.

Although the limestone cannonballs form only a very small proportion of the area surveyed at the wreck site they supported a distinctly different faunal assemblage from that found on adjacent hard substrata, highly characteristic of limestone bedrock in other parts of the country. The cannon balls and their associated fauna have therefore have been counted as a separate biotope.

One species in particular, the phoronid *Phoronis hippocrepia* (which resembles a small fan worm, but is in fact from a completely different phyla), was found only on the cannon balls. Other species included the rock-boring sponge *Cliona celata* and the rock-boring piddock *Hiatella arctica* (a bivalve mollusc); both had eaten into the surface of the limestone.

A total of 14 species were recorded on the cannon balls (see Table 1).

Biotope 3. Lower circalittoral muddy shell gravel plain with *Goneplax rhomboides* and *Cerianthus lloydii* at 23 - 27 m bcd.

The sediment plain comprising a mixture of shelly gravel and muddy sand extended from the base of the rocky slope at the wreck site sloping gradually into deeper water. 'U'-shaped burrows occupied by the crab *Goneplax rhomboides*, and burrowing anemones *Cerianthus lloydii* were frequent over much of the sediment with occasional hermit crabs *Pagurus bernhardus* and scallops *Pecten maximus*. Another more scarce burrowing anemone, *Mesacmaea mitchellii*, was also found at this site. The sediment infauna was not sampled.

A total of 9 species were recorded in this biotope (see Table 1).



Gull Rock wreck site: limestone cannonball embedded in seabed with an overall covering of silty hydroids and two Devonshire cup corals *Caryophyllia smithii*.
Photograph by R. Holt

Table 1. List of taxa recorded at the Gull Rock protected wreck site.

The letters after each taxon are the semi-quantitative abundances recorded at each of the three habitats using the SACFOR (Superabundant, Abundant, Common, Frequent, Occasional, Rare) abundance scale. Nomenclature follows Howson (1987).

	Biotope No. 1 2 3				Biotope No. 1 2 3		
Porifera (sponges)				Opisthobranchia (nudibranchs)			
<i>Leucosolenia botryoides</i>	F	-	-	<i>Lomanotus genei</i>	O	-	-
<i>Scypha ciliata</i>	O	-	-	<i>Doto</i> sp.	C	-	-
<i>Tethya aurantium</i>	O	-	-	<i>Doto fragilis</i>	F	-	-
<i>Suberites carnosus</i>	F	-	-	<i>Diapharodoris luteocincta</i>	F	O	-
<i>Polymastia boletiformis</i>	F	-	-	<i>Polycera faeroensis</i>	F	-	-
<i>Polymastia mamillaris</i>	O	-	-	<i>Polycera quadrilineata</i>	F	-	-
<i>Cliona celata</i>	F	C	-	<i>Janolus cristatus</i>	O	-	-
<i>Axinella damicornis</i>	R	-	-	<i>Trivia monacha</i>	F	-	-
<i>Axinella infundibuliformis</i>	R	-	-	<i>Buccinum undatum</i>	O	-	-
<i>Axinella polypoides</i>	F	-	-	<i>Coryphella lineata</i>	R	-	-
<i>Stelligera rigida</i>	O	-	-	<i>Flabellina pedata</i>	O	-	-
<i>Stelligera stuposa</i>	O	-	-	<i>Facelina bostoniensis</i>	O	-	-

[cont.]

Biotope No. 1 2 3				Biotope No. 1 2 3			
Porifera (sponges) cont.				Pelecypoda (bivalves)			
<i>Raspailia hispida</i>	O	-	-	<i>Pecten maximus</i>	-	-	O
<i>Raspailia ramosa</i>	F	-	-	<i>Pododesmus patelliformis</i>	O	-	-
<i>Ciocalypa penicillus</i>	O	-	-	<i>Hiatella arctica</i>	R	O	-
<i>Esperiopsis fucorum</i>	O	-	-	Cephalopoda (squid, octopus etc.)			
<i>Myxilla incrustans</i>	O	-	-	Squid eggs	F	-	-
<i>Hymedesmia paupertas</i>	O	-	-	Bryozoa (sea mats)			
<i>Hemimycale columella</i>	F	-	-	Crisiidae indet.	C	O	-
<i>Haliclona viscosa</i>	R	-	-	<i>Crisia eburnea</i>	C	-	-
<i>Dysidea fragilis</i>	F	-	-	<i>Alcyonidium diaphanum</i>	F	-	-
Porifera indet. crusts	F	-	-	<i>Pentapora foliacea</i>	F	-	-
Hydrozoa (hydroids)				<i>Parasmittina trispinosa</i>	F	-	-
<i>Halecium halecinum</i>	C	R	-	<i>Schizomavella</i> sp.	F	-	-
<i>Aglaophenia pluma</i>	F	-	-	<i>Cellepora pumicosa</i>	F	-	-
<i>Aglaophenia tubulifera</i>	F	-	-	<i>Omalosecosa ramulosa</i>	F	R	-
<i>Nemertesia antennina</i>	C	-	-	<i>Cellaria</i> sp.	S	F	-
<i>Nemertesia ramosa</i>	O	O	-	<i>Cellaria fistulosa</i>	A	-	-
<i>Abietinaria abietina</i>	F	-	-	<i>Scrupocellaria</i> sp.	C	O	-
<i>Obelia</i> sp.	F	O	-	<i>Bugula flabellata</i>	O	-	-
Anthozoa (soft corals, sea fans, anemones and corals)				<i>Bugula plumosa</i>	F	-	-
<i>Alcyonium digitatum</i>	F	-	-	<i>Bugula turbinata</i>	F	-	-
<i>Alcyonium glomeratum</i>	O	-	-	Bryozoa indet. crusts	C	-	-
<i>Eunicella verrucosa</i>	O	-	-	Phoronida (horseshoe worms)			
<i>Cerianthus lloydii</i>	-	-	F	<i>Phoronis hippocrepia</i>	-	A	-
<i>Epizoanthus couchii</i>	O	-	-	Echinodermata (starfish, brittlestars, sea urchins and sea cucumbers)			
<i>Parazoanthus axinellae</i>	O	-	-	<i>Henricia oculata</i>	O	-	-
<i>Isozoanthus sulcatus</i>	O	-	-	<i>Asterias rubens</i>	O	-	-
<i>Urticina felina</i>	O	-	-	<i>Marthasterias glacialis</i>	F	-	O
<i>Aiptasia mutabilis</i>	F	-	-	<i>Ophiura affinis</i>	O	-	-
<i>Sagartia elegans</i>	F	-	-	<i>Ophiura albida</i>	O	-	-
<i>Cereus pedunculatus</i>	O	-	-	<i>Echinus esculentus</i>	F	-	-
<i>Actinothoe sphyrodeta</i>	F	-	-	<i>Holothuria forskali</i>	F	-	-
<i>Mesacmaea mitchellii</i>	-	-	R	<i>Pawsonia saxicola</i>	O	-	-
<i>Corynactis viridis</i>	C	-	-	Tunicata (sea squirts)			
<i>Caryophyllia smithii</i>	C	-	-	<i>Clavelina lepadiformis</i>	C	O	-
Platyhelminthes (flatworms)				<i>Aplidium punctum</i>	O	O	-
<i>Prostheceraeus vittatus</i>	O	-	-	Didemnidae indet.	O	-	-
Polychaeta (worms)				<i>Ascidia mentula</i>	F	-	-
<i>Harmothoe</i> sp.	O	-	-	<i>Polycarpa rustica</i>	O	-	-
<i>Polydora</i> sp.	R	-	-	<i>Stolonica socialis</i>	F	-	-
Terebellidae sp.	O	-	-	<i>Botryllus schlosseri</i>	O	O	-
<i>Bispira volutacornis</i>	R	-	-	Chondrichthyes (dogfish etc.)			
<i>Myxicola infundibulum</i>	-	-	O	<i>Scyliorhinus stellaris</i>	O	-	-
<i>Pomatoceros triqueter</i>	O	-	-	Osteichthyes (bony fish)			
Spirorbidae sp.	O	-	-	<i>Conger conger</i>	O	-	-
Cirripedia (barnacles)				<i>Entelurus aequoreus</i>	R	-	-
<i>Balanus balanus</i>	O	-	-	<i>Taurulus bubalis</i>	O	-	-
<i>Megatrema anglicum</i>	F	-	-	<i>Ctenolabrus rupestris</i>	O	-	-
Decapoda (prawns, crabs etc.)				<i>Labrus bergylta</i>	F	-	-
<i>Calocaris macandreae</i>	-	-	O	<i>Labrus mixtus</i>	F	-	-
<i>Pagurus bernhardus</i>	F	-	O				
<i>Galathea strigosa</i>	O	-	-				

[cont.]

Biotope No. 1 2 3				Biotope No. 1 2 3			
Decapoda (prawns, crabs etc.) cont.				Osteichthyes (bony fish) cont.			
<i>Maja squinado</i>	C	-	-	<i>Pomatoschistus minutus</i>	O	-	-
<i>Inachus dorsettensis</i>	F	-	-	<i>Thorogobius ephippiatus</i>	O	-	-
<i>Macropodia rostrata</i>	O	-	-				
<i>Cancer pagurus</i>	F	-	-				
<i>Goneplax rhomboides</i>	-	-	F				
Gastropoda (marine snails)				Algae			
<i>Turritella communis</i>	-	-	O	Corallinaceae	O	-	-
<i>Melanella alba</i>	R	-	-	<i>Plocamium cartilagineum</i>	F	-	-
<i>Aporrhais pespelecani</i>	R	-	-	<i>Cryptopleura ramosa</i>	C	-	-



Gull Rock wreck site: limestone cannonball with covering of the phoronid worm *Phoronis hippocrepia*. Photograph by R. Holt.



Gull Rock wreck site: encrusting silty growth on a partially-buried cannon. Photograph by R. Holt.

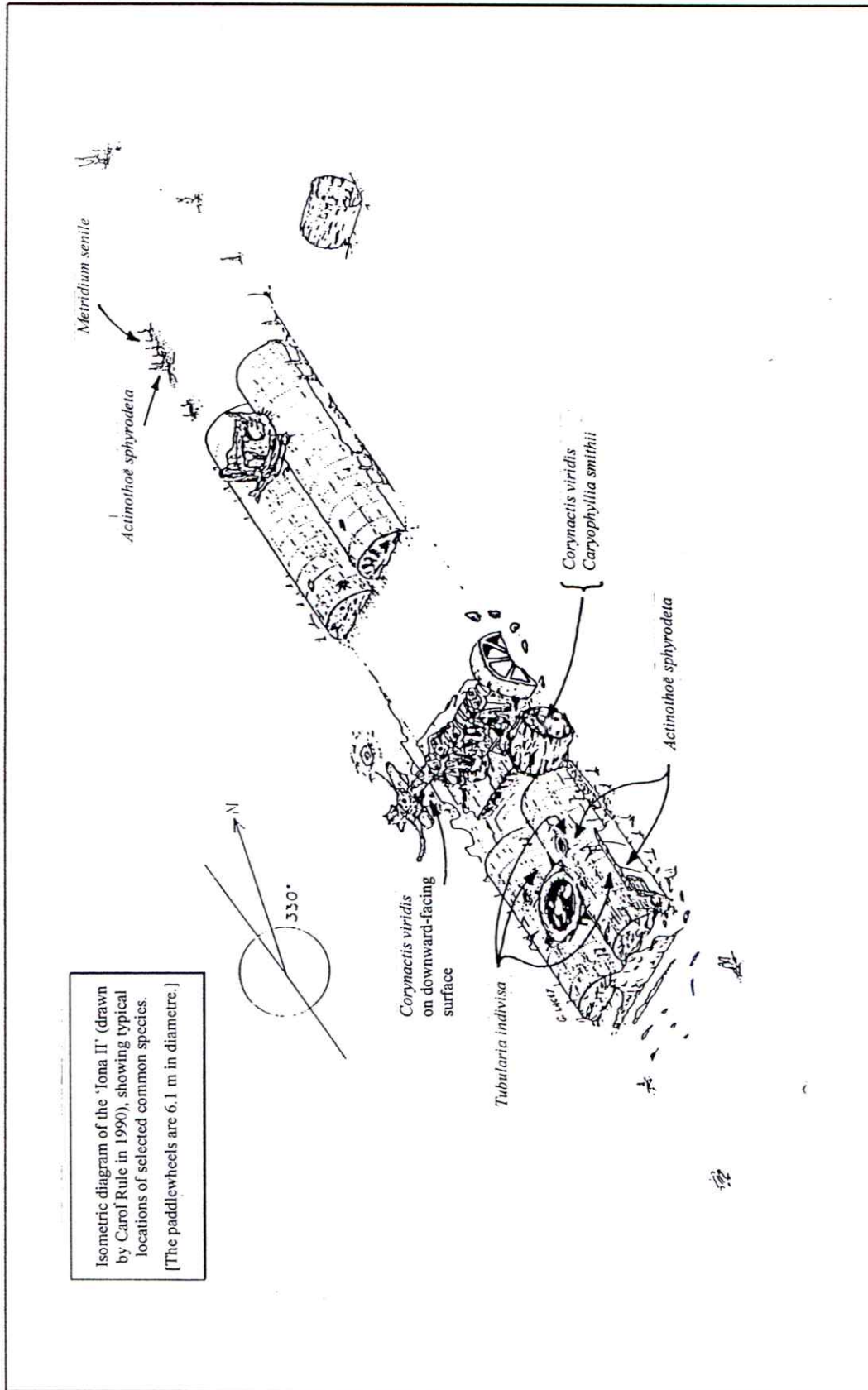


Figure 2. Location of particular species on the wreck of the 'Iona II'

3.2 Marine biological survey of the 'Iona II' protected wreck site

Co-ordinator: David Moss

Introduction

The remains of the paddle steamer 'Iona II' lie about 20 metres below chart datum, on a flat seabed, approximately 1 km off the east coast of Lundy, and about 70 metres from the well-known wreck of the MV 'Robert'. The 'Iona II' was a gunrunner to the Confederacy in the American Civil War, and sank in 1863, barely a year after she was launched. Because of the novel nature of her design, and in particular her oscillating engines, the wreck is protected by law: we were licensed by the Department of National Heritage to dive on her.

