

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

22-29 JUNE 1996

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SYNOPSIS

During a week long visit to Lundy from 22-29 June 1996, a party of eight 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 (Peterborough), the country agency responsible for the management of the MNR, and the warden, Ms Emma Parkes.

The eight divers were of mixed diving experience (though all were of sports diver grade or above) and of mixed marine biological expertise. This trip was organised as part working party and part holiday by Robert Irving. 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 (the sheltered side of the island). Diving operations were carried out from a large (5.0 m) inflatable (kindly lent to the expedition by English Nature) and a smaller 3.8 m inflatable (kindly lent by SE Group, Marine Conservation Society). Unfortunately, our visit coincided with a plankton bloom (dominated by the biflagellate *Phaeocystis*) which severely reduced the underwater visibility to around a maximum of 3 m, hampering some of our observational tasks.

The projects undertaken by the group included continuing the recording of sea fans *Eunicella verrucosa* off the island's east coast (begun in 1995); assessing the impact of lobster/crab pots on the west coast benthos; the recovery of a data logger from the wreck of the MV *Robert*; a sea bed litter survey of the Landing Bay; re-photographing cirralittoral communities at the Knoll Pins 'cave'; and noting the maximum depth limits of kelp and foliose algae at the Knoll Pins.



A pair of mating sea slugs *Polycera quadrilineata* on silt-covered bryozoan turf on the wreck of the MV *Robert*.

Photograph: Robert Irving

CONTENTS

	Page No.
1. INTRODUCTION	1
2. PREPARATION	2
2.1 Logistics	2
2.2 Personnel	2
2.3 Projects	3
2.4 Funding	3
3. RESULTS	5
3.1 Continuation of mapping the distribution of sea fans off the east (& west) coasts and counts of the nudibranch <i>Tritonia nilsodnheri</i> on sea fans. By Tony Hunt	5
3.2 Assessing the impact of lobster/crab pots on the west coast benthos. By Lucy Conway	14
3.3 Recovery of data logger from the wreck of the MV <i>Robert</i> . By Robert Irving	18
3.4 Benthic litter survey of the Landing Bay By Jenni Fleming	19
3.5 Re-photographing circalittoral communities at the Knoll Pins 'cave' By Robert Irving	21
3.6 Checking algal depth limits at the Knoll Pins. By Tony Hunt.	23
3.7 Notes on drift dives in Halfway Wall Bay By Robert Irving & Tony Hunt	25
4. GENERAL CONCLUSION	26
5. RECORD OF DAILY ACTIVITIES	27
6. BUDGET	30
7. ACKNOWLEDGEMENTS	31
8. REFERENCES	31
APPENDIX 1: DIVE TIMETABLE	
APPENDIX 2: SEA FAN RECORDING FORM	
APPENDIX 3: CATERING TIPS & MENUS	

1. INTRODUCTION

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

The objectives of this Marine Conservation Society (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. The tasks, as set out below, had been agreed by Dr Paul Gilliland of English Nature's Maritime Team (based in Peterborough) and by the Warden of the MNR, Emma Parkes.

- **Continuation of mapping the distribution of sea fans *Eunicella verrucosa* off the east (& west) coasts and counts of the nudibranch *Tritonia nilsodnheri* on sea fans.** The northern and southern limits of the distribution of sea fans to be noted off the east coast and their density measured. Exploratory dives off the west coast to note their presence/absence. Numbers of the nudibranch *Tritonia nilsodnheri* (and/or their egg masses) on the sea fans to be counted.
- **Assessing the impact of lobster/crab pots on the west coast benthos.** This would depend on access to the west coast and whether strings of pots were present.
- **Recovery of data logger from the wreck of the MV *Robert*.** A temperature data logger was positioned by the MCS Working Party last June at a depth of 23 m below chart datum, and was due to be recovered (and its data downloaded) after 12 months.
- **Benthic litter survey of the Landing Bay.** Requested by English Nature personnel. To see if there was any evidence of items being thrown overboard from boats moored in the Landing Bay.
- **Re-photographing circalittoral communities at the Knoll Pins 'cave'.** Continuation of photographic monitoring of cup coral communities which was started in 1983.
- **Checking algal depth limits at the Knoll Pins.** Checking the maximum depth limits of kelp and red foliose algae at this site, as has been done in the past.

The week was advertised as being a 'working holiday', so as well as dives involving certain conservation tasks there were also a number of 'fun' dives, where individuals could take photographs or simply enjoy the underwater scenery (there's usually precious little time to do this on 'work' dives!). Participants were all members of the Marine Conservation Society and each had made a contribution towards the cost of the expedition. Costs were kept to within reasonable limits by generous grants from English Nature and the Lundy Field Society (see section 2.4).

2. PREPARATION

2.1 Logistics

The Quarters accommodation on the island is the usual place in which large parties of divers stay. However, a delay in making arrangements to book this (due to uncertainties over the eventual size of our group) with the Landmark Trust, meant that alternative accommodation had to be found. In the end we decided to stay in Millcombe House. This is more expensive than the Quarters, but has a number of advantages. It is very well appointed; it takes eight people comfortably (there was space for a further four); and, perhaps most importantly, there is less of a climb to reach it from the Divers' Beach! The Landmark Trust require a one third deposit for the rent of the property to be paid upon booking, with the remainder due three months in advance. Consequently, expedition members were asked to make their contributions in good time.

By the time of our visit it was hoped that the MNR warden would have had a new rigid-hull inflatable boat (RIB), supplied by English Nature, to have lent us. However, whilst the boat had been delivered, it was found to be of the wrong specifications and could not be used. We therefore had to make alternative arrangements at the last minute. English Nature's Maritime Team kindly agreed to lend us their large inflatable boat plus 55 hp outboard, which they had based at their office near Wareham in Dorset. This boat was transported on its own trailer. Another inflatable and 40 hp outboard, belonging to the South-East Region of the Marine Conservation Society (SE MCS), was kindly lent for the expedition. This boat could fit into the back of an estate car.

Vehicles were left in Bideford (at either public or private car parks) prior to sailing. Annoyingly, at the end of the week, the *Oldenburg* sailed back to Ilfracombe. The Landmark Trust laid on a coach to take visitors back to Bideford, into which all of our luggage was piled (including diving gear). Ian Knight had brought the boat trailer up from Bideford to Ilfracombe which meant that the large inflatable boat could be lifted straight from the deck of the *Oldenburg* directly onto the trailer on the quayside.

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.

Name	Address	Diving Qualification	No. of dives	Boat handling
Miles Brown	Stoke Mandeville, Buckinghamshire	BSAC Sports	~ 40	✓
Lucy Conway	Cambridge, Cambridgeshire	BSAC Dive Leader	~ 150	✓
Jenni Fleming	London, SW17	BSAC Advanced	~ 350	
Sue Fuller	London, SW17	BSAC Advanced	600+	
Tony Hunt	West Hoathly, West Sussex	SAA Dive Leader	700+	✓
Robert Irving	Coldwaltham, West Sussex	BSAC Advanced	~ 700	✓
Mick Quickfall	Redditch, Worcestershire	BSAC Dive Leader	~ 220	
Kath Thorpe	Redditch, Worcestershire	BSAC Advanced	~ 300	✓

Table 2.2.1 Participants in the expedition working party

Each member of the group was given a 'domestic' task to oversee during the length of our stay on the island. These are set out in Table 2.2.2.

Name	Responsibility
Sue Fuller	catering (food purchasing, menus & evening meals)
Jenni Fleming	catering (food purchasing, menus & evening meals)
Mick Quickfall	tank filling (compressor) & boat fuel
Kath Thorpe	tank filling (compressor) & dive log
Robert Irving	work programme; breakfasts
Miles Brown	equipment; diary; breakfasts
Lucy Conway	breakfasts
Tony Hunt	breakfasts

Table 2.2.2 Individual domestic responsibilities

Sue and Jenni (*i/c* catering) had to prepare menus and order food from the Shop well in advance of our arrival on the island (approx. 10 days) - see also Appendix 3. However, difficulties were encountered as two thirds faxed food order were lost in the ether somewhere, so very little of the order had been made up by the time we arrived. Mick and Kath kindly volunteered their services as compressor operators for the whole week (honestly!). The compressor was sited in the farmyard on the top of the island, so empty tanks had to be taken up to the top at the end of each diving day (and occasionally at lunchtime), with full ones being brought down to the Divers' Beach the following morning. Emma Parkes kindly helped with this by ferrying the cylinders from A to B and back again in the back of the island's Land Rover. The remaining four members of the group shared breakfast preparation and other sundry tasks.

2.3 Projects

Table 2.3 sets out the projects which were agreed with English Nature and Emma Parkes (the MNR Warden) prior to our departure. Certain individuals within the group were asked to oversee these and to be responsible for writing them up afterwards.

No.	Project	<i>i/c</i>
1	Sea fan survey & counts of <i>Tritonia nilsodhneri</i>	Tony Hunt
2	Impact of potting on west coast benthos	Lucy Conway
3	Sea bed litter survey within the Landing Bay	Jenni Fleming
4	Retrieval of data logger from the MV <i>Robert</i>	Robert Irving
5	Re-photography of Knoll Pins cave community	Robert Irving
6	Algal limits at the Knoll Pins	Tony Hunt

Table 2.3 Diving projects undertaken by the group.

2.4 Funding

Personal contributions provided the bulk of the funding for the expedition (see section 6). In addition, grant applications were made to English Nature (resulting in an award of £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.



The team: (back row, left to right) Mick Quickfall, Tony Hunt, Robert Irving, Sue Fuller & Lucy Conway; (front row, left to right) Miles Brown, Jenni Fleming & Kath Thorpe

3. RESULTS

3.1 Continuation of mapping the distribution of sea fans off the east (& west) coasts and counts of the nudibranch *Tritonia nilsodhneri* on sea fans

Co-ordinator: Tony Hunt

3.1.1 Introduction

The sea fan survey carried out during June 1996 was a continuation of a previous survey that had been conducted a year earlier during the MCS Working Party visit to Lundy in June 1995 (Irving 1995). The same methodology was adopted with the principal objective of extending the geographical area covered, and the survey quadrats were therefore laid to the north and to the south of the 1995 area. A secondary objective was to observe and record the condition of sea fans elsewhere during the course of dives for other purposes. A comparison of the condition of the sea fans was made with that recorded from the previous year.

