



BULLETIN of the PORCUPINE MARINE NATURAL HISTORY SOCIETY

Spring 2020 — Number 13



Bulletin of the

Porcupine Marine Natural History Society

No. 13 Spring 2020

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Aims of the Society

- To promote a wider understanding of the biology, ecology and distribution of marine organisms.
- To stimulate interest in marine biodiversity, especially in young people.
- To encourage interaction and exchange of information between those with interests in different aspects of marine biology, amateur and professional alike.

Porcupine MNHS welcomes new members - scientists, students, divers, naturalists and all those interested in marine life.

We are an informal society interested in marine natural history and recording, particularly in the North Atlantic and 'Porcupine Bight'.

Members receive 2 Bulletins per year (individuals can choose to receive either a paper or pdf version; students only receive the pdf) which include proceedings from scientific meetings, field visits, observations and news.

Membership fees: Individual £18 Student £10

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Editorial

Connections:

Being a Porcupine means many things. For me it is very much about connecting - with the sea and with people.

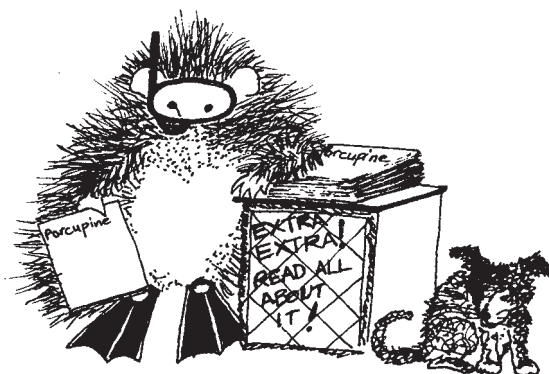
Only yesterday I had the absolute pleasure of meeting with one Porcupine and then a little later, stumbling across two more! The following conversation was hilarious and went in a very unexpected direction – I now know (but can't pronounce) what marine bristle worm is in Welsh! Thank you National Museum Cardiff Porcupines! I won't say that Porcupines are everywhere (we are not) but we are spread across the UK and even further afield. This brings me to muse on how well any of us make good use of our Porcupine network and what else can we learn from each other?

The conference and fieldwork are very much core to the purpose of Porcupine and they are the times to connect and reconnect with like-minded folk. With this in mind the Council have been talking about how we can help facilitate those connections and share our collective knowledge. One idea has been to think about how the field trips could be a place to develop identification skills and share field knowledge. There are two exciting field trips arranged for 2020 – to Lundy Island and to Dale, West Wales. Both will be quite different, involve shore and diving, and there will be experts to quiz and learn from on many taxonomic groups; from molluscs to seaweeds, from squirts to worms. You will find more information on the trips including how to register in this *Bulletin*. We will be putting more information out on social media closer to the dates and if there is a particular group you would like to learn more about let us know so we can put a plan in place!

And in case you were wondering - Marine bristle worm: Mwydyn Gwrychog Morol.

Vicki Howe, Hon. Editor

The distinctive tube of the sand mason worm, Lanice conchilega (Pallas, 1766) (Welsh name: Saer y Tywod)



Porcupine Field Trips 2020

This year we have not one but two exciting fieldwork opportunities for Porcupines to join in with. First, in August, we have been invited to be a part of the Lundy Marine Festival with both diving and shore work on offer. A month later, in September, we head down to west Wales to investigate Dale bay and surrounds. For further details and how to contact the organisers, see Robert Irving's article (p3) and the Dale poster (p4).

Roger Bamber Research Grant 2020 & 2021

The Roger Bamber Research Grant is an award of up to £500 towards small projects. Applications are now closed for the 2020 award and any successful applicants will be informed by 31st March with details published in the Autumn 2020 Bulletin.

Applications for the 2021 award are welcome at any time throughout the next year from now, with a closing date of 31st January 2021.

For further details on the award, eligibility and how to apply, see the website: <http://pmnhs.co.uk/grants-and-awards>

Frank Evans Writing Award

An award presented to the author(s) of the best article published in the Bulletin in any single year. The award is intended to encourage members to publish their research, fieldwork or marine life observations in an engaging and accessible manner that can help engage and enthuse others in the marine world.

The winner of the prize will be announced at the annual conference each year.

Details on eligibility and guidelines are available on the website: <http://pmnhs.co.uk/grants-and-awards>

MBA Short Courses

A program of short courses run by the MBA is now available at <https://www.mba.ac.uk/training-and-courses>. Courses planned for 2020 include Seaweed and Seaweed Pressing, Plankton, Rocky Shore species identification and Scientific Illustration. Courses are open to all and MBA members are eligible for a discount.

17th MBA Postgraduate Conference

**Exeter University, Streatham Campus
20th-22nd April 2020**

This annual conference provides a welcoming and open environment for postgraduate students from leading marine science institutions to share their research. Around 70 postgraduate delegates usually attend and present at the MBA postgraduate conference. Additionally, the program includes a suite of internationally renowned key-note speakers, who are leading experts in marine biological research.

The conference will have three days of talks, poster sessions and workshops designed to develop delegates' scientific and future career skills.

Details are available from <https://mba2020.wixsite.com/exeter>. Registration closes 29th March.

