

SELECTED REPORTS FROM THE MARINE CONSERVATION SOCIETY'S DIVING WORKING PARTY TO LUNDY, 3-10 JUNE 1995

By

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INTRODUCTION

During a week long visit to Lundy from 3-10 June 1995, a party of fifteen volunteer divers, all members of the Marine Conservation Society, undertook a number of marine nature conservation projects within the Marine Nature Reserve (MNR). Most of the projects involved diving, and had been decided upon in consultation with English Nature, the country agency responsible for the management of the MNR, and the MNR Warden, Emma Parkes. The fifteen divers in the party 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 were given the opportunity to learn certain underwater survey techniques whilst making a positive contribution towards the effective management of the MNR.

PROJECTS

Of the nine projects which were undertaken by the group, the three main ones are described in detail below. Further details of all of the various tasks are given in Irving (1995).

1. MARINE BIOLOGICAL SURVEY OF THE 'GULL ROCK' PROTECTED WRECK SITE

Introduction

The site of this 'wreck' lies a few hundred metres offshore, east of Gull Rock, half way along the east side of the 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 sea bed remain largely undisturbed by fishing and lobster potting activities, and divers may only visit the area with permission from the Department of National Heritage.

Descriptions of biotopes

Three distinct habitats and associated communities (= biotopes) were surveyed in the vicinity of the wreck site - see Fig. 1 for a sketch layout of the site.

Biotope 1. Circalittoral bedrock and artificial substrata (iron cannon) with a sponge, hydroid and bryozoan turf at 13 - 26 m bed (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 *Alcyonium glomeratum*, pink sea fan *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*.

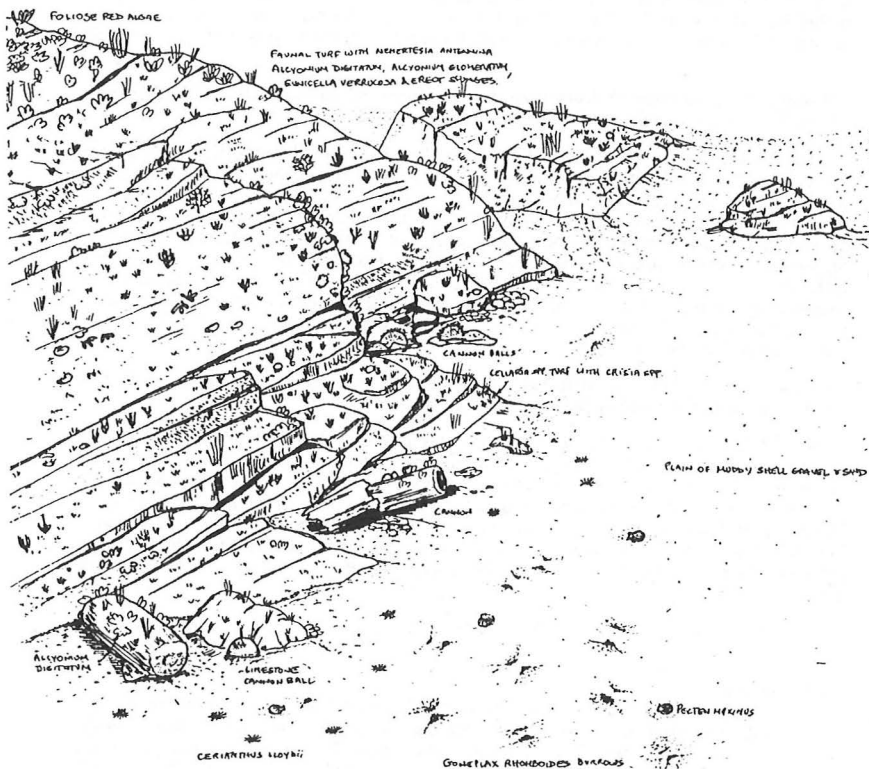


Figure 1. Illustration of the 'Gull Rock' protected wreck site, by Rohan Holt

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 (ie. 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 table 1).

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

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 been counted as a separate biotope. One species in particular, the phoronid *Phoronis hippocrepi* (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 bed.

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 nine species were recorded in this biotope (see table 1).