3.1.2 Aims

The general aims of the survey were the same as for the survey in June 1995:-

- i) To assess the extent and density of populations of sea fans *Eunicella verrucosa* off the east coast of the island.
- ii) To check the condition of the sea fans.
- iii) To search for the small cryptic nudibranch *Tritonia nilsodhneri*, which lives and feeds on *E. verrucosa*.

3.1.3 Methods

The methods adopted for the detailed survey were the same as those utilised in the June 1995 survey and are fully described in the report of that work (Irving 1995). In brief, the technique was for divers to lay a 30 m transect line along the sea bed in a north/south direction, generally along the interface between the boulder and sediment substrates, at a depth of about 18-20 m below sea level. A further line was then laid on the landward side of the transect to mark out a 10 m x 10 m quadrat at one end and this was fully surveyed (visually) by a pair of divers. The line was then moved along the transect to mark out another 100 m² quadrat which was also surveyed. Finally the line was moved to the other end of the 30m transect in order to survey the third contiguous quadrat. The divers recorded their observations and measurements under water using slates and pencils.

In addition to the detailed survey, a record was made of the observations of sea fans during the course of dives for other purposes. These observations are useful for confirming the presence of sea fans in other areas and assessing their condition. However, since no quadrats were laid for these dives, no quantitative measurement of population density can be made.

Accurate mapping of the location of individual fans was not undertaken.

Fig. 3.1.1 Areas Surveyed

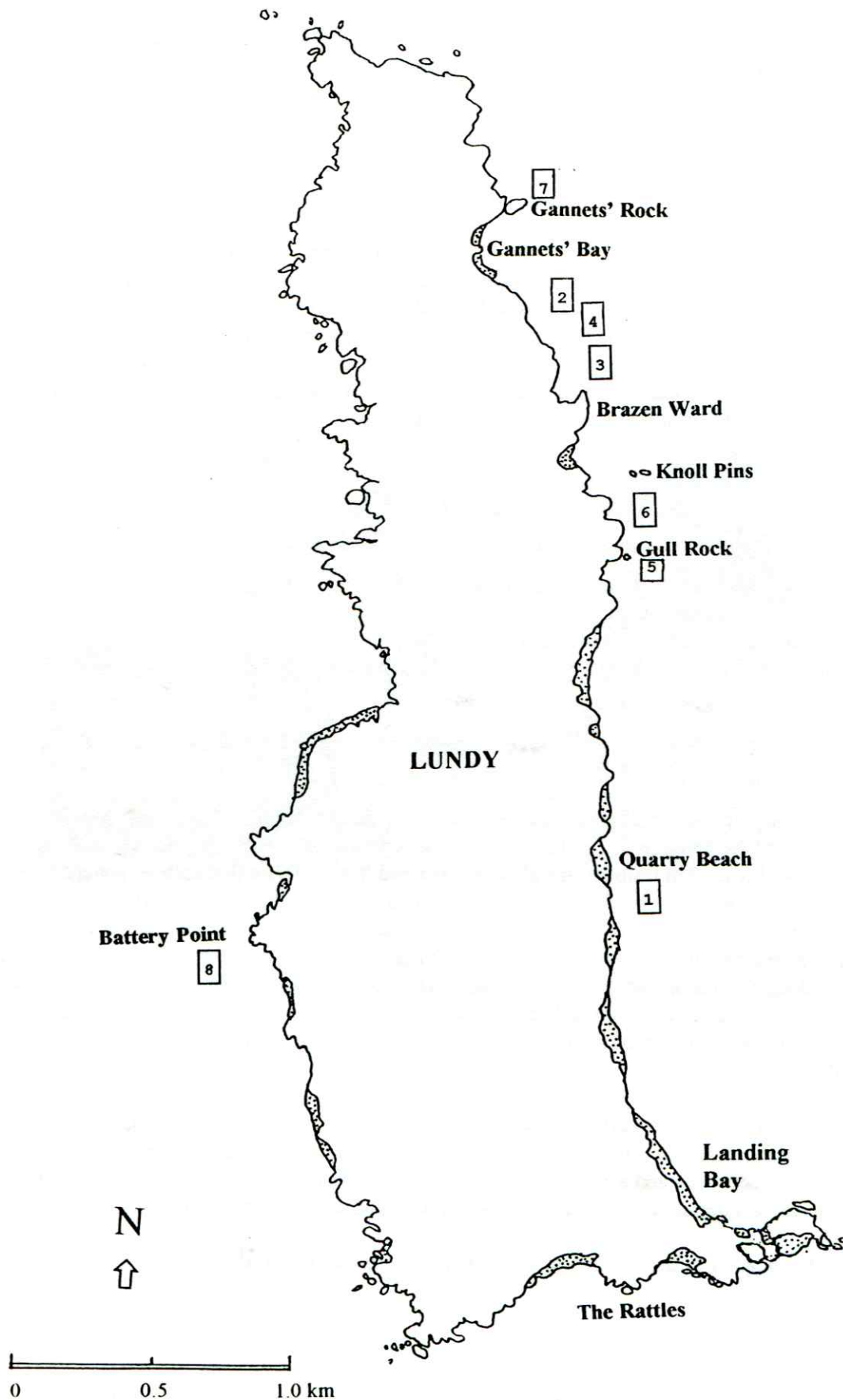
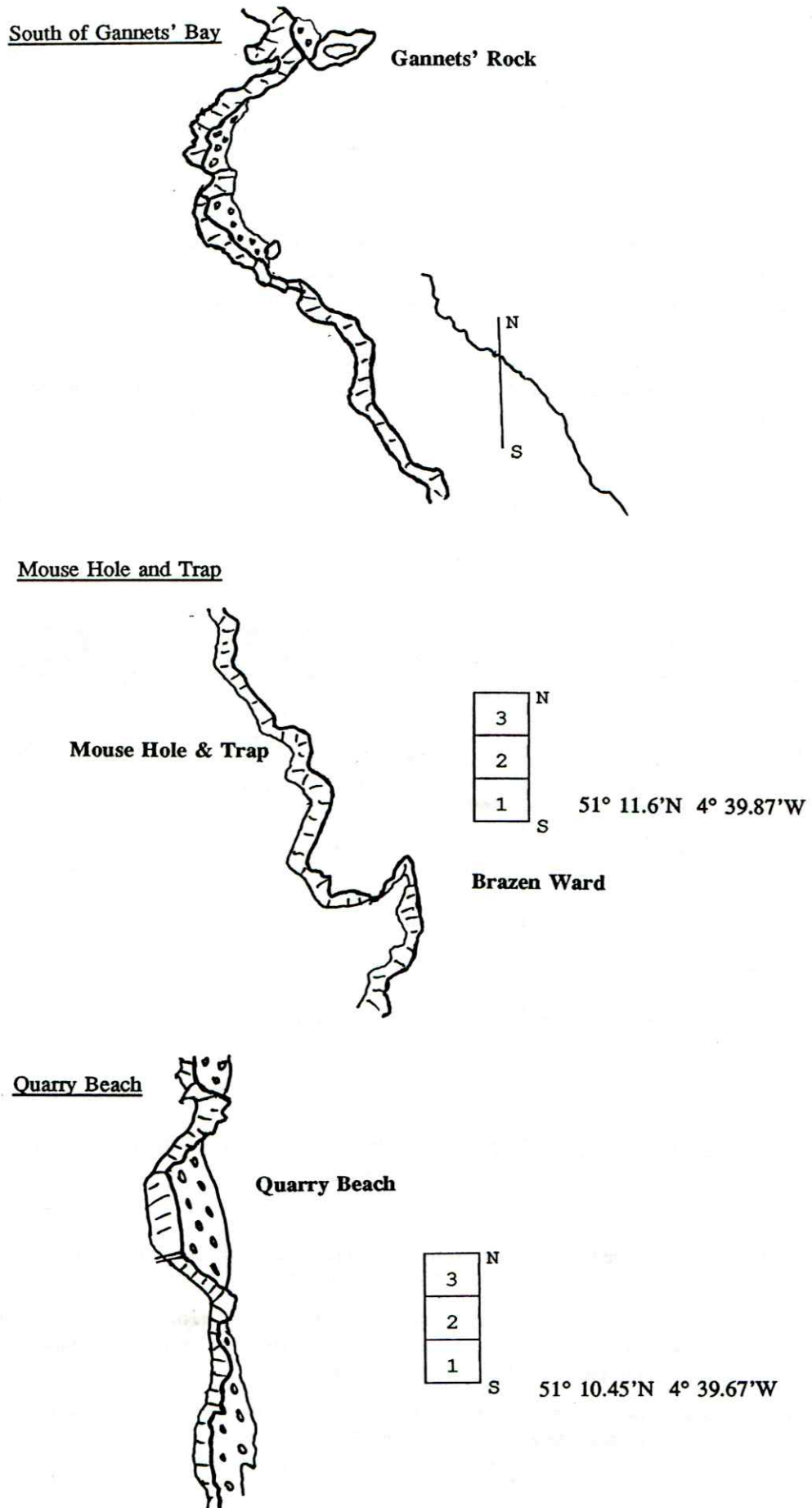


Fig. 3.1.2 Location of survey transects



3.1.4 Results

A. Transect Sites

In the 1995 survey, 46 sea fans were observed in the area off the Quarries, though this figure is by no means comprehensive - there are likely to be more present than were recorded. Areas to the south of Quarry Beach and to the north of Brazen Ward were not surveyed, so the extent of the distribution of sea fans in these areas was not determined. The verification of the limits of distribution was therefore one of the main tasks of the work in 1996. No sea fans were observed along the initial transect laid somewhat to the south of Quarry Beach. It is here that the boulder slope peters out, giving way to silty sediments. This result suggests that the southerly limit for sea fans for this stretch of coast lies in this area just south of Quarry Beach.

Similarly, very few sea fans were observed along the transect south of Gannets' Bay, indicating a northerly limit for the continuous presence of sea fans towards Gannets' Bay. (However, sea fans were observed on the section of coast north of Gannets' Rock during the 1995 survey).

At the Mouse Hole & Trap, the results are approximately comparable with those for the nearby site of Brazen Ward in the 1995 survey.