Ulster Marine Bioblitzes

**Saturday 4th April: Portballintrae boat club
Saturday 1st August: Ballintoy Harbour**

Ulster Wildlife's Living Seas Team are organising two marine bioblitzes. These are ticketed events with ticket sales open now for April and from 1st May for the August event. See <https://www.ulsterwildlife.org/events> for more details.



Lundy Marine Festival 2020

Robert Irving

Co-ordinator, Lundy Marine Festival 2020



In order to publicise the existence of the Marine Protected Area at Lundy and to highlight the cause of marine conservation in general, we're hosting a Marine Festival at the island this coming summer. It'll run from 23rd June until 20th September and will include a whole host of marine-related activities, research projects, displays, talks and other events, all encouraging volunteer participation in the name of citizen science. At the core of the Festival will be a Bioblitz (extending for the whole 3 months), with recording taking place on the island's shores and in the subtidal too.

We're delighted that Porcupine MNHS members will be joining us for a week during August (15th-22nd). The emphasis will be on the Bioblitz during this week in particular, so your ID skills will be much appreciated! The recently renovated St Helen's Church, which has now become an education centre as well as a place of worship, will be used as a field laboratory so that there'll be a place for folks to identify tricky specimens. Two days of boat diving have also been arranged for the weekend at the start of the week, with good middle-of-the-day spring tides occurring later in the week for low shore rummaging. Besides coming up with an inventory of species, we'll also be wanting to undertake some monitoring projects, both on the shore and under water.

Accommodation on the island is limited, with a high demand for the letting properties, particularly during peak holiday time. However, during this week, we have arranged for some large tents with campbeds to be available for PMNHS members at no charge, on a first-come first-served basis. (You can also bring your own tents too). Alternatively, people may wish to visit for a day trip out of Ilfracombe on the Saturday, Tuesday or Thursday (or the final Saturday from Bideford), allowing 4 hours on the island which will coincide with low water (the ferry crossing takes 2 hours). Reduced fares have been negotiated on the ferry for those participating in the Festival.

Doubtless more information will be available by the time this Bulletin is published (this item is being written a fortnight before Christmas). Please visit the PMNHS website for further information. We are also planning a dedicated Festival website (www.lundymarinefestival.org.uk) for the most recent news, which should be up and running by mid-February.

I look forward to welcoming you to Lundy and for some quality recording being accomplished. Now all everyone needs to do is to pray for good weather!

Update Jan 2020: We have just had confirmation that a small team from the Natural History Museum (London), led by Dr Lauren Hughes, will also be on the island for this same week in August, in order to obtain DNA samples for the Darwin Tree of Life project.



Group on Lundy seashore (Photo: Keith Hiscock)



Pink sea fan on the Knoll Pins (Photo: Dan Bolt)

**Porcupine Marine Natural History
Society Field Trip**

**Dale Bay, Pembrokeshire
19th & 20th September 2020**



**Shore surveys: Saturday 19th Sept 2020 Dale shore
Sunday 20th Sept 2020 Gann flats**

Seasearch diving surveys: 19 & 20 Sept 2020
– investigating mixed sediment sites in Dale Bay, 10 divers
– hard boat diving (4 dives £50 per diver plus air fills)

Contact: Kate Lock for further information
rumbalock@rumbalock.plus.com

Initial account of the north-east Scotland field trip, September 2019

Becky Hitchin

Sea caves with blennies blinking in torchlight. Rocky reefs with twisting pink channels lined with kelp spotted all over with blue-rayed limpets. Autumn sun and a tempting array of ice creams waiting at the end of each day's work.

The September 2019 Porcupine field trip was unusual for a number of reasons. Unusual, but wonderful. To start with, the weather forecast suggested that gales would be blowing every day, accompanied by rain and everything Scottish weather could throw at us. It turned out sunny and, if not actually warm, then certainly not chilly. Secondly, there were only two of us there – Adam Jenkins and myself. But what a lesson in seeing how much two people can do!

Where we were based

The field trip was based at Stonehaven, a small market town south of Aberdeen, with a good range of transport options, accommodation and places to eat – i.e. a great place for a field trip! It also has – very importantly – extremely good ice cream and fish and chips. We were based in one of the rooms in the Town Hall, just

back from the beach and an amazing resource for any future field trips in the area.

The east coast of Scotland from Dundee to Aberdeen has a varied and relatively unrecorded coastline, from wide sandy shores through wave-cut rocky platforms to high and remote cliffs. Within the area there are a number of easily accessible shores with diverse and abundant fauna and flora. Records from the area are relatively sparse, with the major published record source being McKay & Smith (1979). Records on the National Biodiversity Network (NBN) show the relative abundance of records from this area compared to the nearby Moray Firth. Recent (re)discoveries intertidally have been stalked jellyfish (*Calvadosia cruxmelitensis* (Corbin, 1978)) and tortoiseshell limpets (*Testudinalia testudinalis* (O. F. Müller, 1776)).