2. MARINE BIOLOGICAL SURVEY OF THE 'IONA II' PROTECTED WRECK SITE

Introduction

The remains of the paddle steamer 'Iona II' lie about 20m below chart datum, on a flat seabed, approximately 1 km off the east coast of Lundy, and about 70m 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. The wreck is partially intact, lying roughly along a north-south axis and rising to approximately 1.5m 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 c

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	-	-
				Pelecypoda (bivalves)			
<i>Raspailia hispida</i>	O	-	-	<i>Pecten maximus</i>	-	-	O
<i>Raspailia ramosa</i>	F	-	-	<i>Pododesmus patelliformis</i>	O	-	-
<i>Ciocalyptra penicillus</i>	O	-	-	<i>Hiatella arctica</i>	R	O	-
<i>Esperioopsis fucorum</i>	O	-	-				
<i>Myxilla incrustans</i>	O	-	-	Cephalopoda (squid, octopus etc.)			
<i>Hymedesmia paupertas</i>	O	-	-	Squid eggs	F	-	-
<i>Hemimycale columella</i>	F	-	-				
<i>Haliclona viscosa</i>	R	-	-	Bryozoa (sea mats)			
<i>Dysidea fragilis</i>	F	-	-	Crisiidae indet.	C	O	-
Porifera indet. crusts	F	-	-	<i>Crisia eburnea</i>	C	-	-
				<i>Alcyonidium diaphanum</i>	F	-	-
Hydrozoa (hydroids)				<i>Pentapora foliacea</i>	F	-	-
<i>Halecium halecinum</i>	C	R	-	<i>Parasmittina trispinosa</i>	F	-	-
<i>Aglaophenia pluma</i>	F	-	-	<i>Schizomavella</i> sp.	F	-	-
<i>Aglaophenia tubulifera</i>	F	-	-	<i>Cellepora pumicosa</i>	F	-	-
<i>Nemertesia antennina</i>	C	-	-	<i>Omalosecosa ramulosa</i>	F	R	-
<i>Nemertesia ramosa</i>	O	O	-	<i>Cellaria</i> sp.	S	F	-
<i>Abietinaria abietina</i>	F	-	-	<i>Cellaria fistulosa</i>	A	-	-
<i>Obelia</i> sp.	F	O	-	<i>Scrupocellaria</i> sp.	C	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	-	-				
<i>Cerianthus lloydii</i>	-	-	F	Phoronida (horseshoe worms)			
<i>Epizoanthus couchii</i>	O	-	-	<i>Phoronis hippocrepia</i>	-	A	-
<i>Parazoanthus axinellae</i>	O	-	-				
<i>Isozoanthus sulcatus</i>	O	-	-	Echinodermata (starfish, brittlestars, sea urchins and sea cucumbers)			
<i>Urticina felina</i>	O	-	-	<i>Henricia oculata</i>	O	-	-
<i>Aiptasia mutabilis</i>	F	-	-	<i>Asterias rubens</i>	O	-	-
<i>Sagartia elegans</i>	F	-	-	<i>Marthasterias glacialis</i>	F	-	O
<i>Cereus pedunculatus</i>	O	-	-	<i>Ophiura affinis</i>	O	-	-

<i>Actinothoë sphyrodeta</i>	F - -	<i>Ophiura albida</i>	O - -
<i>Mesacmaea mitchellii</i>	- - R	<i>Echinus esculentus</i>	F - -
<i>Corynactis viridis</i>	C - -	<i>Holothuria forskali</i>	F - -
<i>Caryophyllia smithii</i>	C - -	<i>Pawsonia saxicola</i>	O - -
Platyhelminthes (flatworms)		Tunicata (sea squirts)	
<i>Prostheceraeus vittatus</i>	O - -	<i>Clavelina lepadiformis</i>	C O -
		<i>Aplidium punctum</i>	O O -
Polychaeta (worms)		Didemnidae indet.	O - -
<i>Harmothoe</i> sp.	O - -	<i>Ascidia mentula</i>	F - -
<i>Polydora</i> sp.	R - -	<i>Polycarpa rustica</i>	O - -
Terebellidae sp.	O - -	<i>Stolonica socialis</i>	F - -
<i>Bispira volutacornis</i>	R - -	<i>Botryllus schlosseri</i>	O O -
<i>Myxicola infundibulum</i>	- - O		
<i>Pomatoceros triquetus</i>	O - -	Chondrichthyes (dogfish etc.)	
Spirorbidae sp.	O - -	<i>Scyliorhinus stellaris</i>	O - -
Cirripedia (barnacles)		Osteichthyes (bony fish)	
<i>Balanus balanus</i>	O - -	<i>Conger conger</i>	O - -
<i>Megatrema anglicum</i>	F - -	<i>Entelurus aequoreus</i>	R - -
		<i>Taurulus bubalis</i>	O - -
Decapoda (prawns, crabs etc.)		<i>Ctenolabrus rupestris</i>	O - -
<i>Calocaris macandreae</i>	- - O	<i>Labrus bergylta</i>	F - -
<i>Pagurus bernhardus</i>	F - O	<i>Labrus mixtus</i>	F - -
<i>Galathea strigosa</i>	O - -		
<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 - -

40 cm diameter) and some wreck debris. Several dives were made on the site, for recording and some photography.