Table 3.1.1 provides a summary of the results for the three transect sites:-

	Quarry Beach ¹	South of Gannets' Bay ²	Mouse Hole & Trap ³
N ^o of fans inspected	0	2	19
Mean density of fans	0	2/100m ²	6.3/100m ²
Mean height (min/max)	-	22cm (18-26)	25.4 (8-57)
Mean width (min/max)	-	7cm (4-18)	23.7 (4-40)
Mean condition score*	-	5	4.2
N ^o of fans with <i>T. nilsodhneri</i> and/or egg masses (N ^o /%)	0 0	1 50%	12 37%

Table 3.1.1. Comparison of sea fans from the three East Coast Transect Sites

Notes

* Condition Score

1 = > 80% cover of weeds etc.	2 = 80% to 50% cover	3 = 50% to 20% cover
4 = < 20% cover	5 = < 5% / pristine	

1. All three quadrats were surveyed and no sea fans were found. The substrate was rocky with foliose red algae at a depth of 16.5 m. (See Fig. 3.1.2 on previous page)
2. The transect was laid from north to south and was mostly on a substrate of boulders with foliose red algae with no sea fans present. Two sea fans only were observed at the northern end near the boulder/sediment interface. (See Fig. 3.1.2 on previous page)
3. The mean density in the summary table does not adequately describe the distribution. In the most southerly quadrat no sea fans were found, in the centre quadrat there were 6 and in the most northerly quadrat there were 19 sea fans. (See Fig. 3.1.2 on previous page)

B Other Sites

The observations for Brazen Ward compare well with those of the 1995 survey both with regard to mean size and condition score. The Gull Rock observations also compare well with those of 1995, although the mean size observed is roughly 30% smaller. Tibbetts Point was not specifically surveyed in 1995 but the site is close to Gull Rock. The 1996 observations at Tibbetts Point are generally similar to those for Gull Rock in 1995.

The Gannets' Rock sea fans are not significantly different in size to those at other sites but they do display the worst condition score of any site recorded in 1996. The site dived in 1996 was the pinnacle itself and is not comparable with the 1995 record for Gannets' Rock, that site being NNW of Gannets' Rock.

The sea fans noted on the west coast dives were generally large in size and displayed the usual condition (mean condition score of 4). Interestingly, a white specimen of *Eunicella verrucosa* was observed growing from the side of a gully at 17 m (below chart datum) off Battery Point (51° 10.27'N 4° 41.07'W) - see Plate 3.1.4. Such specimens are rare, though this particular one has been noted before.

Table 3.1.2. provides a summary of the results for the other sites:-

	Brazen Ward to the south of Gannets' Bay ⁴	Gull Rock ³	Tibbetts Point ⁶	Gannets' Rock ⁷
N° of fans inspected	51	25	13	7
N° of divers reporting [†]	7	2	2	1
Mean height (min/max)	22.7cm (4-70)	18.5cm (2-40)	32.8cm (20-54)	24cm (12-38)
Mean width (min/max)	22.3cm (2-50)	17.9cm (1-38)	25.2cm (14-40)	29.4cm (16-40)
Mean condition score [*]	4	3.9	4.5	3.1
N° of fans with <i>T. nilsodhneri</i> and/or egg masses (N°/%)	8 16%	3 12%	3 23%	0 0

Table 3.1.2. Comparison of sea fans from the other East Coast Sites

	Battery Point ⁸
N° of fans inspected	16
N° of divers reporting [†]	4
Mean height (min/max)	28.3cm (20-40)
Mean width (min/max)	31.5cm (3-50)
Mean condition score [*]	4
N° of fans with <i>T. nilsodhneri</i> and/or egg masses (N°/%)	0 0

Table 3.1.3. Comparison of sea fans from the West Coast Sites

[see overleaf for notes on Table 3]

Notes

† Mean Density of Sea Fans

For the other sites, where no quadrats were laid, it is not possible to quantify accurately the population density of the sea fans. However the number of divers making observation reports has been recorded. The divers surveyed in pairs with a dive generally lasting at least 30 minutes. There is no record of the area surveyed during these dives, but the number of divers making reports does serve as a rough relative measure to place the number of sea fans inspected in context.

4. This record represents 4 dives at various sites between Brazen Ward and the south end of Gannets' Bay.
5. This record is from 1 dive and combines the observations of both the divers.
6. This record is from 1 dive and combines the observations of both the divers.
7. This record is from 1 dive. All the observations were recorded by one diver.
8. This record represents 3 dives at slightly different sites off Battery Point.

3.1.5 Condition of the sea fans at all sites

The condition score as a mean of all the records at all sites was 4.0. The observations during the 1995 survey produced a similar mean condition score (ranging from 3.9 to 4.1 at various sites). The various species noted as being attached to the fans were also similar and included various algae, hydroids, bryozoans, and also the sponge *Leucosolenia*, the soft coral *Alcyonium digitatum* and the egg capsules of the dogfish *Scyliorhinus canicula* (commonly known as mermaid's purses). There was one record of the rare anthozoan *Amphianthus dohrnii*, typically found on *Eunicella*, in south Gannets' Bay, as there had been in 1995.

However, unlike 1995, there were several sightings of the small, cryptic nudibranch *Tritonia nilsodhneri* and its egg masses off the east coast. In all, 28 slugs and 13 egg masses were recorded and the number of sea fans affected ranged from 12% to 37% on those sites where *T. nilsodhneri* was found.

The spread of condition scores at the various sites is as follows:-

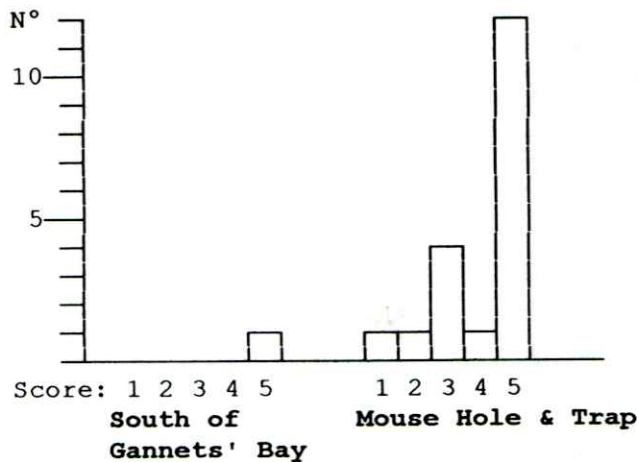


Fig. 3.1.3 Distribution of Condition Scores at the Transect Sites

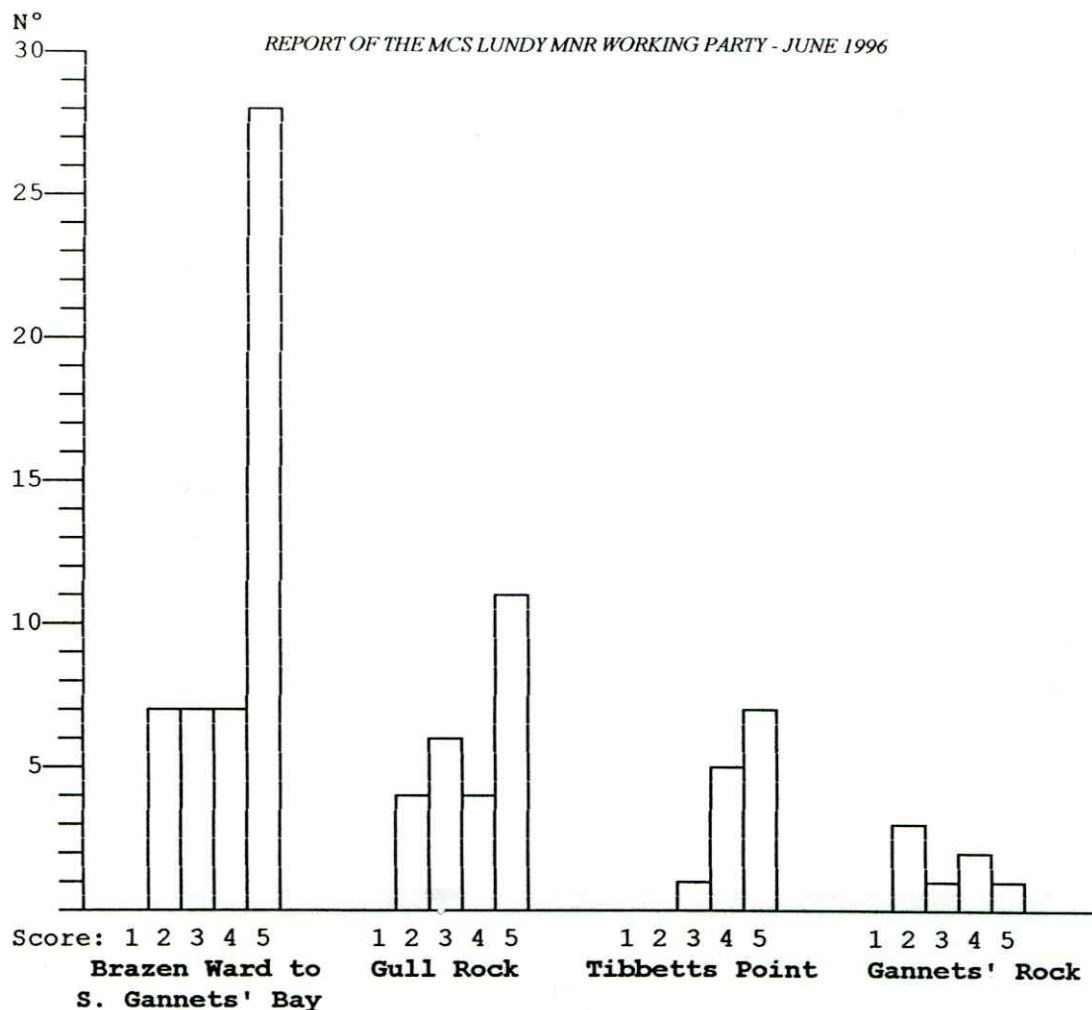


Fig. 3.1.4 Distribution of Condition Scores at the Other East Coast Sites

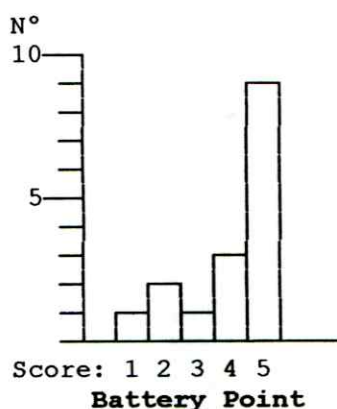


Fig. 3.1.5 Distribution of Condition Scores at the West Coast Sites

3.1.6 Conclusions

The survey established the limits of distribution of the sea fans along the central portion of the east coast. A comparison of the distribution, size and condition of the sea fans at similar sites to those of the survey of the previous year showed that there had been no significant changes.