Where we worked

Having a small number of participants was a blessing and a curse. With more people, we could have recorded from a wider range, but with a smaller number of people, we could go to some of the more challenging shores that no field trip leader would have wanted to try and keep track of more than one small group of people crouched down in kelp on. We spent most of our days around the shores of Stonehaven, working our way northwards



Fig. 1: Map of the general area of Stonehaven

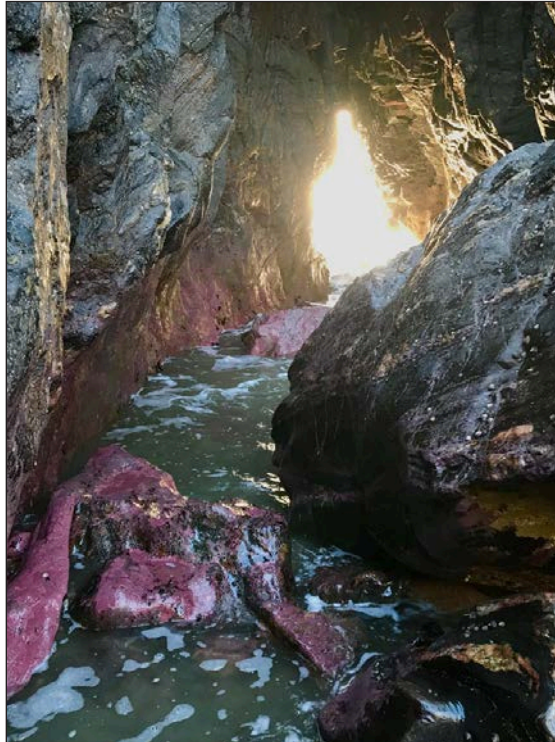


Fig. 2: Muchalls shore cave with pink coralline algae walls

from Cowie along the wide, shallowly sloping reef that leads down from areas of rockpools through geologically-tormented and twisted valleys and ridges down to a kelpy subtidal zone.

We went south of Stonehaven to Catterline, more commonly known as a local dive spot than a shore survey area, as we wanted to see how much we could increase the mainly subtidal records of the area by. The shore is packed full of deep gullies, some over 2–3m deep, craggy and dark at the bottom. This was a bit of an exploratory day, but again successful in terms of recording a good amount of fauna and flora.

We also had a more adventurous day at a small shore north of Stonehaven near the village of Muchalls. Not only is there a wonderful footpath leading over the cliffs through caves and arches but on the shore itself is a semi-submerged sea cave, pink-walled with beadlet anemones, sponges and a wide range of red seaweeds (Figures 2 & 3).

Recording

We don't yet have a full account of everything recorded on the trip, but the total is looking to be around 200 species. Adam focussed on



Fig. 3: Muchalls shore, viewed from the coast path.

tiny critters – mainly infaunal crustaceans and polychaetes. I looked at seaweeds, sponges, anything and everything epifaunal. So the division of labour worked out well.

Each of the shores (full records / biotopes to be provided in the next *Bulletin*) were similar epifaunally, though the infaunal communities are looking to be somewhat more distinct. Sponge-wise *Halichondria* (*Halichondria*) *panicea* (Pallas, 1766) was present on all shores, and most also contained records of *Oscarella*, *Sycon ciliatum* (Fabricius, 1780) and *Grantia compressa* (Fabricius, 1780), especially on overhangs and amongst the higher kelp holdfasts. Beadlet anemones *Actinia equina* (Linnaeus, 1758) were present mainly in rockpools but also in abundance around the sea cave at Muchalls. Hydroids, as generally seen in the area, were somewhat rare. Only *Dynamena pumila* (Linnaeus, 1758) and a species of *Sertularella* were found, even with some dedicated searching.

So far, we only have records for the molluscs and crustaceans that were not identifiable by specialists, and there were a lot of very small 'micro' molluscs and crustaceans to look at. Of note in the molluscs were records of *Boreochiton ruber* (Linnaeus, 1767) – again



Fig. 4: Typical under-boulder community

seemingly a speciality of the area. *Patella pellucida* Linnaeus, 1758 were frequent if not common in most sites. Adam seemed particularly pleased with his amphipod and isopod haul, and those records will be highlighted in the next *Bulletin*.

Of all the surveys I've done at Stonehaven and surroundings, I've never before seen any specimens of the bright green polychaete *Eulalia viridis* (Linnaeus, 1767). So I was rather excited to see my first one. By my tenth, I was slightly less excited, though I'm intrigued as to whether we just caught them at the right time of the year for a population increase, or whether there's been an overall increase of abundance in the area. The same goes for *Sabellaria spinulosa* (Leuckart, 1849).

Also interesting in a less exciting way was the recording of *Corella eumyota* Traustedt, 1882 in nearly every site. This is an invasive non-native species of sea squirt, and has been on

the Stonehaven shores for at least 6-7 years now. Luckily, it doesn't seem to be increasing in abundance, remaining in specific habitats such as rockpools.

Algae are diverse, our initial count of species being 53, including *Alaria esculenta* (Linnaeus) Greville, 1830, a number of *Ceramium* species and, we think, *Callithamnion* sp and *Caulacanthus okamurae* Yamada, 1933, though both of those need confirmation.

So please look out for part two of this report, which will be more scientific and will provide full records of everything found. If anyone wants to come over to the east coast before or after the March 2020 Porcupine conference, please do! I'd be delighted to show you the wonderful shores we have here.