The wreck is partially intact, lying roughly north-south and rising to approximately 1.5 metres above the seabed. Figure 2 gives a reasonable impression of the site, although some deterioration, eg of the paddle wheel, seems to have occurred, and there are several beams ("spars") projecting towards the seabed from the main wreckage, which are not shown. The surrounding seabed is a plain of mud on coarser sediment, with a few small, flattened boulders (to ca 40 cm diameter) and some wreck debris. Several dives were made on the site, for recording and a little photography, and the following description is compiled from notes made by CD, TH, CM, KM, DM and LS.

General biological description

The hydroid *Tubularia indivisa* was the most widespread and conspicuous species, growing thickly, especially on edges and some surfaces of the engine remains. Vertical surfaces in particular tended to have *T. indivisa* concentrated to the edges, and growing relatively sparsely towards the centre. Large plumose anemones *Metridium senile* were found in quite thick clumps on some of the ribs emerging from the substrate (but not on all). Elsewhere there were only one or two individuals on the spars that extended from the main wreckage towards the substrate.

The anemone *Actinothoe sphyrodeta* was found in patches on the protruding ribs, maybe with *Metridium senile*, and on some vertical surfaces left unoccupied by *Tubularia indivisa*, to 100 /m² in patches to 20 x 20 cm². The Devonshire cup-coral *Caryophyllia smithii* was present to densities of 50-100 /m² on vertical and horizontal surfaces. One colony of the rarely seen *Caryophyllia inornata* was found. The jewel anemone *Corynactis viridis* occurred on vertical surfaces, and thickly on the downward-facing surface of a ca 25 cm diameter horizontal pipe.

There was a hydroid/bryozoan turf inside the horizontal funnel segment and on some protruding surfaces. Porifera were scarce and individuals were small. A number of nudibranchs were observed, mainly feeding on *Tubularia indivisa*. Fish were not especially common - a shoal of a couple of dozen bib *Trisopterus luscus*, and some wrasse *Labrus* spp., were the most conspicuous.

Comments

The 'Iona II' provides a striking visual contrast to the nearby wreck of the MV 'Robert'. Whereas the 'Robert' has a spectacular covering of *Metridium senile*, immortalised in innumerable photographs, this species is not widely distributed on the 'Iona II', being confined to certain discrete locations. In contrast, the 'Iona II' is dominated by the much less eye-catching (and less photogenic!) *Tubularia indivisa*. This species is reasonably common on the 'Robert', but is visually relatively inconspicuous.

There are two obvious physical differences between the two wrecks. The 'Iona II' has been on the seabed for more than 130 years, the 'Robert' for just 20. Further, the latter stands much

higher off the seabed, and further into the tidal stream. These factors suggest two possible reasons for the differing dominant fauna: that they represent different stages in the natural faunal succession of the area, or that the marked greater extension of the 'Robert' into the tidal stream is more suited to *Metridium senile*. (Of course, *Tubularia indivisa* is itself quite typical of tide-swept sites.). The latter explanation is perhaps given some support by the *Metridium senile* on the 'Iona II' being largely confined to the isolated ribs (standing at most 1 metre proud of the seabed). Of course, this distribution could also represent the last outposts against a take-over by *Tubularia indivisa*.

Table 2: List of species recorded at the 'Iona II' protected wreck site.

SPECIES	ABUNDANCE ON		COMMENTS
	WRECK	SEABED	
Porifera (sponges)			
<i>Suberites domuncula</i>	R	-	} All on upward-facing horizontal surfaces.
<i>Raspailia ramosa</i>	R	-	
<i>Dysidea fragilis</i>	R	-	
<i>Hemimycale columella</i>	R	-	
Anthozoa (soft corals, seafans, anemones and corals)			
<i>Actinothoe sphyrodeta</i>	C	O	Locally, on ribs and vertical surfaces. On boulders.
<i>Cereus pedunculatus</i>	-	O	In sediment.
<i>Sagartia elegans</i> var. <i>mineata</i>	O	-	
<i>Metridium senile</i>	C	R	Mainly on ribs, occasionally on protruding spars. On boulders.
<i>Cerianthus lloydii</i>	-	O	In sediment.
<i>Corynactis viridis</i>	C	-	On verticals and underside of pipe. Inside horizontal funnel segment.
<i>Caryophyllia smithii</i>	C	O	On horiz. & vert. surfaces. Occ. on funnel segment and on boulders.
<i>Caryophyllia inornata</i>	R	-	One colony seen, photographed by CM.
<i>Alcyonium digitatum</i>	O	O	On horizontal & vertical surfaces, spars. Boulders, debris.
<i>Eunicella verrucosa</i>	R	-	
<i>Tubularia indivisa</i>	A	-	On upward facing, horizontal & protruding surfaces & edges.
<i>Abietinaria abietina</i>	O	-	}
<i>Nemertesia antennina</i>	O	-	
<i>Nemertesia ramosa</i>	F	-	} Mainly on protruding edges & spars.
<i>Kirchenpaueria pinnata</i> (?)	O	-	
Hydroïd turf	F	-	} - ditto - & in horizontal funnel segment.
Annelida (worms)			
<i>Bispira volutacornis</i>	R	-	
Mollusca (nudibranchs, bivalves etc.)			
<i>Onchidoris luteocincta</i>	P	-	
<i>Polycera</i> sp.	P	-	
<i>Coryphella</i> sp.	F	-	
<i>Pecten maximus</i>	-	R	
squid eggs	R	-	One clump, attached to wreck.
Crustacea (crabs)			
<i>Maia squinado</i>	O	-	
<i>Cancer pagurus</i>	R	-	
hermit crab	-	R	sp. unspecified: ? <i>Eupagurus bernhardus</i>
Bryozoa (sea mats)			
<i>Pentapora foliacea</i>	R	R	On spars and debris/boulders.
<i>Bugula turbinata</i>	O	-	
<i>Alcyonidium diaphanum</i>	O	-	
bryozoan turf	O	-	

[cont.]

SPECIES	ABUNDANCE ON		COMMENTS
	WRECK	SEABED	
Echinodermata (starfish, sea urchins)			
<i>Asterias rubens</i>	O	O	
<i>Marthasterias glacialis</i>	O	R	
<i>Echinus esculentus</i>	O	R	
Chordata			
<i>Stolonica socialis</i>	P	-	
(fishes)			
<i>Trisopterus luscus</i>	P	-	Shoal of ca. 25 individuals.
<i>Labrus bergylta</i>	P	-	2-3 individuals seen.
<i>Labrus mixtus</i>	P	-	2-3 individuals seen.
<i>Conger conger</i>	P	-	1 seen.
<i>Taurulus bubalis</i>	P	-	
gobies	-	P	sp. unspecified.

3.3 Distribution of sea fans *Eunicella verrucosa* off the east coast & counts of the nudibranch *Tritonia nilsodhneri* on sea fans

Co-ordinators: Paul Biggin & David Newton

Aims

The aims of this survey were (1) to assess the distribution of sea fans *Eunicella verrucosa* off the east coast of the island; (2) to check the condition of sea fans; and (3) to search for the nudibranch *Tritonia nilsodhneri*, which lives and feeds on *E. verrucosa*. The locations chosen approximated to those that had been previously surveyed some time ago, the intention being that results could be compared to those from earlier investigations.

Methods

Two shot lines (together) were lowered into the water at the selected site, each line having its own surface marker buoy. A pair of divers then descended the shot lines, making sure they did not tangle. On the seabed, the divers made sure the area was suitable (i.e. not in kelp) and then attached two 30 m tapes to one shot (shot A). One diver then swam due south carrying the second shot (B), unreeling the tape until the end (30 m) was reached. Shot B was then positioned on the seabed and the tape attached to it. The second diver, unreeling the second tape, swam due west for 10 m, then due south for 10 m, and finally due east for 10 m, meeting up with the main tape at the 10 m mark, thereby forming a 10 m square (of area 100 m²). By this time, the first diver had swum back to meet the second diver (see figure 3).

The two divers then swam side by side in a south → north direction covering an approximate 5 m strip of the quadrat, then north → south covering the other half. Once the first quadrat had been surveyed, the second tape would be moved south from shot A to form another 10 m x 10 m quadrat between the 10 m and 20 m positions on the north/south tape. Finally, the tape was moved to the 20 m and 30 m positions. At some sites where it was clear that sea fans were present beyond the 30 m position, just the tapes were lifted at the end of the dive(s) and the shot lines left in place to allow for the same survey to continue; at other sites, the shot lines were lifted as well.

Each quadrat was checked for the number of fans, their overall size, attached growths (e.g. drift weed, dogfish eggs etc.), the presence/absence of *Tritonia nilsodhneri* nudibranchs and any signs of damage. Each set of three quadrats was worked on by two or more pairs of divers, depending on the time taken to set up the quadrats and to carry out the survey.

Most of the survey sites were along the boulder/muddy sand interface at a depth of 18-20 m below sea level.

Results

(1) Distribution

Individual sea fans were inspected at four sites close inshore along the east coast of the island: The Quarries, Gull Rock, Brazen Ward and NNW of Gannets' Rock. Assessment of the growth of sea fans and axinellid sponges has taken place at The Quarries in the past (Hiscock 1984; Irving 1990), where a 'permanent' monitoring site was established in 1984. Prior to the remaining sites being investigated, it was not certain as to whether there were any sea fans to be found at these locations.

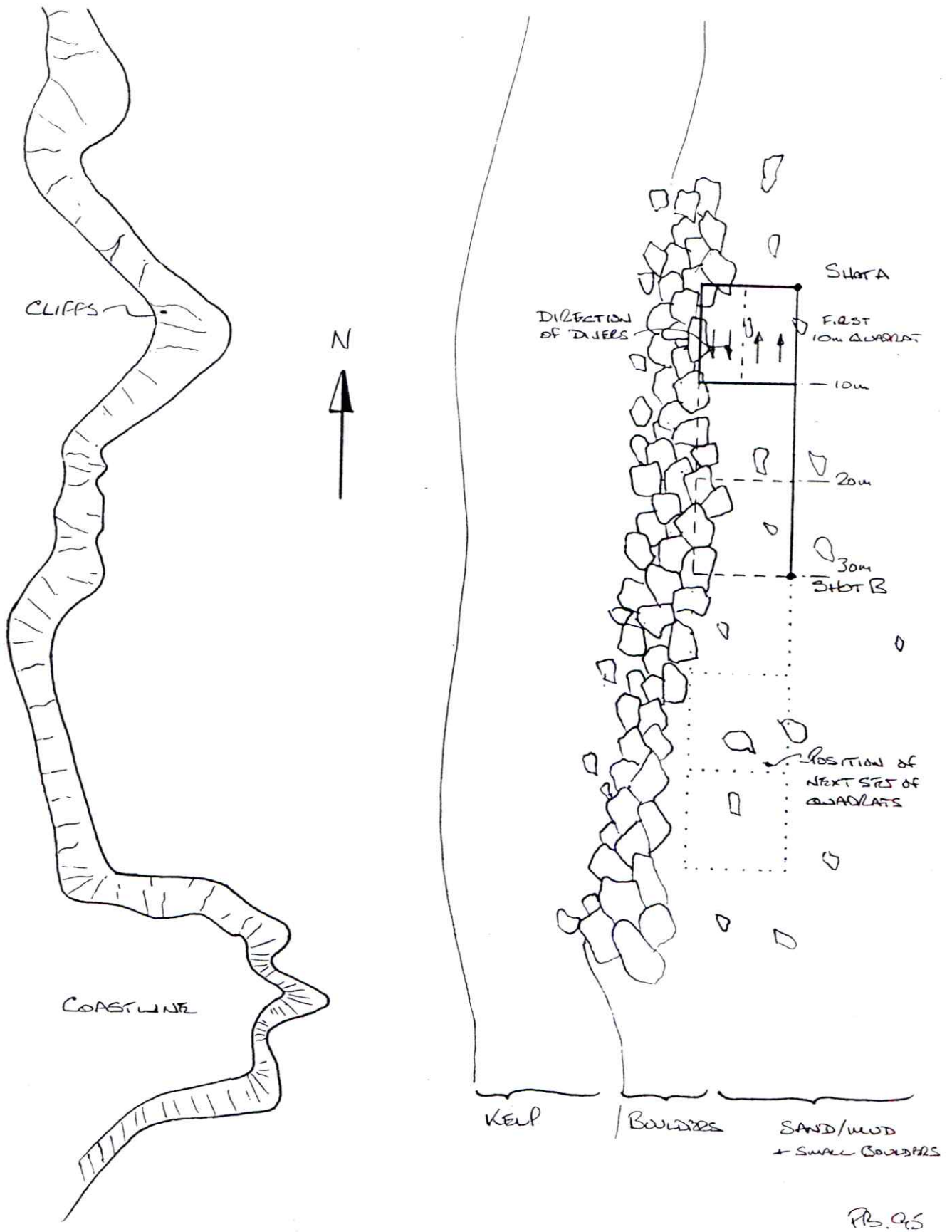
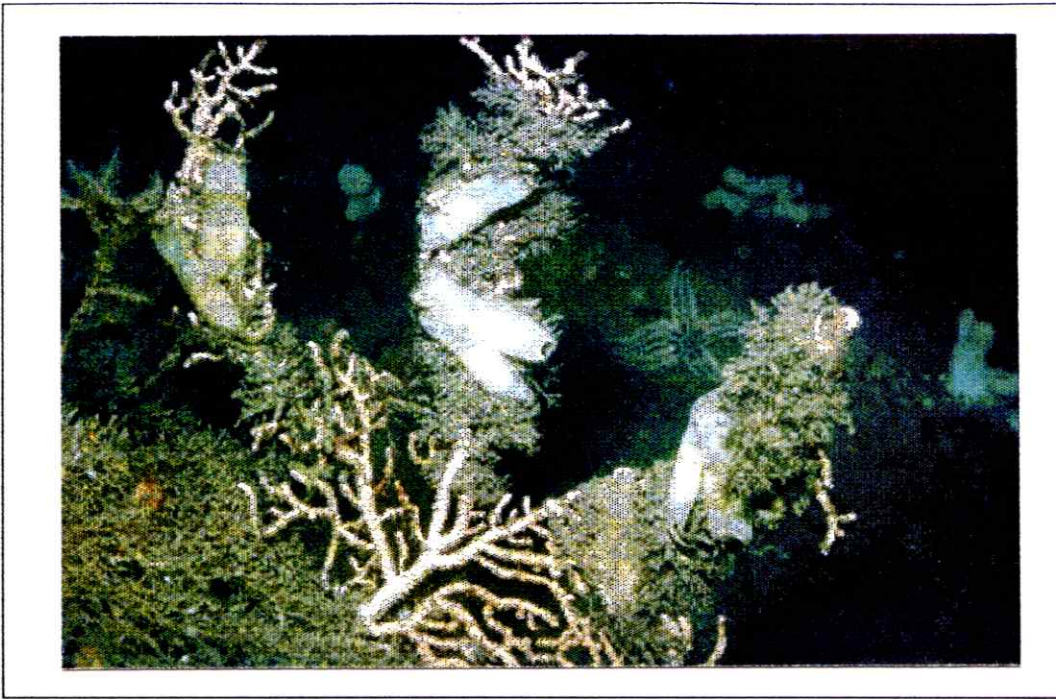