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 substratum. The anemone *Actinothoë sphyrodeta* was found in patches on the protruding ribs, sometimes with *Metridium senile*, and on some vertical surfaces left unoccupied by *Tubularia indivisa*, to 100 /m² in patches of 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 c 25 cm diameter horizontal pipe. There was a hydroid/bryozoan turf inside the horizontal funnel segment and on some protruding surfaces. Porifera (sponges) 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*, 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 *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 twenty. 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, and/or that the marked greater extension of the 'Robert' into the tidal stream is more suited to *Metridium senile* (though *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 1m proud of the seabed). Of course, this distribution could also represent the last outposts against an eventual take-over of the 'Robert' by *Tubularia indivisa*.

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

SPECIES	ABUNDANCE ON WRECK	ABUNDANCE ON SEABED	COMMENTS
Porifera (sponges)			
<i>Suberites domuncula</i>	R	-]
<i>Raspailia ramosa</i>	R	-]
<i>Dysidea fragilis</i>	R	-	} All on upward-facing horizontal surfaces.
<i>Hemimycale columella</i>	R	-	
Anthozoa (soft corals, sea fans, 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 var. 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>Cryptopleura ramosa</i>	C	-	On verticals 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	-	
Hydroid turf	F	-] - ditto - & in horizontal funnel segment.
Annelida (worms)			
<i>Bispira volutacornis</i>	R	-	
Mollusca (nudibranchs, bivalves etc.)			
<i>Diapharodoris luteocincta</i>	P	-	
<i>Polycera sp.</i>	P	-	
<i>Coryphella sp.</i>	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	-	
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. DISTRIBUTION OF SEA FANS *EUNICELLA VERRUCOSA* OFF THE EAST COAST AND COUNTS OF THE NUDIBRANCH *TRITONIA NILSODHNERI* ON SEA FANS

Introduction

The pink sea fan *Eunicella verrucosa* is a nationally protected species which is found on west and south-west coasts of Britain. It grows at a very slow rate (averaging about 10 mm per annum on certain branches) and specimens used to be collected as souvenirs/curios during the late 1960s and early 1970s. 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.

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 (Fig. 3). 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 present at these locations. In order to assess the density of sea fans at a number of sites, a series of three 10 m x 10 m quadrats (using measuring tapes) 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

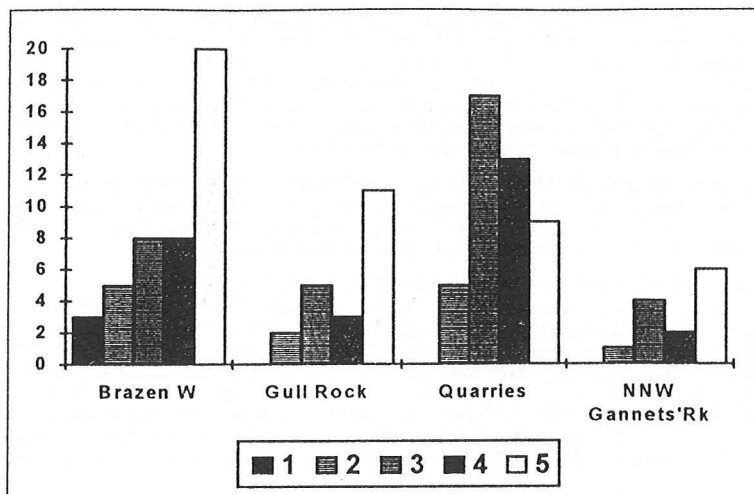
*Condition score: 1 = >80% weed cover; 2 = 80-50% weed; 3 = 50-20% weed; 4 = <20% weed; 5 = <5% / pristine

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 four 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 were 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 (and thus ages) of individuals at each site. The condition of each fan was noted using a scoring system (see table 3 and Fig. 4), which denoted the percentage of the fan which was encumbered by drift weed or other entanglements such as dogfish eggs (present on seventeen 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.

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



(3) Counts of the nudibranch *Tritonia nilsodhneri*

A total of 143 sea fans (which included those whose condition was also being checked) were inspected for the presence of the nudibranch *Tritonia nilsodhneri*. No signs of the nudibranchs (ie. 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 reported to be 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 [ie. 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.