References

McKay, D.W. & Smith, S.M. 1979. *Marine Mollusca of East Scotland*. Published by the Royal Scottish Museum. Edinburgh. 185 pp.

Mud, Rocks, Fish and Crustaceans: Dale 2019

Aran Lock

From a young age I have always been a huge fan of catching sea creatures on shores – I kind of get it from my mum; she is a marine biologist after all! I never was squeamish and preferred to do everything by hand. After taking every opportunity to go catching, I ended up pretty good at it and gained a local reputation.

One of my favourite sites to go to is Dale Beach in Pembrokeshire, definitely not the most immediately appealing place to go catching as there are no rockpools, simply mud and rocks. However, as I have discovered, you can find over 15 different species of fish, and practically every crustacean in the book. There is also a large variety of shells, sea squirts, sponges and seaweed. So then at the age of 15, the idea came to me, why don't I log my finds and do a write-up on them?

The Plan

I checked the tide table and chose four of the lowest tides in the year, so that I could show

the diversity of what I catch over the season from May to October. Along with a couple of keen friends we targeted these dates. We concentrated on fish and crustaceans along with other mobile species that we found interesting.

In Dale there is a small rocky area at the top of the beach, large boulders are found in the middle section of the beach and at the lowest point of the tide the boulders become scarcer and the beach opens up to a simple muddy platform, with the occasional mooring block and buoy.

We focused our time in the boulder area (Figure 1), the boulders had a diameter size range of 20cm to 1.5m, and they were turned by hand. All mobile animals under the boulders were caught by hand, before turning the boulders back over. We also had a large sweep net (1.5m across; Figure 2), which we would take out up to about waist height to push around. We tended to cover a search area of beach approximately 100m², always with five buckets; three small white buckets for delicate and small animals, a large purple one roughly 50cm diameter for crustaceans and a very large orange bucket about 1m diameter for large fish.



Fig. 1: Dale shore boulders and muddy mixed sediments



Fig. 2: Using a sweep net off the Dale shore

Results from May to October

The results of our finds for the four surveys are shown in Table 1.

Our first session was 18th May: the tide was 0.5m and we were excited to get started. As it was still early season, the sea temperature wasn't even hitting double figures yet and because of this we had quite a small turnout of creatures in comparison to the later three sessions. One thing immediately noticeable was that there were practically no juvenile fish. The highlights of the session were a small spotted cat shark and shore clingfish. The clingfish was an anomaly as this is not the expected habitat for one which is why it was such a treasured find. Another catch which was a first for me were two conger eels (Figure 3), both measuring over a metre, they were



Fig. 3: Conger eel

certainly a favourite of the first session. Other cool finds were a grey sea slug and three large sea hares. We were also catching crustaceans and were pleased to get spiny spider crabs and a large edible crab.

The second session, on August 4th, was also a lot of fun. The sea temperature had risen to around 14°C, and this meant that there was a greater diversity in what was caught to the previous session. For example, we had shore (Figure 6B) and five-bearded rocklings as well as fifteen-spine sticklebacks. There were also many juvenile gadoids and wrasses flooding into the sweep net. My personal highlights of the session were the dragonet and the sea scorpion (Figure 4), I am just a big fan of the appearance of both and think that they are seriously cool fishes. Again, to my amazement we found a conger eel, and under the same



Fig. 4: Sea Scorpion

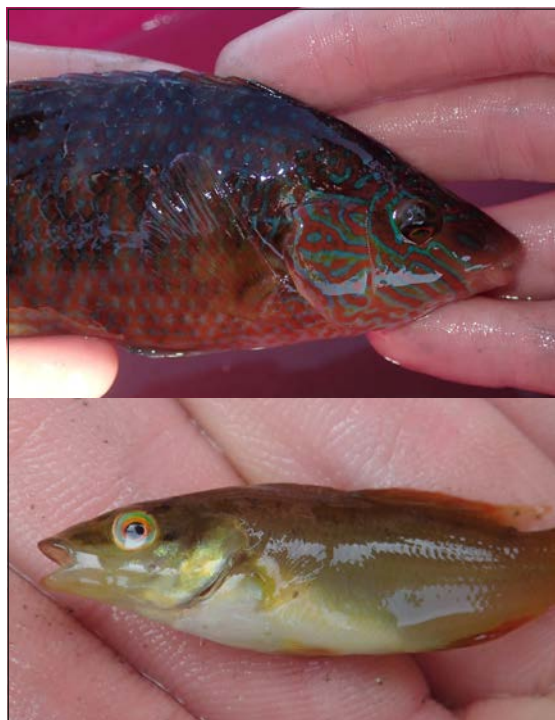


Fig. 5: Adult (top) and juvenile (bottom) Ballan wrasse were both found

boulder as there was one before, leading me to think that we have stumbled across a home of one. We were happy to see another cushion star (Figure 6D), and we also noted that common shore crabs were definitely the dominant crab species.

The third session, on September 29th, with the sea temperature at 16°C and a 0.3m tide was mutually agreed by the team to be the best session of the four. We had the highest number of species by a long shot. This time of year is certainly prime for catching; we had our first large Ballan wrasse (Figure 5) and a beautiful Montagu's blenny. However, this came at the price of our fingers, with over 100 velvet swimming crabs a certain record, they certainly made quite the challenge. However, there were no complaints as I had three personal firsts: a common squat lobster, juvenile common lobster (Figure 6A&C) and a feather star. These were all extremely cool finds and definitely stood out for me personally, once again we found a conger eel under the exact same rock.