Figure 3. An indication of how the 10 m x 10 m quadrats were laid out for the counts of sea fans *Eunicella verrucosa* off The Quarries. Sketch by Paul Biggin.



Sea fan *Eunicella verrucosa* with attached growths including hydroids and several dogfish egg cases (mermaid purses). Condition score = 2 (i.e. 50-80% 'weed' cover).
Photograph by R. Holt.

A series of 10 m x 10 m quadrats (as described above) was laid at The Quarries, Gull Rock and Brazen Ward. The site NNW of Gannets' Rock was visited without marker tapes, the sea fans being counted and measured along a swim line for approximately 50 m due N. The density of fans here was estimated as being about 30/100 m².

	The Quarries	Gull Rock	Brazen Ward	NNW of Gannets' Rock
No. of fans inspected	46	21	44	13
Mean density of fans	7.7 /10m ²	10.5 /10m ²	?	~3.0 /10m ²
Mean height (min./max.)	22.3 cm (3 - 45)	26.1 cm (15 - 35)	23.7 cm (15 - 33)	31.5 cm (10 - 50)
Mean width (min./max.)	19.3 cm (1.5 - 55)	31.0 cm (10 - 43)	27.5 cm (12 - 55)	29.4 cm (13 - 50)
Mean condition score*	3.6	4.1	3.9	4.0

*Condition score: 1 = >80% weed cover; 2 = 80-50% weed; 3 = 50-20% weed; 4 = <20% weed;
5 = <5% / pristine

Table 3. Comparison of data on sea fans from four sites.

(2) Checking the condition of sea fans

A total of 124 individual sea fans were inspected at the 4 sites mentioned above. The density of sea fans was greatest at the Gull Rock site (with a mean of 10.5/10 m²), though unfortunately insufficient data was collected to provide a comparable figure for the Brazen Ward site. The size of fans varied from very small (3.0 x 1.5 cm) to very large (50 x 50 cm), with an even distribution of sizes (& thus ages) of individuals at each site. The condition of each fan was noted using a scoring system (see Table 3), which denoted the percentage of the fan which was encumbered by drift weed or other entanglements such as dogfish eggs (mermaid's purses),

present on 17 of the sea fans, or squid eggs, present on two of the sea fans. The mean condition score was around the 4 mark for each site, indicating that, for the total area of fans' branches inspected, there was a mean of < 20% weed cover. A sample recording form is included in Appendix 2.

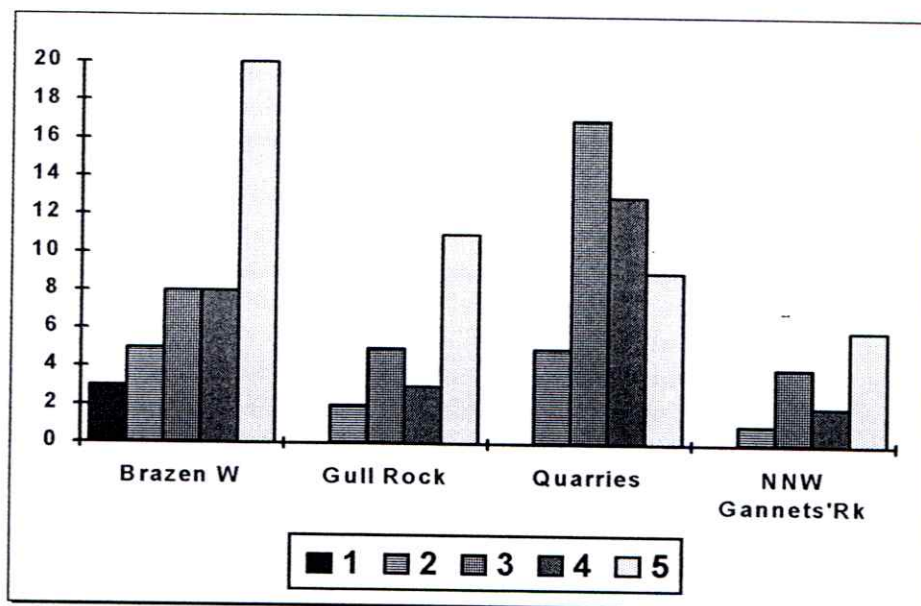


Figure 4. The range of condition scores (1-5) of sea fans inspected at four sites off the east coast.

(3) Counts of the nudibranch *Tritonia nilsodhneri*

A total of 143 sea fans *Eunicella verrucosa* (which included those whose condition was also being checked) were inspected for the presence of the nudibranch *Tritonia nilsodhneri*. No signs of the nudibranchs (i.e. individuals or their spawn masses) were found on any of the fans.

Other organisms found on individual sea fans included one specimen of the rare anemone *Amphianthus dohrnii* at Brazen Ward.

Conclusions

Eunicella verrucosa is present all around the island in depths greater than 10 m, but only common in localised patches. Hiscock (1974) notes that the maximum overall abundance at any one site is about one colony [i.e. an individual fan] per 10 m². Our findings indicate that this figure could be increased at all of the east coast sites visited (by as much as tenfold at the Gull Rock site), though direct comparisons are perhaps inappropriate as the area of seabed included within 'a site' is not known in either case. However, it would appear that the number of sea fans has increased during the past twenty years. This could simply indicate a recovery from collecting pressure during the 1960s or it may be linked to an apparent decline in numbers of the predatory nudibranch *Tritonia nilsodhneri* (see below).

The occurrence of the anemone *Amphianthus dohrnii* is of particular interest. As far as we are aware, this species has not been recorded at Lundy before, and was not included in the list of Coelenterata prepared by Keith Hiscock from observations and collections made between 1969 and 1974 (Hiscock 1974). Manuel (1983) records the known distribution of this species as being "English Channel, south-west Ireland and W. Scotland, around western Europe and in the Mediterranean. Formerly common on *Eunicella* in the Plymouth area, this species appears to have become rare in recent years". Sanderson (in press) regards this species as being 'regionally rare'.

The apparent absence of *Tritonia nilsodhneri* on sea fans is of some note, though no firm conclusions can be made as to why this may be so, particularly as the abundance of nudibranchs is known to be very variable from one year to the next. Counts in 1975 (when it was first discovered at Lundy) indicated that 30% of sea fans from Brazen Ward (that is 11 out of 36) had on them individual slugs and/or their spawn masses (Brown & Hunnam 1976). In 1986, this proportion had fallen to 22% of sea fans (20 out of 76), though on this occasion the counts were undertaken near to the Quarry Bay monitoring site (Hiscock 1986). Another count was undertaken at Quarry Bay in 1987 (Howard 1987), when 63 sea fans were inspected with 3 *Tritonia* and 8 spawn masses being recorded from 7 fans (= 11%). In 1990, when the last known count was done, 23 sea fans were inspected with five *Tritonia* and 14 egg masses being recorded from 8 fans (= 35%) (Irving 1990).

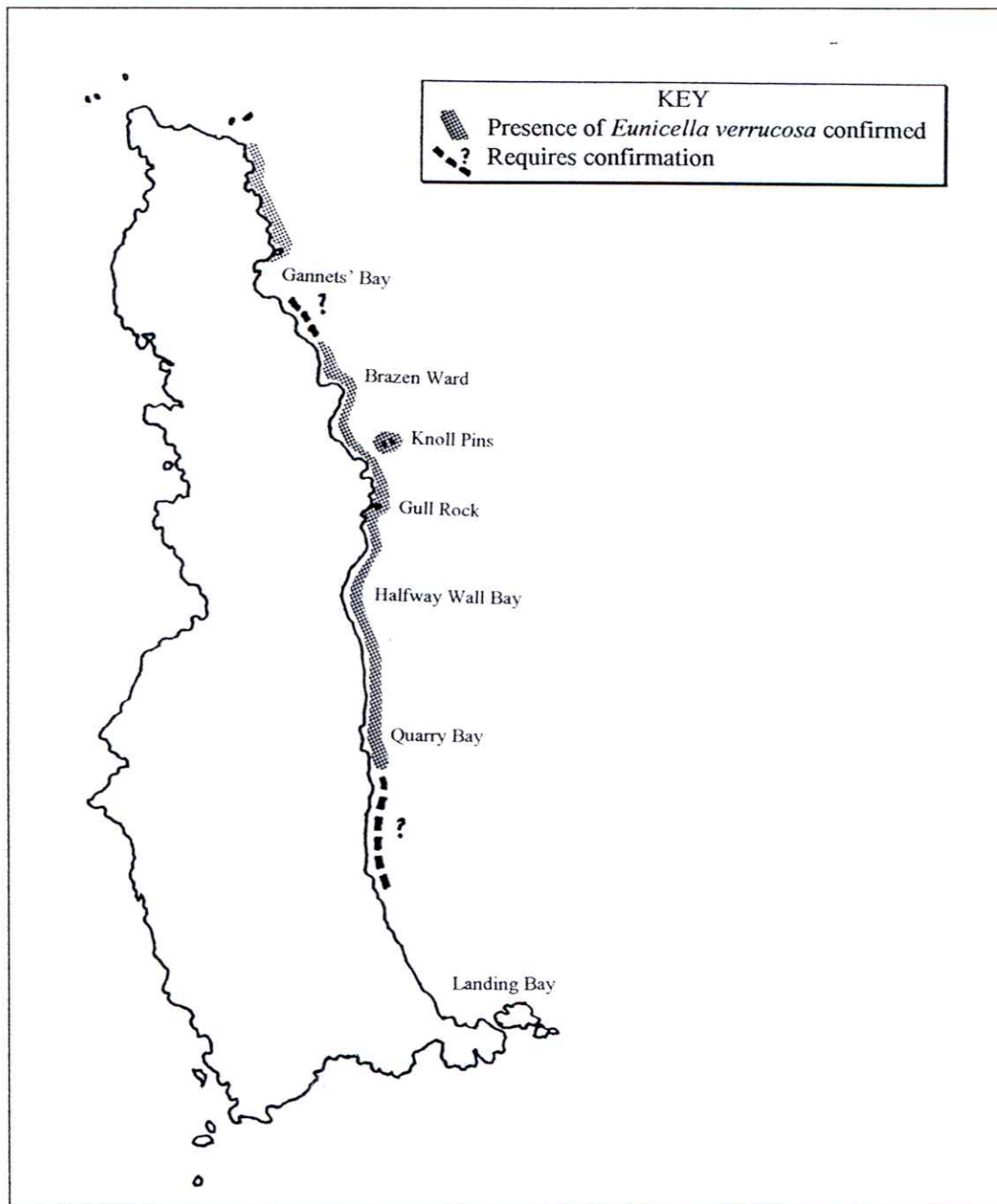


Figure 5. Distribution of sea fans *Eunicella verrucosa* along Lundy's east coast.