ADDITIONAL PROJECTS

4. POSITIONING OF TWO SUBLITTORAL TEMPERATURE DATA LOGGERS

In addition to the above projects, the group was 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 bcd; and (ii) at the base of a mooring chain in the Landing Bay, at a depth of approximately 2 m bcd. These small sealed units, measuring 50 x 50 x 15 mm, are capable of recording variations in sea temperature over a long period of time (in excess of 12 months), with the information then being down-loaded to a computer, prior to the unit being put back into the sea (if required). It is hoped that the long-term measurement of sea water temperature will provide a valuable contribution towards the understanding of reproduction strategies of certain long-lived species (such as cup corals) at Lundy.

5. PHOTOGRAPHIC MONITORING OF THE WRECK OF THE MV 'ROBERT'

A number of viewpoint photographs (ie. photographs taken from a certain location) on this wreck were taken in 1990. A repeat of this exercise was done, allowing for comparisons of the communities growing on certain parts of the wreck.

6. SEARCHES FOR THE RED BAND FISH *CEPOLA RUBESCENS*

Swim and drift searches for the elusive red band fish and/or its burrows were undertaken within Gannets' Bay and off Halfway Wall Bay. No actual fish were seen during these searches, but a total of forty-four burrows were recorded, seventeen from Gannets' Bay and twenty-seven from Halfway Wall Bay. Burrows tended to be clustered into groups, with between three and twelve in any one group. At the weekend after our departure, members of the Appledore Sub-Aqua Club saw five red band fish out of their burrows to the east of the Knoll Pins (north of our search area) in a depth of about 20 m. This confirms that the burrows we observed were quite likely to be occupied by fish.

7. SEASEARCH SURVEYS

SEASEARCH is a project run by the Marine Conservation Society which encompasses a general 'Phase 1' description of sea bed habitats and their associated communities. Descriptions were made by divers from two locations: SE of Gannets' Rock; and Lee Rocks, south of the Rattles. These descriptions will add to the overall map of sublittoral habitats present around the island.

8. 3-D MAPPING OF THE SEA BED IN THE AREA OF GANNETS' ROCK

A series of echo soundings were carried out from a small boat in an attempt to interpret the topography of the sea bed in the area to the east and north of Gannets' Rock. A pinnacle of rock rises from the sea bed at about 28 m bcd to its summit at 12 m bcd just to the east of Gannets' Rock. This features a number of species of nature conservation interest, which have been monitored for a number of years. In addition to this pinnacle, there is a similar one lying a short distance to the north. The echo soundings confirmed the presence of this second pinnacle, but lack of time prevented a more detailed exploration by divers.

9. MONITORING THE COVER OF THE ALGA *BIFURCARIA BIFURCATA* IN A ROCKPOOL

This was the only project undertaken which did not require diving. However, it did require some rock climbing, as the rockpool in question lies at the base of a steep cliff at the back of the South Light! A study in 1984 revealed the surface cover provided by the alga *Bifurcaria bifurcata*, a southern species close to its northern limit at Lundy, was approximately 27%. It was decided to repeat this measurement in 1995, when the figure was found to be 21%.