The presence of the sea anemone *Amphianthus dohrnii*, which had been observed in 1995, was confirmed. A population of *Tritonia nilsodhneri* was observed although none had been seen in 1995. The number of sea fans supporting *Tritonia nilsodhneri* ranged from 12% to 37% at various sites and was 19% overall for the east coast sites. This is comparable with the population densities noted in some previous years.

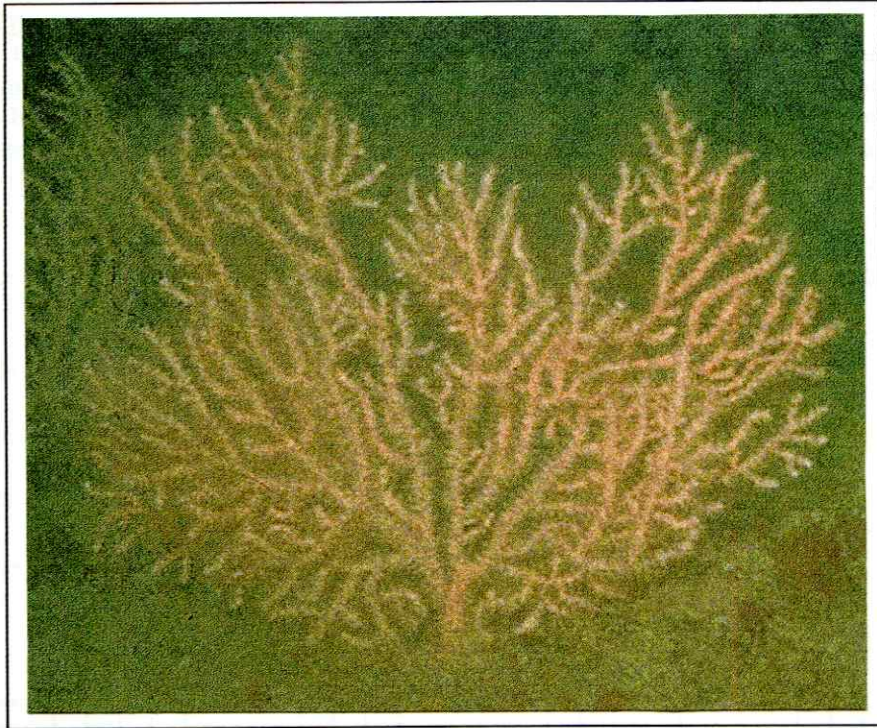


Plate 3.1.1. Large specimen of *Eunicella verrucosa* (approx. 50 cm wide) with a condition score of 5 (= <5% cover by drift weed). Photograph: Robert Irving



Plate 3.1.2 Close-up of branches of *Eunicella verrucosa* showing the nudibranch *Tritonia nilsodhneri* bottom left
Photograph: Jenni Fleming



Plate 3.1.3 Close-up of branches of *Eunicella verrucosa* entangled by other material (condition score: 3).
Photograph: Jenni Fleming



Plate 3.1.4 A rarely-seen white specimen of *Eunicella verrucosa* photographed in a gully off the west coast near Battery Point.
Photograph: Robert Irving

3.2 Assessing the impact of lobster/crab pots on the west coast benthos.

Co-ordinator: Lucy Conway

Introduction

The aim of this study was to determine the extent of damage resulting from lobster pot deployment on the west coast of Lundy. However, it should be noted that the time available to do this study was limited and that consequently it was incomplete - little, if any, conclusion can be derived from the findings. A more comprehensive study of this problem has recently been carried out with EU funding by EN, CCW & JNCC.

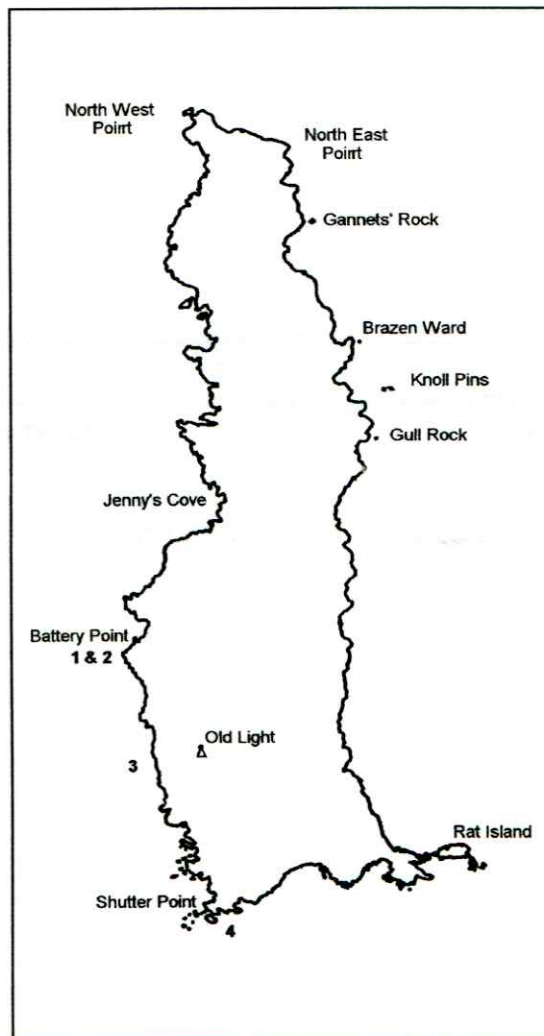


Figure 3.2.1. Location of the dives investigating the impact of lobster pots off the west coast of Lundy. Dive numbers (1-4) shown in bold.

Methods

A total of four dives investigating lobster pot damage were made along the west coast (Fig 3.2.1). Observations were made of the seabed type and the vulnerable marine life in the area as well as the number of pots investigated and the extent of damage they had caused. This information, together with the exact location of the sites has been recorded in Table 3.2.1.

Results

Table 3.2.1. Details of the dives investigating the impact of lobster pots off the west coast.

Dive no.	Date	Divers	Site location	Site coordinates	Sea floor type	Depth (bod)	No. of pots inspected	Extent of damage	Other marine life	Notes
1	25.6.96	R/MB	Battery Point	51° 10.27'N 4° 41.07'W	Horizontal, level slabs of bedrock, with gullies.	14 m	1	No obvious damage.	Several large sea fans 2m from pot on sides of gully; also delicate <i>Pentapora foliacea</i> colonies on horizontal surfaces.	End pot of a line of several, though only this one was inspected. Poor viz. (< 3 m).
2	25.6.96	KT/MQ	Battery Point	51° 10.07'N 4° 41.04'W	Large boulders, horizontal surfaces colonised.	20-23 m	2	<i>Axinella</i> sp. crushed by first pot, 10% of a <i>P. foliacea</i> broken away by second pot.	<i>Eunicella verrucosa</i> , branching sponges, large colonies of <i>P. foliacea</i> and scattered <i>Caryophyllia smithii</i> .	
3	27.6.96	TH/MB	Old Light	51° 09.76'N 4° 40.78'W	Large boulders on sand.	20-23 m	7	Broken top of <i>P. foliacea</i> adjacent to pot one; broken <i>P. foliacea</i> nearby to second pot. No other damage.	Regular clumps of <i>P. foliacea</i> .	See diagram (Fig. 3.2.2)
4	27.6.96	LC/RI/ MQ	Shutter Point	51° 09.42'N 4° 40.15'W	Large boulders on fine sand.	13 m	1	No damage observed.	Moderate kelp coverage.	Appeared to be an empty store pot.

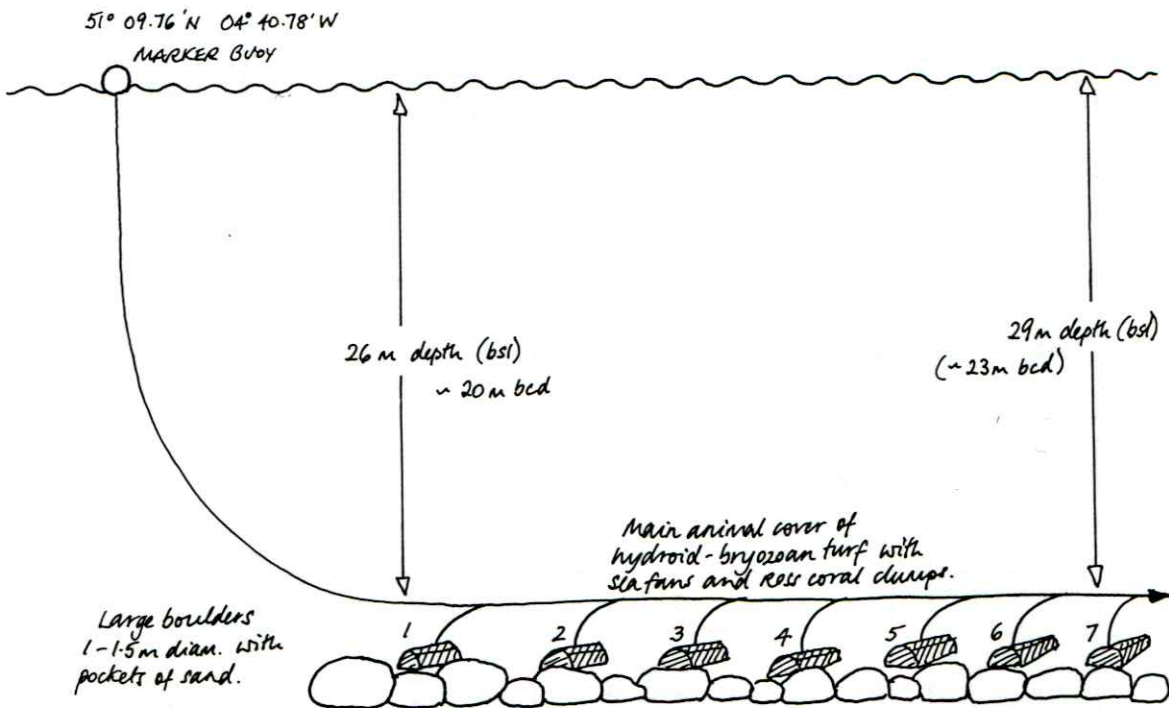


Fig. 3.2.2 Sea bed profile off the Old Light, with string of pots (after original sketch by Tony Hunt)