3.4 Searches for the red band fish *Cepola rubescens*

Co-ordinator: Tony Hunt

Introduction

The red band fish *Cepola rubescens* is an eel-like fish which can grow to 75 cm in length. It is unusual in habit in that it lives in mud burrows. These are club-shaped, a shaft about 40 cm long leading to a chamber where the fish spends much of its time. The burrows appear on the surface as perfectly rounded holes which are distinctive in the way that they descend vertically.

Prior to 1974, when a population of *C. rubescens* was found in relatively shallow water (17 m below chart datum) off the east coast of Lundy, the fish had only been known from deep water locations (70 - 200 m) off the west coast of Britain. Studies were undertaken on the Lundy population during the late 1970s, its size being estimated at c.16,000 individuals in 1977 (Pullin and Atkinson 1978). However, by 1981 the population appeared to have either crashed or migrated: brief investigations revealing only a few groups of the fish. By 1983, no fish or their burrows could be found. Searches for the fish and/or their burrows continued annually from 1984 to 1990 (except for 1989), as part of the NCC's sublittoral monitoring programme. No signs of the fish were found in 1984, 1985, 1986 or 1988. In 1987, however, a small group of burrows and a total of six fish were located to the north of Quarry Beach at a depth of 17 m below sea level (Irving 1989). In 1990, a few burrows were found but no fish seen.

It was decided that our group could continue these searches in the same areas where the fish and/or their burrows had been encountered previously, i.e. to the north of the Quarries and in Gannets' Bay. No special equipment was used for these searches, divers simply being instructed to swim along a straight course following a compass bearing whilst looking for the unmistakable burrows.

Results

The results of the swimline searches are given in Table 4. No actual red band fish were seen during these dives but several of their burrows were observed. A sample recording form is included in Appendix 3.

Comments

Burrows were found on the muddy seabed of Gannets' Bay from 12 - 16 m below chart datum. They appeared to be absent from the periphery of the Bay where the muddy plain rises to adjoin a boulder slope. It is possible that fish may have been inside these burrows: indeed, in the divers' opinions, these burrows were sufficiently open to indicate recent occupation.

The accuracy of the GPS lat./long. co-ordinates for the start and end of each dive is in some doubt. The hand-held Magellan 5000 unit that was used appeared to take some time to settle after providing an initial reading, and this was not always allowed for before readings were taken.

Editor's note: It was pointed out to RI by John Heath that members of his dive club (Appledore) who visited the island the weekend after our departure, saw five red band fish out of their burrows to the east of the Knoll Pins at a depth of about 20 m. This confirms that the burrows we observed were quite likely to be occupied by fish.

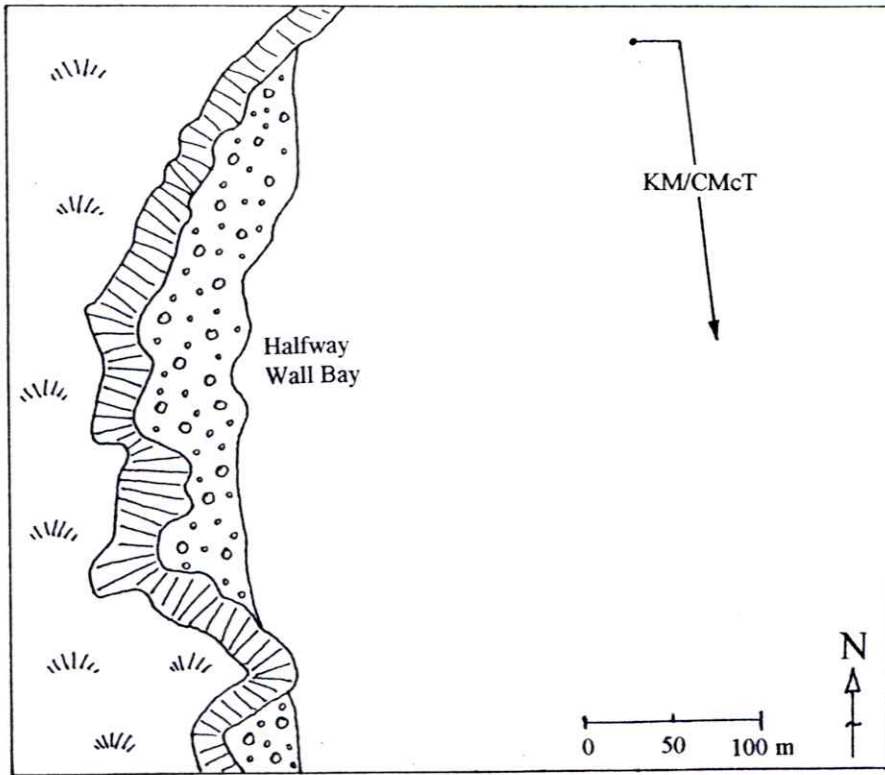


Figure 6. General location of dives searching for red band fish in the Halfway Wall Bay area. [Only KM/CM's dive is shown as accuracy of GPS marks for other two dives are suspect].

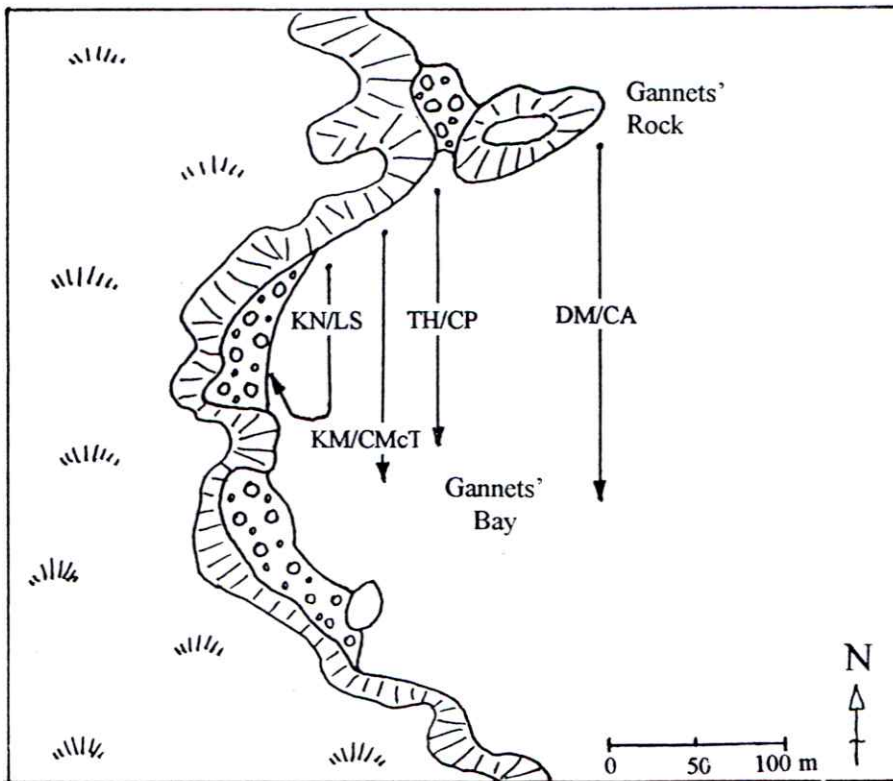


Figure 7. Location of dives in Gannets' Bay, searching for red band fish and/or their burrows.

Table 4. Red Band Fish *Cepola rubescens* Survey - Summary of Results.

DATE	TIMES	DIVERS	SITE	START POSITION	END POSITION	MAX. DEPTH (bcd)	OBSERVATIONS
5/6/95	11.02 - 11.20 11.02 - 11.24	David Moss Carol Aldridge	Gannets' Bay	51° 11.821' N 4° 40.082' W	51° 11.744' N 4° 40.026' W	15.5 m	Began at tip of Gannets' Rock and swam south to approx. half way across Bay. 1 definite hole seen after 1 min.; 1 possible hole seen after 7 mins. Total no. of burrows = 1
5/6/95	11.08 - 11.40 11.08 - 11.40	Kate Northen (1) Leona Shepherd (2)	Gannets' Bay	51° 11.628' N 4° 40.132' W	51° 11.787' N 4° 40.144' W	12.3 m	(1) Dropped down onto soft mud @ 12.3 m. Swam south. 3 definite burrows seen. 3 more burrows seen after 7 mins., 1.5 m apart, after 17 mins. @ 10.2 m. no burrows; there-after, boulder slope rises from 10 m. Changed course to 330° but no further burrows seen. Total no. of burrows = 6 (2) 4 burrows seen after 4 mins.; 1 burrow after 5 mins.; 1 burrow after 6 mins.; 2 burrows after 8 mins. Total no. of burrows = 8
5/6/95	11.44 - 12.17 11.44 - 12.17	Kevin Morgan Chris McTernan	Gannets' Bay	51° 11.790' N 4° 40.070' W	51° 11.700' N 4° 40.010' W	12 m	Began dive in gully east of Gannets' Rock, swimming south to approx. ¼ way across Bay. 2 burrows seen on mud, soon after start of dive. Total no. of burrows = 2
5/6/95	12.07 - 12.40 12.07 - 12.40	Tony Hunt Clive Pearce	Gannets' Bay	51° 11.810' N 4° 40.110' W	51° 11.700' N 4° 40.070' W	11.3 m	Began dive east of gully east of Gannets' Rock. Swam south approx. ¾ way across Bay. Only <i>Goneplax</i> burrows seen. Total no. of burrows = 0
5/6/95	15.40 - 16.20 15.40 - 16.20	Leona Shepherd Tony Hunt	Bay north of the Quarries	51° 10.030' N 4° 39.549' W	51° 10.652' N 4° 39.631' W	13.7 m	No obvious <i>Cepola</i> burrows seen. Total no. of burrows = 0
5/6/95	16.59 - 17.26 16.59 - 17.26	Kevin Morgan Chris McTernan	Bay north of the Quarries	51° 10.958' N 4° 39.676' W	51° 10.870' N 4° 39.590' W	15.8 m	From start point swam E for about 30 m then turned S onto swimline (start of timing). 3 burrows seen after 2 mins.; 3 burrows seen after 5 mins.; 12 burrows seen after 7 mins., 2 m apart in group; 1 burrow seen after 10 mins.; 1 burrow seen after 11 mins.; 5 burrows seen after 13 mins.; 1 burrow seen after 15 mins.; 1 burrow seen after 17 mins.; ascend after 19 mins. Total no. of burrows = 27
5/6/95	17.05 - 17.42	Kate Northen	Bay north of the Quarries	51° 10.110' N 4° 39.550' W	51° 10.820' N 4° 39.630' W	19.7 m	No obvious <i>Cepola</i> burrows seen. Total no. of burrows = 0
7/6/95	?	Leona Shepherd Mary Hamilton	South of Gull Rock	?	?	18 m (bsl)	No obvious <i>Cepola</i> burrows seen. Total no. of burrows = 0
7/6/95	?	Chris McTernan Paul Biggin	South of Gull Rock	?	?	17.5 m (bsl)	No obvious <i>Cepola</i> burrows seen. Total no. of burrows = 0

3.5 Photographic monitoring of the wreck of the M.V. 'Robert'

Co-ordinator: Val Shepherd

Introduction

The wreck of the 'MV Robert' is situated approximately 1 km off the east coast of Lundy, close to the protected wreck site of the 'Iona II' (though just outside the latter's 50 m exclusion zone). The MV 'Robert' was a small coastal vessel which sank in January 1975 when her cargo of coal dust shifted during a storm, whilst the ship was at anchor in the lee of the island. Being a relatively recent wreck and still largely intact, the wreck provides interest as a subject for the study of colonisation by marine organisms.

Baseline photographs of 19 viewpoints on the wreck were taken by Steve Bolt during an NCC-funded survey in August 1990. The purpose of the current project was to re-locate and re-photograph the same sites on the wreck, and anything else of interest.

The dives

The dives during which photographs were taken specifically for this project were undertaken by Val Shepherd & Kevin Morgan and Chris McTernan & Paul Biggin on 6th June 1995 between 12.30 and 13.15 hrs. Three of the four divers mentioned above used underwater cameras, one with a wide-angle lens, one with a 35 mm lens and one with a close-up lens. A diagram showing the lay-out of the wreck was photocopied onto acetate film and taken on the dive. It was fastened to a slate with rubber bands which allowed notes to be made directly onto it under water.

On 9th June 1995, further dives on the wreck were made. One pair of divers (David Moss & Leona Shepherd) had the task of clearing further patches of encrusting life in order to allow studied of re-colonisation to continue; and the other pair (Val Shepherd & David Newton) attached an automatic temperature sensor to the port side forward steps which will monitor water temperatures over a twelve month period. [N.B. Another temperature sensor was also fixed to the anchor chain of the outer mooring in the Landing Bay by John Heath].