So, our last session had arrived, October 28th, and the sea temperature was around 14°C. The weather was awful, and morale was low before we started. Nonetheless it was still a good session being able to catch a lot of cool

creatures we had seen previously. However, there was nothing new. This was also the first session where we did not find a conger eel under the famed conger eel rock. I believe this is because some sediment had shifted under the rock meaning that the gap between the rock and the mud was not large enough to house the animal. A shame but we were still able to find another smaller one, nonetheless.

What we learnt and plans for future investigations

We have learnt a lot about the changes through the seasons and how the sea temperature has an influence on what animals are present, and the data in Table 1 shows this. A total of 19 species of fish were recorded with additional records of juvenile gadoid and flat fish species that were not identified to species. It was really interesting to find that only four species were found on all four surveys, these were: conger eel, European eel, snake pipefish and sand gobies along with the juvenile gadoids.

On all four sessions, we were only able to catch creatures on a low tide and with my obsession I want to be able to see what else is there during the tidal cycle. I'm therefore planning on building a fish trap to put out over the high tide and possibly also at night. I also would like to propose the idea of having a Porcupine field trip down to Dale Beach to record all the different marine groups as I believe that it is the perfect location to find a large diversity of animals and, of course, seaweeds.

Acknowledgements

I did not do the surveys alone. Sam Burton and Charlie Utting helped on all the surveys and Brynley Moore on the first two. Kate Lock helped confirm some of the identifications when going through our finds and did the scientific names in the table. Thanks to Mike Camplin for the extended loan of his fantastic sweep net and to Vicki Howe for suggesting doing this write up for Porcupine.



Figure 6: Highlights from the boulder surveys (top left) included (A) juvenile lobster, (B) shore rockling, (C) common squat lobster and (D) cushion star.

Table 1: List of all species found during the Dale Beach surveys

| Species (common name) | Species (Scientific name) | Authority | Date of Survey | | | |
|------------------------------|--|----------------|----------------|----------|----------|----------|
| | | | 18/05/19 | 04/08/19 | 29/09/19 | 28/10/19 |
| PISCES | | | | | | |
| Conger eel | <i>Conger conger</i> | Linnaeus, 1758 | 2 | 1 | 2 | 1 |
| European eel | <i>Anguilla anguilla</i> | Linnaeus, 1758 | 30 | 15 | 8 | 15 |
| Snake pipe fish | <i>Entelurus aequoreus</i> | Linnaeus, 1758 | 35 | 6 | 2 | 3 |
| Butter fish | <i>Pholis gunnellus</i> | Linnaeus, 1758 | 1 | 2 | 2 | |
| Rockling - shore & 5-bearded | <i>Ciliata mustela</i> & <i>Gaidropsarus mediterraneus</i> | Linnaeus, 1758 | | 12 | 30 | 100 |
| 15 spine stickleback | <i>Spinachia spinachia</i> | Linnaeus, 1758 | | 40 | | 3 |
| Shanny/Shore blenny | <i>Lipophrys pholis</i> | Linnaeus, 1758 | 2 | 3 | 3 | |
| Montagu’s blenny | <i>Coryphoblennius galerita</i> | Linnaeus, 1758 | | | 1 | 1 |
| Ballan wrasse | <i>Labrus bergylta</i> | Ascanius, 1767 | | | 1 | |
| Ballan wrasse (Juv) | <i>Labrus bergylta</i> (Juv) | | | 50 | 3 | 4 |
| Corkwing wrasse (juv) | <i>Symphodus melops</i> | Linnaeus, 1758 | | | 6 | 6 |