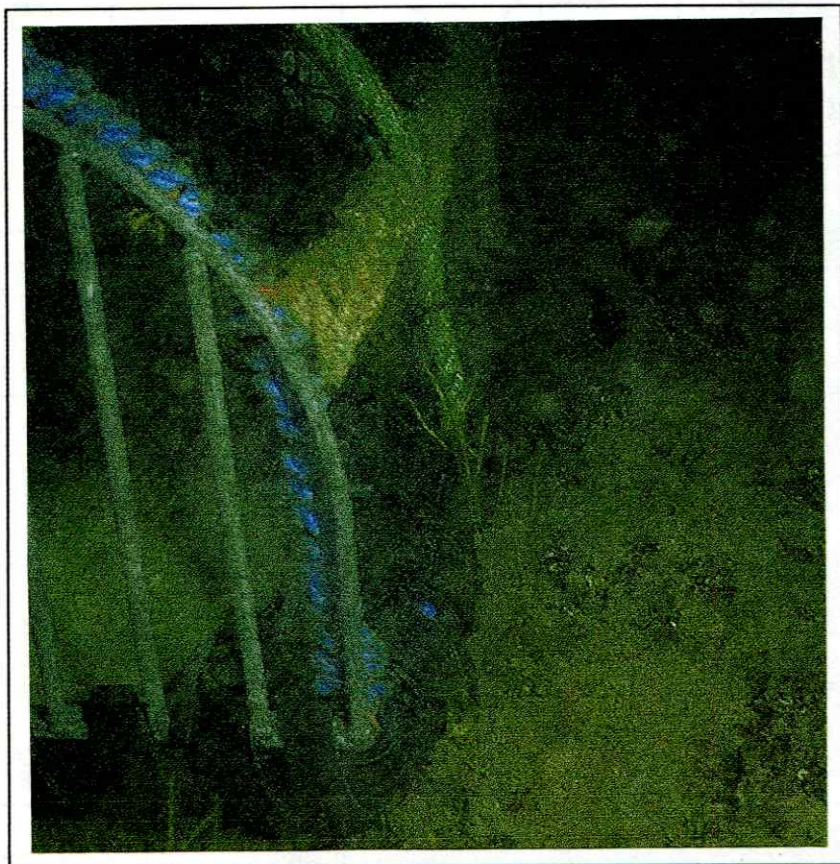


Plate 3.2.1 Large empty pot in shallow water off Shutter Point, showing little if any damage to surrounding attached organisms. Photograph: Robert Irving

Conclusions

A general assumption was made by divers participating in this study that damage to individual organisms in the close vicinity of a pot (i.e. within 0.5 m or so) was probably caused by the deployment of that pot. As the actual deployment was not witnessed, this may not have been true, though it is usually possible to assess whether pieces of the brittle bryozoan *Pentapora foliacea* (also known as Ross coral) have recently been broken off or have been lying on the sea bed for some time.

Although the extent of damage recorded from the vicinity of the eleven pots examined was not great, observations made of nearby species indicates the potential for further injury to occur on subsequent deployments. For example, it was noted in dive number 2 that two of the four *Eunicella verrucosa* sea fans growing near to a pot had been broken. Whilst the damage could not be directly attributable to the setting of crab/lobster pots, the presence of this species, together with various erect sponges and colonies of *Pentapora foliacea*, suggests they could be vulnerable to future potting activity.

At present a 'no-potting zone' exists on the east coast of Lundy stretching from Rat Island in the south up to as far as the Knoll Pins. This exclusion zone is adhered to by the potting boats, largely because they rarely fish this section of the coast. However, the landward limit of this zone does not abut the shore: there is a band (100 m wide) within which pots may still be sunk. This is so that store pots may be kept here. Ironically, this band includes the sloping sea bed of boulders where large numbers of sea fans are found.

Regular counts have been made over the last couple of years of lobster pot strings around the remainder of the island. However, these strings cannot always be seen from the top of the cliffs and there is also no way of telling how many pots there are on any one string. The Devon Sea Fisheries Committee have recently started keeping a clear record of who is potting around Lundy, exactly what gear is being put down and the catches being made. Monitoring such as this tells us to what degree potting is taking place but provides no information as to the damage occurring on the seabed.

It would appear from observations made during this study that vulnerable species, such as *Eunicella verrucosa* and *Pentapora foliacea*, frequently occur off the west coast of Lundy, but a more detailed biological survey of this area is required to verify this. Information gained from such a survey could possibly be used to relocate the boundaries of the no-potting zone to include sensitive areas on both the west and east coasts of the island.

3.3 Recovery of data logger from the wreck of the MV *Robert*.

Co-ordinator: Robert Irving

Introduction

On 9th June 1995, a 'Tinytalk' automatic data logger (measuring variations in sea water temperature), supplied by English Nature, was tied in place by two MCS divers on the port side fore'd stairway of the wreck of the MV *Robert*. A diagram giving its position was reproduced in Irving (1995). It was positioned in such a way so as to hide it from other divers yet so that it could be easily relocated for recovery. The battery/memory capacity of the unit was given as twelve months.

The unit was indeed easy to relocate and was found to be encrusted with various organisms, most noticeably keelworms *Pomatoceros triqueter*, saddle oysters *Pododesmus* sp. and encrusting bryozoan colonies. It was brought to the surface and eventually returned to English Nature's Maritime Team in Peterborough.

To our great sadness (in light of the effort which had gone in to placing and recovering the unit), we were later told that the unit had flooded whilst being under water and that none of the data was recoverable. We understand from English Nature that the manufacturers are willing to replace the unit with another more robust one for future use.

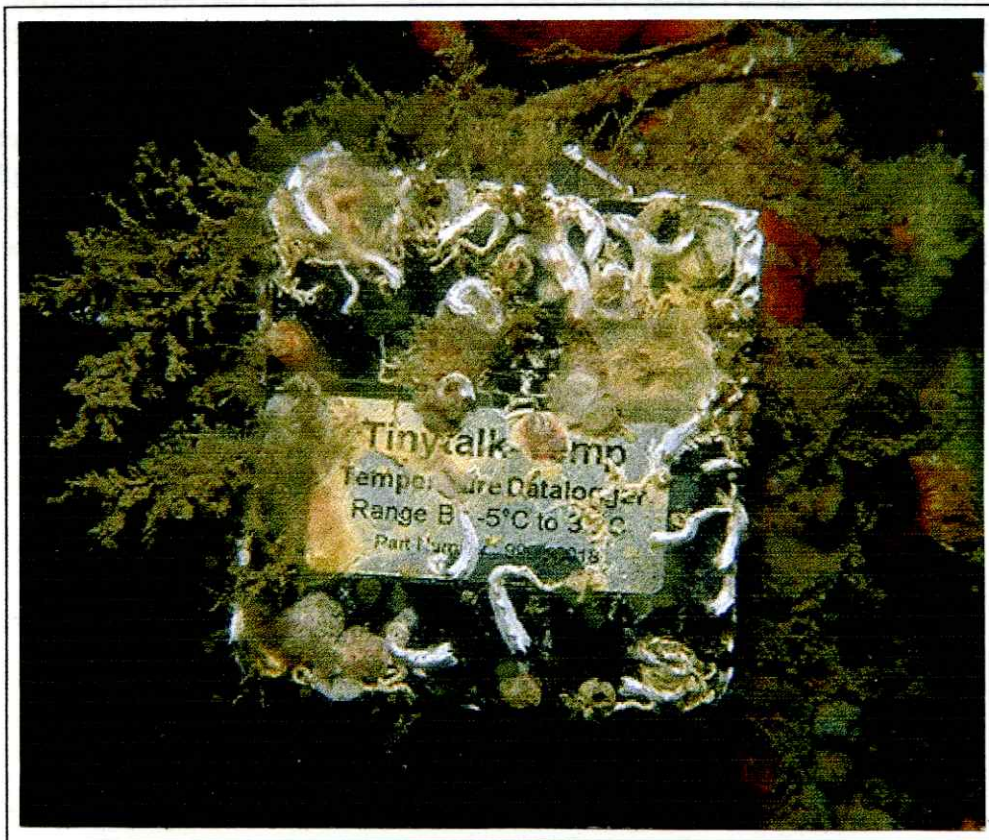


Plate 3.3.1 The data logger photographed in place on the port side fore'd stairway of the wreck of the MV *Robert* prior to recovery. Photograph: Robert Irving

3.4 Benthic litter survey of the Landing Bay

Co-ordinator: Jenni Fleming

Introduction

This survey had been requested by English Nature personnel to see if there was any evidence of items being thrown overboard from boats moored in the Landing Bay. Three dives were undertaken in the Landing Bay, using a swimline search technique following set compass courses

Results

The approximate courses of the swimline searches are given in Fig. 3.4.1. and the findings in Tables 3.4.1 - 3.4.3. No litter items of any significance were found. This is not particularly surprising: small, lightweight items are likely to be swept around the bay during the tidal cycle (especially on spring tides when currents are stronger), and even out into deeper water. Heavier objects can quickly become buried in the sand.