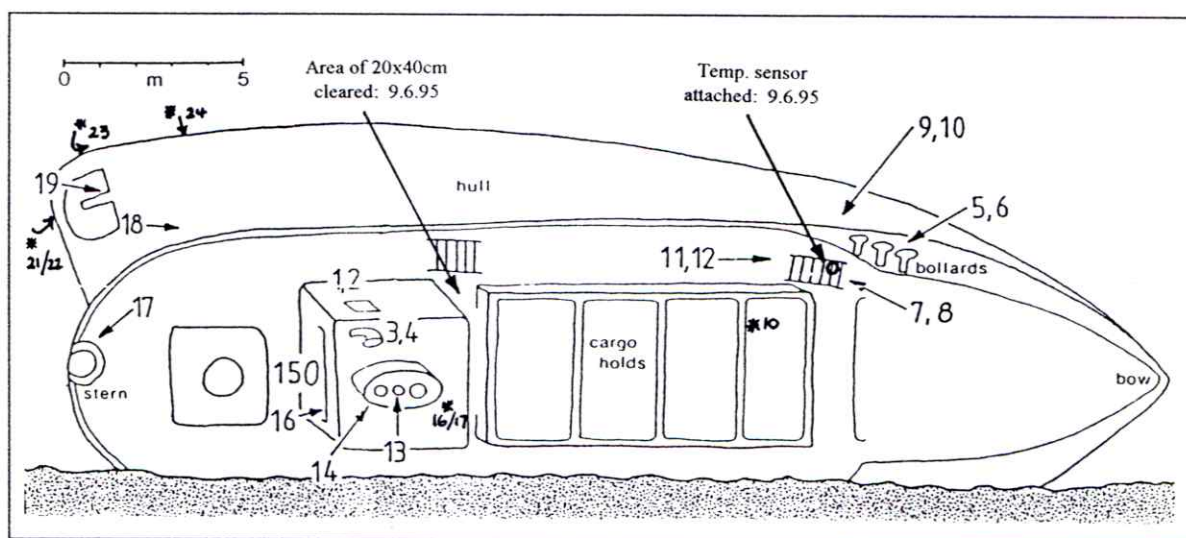


Figure 8. Diagram (taken from Irving 1990) indicating the positions of viewpoint photographs on the wreck of the MV 'Robert' taken in 1990. Drawn in 1990 from memory by S. Bolt and therefore not to scale. Asterisks indicate where additional photographs were taken by VS in 1995.

VIEWPOINT No. (on diagram)	DESCRIPTION	SLIDE No. (VS)	SLIDE No. (CM)
7 & 8	Ladder to holds	5 & 6	
5 & 6	Bollard beside ladder, looking towards bow	7	
5 & 6	Bollard beside ladder, looking towards stern	8	
11 & 12	Ladder, looking other way	9	
(10)	Edge of cargo hold, position marked	10	
(11)	Second ladder, position marked	11	
13 or 14	Edge of funnel	12	6
16?	Corner of wheelhouse	13	
13 or 14	(portrait view) & 15 Funnel	14	
15/16			12, 13 & 15
(16/17)	Conger in pipe, position marked	16 & 17	
17	Stern, from each side	18 & 19	
?17			3 & 9
18			21 & 22
19	Part of rudder	20	17, 18 & 19
(21/22)	Squid eggs, attached beneath rudder	21 & 22	
(23)	Underside of rudder (previously cleared? - note different colour and size of anemones)	23	
(24)	Signature by "DSAC" on keel, position marked	24	
18	Bare patch	25	
18	Bare patch, showing top edge	26	
1/2?	Window	27	
3/4?	Unidentified - around wheelhouse?	28	
	Edge of pipe - around wheelhouse?	29 & 30	

Table 5. Photographs taken by VS and CM taken on the MV 'Robert'. These photographs are now held by English Nature (Maritime Team) in Peterborough.

Results

Conditions were good on both days both above and below water and we had no difficulty in starting and finishing our dives via the buoy line, which was attached to one of the bollards (as indicated in the drawing). Photographs taken are as set out in Table 5.

Comments

Detailed biological records were not made during these dives. However, it can be said that variously coloured plumose anemones *Metridium senile* still dominate the hull and outer surfaces of the wreck. Small patches of rust, found near the stern of the hull, remain bare of marine life. The feather star *Antedon bifida*, which Hiscock (1981) reported as being common on protruding features such as deck edges and strakers was not recorded at all.

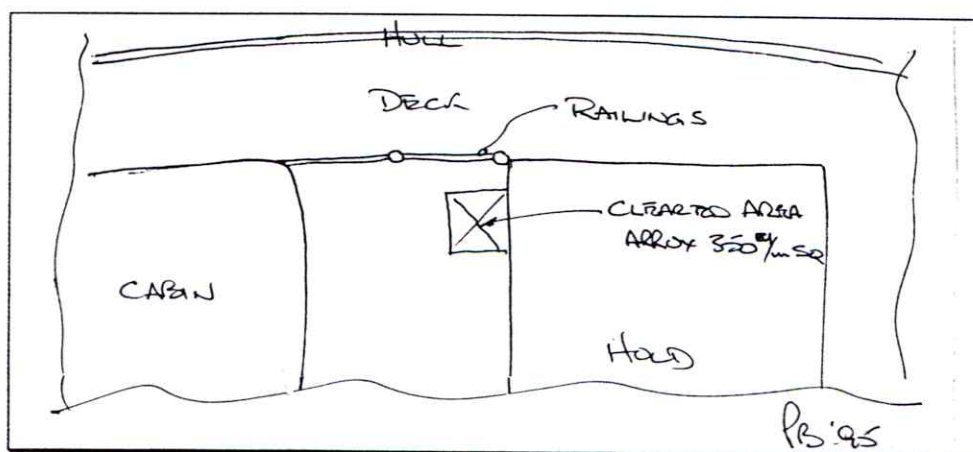
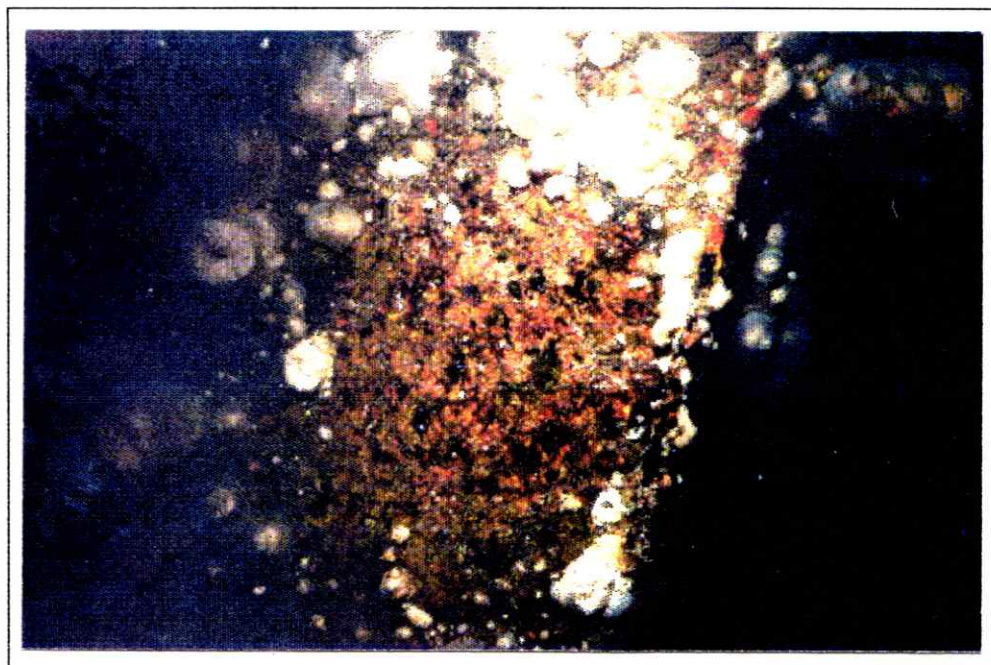


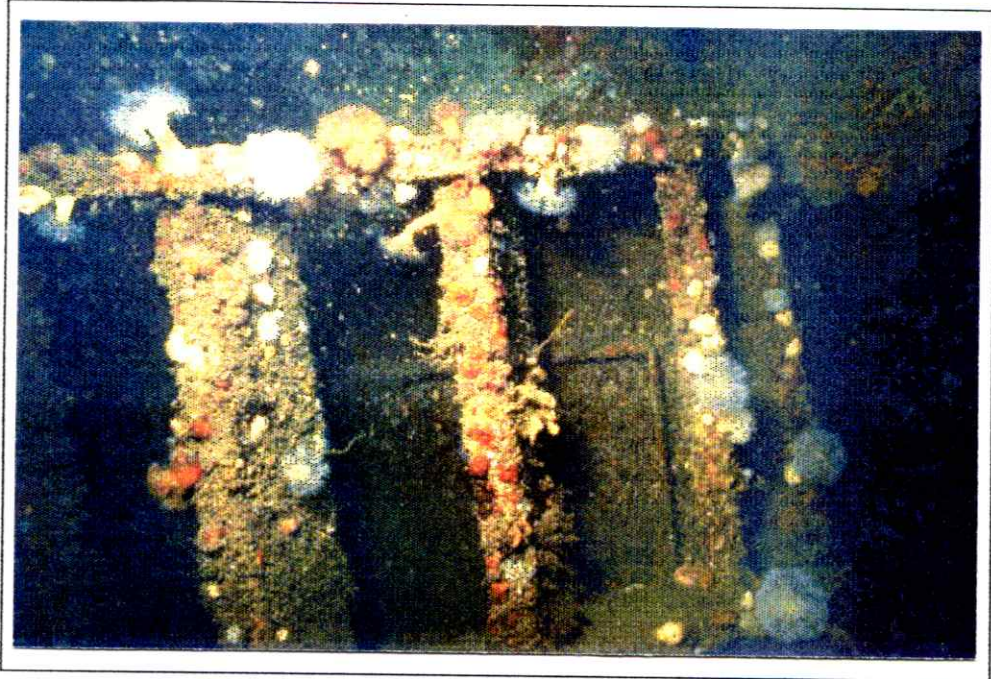
Figure 9. Sketch by P. Biggin of the port side superstructure of the MV 'Robert' indicating location of cleared area.



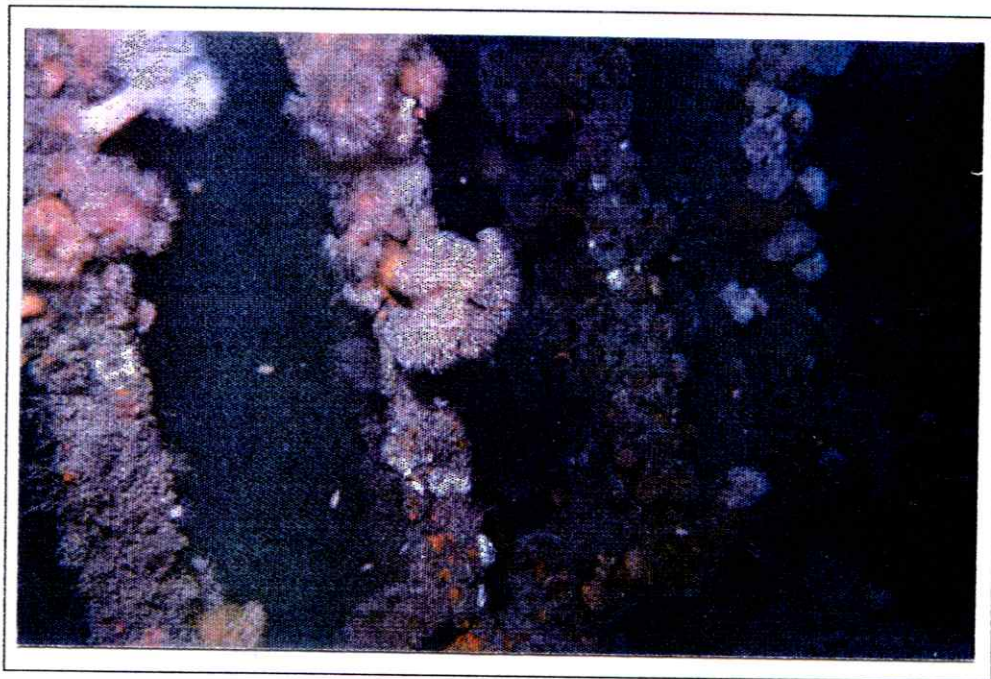
Part of the superstructure on the wreck of the MV 'Robert' prior to the encrusting marine life (mostly plumose anemones *Metridium senile*) being scraped away.
Photograph by D. Moss.



Part of the superstructure on the wreck of the MV 'Robert' after the encrusting life had been scraped away. Photograph by D. Moss.



The forward port-side steps leading to the hold on the wreck of the MV 'Robert'.
Photograph by S. Bolt in 1990 (NCC).



The forward port-side steps leading to the hold on the wreck of the MV 'Robert'.
Photograph by V. Shepherd in 1995.

3.6 SEASEARCH Surveys

Co-ordinator: Kevin Morgan

In order to contribute to information on descriptions of seabed habitats and species within the MNR, SEASEARCH dives were undertaken in two areas during the week: Gannets' Bay area (S of Gannets' Rock) off the NE coast; and on Lee Rocks, off the central south coast (Table 6).

SE Gannets' Rock: 6.6.95			Lee Rocks: 8.6.95		
KM/VS	In: 51° 11.57' N	4° 39.80' W	CM/KM	In: 51° 09.354' N	4° 39.145' W
	Out: 51° 11.58' N	4° 39.84' W		Out: 51° 09.335' N	4° 39.168' W
PB/CM	In: 51° 11.62' N	4° 39.91' W	PB/DM	In: 51° 09.361' N	4° 39.263' W
	Out: 51° 11.63' N	4° 39.87' W		Out: 51° 09.313' N	4° 39.223' W
			KN/RI	?	?
			TH/CD	?	?

Table 6. GPS locations of SEASEARCH dive sites

1. SE of Gannets' Rock

SEASEARCH dives were undertaken on Tuesday, 6th June by Kevin Morgan & Val Shepherd and Paul Biggin & Chris McTernan in an area to the south of Gannets' Rock at a depth of 17.9-21.9 m below chart datum (bcd) (Fig. 10).