Table 1 (cont.): List of all species found during the Dale Beach surveys

| Species (common name) | Species (Scientific name) | Authority | Date of Survey | | | |
|---------------------------|----------------------------------|---------------------------------|----------------|----------|----------|----------|
| | | | 18/05/19 | 04/08/19 | 29/09/19 | 28/10/19 |
| Sand goby | <i>Pomatoschistus minutus</i> | Pallas, 1770 | 10 | 7 | 15 | 1 |
| Rock goby | <i>Gobius paganellus</i> | Linnaeus, 1758 | | | 8 | 3 |
| Dragonet | <i>Callionymus lyra</i> | Linnaeus, 1758 | | 1 | | |
| Sea scorpion | <i>Taurulus bubalis</i> | Euphrasen, 1786 | | 1 | 2 | 1 |
| Small spotted cat shark | <i>Scyliorhinus canicula</i> | Linnaeus, 1758 | 1 | | | |
| Plaice (Juv) | <i>Pleuronectes platessa</i> | Linnaeus, 1758 | 1 | | | |
| Flat fish (Juv) | (unidentified) | | | 1 | | |
| Gadoids (Juv) | | | 50 | 20 | 20 | 15 |
| Shore clingfish | <i>Lepadogaster lepadogaster</i> | Bonnaterre, 1788 | 1 | | | |
| ARTHROPODA | | | | | | |
| Edible Crab | <i>Cancer pagurus</i> | Linnaeus, 1758 | 15 | 15 | 10 | 5 |
| Velvet swimming crab | <i>Necora puber</i> | Linnaeus, 1767 | 20 | 30 | 100 | 30 |
| Green shore crab | <i>Carcinus maenas</i> | Linnaeus, 1758 | 50 | 70 | 50 | 50 |
| Long claw porcelain crab | <i>Pisidia longicornis</i> | Linnaeus, 1767 | 20 | 5 | 30 | 50 |
| Broad claw porcelain crab | <i>Porcellana platycheles</i> | Pennant, 1777 | 100 | 40 | 30 | 100 |
| Scorpion spider crab | <i>Inachus dorsettensis</i> | Pennant, 1777 | 3 | 1 | 1 | 1 |
| Spiny spider crab | <i>Maja brachydactyla</i> | Balss, 1922 | 2 | 3 | | |
| Long legged spider crab | <i>Macropodia rostrata</i> | Linnaeus, 1761 | 1 | 2 | 2 | 15 |
| Hermit crab | <i>Pagurus bernhardus</i> | Linnaeus, 1758 | 15 | 5 | 5 | 5 |
| Common prawn | <i>Palaemon serratus</i> | Pennant, 1777 | 100 | 100 | 100 | 100 |
| Glass shrimp (Mysidacea) | Mysids | | 100 | 100 | | |
| Brown shrimp | <i>Crangon crangon</i> | Linnaeus, 1758 | 10 | 30 | 20 | 100 |
| Common squat lobster | <i>Galathea squamifera</i> | Leach, 1814 | | | 1 | |
| Common lobster (Juv) | <i>Homarus gammarus</i> | Linnaeus, 1758 | | | 1 | |
| MOLLUSCA | | | | | | |
| Spotted cowrie | <i>Trivia monacha</i> | da Costa, 1778 | | | 15 | 30 |
| Sea hare | <i>Aplysia punctata</i> | Cuvier, 1803 | 3 | | | |
| Grey sea slug | <i>Aeolidia papillosa</i> | Linnaeus, 1761 | 1 | | | |
| Sea lemon | <i>Doris pseudoargus</i> | Rapp, 1827 | | | 3 | 1 |
| ECHINODERMATA | | | | | | |
| Cushion star | <i>Asterina gibbosa</i> | Pennant, 1777 | 1 | 1 | | |
| Brittle star | <i>Ophiothrix fragilis</i> | Abildgaard in O.F. Müller, 1789 | 6 | | 10 | 15 |
| Feather star | <i>Antedon bifida</i> | Pennant, 1777 | | | 1 | 2 |
| Shore urchin | <i>Psammechinus miliaris</i> | P.L.S. Müller, 1771 | | 1 | | 1 |
| NEMERTEA | | | | | | |
| Bootlace worm | <i>Lineus longissimus</i> | Gunnerus, 1770 | | 1 | 2 | 2 |

Survey Project 2016-2019

Rebecca MacDonald

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Introduction

The Somerset coast is a highly dynamic environment lying on the Bristol Channel and is renowned for its large tidal range. The coastline is also well known for its large expanses of mud and sand but it is generally not appreciated for the wide diversity of species and habitats that can be found there. Its 75 km length stretches from boulder shores and kelp forests at Glenthorne in the east to one of Europe's longest sandy beach ending at Brean Down in the north.

In recent years this coastline has become increasingly developed and Somerset Wildlife Trust (SWT) recognised that this needed to be managed in a way that enhanced the natural environment. As part of the Severn Vision project, SWT pledged to 'grow knowledge to enable better decision making' and in 2016 they launched their Coastal Survey Project aiming to map the biotopes of the intertidal zone.

Methodology

Aerial imagery of the Somerset coast taken in 2013/14 was obtained from the Channel Coastal Observatory alongside polygonal broadscale ecological mapping data which was developed as part of the Southwest Strategic Regional Coastal Monitoring Programme completed in 2015/16 (Figure 1). Layering of these data in ArcGIS provided a baseline for the mosaic of habitats found across the



Fig. 1: Screenshot of aerial and polygonal imagery of Warren Bay - Watchet Harbour.