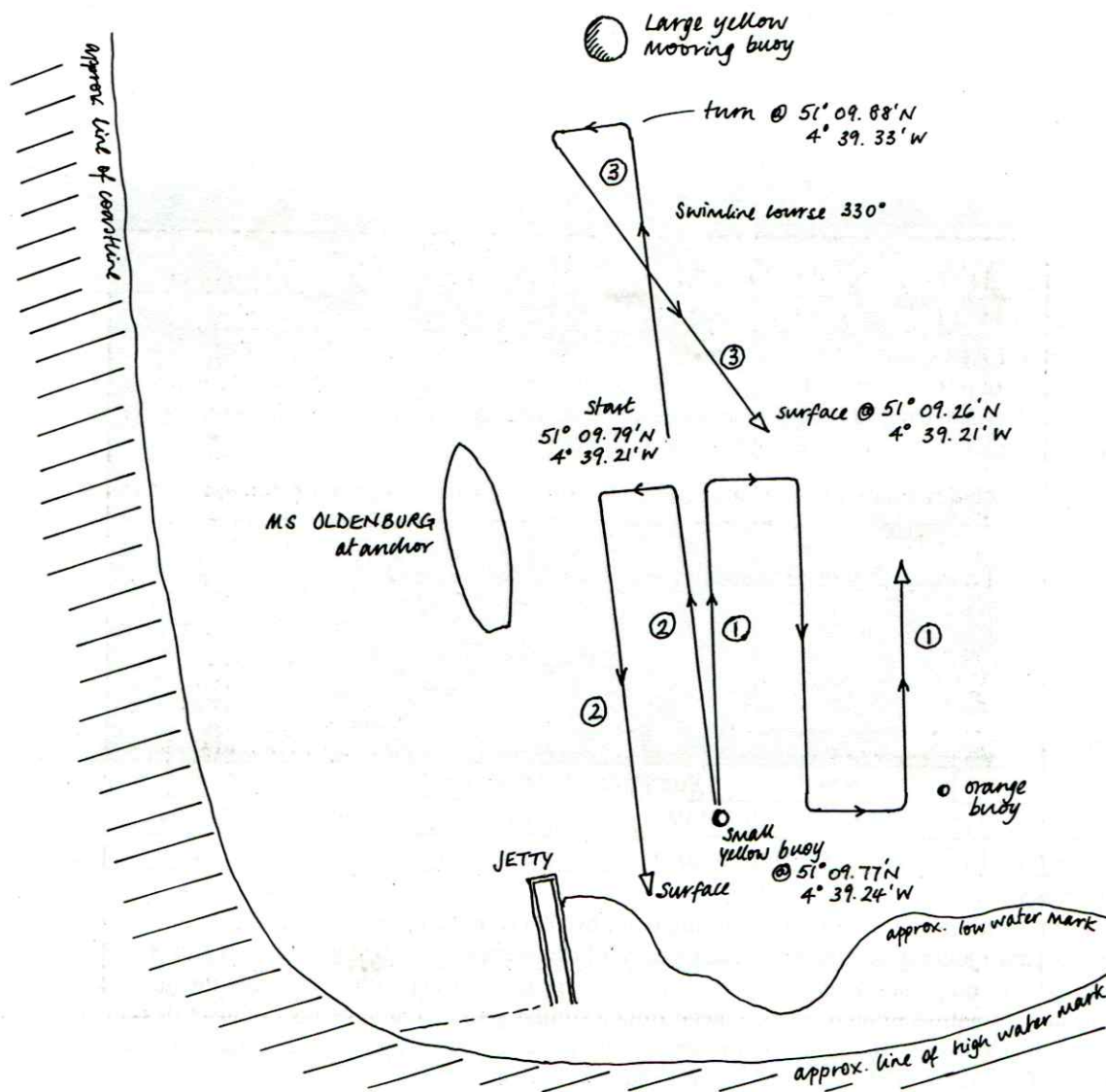


Fig. 3.4.1. Location and approximate courses of the swimline searches for items of litter.

Dive No.	Date	Divers	Time in	Time out
1	24.6.96	Jenni Fleming & Miles Brown	16:01	16:44
<i>Start point:</i> 51° 09.77' N 04° 39.24' W		<i>Finish point:</i> not noted		
<i>Starting depth:</i> 6 m (bsl) = 2.9 m (bcd)		<i>Finishing depth:</i> 8.6 m (bsl) = 5.5 m (bcd)		
<i>Comments:</i>				
<p>Headed NE from small yellow mooring buoy on the southern side of the Landing Bay for approx. 100 m. Two divers 3 m apart with buddy line inbetween (due to poor viz.). Average depth 6 m (bsl). Mainly sandy bottom, a few isolated rocks with weed attached. No litter seen. One patch of rust-coloured sand, approx. 0.75 m diam., with a spike of metal reinforcing rod protruding which could not be moved. Changed course & swam approx. 10 m eastwards (seaward) - should have been landward, but got navigation wrong! Then changed course again, heading southwards for approx. 100 m. At point of turn found strip of canvas strapping on sand. A short distance further on, a Mars bar wrapper + shreds of toilet paper were found amongst weed on a boulder. Changed course again, through 180° & swam northerly again for a further 100 m to complete the search.</p> <p>Area appeared clean of litter. Evidence of burrowing marine life in sand (tube worms, heart urchins etc.), small flat fish, gobies & occasional starfish. Also some kelp & other weed on isolated rock outcrops, some wrasse & 3 spider crabs.</p>				

Table 3.4.1. Landing Bay litter search - Dive 1.

Dive No.	Date	Divers	Time in	Time out
2	26.6.96	Jenni Fleming & Tony Hunt	14:55	15:20
<i>Start point:</i> 51° 09.77' N 04° 39.24' W		<i>Turning point:</i> 51° 09.78' N 04° 39.29' W		
<i>Max. depth:</i> 9.2 m (bsl) = 5.9 m (bcd)		<i>Course out:</i> 330°		
<i>Comments:</i>				
<p>Small pieces of toilet paper; 1 m length of cord; small piece of cellophane (from cigarette packet?). Evidence of anchor drag in sand-furrow approx. 0.5 m wide. Also another unidentified raised track with small ripple-like furrows on either side.</p> <p>Marine life included small juvenile flatfish, hermit crab, <i>Liocarcinus depurator</i>, Razor shells (<i>Ensis</i> sp.).</p>				

Table 3.4.2. Landing Bay litter search - Dive 2.

Dive No.	Date	Divers	Time in	Time out
3	26.6.96	Sue Fuller & Miles Brown	15:30	15:57
<i>Start point:</i> 51° 09.79' N 04° 39.21' W		<i>Turning point:</i> 51° 09.88' N 04° 39.33' W		
<i>Max. depth:</i> 10.3 m (bsl) = 7.0 m (bcd)		<i>Finishing point:</i> 51° 09.26' N 04° 39.21' W		
<i>Comments:</i>				
<p>Swam out on a bearing from near to turning point by JF/TH, heading towards the large yellow mooring buoy. Outward journey on course, return journey a little wayward! Seabed was of sand and completely litter free. The only man-made items found were a large sheet of glass fibre (probably the remains of a yacht) and a smallish lump of shaped metal from a similar source. Large number of juvenile flatfish ranging in size from 1-10 cm in length. Several shore crabs, one spider crab and a masked crab. Also a number of empty razor shells on the surface and evidence of burrows.</p>				

Table 3.4.3. Landing Bay litter search - Dive 3.

3.5 Re-photographing circalittoral communities at the Knoll Pins 'cave'

Co-ordinator: Robert Irving

Introduction

The Knoll Pins, located just north-east of Tibbett's Point on the east coast of the island, are the richest site on Lundy for Mediterranean-Atlantic species. At the eastern end of the canyon between the Outer Pin and the Submerged Pin, a small 'cave' is present at about 15 m depth (below chart datum), which is easy to locate. (To call this feature a cave is a slight exaggeration as it is more of a deep recess in the near-vertical rock face. However, it has been referred to as a cave in previous work). The cave and the rock immediately surrounding it contain large numbers of the rare yellow cup coral *Leptopsammia pruvoti* and good populations of the Devonshire cup coral *Caryophyllia smithii*. Other rarely-recorded anthozoan species of great interest which are also present include the cup coral *Caryophyllia inornata* (almost impossible to distinguish from small specimens of *C. smithii*), the Weymouth carpet coral *Hoplangia durotrix* and the soft coral *Parerythropodium coralloides (hibernicum)*. The adjacent vertical rock, typically quite heavily silted, has large colonies of the jewel anemone *Corynactis viridis* and many areas are dominated by the golden zoanthid anemone *Parazoanthus axinellae* and red sea fingers *Alcyonium glomeratum*.



Plate 3.5.1 The cup corals *Leptopsammia pruvoti* and *Caryophyllia smithii* at the Knoll Pins.
Photograph: Robert Irving

The site was first photographed for monitoring purposes in 1983 by Dr Keith Hiscock (Hiscock 1984a & b) using overlapping close-up photography with a Nikonos underwater camera. It was then re-photographed in 1984, 1985, 1986, 1987, 1988 and 1990. The results of these studies were analysed by Fowler & Pilley (1992), who found that the numbers of both *Leptopsammia* and *Caryophyllia* were declining at a rate of between 0.5% and 1.5% per annum (see Table 3.5.1).

<i>Leptopsammia pruvoti</i>			<i>Caryophyllia smithii</i>		
Year	No. in 0.817 m ²	density/m ²	Year	No. in 0.817 m ²	density/m ²
1983	215	263.2	1983	-	-
1984	211	258.3	1984	-	-
1985	208	254.6	1985	265	324.4
1986	207	253.4	1986	262	320.7
1987	205	250.9	1987	243	297.4
1988	202	247.3	1988	266	325.6
1990	197	241.1	1990	247	302.3

Table 3.5.1 Numbers and populations densities of *Leptopsammia pruvoti* and *Caryophyllia* (*C. smithii* and *C. inornata* combined) at the Knoll Pins cave (taken from Fowler & Pilley 1992).

Some close-up photography of this site has been undertaken by Dr Keith Hiscock since 1990, though English Nature has not seen fit to continue the monitoring on a regular annual basis. Although the re-photographing of this site had not been agreed by English Nature as part of this expedition, it was thought that it would be as well to make the most of the opportunity to do so.

Method

The site was re-photographed on 26 June 1996 by Robert Irving, using a Nikonos V camera with a 28 mm lens + Ocean Optics close-up lens and framer. Film was Kodacolor 100 asa print film. No attempt was made to analyse the photographs prior to handing them on to English Nature. Consequently, no conclusions of this study are presented here.

In addition to re-photographing the cave community, an attempt was made to inspect visually the site of the horizontal monitoring transect which includes the cave and runs along the southern side of the canyon. We had been asked to do this by Paul Gilliland of English Nature, so that an assessment could be made as to whether a 'diver description' of the communities present could be compared with video recordings made by an R.O.V. Having got one of our group to attempt the 'diver description', we realised that accurate recording of the extent of attached animal colonies would be required if this exercise was to be repeated in future.