The dive started to the SW of Gannets' Rock at about 18 m bcd on a slope with numerous scattered rocks with a light covering of red seaweed. This slope started to level out at around 21 m where red seaweed disappeared and the boulders decreased in number and size. Most of KM/VS's dive (SSW for first 20 min. and then W for last 10 min.) was on a level fine silty sand/fine broken shell bottom at about 22 m with scattered small boulders, often in slight depressions, over about 5-10% of the bottom.

Most of the small boulders had large colonies of the bryozoan *Pentapora foliacea* growing on them, a scattering of Devonshire cup corals *Caryophyllia smithii* and a covering of hydroid-bryozoan turf (including *Gymnangium montagui* and *Nemertesia ramosa*). There were occasional sponges including the branched *Axinella polypoides*. Nudibranchs were observed amongst the *Pentapora* colonies including two *Janolus cristata* (together) and three red-brick coloured *Lomanotus genei*. No sea fans or soft corals were seen.

Compared to the finer and shallower silt areas closer inshore, where the burrows of red band fish *Cepola rubescens* were observed (no burrows seen on KM/VS's dive), the bottom terrain was not so fine with more sand and more evidence of broken shells in the fine sand/silt mixture. Many holes of the burrowing angular crab *Goneplax rhomboides* were present, with occasional unidentified burrowing anemones. Spiny spider crabs *Maja squinado* were in evidence throughout the site in good numbers, along with hermit crabs in auger shells, some of which had the anemone *Calliactis parasitica* attached to the shell. Other obvious crustacea included two long-clawed squat lobsters *Munida rugosa* and several velvet swimming crabs *Necora puber* were seen close to the boulders. Overall, however, apart from the more robust types, mobile species were not that obvious, with the bottom terrain dominated by soft sediments and scattered small boulders. Fish, seen only in small numbers, included cuckoo wrasse *Labrus mixtus*, ballan wrasse *Labrus bergylta* and sand goby *Pomatoschistus minutus*. No echinoderms were observed during the dive.



The nudibranch *Lomanotus genei* seen on two occasions at Gull Rock and SE Gannets' Rock.
Photograph by R. Holt.

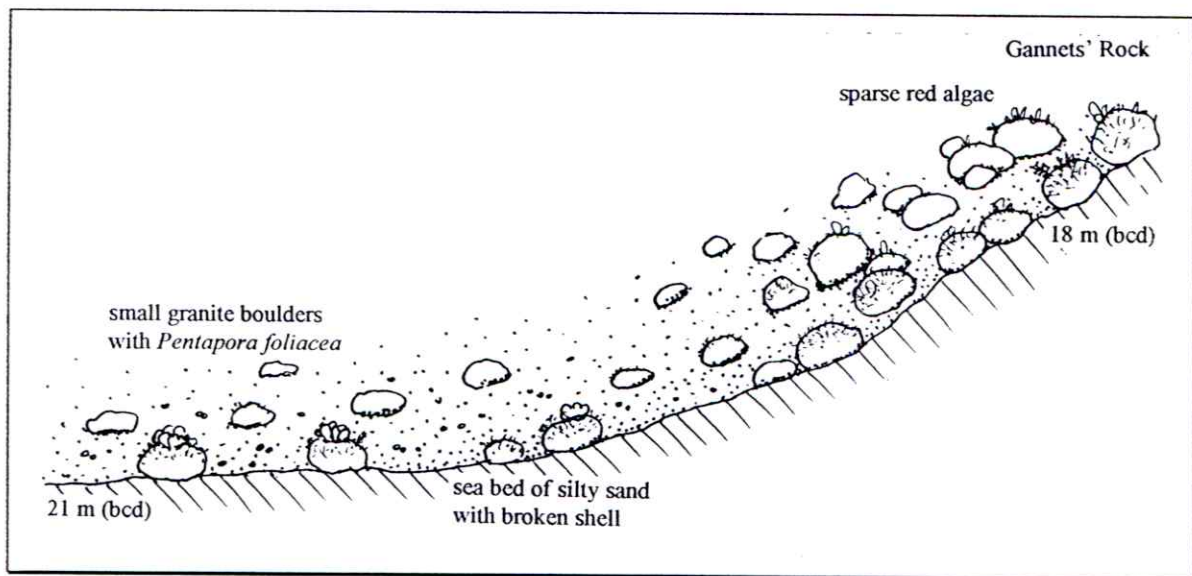


Figure 10. Sketch of seabed profile to the SE of Gannets' Rock.

2. Lee Rocks, south of the Rattles

A number of dives were carried out on 8th June at different depths (~8 to 26 m bcd) in the general area of Lee Rocks.

Divers	Depth range	Divers	Depth range	Divers	Depth range	Divers	Depth range
KN & RI	16-17 m	TH & CD	14-22 m	DM & PB	14-30 m	KM & CM	24-32 m

These dives confirmed that Lee Rocks is formed from slate bedrock with jagged irregular outcrops at the top of the reef at between 8 - 12 m. The edge of the rocky outcrops gives way to sand, the interface appearing from 14 m to 22+ m. The gradient of slope lessened at 26 m where the main reef appeared to end, although no dives deeper than this depth to confirm the absence of further rock outcrops. At shallower depths, the gullies between the outcrops were narrow (< 1 m) yet deep in profile (2 m) with rippled coarse sand at their bases. On the deeper and steeper sides of the reef the width of the gullies increased to 5-10 m, being 4+ m deep. There were some interesting vertical rock surfaces and pinnacles on the steepest sandy slopes at around 22 m depth. On the deepest dive by KM & CM, the slate fissures appeared to run ESE to WNW. Overall, the reef formed a diverse terrain and for many of the participants on the expedition, this was one of the most interesting reefs experienced during the week's diving.

Marine life seen was varied and differed noticeably from that encountered on the granite bedrock of the more sheltered east coast. Species observed are listed in Table 8. No sea fans were observed.

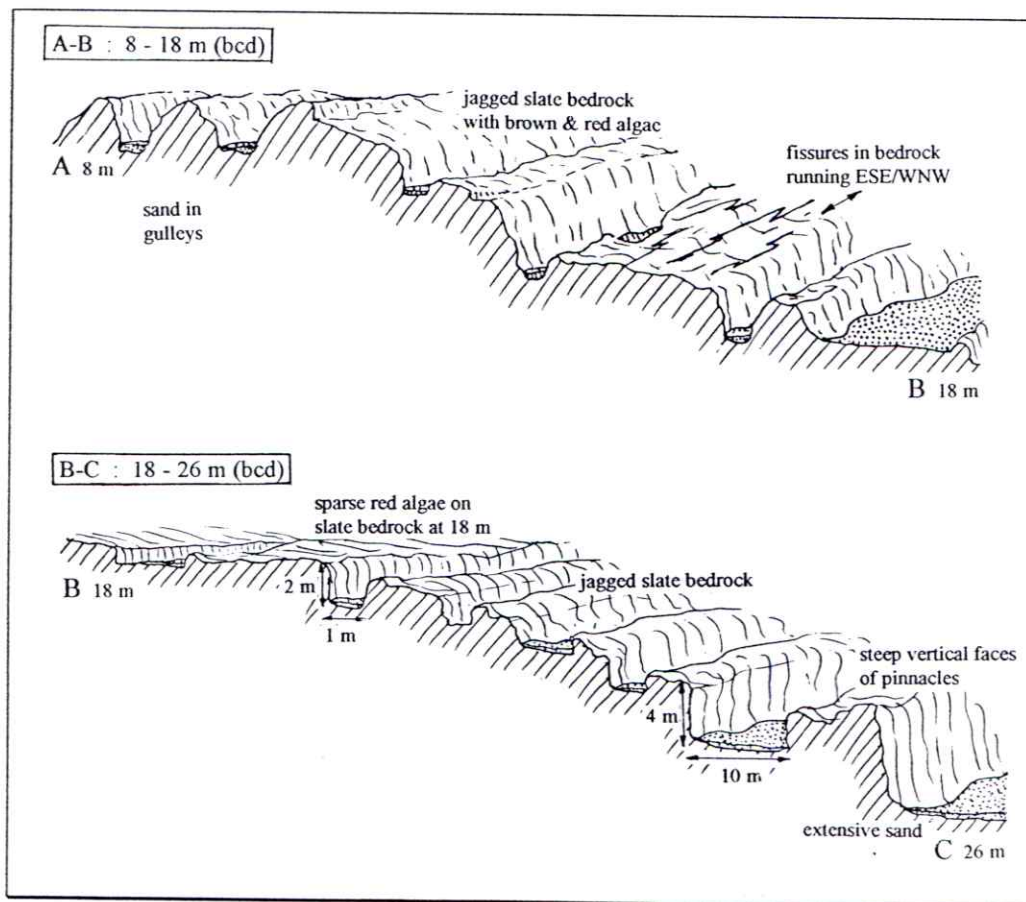


Figure 11. Sketch of seabed profile in the area of Lee Rocks.

Table 7. List of species recorded at Lee Rocks, south of the Rattles.

SPECIES		NOTES	SPECIES		NOTES
Kelp (spp. indet.)		Present to at least 8 m bcd.			
<i>Halidrys siliqua</i>		Present at 17.7 m.			
Red seaweeds (indet.)		Thinning out around 11.6 m, but present to at least 24 m, with 60+% cover at shallower depths. Includes <i>Delesseria sanguinea</i> .	Crustacea		Decapods not very evident (perhaps due to lack of nooks and crannies and large loose boulders?)
			<i>Necora puber</i>	R	
Porifera (sponges) indet.			<i>Galathea squamifera</i>	R	
<i>Axinella polypoides</i>	F				
<i>Axinella infundibuliformis</i>	R		Molluscs (indet.)		Shellfish not very evident
<i>Pachymatisma johnstoni</i>	F		<i>Trivia arctica</i>	O	
<i>Haliclona viscosa</i>	R		<i>Coryphella browni</i>	R	
<i>Cliona celata</i>	F	Boring & massive forms	<i>Coryphella lineata</i>	R	
<i>Stelligera rigida</i>	R		<i>Facelina coronata</i>	R	
<i>Stelligera stuposa</i>	R		<i>Simnia</i> sp.	R	
<i>Polymastia mamillaris</i>	O/F				
<i>Raspailia ramosa</i>	F		Bryozoa (indet.)		Hydroid/bryozoan turf covered 40% of rock surfaces in places.
<i>Myxilla incrustans</i>	R		<i>Bugula plumosa</i>	O	
<i>Hemimycale columella</i>	O		<i>Bugula turbinata</i>	O	
<i>Dysidea fragilis</i>	R		Crisidae	F	
<i>Thymosia guernei</i>	R		<i>Pentapora foliacea</i>	C	On tops of ridges.
<i>Halichondria panicea</i>	O		<i>Alcyonidium diaphanum</i>	R	
<i>Ciocalyptra penicillata</i>	F				
			Echinoderms		
Hydroids indet.		Hydroid/bryozoan turf covered 40% of rock surfaces in places.	<i>Asterias rubens</i>	O	
<i>Halecium</i> sp.	O		<i>Marthasterias glacialis</i>	O	
<i>Gymnangium montagui</i>	O		<i>Henricia ?oculata</i>	R	
<i>Tubularia indivisa</i>	R		<i>Luidia ciliaris</i>	R	
<i>Aglaophenia pluma</i>	O		<i>Echinus esculentus</i>	O	
<i>Kirchenpaueria pinnata</i>	O		<i>Holothuria forskali</i>	R	
<i>Nemertesia antennina</i>	O		<i>Pawsonia saxicola</i>	R	
<i>Nemertesia ramosa</i>	O		<i>Thyone roscovita</i>	R	
Cnidaria (corals & anemones)			Sea squirts		
<i>Caryophyllia smithii</i>	R	On hard surfaces	<i>Clavelina lepadiformis</i>	R	
<i>Corynactis viridis</i>	R/F	On vertical sides of gullies	<i>Morchellium argus</i>	R	
<i>Alcyonium digitatum</i>	C	On sides of gullies	<i>Botryllus schlosseri</i>	R	
<i>Actinothoe sphyrodeta</i>	O				
<i>Sagartia elegans</i>	O		Fish		Only in small large numbers. No cuckoo wrasse.
<i>Epizoanthus couchi</i>	R		<i>Scyliorhinus canicula</i>	R	
			<i>Lophius piscatorius</i>	R	
Polychaetes			<i>Taurulus bubalis</i>	R	
<i>Bispira volutacornis</i>	R		<i>Labrus bergylla</i>	O	
			<i>Ctenolabrus rupestris</i>	O	
			<i>Thorogobius ephippiatus</i>	O	

Abundance scale: A: Abundant; C: Common; F: Frequent; O: Occasional; R: Rare

3.7 Monitoring the cover of the alga *Bifurcaria bifurcata* in a rockpool

Co-ordinator: Mary Hamilton

In August 1984, a study was undertaken by Keith Hiscock, Chris Lumb and Robert Irving to assess the percentage cover provided by the brown alga *Bifurcaria bifurcata* in an upper midshore rockpool close to Lametry Beach on the south side of the South Light (Hiscock 1984). It was decided to repeat this study during our visit to the island, as it was thought that it had not been undertaken since this initial study was carried out. The following paragraphs are taken from Hiscock (1984) in order to give some background to the study.