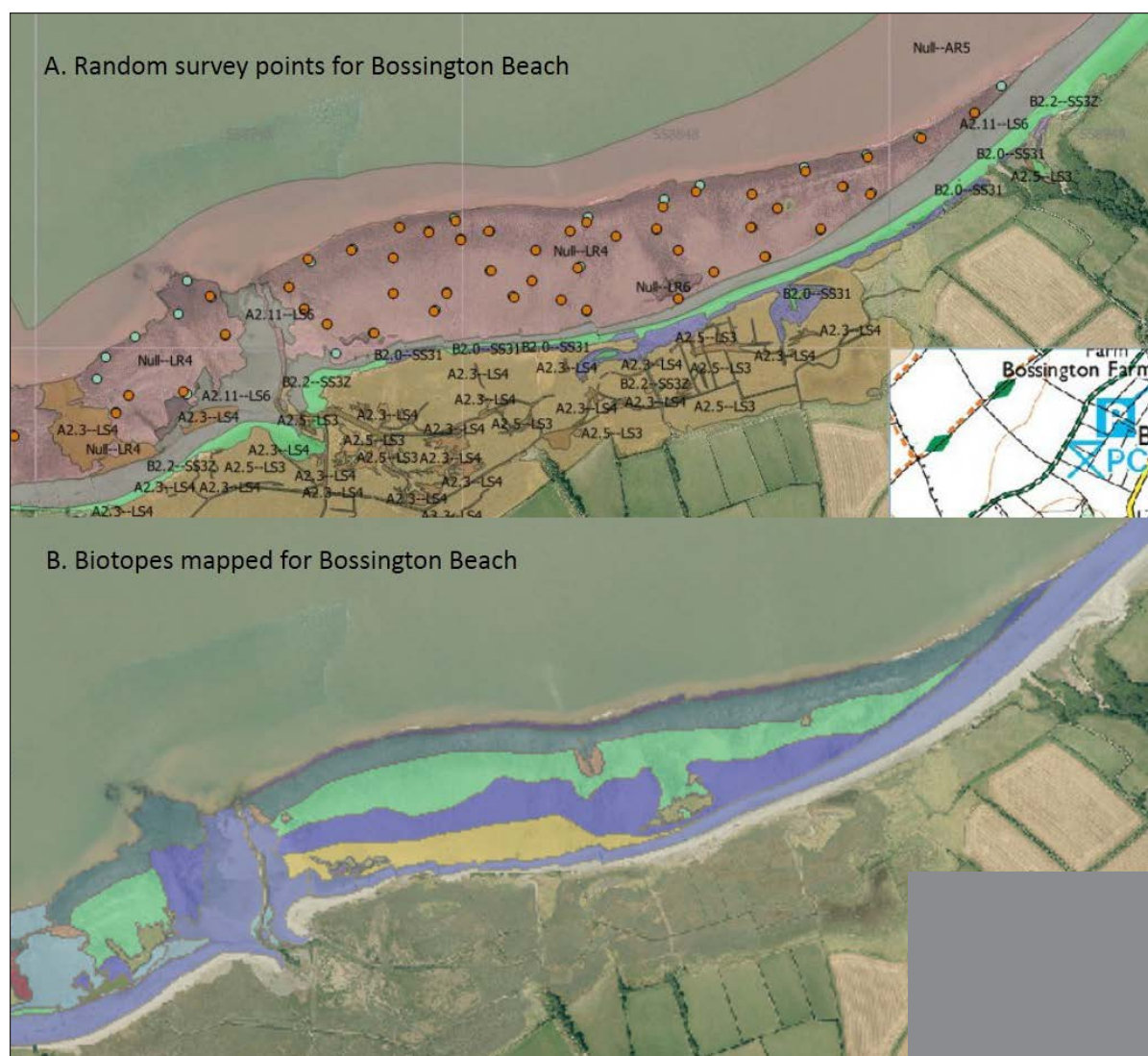


Fig. 2: Bossington Beach mapping layers.

intertidal and facilitated survey planning. A layer of random survey points (Figure 2A) was created where 1m² quadrats would be used to collect more detailed data. These layers were then transferred to a rugged tablet (ConkerTab) with QGISGeo. This provided a means of locating the random quadrat points and adding in additional data alongside the creation or modification of polygons in the field. Figure 2 shows an example of how the biotope mapping developed using this method.

In the field, walkovers of each polygon were completed to support the data collected in the random quadrat points to ensure that the highest possible biotope level could be assigned (both MNCR and EUNIS were used).

Results

Rocky shore surveys covering an area the size of Taunton were completed during the 2017–19 survey seasons (March–October). Further surveys and verification of the assigned biotopes took place throughout the 2019 survey season producing a detailed biotope map of the Somerset coast, as shown for Watchet in Figure 3. Time and resource constraints meant that the project was unable to extend to the intertidal sediments. A database of species records has also been maintained and shared with the Somerset Environmental Records Centre.

Surveys revealed the locations of Priority Habitats including a patchy reef of *Sabellaria* spp. that runs from around Hinkley point to Minehead and intertidal underboulder