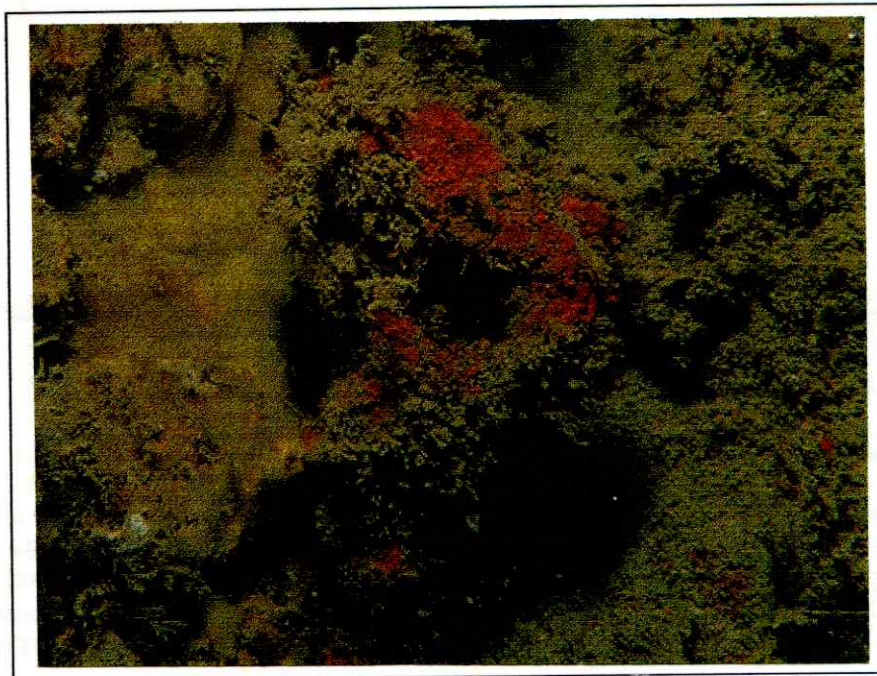


Plate 3.5.2 Permanent piton at the base of the Gannets' Rock vertical monitoring transect.
Photograph: Robert Irving

3.6 Checking algal depth limits at the Knoll Pins

Co-ordinator: Tony Hunt

Introduction

Following discussion held with Dr Alastair Burn and Neil Hailey, English Nature's water quality experts in Peterborough, and Sarah Welton of MCS, it was decided to use this working party to trail a project for noting the maximum depth limits of certain algal species. The maximum depth at which these algae can grow is thought to give a reasonable indication of water clarity over a period of time, and thus the amount of light suitable for photosynthesis which reaches the plant. However, other factors such as the amount of cloud cover during a growing season could also affect survival/growth rates of individual plants.

In recent years there has been growing interest in varying levels of turbidity within coastal waters, and English Nature (as well as other organisations such as the Environment Agency) are keen to acquire some baseline data. Changes in levels of turbidity could be affected naturally by long-term climatic variations or by the apparent 19 year periodicity of the tidal cycle leading to increased erosion of intertidal soft sediment habitats (P. Gilliland, pers. comm.); in the short-term, levels of turbidity can be increased by stormy weather conditions (leading to the re-suspension of silt in the water column), or by unusually persistent plankton blooms. However, they could also be man-induced and arise from increased levels of bottom trawling, scallop dredging, aggregate extraction, the dumping of dredged material at sea or the construction of a Severn Tidal Barrage.

Though relatively straightforward to carry out, this project was experimental in nature, and little time was devoted to it. The site chosen at the Knoll Pins is easily re-locatable and algal depth limits have been noted from here in the past (see below). The exact position was following the canyon down between the submerged and outer pin onto a boulder slope. The divers were simply asked to note the maximum depth at which they encountered kelp (*Laminaria hyperborea*) and red foliose algae.

Results

Only one dive was dedicated to undertaking this project. The results are set out in Table 3.6.1.

Divers:	Tony Hunt & Jenni Fleming	
Date:	26 June 1996	Site: Knoll Pins
Time in:	11:50	
Time out:	12:20	
Tidal height:	@ 12.00: 4.85 m above chart datum (Tidecalc)	
Max. depth limit of kelp	= 14.0 m (bsl); 9.2 m (bcd)	
Max. depth limit of foliose red algae	= 26.7 m (bsl); 21.9 m (bcd)	

Table 3.6.1 Maximum depth limits of kelp and foliose red algae at the Knoll Pins, 26.6.96.

The occurrence of the deepest red algae was on the outer slope of the Outer Pin, near the mouth of the canyon. The kelp plant was observed at the head of the canyon where the gradient of the substratum had eased from the vertical. Halfway down the canyon, the kelp reached only 11 m bsl (= 6.15 m bcd) because it was unable to attach to the vertical walls of the canyon. At that

point its abundance was considered to be dense (1 plant per 0.01m^2); at 14 m (= 9.15 m bcd) it was sparse (1 plant per 1m^2).

Discussion

The measurements taken in 1996 compare well with those taken in previous years (see Table 3.6.2), especially for the lowest limit of foliose red algae. However, it should be noted that from 1985 until 1988, all records were taken along a fixed (though temporary) transect. It is possible that odd plants beyond the bounds of this transect may occur either slightly shallower or deeper than those directly adjacent to the transect. No attempt was made to relocate the positioning of this transect in 1996.

	1985	1986	1987	1988	1990	Mean (1985-1990)	1996
Lower limit of kelp	7.3	~ 7	10	-	-	8.1	9.2
Lower limit of foliose algae	21.8	~ 22	22	22.8	21.5	22.02	21.9

Table 3.6.2 Lower depth limit of main algal zones at the Outer Knoll Pins (depths given in metres below chart datum). Taken from Fowler & Pilley 1992.

The records are very much dependent upon the use of accurate depth gauges and/or decompression computers by individual divers: analogue depth gauges are known to vary by up to 2 m at 30 m depth and even depth computers produced by different manufacturers do not always give identical readings. Added to this variability, calculations to correct depths below sea level to depths below chart datum level using tide tables (as were used this year as in past years), do not take into account barometric pressure effects on the day! These possible variables need to be taken into account in future studies of this sort.

3.7 Notes on drift dives in Halfway Wall Bay

By Robert Irving & Tony Hunt

On the Friday afternoon, there was a choice of dive sites for 'look-see' dives: Kath & Jenni went to the Knoll Pins to take some species photographs, while the others (plus Emma) had a drift dive in Halfway Wall Bay, in the hope of finding some red band fish burrows and (with luck) the fish themselves. The following are notes made by Robert and Tony on their dives.

<i>Date:</i> 28 June 1996	<i>Time:</i> 15.16 - 15.52	<i>Divers:</i> RI / MQ / EP
<i>Max. Depth:</i> 23.1 m (bsl) = 16.7 m (bcd) [<i>tidal correction:</i> 6.4 m]		
<i>Location:</i> Began approx. 100 m SE of Gull Rock and drifted south for approx. 200 m.		
<i>Observations:</i> Sea bed throughout of fine mud mixed with gravel and shell debris. Burrowing anemones frequent (mostly <i>Cerianthus lloydi</i> , <i>Edwardsia</i> sp. & <i>Mesacmaea mitchelli</i>). Many holes of varying diameters, some of <i>Goneplax rhomboides</i> (one individual seen) and possibly <i>Nephrops</i> (no individuals seen). Group of five red band fish burrows encountered towards the end of the dive. One fish visible in one of them, but it refused to come out.		

<i>Date:</i> 28 June 1996	<i>Time:</i> 16.08 - 16.41	<i>Divers:</i> TH / LC
<i>Max. Depth:</i> 21.3 m (bsl) = 14.5 m (bcd) [<i>tidal correction:</i> 6.8 m]		
<i>Location:</i> North of Quarry Bay (at the southern end of Halfway Wall Bay). Initially on mud @ 15.2 m (bcd) and finally on coarse sand @ 11.2 m (bcd). Drifted south.		
<i>Observations:</i> On mud: many burrows. About 4 probable red band fish burrows (fish not seen), <i>Nephrops</i> burrows (one <i>Nephrops</i> seen) and other smaller burrows. Main concentration of burrows in the first half of the dive in the slightly deeper water. Small hermit crabs and <i>Hyas araneus</i> common. White anemones (25 mm oral disc x 30-40 mm column height above sediment) seen several times (8-12 individuals) - not identified. On coarse sand: <i>Cerianthus</i> spp. Eggs of <i>Natica</i> . <i>Corymorpha nutans</i> . <i>Mesacmaea mitchelli</i> . Distinctive egg spirals of the nudibranch <i>Okenia aspersa</i> observed. Sea squirts <i>Molgula</i> (presumed to be <i>M. oculata</i>) found buried in the sand. Adult nudibranch not seen.		

Comments:

The confirmation of the presence of red band fish in small groups within this vicinity is to be welcomed. Groups of burrows together with fish have been observed by other divers this year, particularly in the vicinity of Gull Rock and the Knoll Pins. The presence of the nudibranch *Okenia aspersa* is of particular note. As far as we can tell, this species has not been recorded from Lundy before - it was not included in the list produced by Brown & Hunnam (1976) nor is it listed in the separate species appendix to the 1994 Management Plan (P. Gilliland, pers. comm.). However, *Molgula oculata*, its favoured prey species, has been recorded from the Landing Bay, on sand at a depth of 4 m (Lane 1976).

4. GENERAL CONCLUSION

This was the second MCS Diving Working Party to visit Lundy (the first being in 1995), though a group of UCS divers undertaking habitat surveys had visited Lundy in the summer of 1983 under the leadership of Dr Keith Hiscock. Once again, the success of this group has demonstrated that conservation-related tasks under water can be undertaken by volunteer divers, assuming the chosen tasks are within their capabilities. We were fortunate that the weather did not hinder our diving activities at all.

It is to be hoped that the Marine Conservation Society will continue to mount such expeditions to Lundy, especially where these can tie in with useful work programmes within the overall management objectives for the MNR.

5. RECORD OF DAILY ACTIVITIES**Miles Brown****Saturday 22 June**

The party met on the quay at Bideford at 09.15 and sailed at 10.30 am aboard the MS *Oldenburg*. Prior to the 2¼ hour crossing all the diving equipment had to be stowed in packing cases and the large EN inflatable (later to be named 'Grey seal') loaded aboard, with the smaller (collapsed) SE MCS inflatable ('Seal pup') inside her. The conditions were fair and the journey straight forward. Upon arrival the large inflatable (with the small inflatable and Tony & Robert within it) was winched over the side and moored; the small inflatable was then assembled on the jetty once the others had disembarked. Our accommodation for the week was Millcombe House, the villa built by William Heaven, the then owner of Lundy, in 1836. The rest of the day was spent settling in and sorting out diving equipment etc., which took four hours after landing to find its way to the Divers' Beach. Robert gave a talk in the evening about the marine environment of Lundy and outlined the tasks for the week.

Sunday 23 June

Wind: NNW 3 *Dry:* *Visibility:* good. *Sea State:* slight
High Water: 11 10 (6.45 m) *Low Water:* 16.50 (2.10 m)

All the group, took part in the first dive of the trip. The aim was two-fold: as a general practice dive to become familiar with our equipment, and to look at sea fans on the East side of the Island from Brazen Ward north into Gannets Bay, measuring their size and the percentage weed cover. During her dive, Lucy lost her weight belt at 15m and made a fairly rapid ascent. She was swiftly taken back to the Divers' Beach where, as a precaution, O₂ was administered but fortunately no adverse symptoms developed. She was recommended to take a rest from diving for the next few days.