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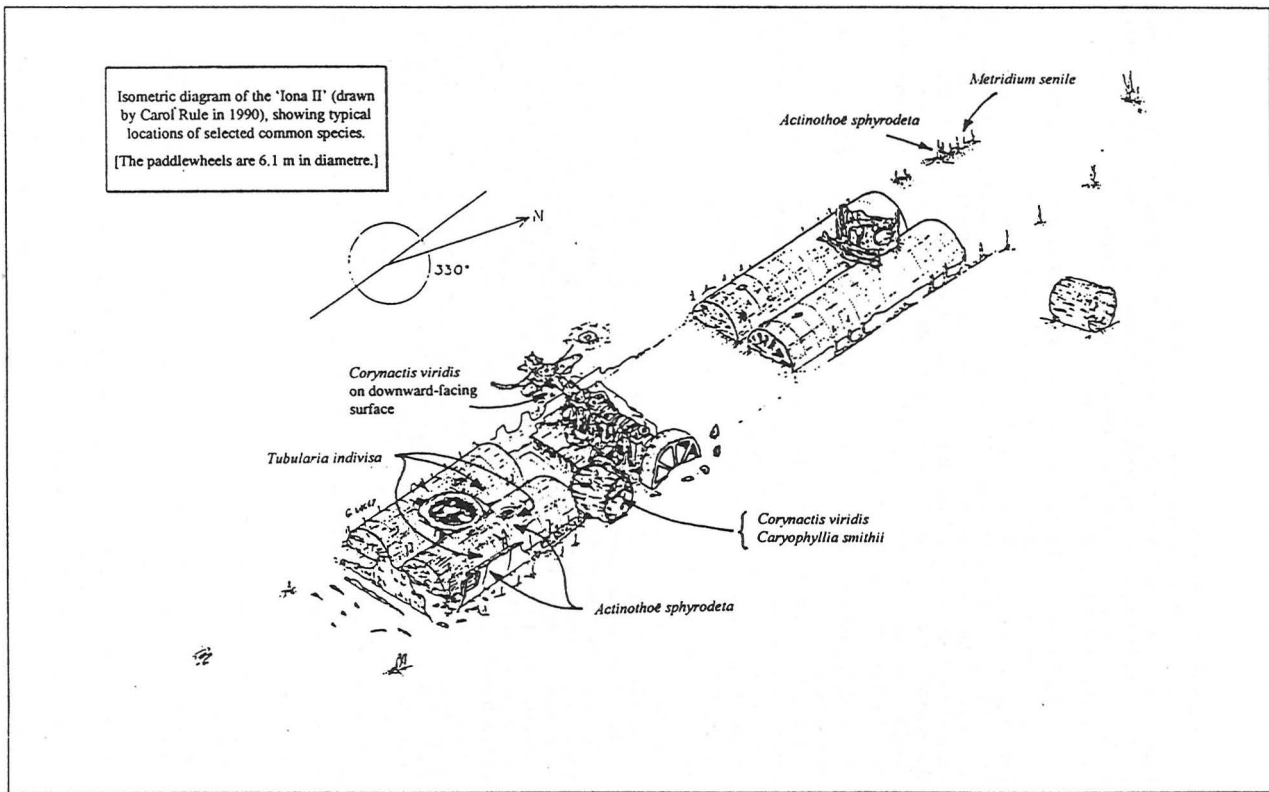


Figure 2. Location of particular species on the 'Iona II' protected wreck site

Manual, R.L. 1983. *The anthozoa of the British Isles - a colour guide (2nd edn.)*. Produced for the Underwater Conservation Society by R. Earll, 80pp.

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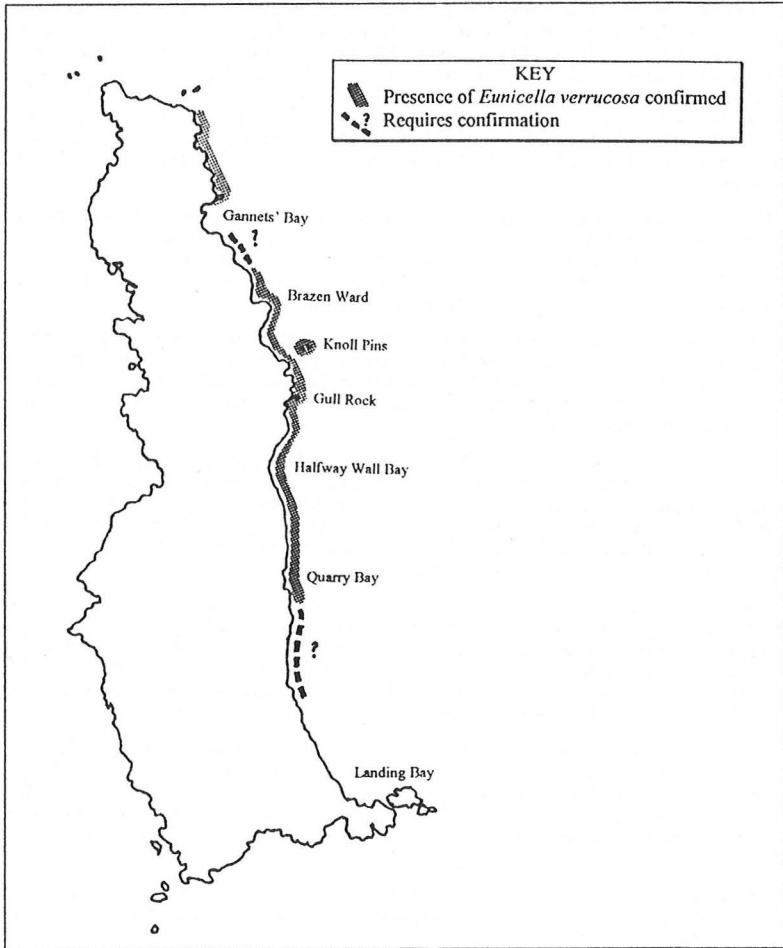


Figure 3. Distribution of sea fans *Eunicella verrucosa* along Lundy's east coast.