“*Bifurcaria bifurcata* is a southern algal species which appears to be close to its known northern limit in British waters at Lundy. Its occurrence around the island is sparse, although it was found to be the dominant species of algae (apart from an overall covering of encrusting Corallinacea) in one large pool south of Lametry. This study was initiated so that both seasonal and longer-term changes in the extent of the *Bifurcaria* cover in the pool could be assessed by regular monitoring of the site.

The pool lies on a horizontal shelf in the slate bedrock, almost midway between the west side of Lametry Beach and Mermaid’s Hole on the south coast. Apart from the conspicuous cover of *Bifurcaria*, the pool was chosen because of its readily accessible location [does this include negotiating a near-vertical cliff face?], its overall size (approx. 50 m²), and that the only apparent loss of water from it was by evaporation. The average depth of the pool was 0.2 m, with a maximum depth of 0.5 m.”

The repeat study in June 1995 found the outline shape of the pool to be very irregular and that it appeared to differ somewhat from the last survey, though this may reflect inaccuracy in the sketch of the pool that was made at that time. Despite this, it was still possible to position the main measuring tape transecting the pool at the same location as in 1984. A second tape was laid at right angles to the transect tape, with readings being taken along this tape, positioned every 1 m distance along the transect tape. The width of rock, surface water and the length taken up by fronds of *Bifurcaria* were noted alongside the second tape. These measurements are set out in Table 7 .

POSITION No.	TOTAL POOL WIDTH (m)	WIDTH OF ROCK IN POOL (m)	WIDTH OF WATER (m)	BIFURCARIA COVER (m)	% BIFURCARIA COVER
1	4.75	1.90	2.67	0.18	3.78
2	4.45	1.07	2.80	0.58	13.03
3	5.60	0.76	3.13	1.71	30.53
4	6.15	2.60	2.05	1.50	24.39
5	5.70	3.77	1.53	0.40	7.01
6	5.70	3.15	1.51	1.04	18.24
7	6.10	1.92	3.49	0.69	11.45
8	6.25	1.26	4.34	0.65	10.40
9	6.82	1.23	3.23	2.36	34.60
10	5.62	1.01	3.67	0.94	16.72
11	6.10	0.47	3.38	2.25	36.88
12	4.74	0.70	2.46	1.58	33.33
13	4.12	0.13	3.90	0.09	2.18
14	3.95	0.00	1.71	2.24	56.70
15	3.80	1.00	1.95	0.85	22.36
				Overall average cover	21.44%

Table 8. Linear cover of *Bifurcaria bifurcata* at intervals of 1 m in the rockpool.

Conclusion: the overall average *Bifurcaria* cover of 21% is slightly less than the 1984 average cover of 27%.

3.8 3-D mapping of the seabed in the area of Gannets' Rock

Co-ordinator: Robert Irving

A photographic monitoring transect was set up by the NCC in 1984 against a near-vertical rock face on the 'Gannets' Rock pinnacle'. This sharp pinnacle of rock rises from the seabed at ~28 m (bcd) to its summit at ~12 m (bcd), some 50 m to the north-east of Gannets' Rock. In addition to this pinnacle, there is another similar pinnacle lying a short distance to the north. The topography of this area is therefore of some interest, as the communities of nature conservation importance which have been recorded from the first pinnacle (known as the Gannets' Rock pinnacle) may well be present on the second pinnacle, about which far less is known.

An attempt was made to dive on both of these pinnacles in order to make a sketch of their appearance, thereby providing some indication of how they lie in relation to each other. However, some difficulty was encountered in executing this task. It took one dive to locate the top of the Gannets' Rock pinnacle and to mark it with a surface marker buoy (attached to a concrete block). This was left in place overnight, with the intention of returning to the site the following day. Upon our return the next day, timed to coincide with slack water, there was no sign of the surface marker buoy - presumably it had been swept away by the current at high water. Though an attempt was made to relocate the pinnacle this failed, and instead an inspection was made of the sea fans to the north of Gannets' Rock.

A third visit to the site in Philip Robertson's R.I.B. provided an opportunity to criss-cross the area with an echo sounder, at the same time noting down the Decca positions at the start and finish of each transect (Table 9). Approximations of the shape of the seabed (as indicated by the echo sounder) were sketched onto a dive slate and are reproduced in Figs. 12 & 13.

TRANSECT	POSITION				DIRECTION OF TRAVEL
	START		FINISH		
A - A'	51° 12.01' N	04° 40.12' W	51° 12.06' N	04° 39.96' W	W → E
B - B'	51° 12.04' N	04° 39.95' W	51° 12.00' N	04° 40.13' W	E → W
D - D'	51° 12.04' N	04° 40.16' W	51° 12.06' N	04° 40.03' W	W → E
C - C'	51° 12.08' N	04° 40.00' W	51° 12.04' N	04° 40.16' W	E → W
1 - 1'	51° 12.07' N	04° 40.08' W	51° 12.09' N	04° 40.14' W	N → S (165°)
2 - 2'	51° 11.99' N	04° 40.00' W	51° 12.07' N	04° 40.00' W	S → N
3 - 3'	51° 12.10' N	04° 40.14' W	51° 12.02' N	04° 40.09' W	N → S
4 - 4'	51° 11.99' N	04° 40.07' W	51° 12.13' N	04° 40.16' W	S → N
5 - 5'	51° 12.15' N	04° 40.15' W	51° 12.01' N	04° 40.06' W	N → S

Table 9. Decca positions of each transect line across Gannets' Rock area.

It should be stressed that these positions and profiles are very approximate and probably include a high degree of inaccuracy. The results do indeed confirm the presence of a second pinnacle, some 50 m to the north of the Gannets' Rock pinnacle, but further bathymetric survey(s) would be required before a full interpretation of these results could be attempted.

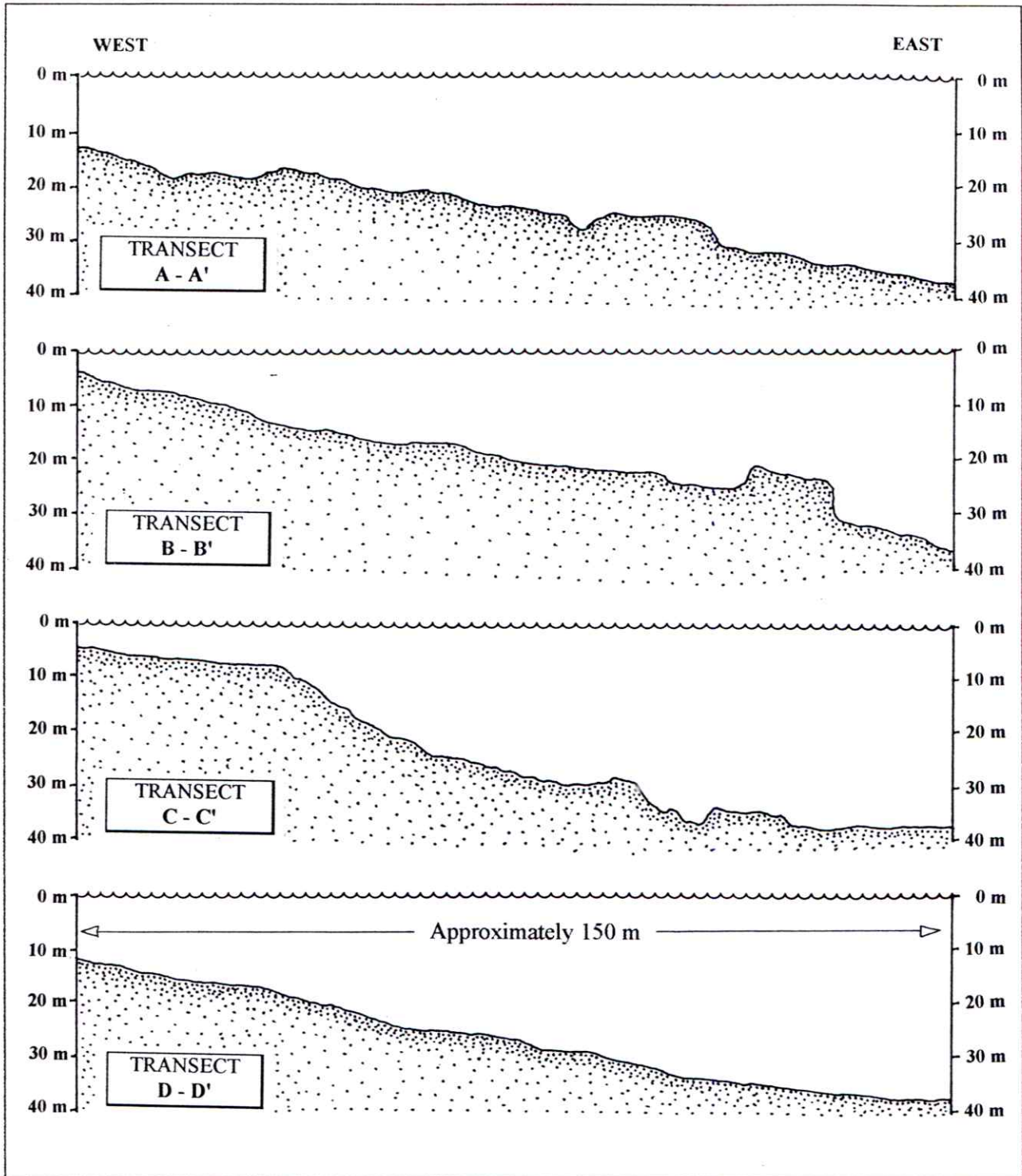


Figure 12. West-east (approx.) echo sounder transects in the area NE of Gannets' rock.

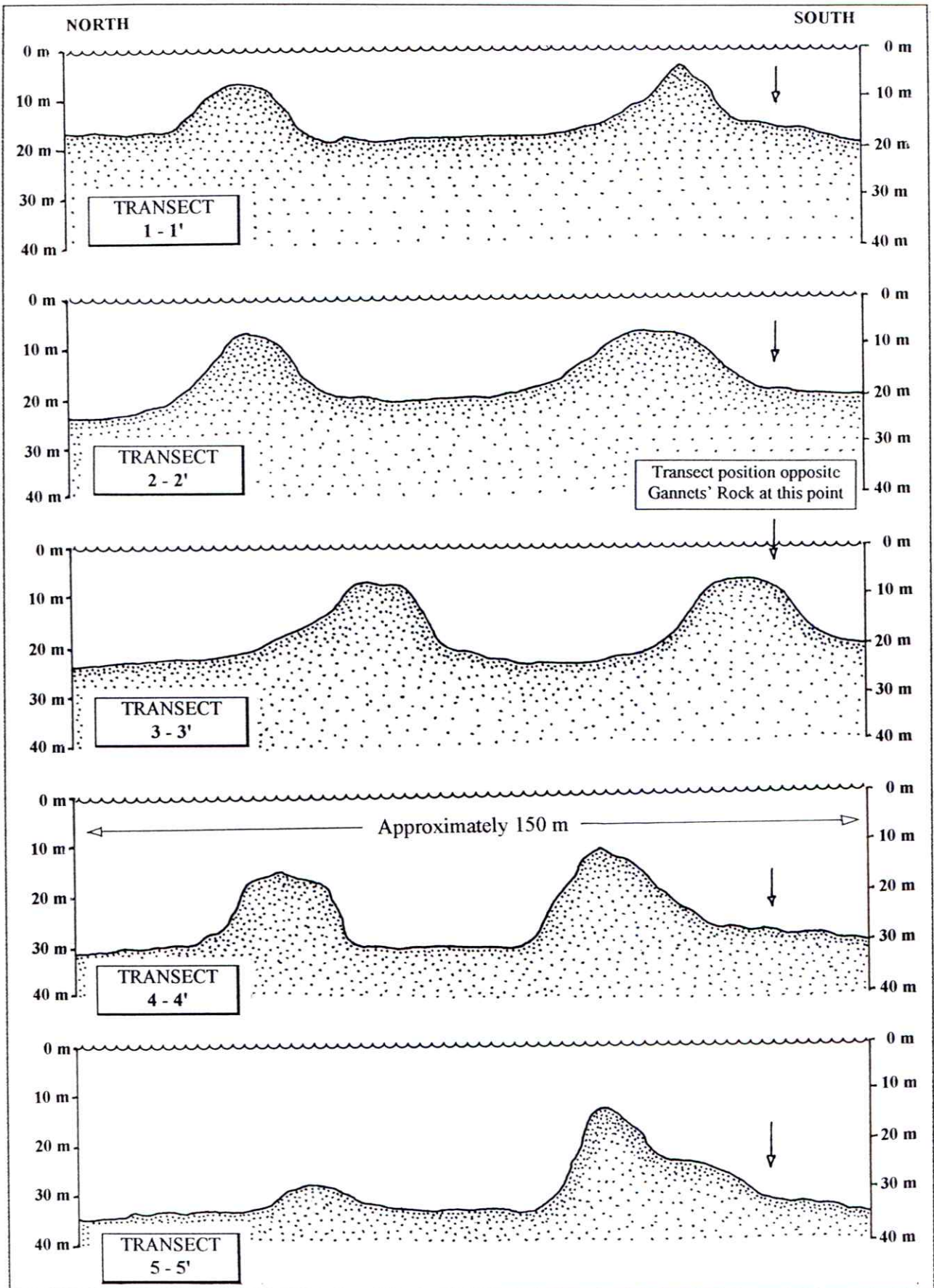


Figure 13. North-south echo sounder transects in the area NE of Gannets' Rock

4. GENERAL CONCLUSIONS

The following conclusions can be made about the successes/failures of the expedition and of the various projects undertaken:-

1. Marine conservation work of this sort can be successfully undertaken by trained volunteer divers, as the Marine Conservation Society has shown in the past. Costs are kept to a minimum and worthwhile results can be obtained if a work programme is agreed which does not require too high levels of technical expertise. As it was, our group included a mix of experienced marine biologists and some newcomers to this sort of diving. Thus the biological surveys could be undertaken by those with most marine biological knowledge; underwater photography by those with expertise in this field; and quadrat work and counts of sea slugs by those who could offer competent diving skills.
2. The 'working holiday' concept seemed to be readily accepted by all members of the group. At the end of the week, it appeared as though everyone had enjoyed the diving (despite not getting to dive all round the island), and had had some fun too. All had 'mucked in' when required, helping to share the chores and taking their own individual project responsibilities seriously.
3. It was estimated that about 70% of the work programme was completed, which is a very satisfactory achievement, if one takes into account the weather, breakdown of equipment and other hazards. Fortunately, the weather allowed the diving programme to be carried out as planned, with the exception of the strong NE winds experienced on the Thursday, when plans had to be changed and dives took place in the lee off the south coast.