In the afternoon, only four members dived. Robert and Miles collected more sea fan data from just south of Gannets' Bay whilst making an unsuccessful search for Lucy's lost weight belt. Mick and Tony dived off Quarry Beach to set up three quadrats, each 10m x 10m, along a 30 m transect line running south from Quarry Beach. The aim was to determine both the density and the southernmost range of the sea fans on the east side of the Island. They laid the transect line successfully, with shot lines at each end, and counted fans within the first (southernmost) quadrat.

Monday 24 June

Wind: N 3 *Dry:* *Visibility:* good. *Sea State:* calm.
High Water: 12.00 (6.04 m) *Low Water:* 18.10 (2.46 m)

In the morning six divers returned to the transect site at Quarry Beach. Counting fans within the remaining two quadrats was completed by Sue and Kath. No sea fans were found suggesting from data gathered in 1995 that this marks the southerly limit of their range. The shot and transect lines were lifted and re-deposited at the south end of Gannets' Bay by Tony and Mick. Two sea fans were observed, but due to most of the substrate being of mud and boulders covered in red seaweeds, the site was considered unsuitable. The transect line was then moved a further 70 m south to off the headland known as Mouse Hole and Trap, and reset by Robert with help from Miles. They completed a count of fans within the southernmost quadrat.

In the afternoon Mick, Tony, Kath and Sue returned to the site off the Mouse Hole and Trap to survey the middle and northern sections. Approximately half a dozen sea fans were observed in the middle section, and a dozen in the northern section.

Jenni and Miles conducted a sea bed litter survey on the east side of the Landing Bay. Three pieces of litter were found: a piece of canvas strapping, a Mars Bar wrapper and a piece of tissue paper - not exactly the haul they'd been expecting! Also signs of anchor dragging.

In the evening, the group attended a talk by Emma Parkes, the island's warden. Emma gave the audience a thorough introduction into Lundy's flora and fauna, both terrestrial and marine. The talk was intended to be delivered in the church, but a combination of a high evening sun and broken blind meant the slides could not be seen. A consensus of opinion of those present soon agreed to adjourn to the Tavern for the show.

Tuesday 25 June

Wind: 2 - 3 variable, locally calm, westerly by afternoon. *Visibility:* good but overcast.

Sea state: very slight to smooth on east side, swell much greater on the west side.

Air temp. 19°C. *Sea temp.* 13°C.

High Water: 13.00 (5.94 m) *Low Water:* 19.10 (2.50 m)

A later start today, with both boats being taken to the west side of the island, where the sea swell was considerably greater. Robert and Miles dived on a line of pots off Battery point, as did Kath and Mick, though they were slightly to the SW. The aim was to look for lobster pot damage, and also to undertake general Seasearch recording. Tony and Sue dived off Dead Cow Point and noted sea fan information.

Lunch was taken on the water, after which we returned to the Divers' Beach to exchange cylinders etc. Both boats were then taken to the Gull Rock and Tibbetts Point areas. The same buddy pairs dived. There was no specific task, other than taking note of sea fans. Mick and Kath measured vertical surface water visibility using a Secchi disc lowered from the boat, firstly close to the cliffs, and then from distances of approximately 250m and 500m. Visibility has been greatly reduced on all dive sites during the week by a dense bloom of phytoplankton, most noticeably of the small dinoflagellate *Phaeocystis*.

Wednesday 26 June

Wind: 2 - 3 Misty though this cleared by late morning. *Visibility:* moderate.

Sea state: slight *Air temp:* 18°C. *Sea temp:* 13°C.

High Water: 14.10 (6.03 m) *Low Water:* 20.00 (2.39 m)

A very misty start to the day made us think that diving would be unlikely, but as we descended to the Landing Bay it became apparent that the mist was only lingering around the top of the island, with it being clear at sea level.

The aim for the morning was to set up a temporary horizontal transect line at the Knoll Pins canyon, where monitoring studies had taken place before. A line was set using existing site diagrams embedded in plastic sheets. An attempt was made to locate the marker pitons, but none were found. The line was laid by Robert with help from Sue and Miles. Kath and Mick then surveyed the communities along the transect.

In the afternoon Mick and Kath continued with the community survey along the transect line at the Knoll Pins. Robert (with Lucy) photographed the cave community at the east end of the transect line.

During the evening after dinner Millcombe House was very quiet as people were drawn up to the Tavern (and on to Emma's house as there was no TV in the Tavern), to watch England v Germany in the Euro '96 semi finals.

Thursday 27 June

Wind: N - NW 2. Dry with patchy cloud and sunny spells.

Visibility: good to moderate. *Sea State:* smooth to slight. *Air temp.:* 19°C. *Sea temp.:* 15°C

High Water: 15.30 (6.34 m) *Low Water:* 09.10 (2.09 m)

(Robert nearly cracks during breakfast, after yet another question about weights and buoyancy from Miles!) The party dived on the MV 'Robert', which sank in 1975 about 1km to the east of Tibbetts Point, whilst carrying a cargo of coal dust. The wreck was covered with plumose anemones *Metridium senile* and housed at least two conger eels. Robert with Mick and Lucy located a data logger which had been secured there a year ago to record sea water temperatures. Photographs were also taken of an area 35cm² which had been scraped last year, to help provide an indication the rate of re-colonisation. Sue and Jenni measured visibility with the Secchi disc (8m), similar to that measured 500m offshore.

During the afternoon the group moved to the west side of the island to assess possible pot damage. Tony and Miles investigated seven pots off Pilots' Quay, one of which may have caused some minor Ross coral damage. The only catch evident was a single edible crab. Robert, Lucy and Mick descended on a storage pot, 200m south of Shutter Rock, but saw no signs of damage. Sue and Jenni dived 300m north of Black Rock, no pots were located.

Friday 28 June

Wind: SW 4 -5 veering to NW 4 - 5 by during afternoon Misty in morning becoming brighter by afternoon. *Sea State:* slight to moderate *Air temp:* 15°C *Sea temp:* 14°C

High Water: 16.20 (6.77 m) *Low Water:* 10.20 (1.63 m)

During the morning both boats visited Gannets' Rock. Transit marks were used to locate the pinnacle from the surface. Robert and Mick entered the water to confirm the position. A shot line was sent down their SMB. Photographs were taken of cup corals and sea fans and the bottom piton from a vertical transect line was relocated. The site was also dived by Tony and Lucy, Jenni and Kath, Sue and Miles.

For the afternoon we were joined by Emma Parkes, to dive the muddy gravel to the north of Quarry Bay. Jenni and Kath dived the Knoll Pins. No specific task was set for the afternoon. Seal Pup was dismantled for the journey home, and dive kit packed away.

Our final evening meal was taken in the Tavern.

Saturday 29 June

Baggage was collected at 08.30 by Emma in the Land Rover, and dive equipment was collected about an hour later from the Divers' Beach. A day of cleaning, tidying and general pottering. We had to assemble on the Divers' Beach jetty at 16.00 for the return journey on the MS *Oldenburg*.

6. BUDGETINCOME

Individual contributions from volunteers		£1575.00
Less contribution towards MCS overheads (part donation)	- £40.00	
Grant from English Nature		£500.00
Grant from Lundy Field Society		<u>£200.00</u>
	TOTAL	£2215.00

EXPENDITURE

Accommodation on Lundy (Millcombe House) for 1 week	£1153.00
Booking insurance	£17.00
Return tickets aboard MS Oldenburg	£280.00
Transport of diving gear + boats + engines	£50.00
Office overheads (postage, telephone etc.)	£35.00
Food	£320.00
Survey equipment	£40.00
Diving air, boat fuel & engine oil	£140.00
U/w film + set of duplicate prints	£15.00
Use of SEMCS boat & insurance contribution	£45.00
Report reproduction costs (20 copies)	<u>£120.00</u>
	TOTAL
	£2215.00

LOAN OF EQUIPMENT

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

- Zodiac 5 m inflatable plus 55 hp outboard + trailer [from English Nature's Maritime Team]
- Avon 3.5 m sportsboat inflatable plus 30 hp outboard [SE MCS]
- 1 x hand-held Magellan GPS unit [English Nature/Sussex *SEASEARCH* project]
- 1 x hand-held VHF radio [SE MCS]
- 1 x portable echo sounder [English Nature's Maritime Team]
- Estate car with tow bar [Chris & Liz Wood]

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APPENDIX 1 DIVE TIME TABLE

SITE	Brazen Ward	S. Gannet's Bay	S. Quarry Bay	Mousehole & Trap	Landing Bay	Battery Point	Dead Cow Point	Gull Rock	Tibbets Point	Knoll Pins	'Robert'	Off SW Point	N. of Black Rock	Off Pilots' Quay	Gannets' Rock pinnacle	Halfway Wall Bay
PURPOSE	Sea fan counts/ rock-see	Sea fan counts	Sea fan counts	Sea fan counts	Litter survey	Sea fan counts	Sea fan counts	Look-see/sea fan counts	Look-see/sea fan counts	Inspecting monitoring site/ re-photo cave community	Look-see & re-photo monitoring sites	Assessing possible pot damage	Assessing possible pot damage	Assessing possible pot damage	Look-see	Look-see (drift dive)
SUN. 23 June a.m.	KT/MQ JF/SF RI/MB LC/TH															
p.m.		RI/MB	TH/M Q													
MON. 24 June a.m.		TH/MQ	SF/KT	RI/MB												
p.m.				TH/MQ KT/SF	MB/JF		TH/SF									
TUES. 25 June a.m.						RI/MB KT/M Q										
p.m.								KT/MQ TH/SF	RI/MB							
WED. 26 June a.m.										RI/SF/MB MQ/KT						
p.m.										RI/LC MQ/KT						
THURS. 27 June a.m.											MQ/LC/RI TH/MB SF/JF					
p.m.												RI/MQ/LC	SF/JF	TH/MB		
FRI. 28 June a.m.															RI/MQ TH/LC JF/KT SF/MB	
p.m.										JF/KT						RI/MQ/EP TH/LC SF/MB

TH: Tony Hunt MB: Miles Brown RI: Robert Irving LC: Lucy Conway JF: Jenni Fleming SF: Sue Fuller EP: Emma Parkes
 KT: Kath Thorpe MQ: Mick Quickfall