5. RECORD OF DAILY ACTIVITIES

Clive Pearce

Saturday, 3rd June

HW: 09.26 hrs (6.6 m) LW: 15.38 hrs (1.8 m)

Overcast with occasional showers, later becoming sunny with a light wind.

Expedition participants met at Bideford Quay at 09.15 hrs and after loading of equipment, personal effects and 4 boats, departed for Lundy at 10.35 hrs, with three of the party only just getting aboard after parking boat trailers. The crossing, which was choppy with a light swell, was completed at 13.00 hrs. The remainder of the day was spent unloading equipment and effects, settling into the Quarters (our accommodation for the week) and preparing for the first day's diving tomorrow. Supper was at 20.15 hrs followed by a showing of slides of Lundy and an outlining of the tasks and aims of the expedition by RI.

Sunday, 4th June

HW: 10.06 hrs (6.4 m) LW: 16.18 hrs (2.0 m)

Wind: W to NW 3-4. Warm and sunny (19°C)

Breakfast at 08.00 hrs. After descent to the Landing Beach, expedition members prepared for diving. During the first day, groups dived at Brazen Ward, the Quarries and Gull Rock. Some dived on the C.16th protected wreck site close to Gull Rock, finding it relatively undisturbed since last inspected. During the afternoon the sea became more lumpy making the loading and unloading of our boats by the small jetty increasingly difficult. Initial observation of sea fans *Eunicella verrucosa* showed little evidence of infiltration by the sea slug *Tritonia nilsodhneri*, but some anemones *Amphianthus dohrnii* were present on some sea fans. Supper was at 20.00 hrs following writing up the logs and checking reference books for species seen during the day. RI gave instructions and advice for the next day on monitoring sea fans *Eunicella verrucosa* and their present state, as well as on the searches for red band fish *Cepola rubescens* and evidence of their burrows.

Monday, 5th June

HW: 10.51 hrs (6.2 m) LW: 17.06 (2.1 m)

Wind: NW to N 2-4. A sunny warm day (21°C) with increasing cloud cover.

Breakfast at 08.00 hrs. After assembling at the Landing beach at 09.15 hrs diving took place at Gull Rock and the Quarries in search for the red band fish and for sea fan mapping using three consecutive 10 m² grids laid out along a 30 m measuring tape. A further dive was on the Gull Rock protected wreck site. Diving went on until 18.45 hrs.

Tuesday, 6th June

HW: 11.46 hrs (6.1 m) LW: 18.06 hrs (2.2 m)

Wind: SW 3. Sea calm. Warm (21°C) with increasing high cloud.

Breakfast at 08.15 hrs. Diving in the morning was on the submerged pinnacle at Gannet's Rock - this was buoyed after relocation. Marine life down to a depth of 32 m was recorded. Others dived the wreck of the 'Iona II' paddle-steamer which sank in c.1860 whilst conveying contraband between Scotland and America during the Civil War there. Others dived the 'Robert', a collier which sank onto its side fully loaded in 1975. Numerous photographs of the anemones and hydroids growing on its structure were taken. By evening there was increasing cloud and the sea state had deteriorated somewhat.

Wednesday, 7th June

HW: 12.51 hrs (6.1 m) LW: 19.15 hrs (2.2 m)

Wind: N to NE 5-6. Early cloud and occasional drizzle gave way to sunny afternoon with a few clouds (19°C). Lumpy sea with a heavy swell by evening.

After Breakfast at 08.00 hrs. expedition members met at the diving beach and set off in the inflatables - one of which (the eponymous *Porcus Niger*) was prone to become swamped and alternatively or reciprocally deflated. One group dived at the Quarries fixing 10 m areas for counting sea fans. A second group dived Brazen Ward to make a random inspection of sea fans there and to ascertain whether any sea slugs *Tritonia nilsodhneri* were on them. The third group dived the pinnacle at Gannet's Rock descending the north side and recording and photographing the species present there - this group included the Warden, Emma Parkes. In the afternoon there was an optional dive made by some to Gull Rock, including Mary Hamilton who had just come over today on the MV Oldenburg. On returning from this dive in the ribbed inflatable, increasing lumpy seas and a freak squall made landing and the unloading of equipment somewhat frenetic and tentative alongside the jetty, since the wind had veered to the NE. Rohan Holt on his departure made a rather hazardous return to the MV Oldenburg still in his dry suit. In the evening all dined out at the Marisco tavern.

Thursday, 8th June

HW: 14.02 hrs (6.2 m) LW: 07.55 hrs (2.1 m)

Wind: NW to N. Sea state moderate. After a somewhat overcast start to the day the weather became warmer (19°C) and sunny.

After assembling at the landing beach following the descent after breakfast, the diving situation was assessed since the wind was veering from N to NNE, promising to make the diving difficult on the east coast of the island. Eventually it was decided that all expedition members would dive off the south coast in the area of the Rattles/Lee Rocks. After difficult launching of the inflatables at the divers' beach, equipment was manhandled over the rocks through the Devil's Kitchen. It was then loaded onto the boats which had come round Surf Point. Diving began at 12.30 hrs when a current had begun to run. The seabed at Lee Rocks was very light with numerous gullies teeming with marine life. The conservation ship "Earthkind" was nearby assisting with a search for seals in some of the sea level caves. After a late lunch back at divers' beach, a group of four made a shore dive in the Devil's Kitchen, whilst others returned to the Quarters to write up logs and reports well into the evening after supper.

Friday, 9th June

HW: 15.09 hrs (6.5 m) LW: 09.05 hrs (1.9 m)

Wind: NW 4. Sea state moderate but choppy at times. An overcast but warm morning (21°C) developing into a sunny afternoon with high fair weather cirrus clouds.

In the morning after the descent to the landing beach, one group dived the wrecks of the 'Iona II' and the 'Robert' - on the latter, areas were scraped clean to observe long-term recolonisation by marine growth and a temperature data logger was attached to monitor sea water temperature changes over a year. The celebrated conger eel, ensconced permanently in a pipe in the ship's funnel was seen by most divers. Many photographs were taken of the marine life on the wrecks. Another group dived at Brazen Ward. After lunch at the divers' beach, one group dived on the Knoll Pins, descending from the pinnacles visible just beneath the surface down the walls to 25 m +. RI, KN & JH dived the Gull Rock protected wreck site. A third group dived at Quarry Beach to continue surveying the growth, distribution and state of sea fans. Diving ended at

18.30 hrs so supper was delayed until 21.00 hrs. After completing logs, reports and research into marine species identifications, packing for the morrow's departure began.

Saturday, 10th June

HW: 16.10 hrs (6.9 m)

LW: 10.09 hrs (1.5 m)

A blustery morning with a force 5 northerly wind promised to make embarkation difficult. The Quarters were vacated by 10.00 hrs and diving equipment was packed at the divers' beach. Whilst waiting to board MV Oldenburg, a visit was made to the South Lighthouse. The vessel left at 15.30 hrs., reaching Ilfracombe at 17.45 hrs. After landing and unloading gear and effects, a coach took most of the group to Bideford to collect their cars, some of which then needed to return to Ilfracombe to load up their gear.

6. BUDGET

INCOME

Individual contributions from volunteers		£1750.00
Less contribution towards MCS overheads (part donation)	- £50.00	
Additional contributions to cover report production		£ 75.00
Grant from English Nature		£ 500.00
Grant from Lundy Field Society		£ 200.00
TOTAL		£2475.00

EXPENDITURE

Accommodation on Lundy (The Quarters) for 1 week	£594.00	
Booking Insurance	£ 15.00	
Return tickets aboard MS <i>Oldenburg</i>	£510.00	
Additional charge for diving gear (@ £5 per person)	£ 75.00	
Insurance cover for JNCC boat/trailer	£159.00	
Office overheads (postage, telephone, fax etc.)	£ 45.75	
Car (+ trailer) petrol/parking costs	£ 38.47	
Food	£622.78	
Survey equipment	£ 25.00	
Boat fuel + engine oil	£115.00	
Diving air	£125.00	
Report production costs (30 copies)	£150.00	
TOTAL	£2475.00	

LOAN OF EQUIPMENT

The following items were kindly loaned for the duration of the expedition:

- Zodiac 4.5 m inflatable + 40 hp outboard + trailer [from MNCR, JNCC, Peterborough]
- 2 waterproof hand-held radios + chargers [from MNCR, JNCC, Peterborough]
- 4 diving air cylinders [from the Maritime Team, English Nature, Peterborough]
- Hand-held Magellan GPS unit [English Nature/Sussex *SEARESEARCH* project]

7. ACKNOWLEDGEMENTS

The members of the expedition would like to thank the following:-

- Philip Robertson, for the loan of two boats during our stay, hours of boat handling and his general helpfulness;
- John Heath, for his expertise and knowledge of the Gull Rock wreck site;
- Emma Parkes, warden on Lundy, for advice, expertise and helpfulness;
- The Captain, Roger Hoad, and crew of the MS *Oldenburg*;
- all the other Lundy residents who run the tavern, shop and maintain the island;
- Dan Laffoley, Sandy Downie and Paul Gilliland of English Nature's Maritime Team for advice and financial assistance;
- Lundy Field Society Grants Committee, for the award of a grant to the expedition;
- David Connor, Head of JNCC's MNCR team, for the loan of their Zodiac boat & radios.

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APPENDIX 1 DIVE TIMETABLE

SITE	Gannet's Rock	Gannet's Bay & SE Gannet's Bay	Brazen Ward	Knoll Pins	'Tona II' MV 'Robert,	Gull Rock wreck site	Gull Rock	S. of Gull Rock / Halfway Wall Bay	N. Quarries	Devil's Kitchen Gullies	Lee Rocks / S. of The Rattles	?N. Quarries / Gannet's Rock
PURPOSE	Mapping / Look-see	RBF searches / Seasearch	Look-see / sea fans & sea slug counts	Look-see	Recording / Look-see	Recording / Look-see	Sea fans & sea slug counts	RBF searches	Sea fans & sea slug counts	Look-see	Seasearch	RBF searches
Sun. 4th (a.m.)			LS/TH CD/PB RH/CP				CD/PB VS/DN PB/CD		VS/DN RI/KN CA/CM KM/DM			
(p.m.)			CA/CM RI/KN KM/DM			LS/TH CD/PB RH/CP JH/PR						
Mon. 5th (a.m.)		KM/CM DM/CA TH/CP					CD/PB VS/DN					
(p.m.)						RI/RH			DM/CA CD/PB VS/DN			LS/TH KM/CM ?KN
Tues. 6th (a.m.)	RI/CP KN/CA	KM/VS PB/CM				RH/JH DM/PR LS/TH CD/DN						
(p.m.)												
Wed. 7th (a.m.)	RH/CM LS/VS RI/EP DN/TH	DM/CA KM/KN										
(p.m.)								CM/PB VS/DN				
Thurs. 8th										KM VS		
Fri. 9th (a.m.)			RI/KN/EP MH/CA			RI/KN/JH						
(p.m.)			PB/DM VS/DN LS/CMcT/KM									
CA	Carol Aldridge	PB	Paul Biggin	CD	Cath Downie	MH	Mary Hamilton	RH	Rohan Holt	JH	John Heath	
TH	Tony Hunt	RI	Robert Irving	CMcT	Chris McTernan	KM	Kevin Morgan	DM	David Moss	KN	Kate Northen	
DN	David Newton	EP	Emma Parkes	CP	Clive Pearce	PR	Philip Robertson	LS	Leona Shepherd	VS	Val Shepherd	

SEA FAN RECORDING FORM

APPENDIX 2

DAY:

DATE:

RECORDER:

LOCATION: (GPS) Lat.

Long.

In words:

No.	Height (cm)	Max. Width (cm)	Condition: 1: > 80% weed 2: 20-50% weed 3: 50-20% weed 4: < 20% weed 5: <5% / pristine	No. of slugs	No. of egg masses	Other notes
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
TOTALS						

APPENDIX 3

RED BAND FISH SURVEY FORM

DIVERS:	
DATE:	
SITE:	
START POSITION:	END POSITION:
APPROX. DIRECTION OF SWIMLINE:	
DEPTH PROFILE:	
OBSERVATIONS - SIGHTINGS OF RED BAND FISH AND/OR BURROWS:-	

Locations of places mentioned
in the text of this report