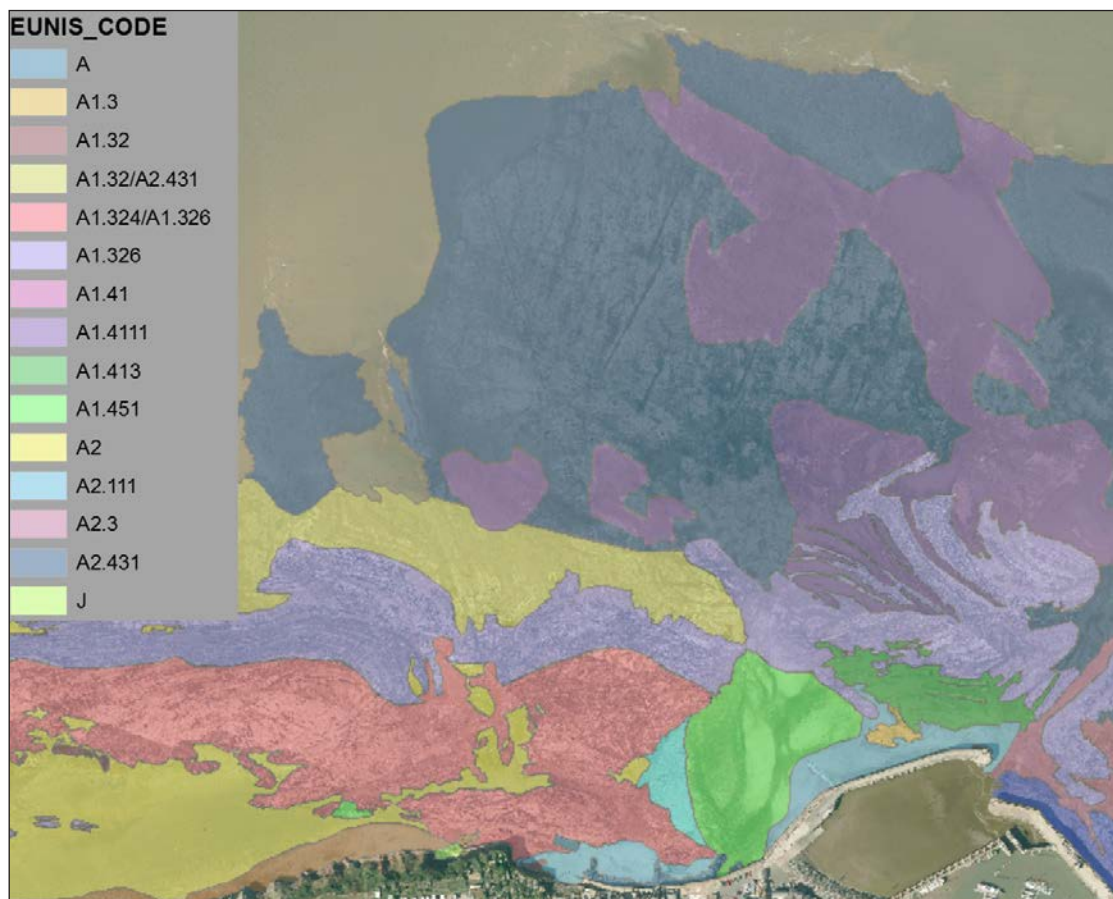


Fig. 3: Biotopes of the intertidal zone at Watchet

communities occurring from Bossington to Glenthorne. Bossington surveys also revealed the presence of *Edmundsella pedata* (Montagu, 1816), a tiny nudibranch distinguished by its striking violet colouration (Figure 4), reaching up to 48 mm and normally found in the shallow subtidal (Hayward & Ryland

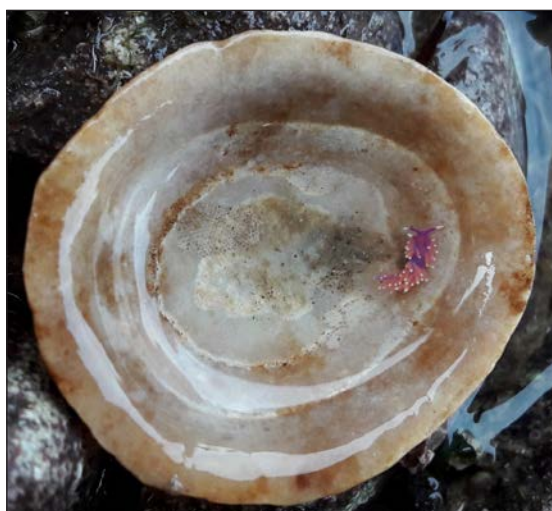


Fig. 4: *Edmundsella pedata* found in a limpet shell at Bossington Beach (Georgie Blow, Somerset Wildlife Trust).

2017), occurring within the underboulder community. It has also been found within these communities at Porlock.

Data, engagement and monitoring

The raw data and mapping shapefiles are freely available to anyone who wishes to use them. Further data were provided by Natural England and EDF Energy which have been added to produce a more comprehensive intertidal biotope map for the online resource (please note SWT are unable to share any data from these additional sources).

An online engagement resource has been developed to inspire people to visit, engage with and conserve their coastline containing three interactive tools: 1) a Photographic Tour revealing several Somerset highlights, 2) a Discovery Map allowing users to navigate the main visitor sites around the coast including information on amenities and interests alongside inspirational imagery and 3) the Explore Map which uses the biotope data to reveal the variety of habitats the coast has to

offer and provides information on the species that can be found within the communities (Figure 5). The raw data was converted into a modified version of *Lifeforms* to make it more accessible for this tool.

To ensure that data collection continues and to enable monitoring to begin, Shoresearch training sessions have been running and surveys are planned throughout 2020. These are being organised by Mark Ward, the *Somerset's Brilliant Coast* Project Manager - if you are interested in getting involved please look at the SWT website for details.

Acknowledgements

Many thanks to everyone who has supported the project including the Peter de Haan Charitable Trust, ERCCIS, Cornwall Wildlife Trust, Natural England, Devon & Severn IFCA, SERC and SWT's amazing volunteers and members.

Links

Somerset Wildlife Trust's Coastal projects: <https://www.somersetwildlife.org/what-we-do/restore-somerset-nature/create-living-landscapes/somerset-living-coast>

References

Hayward, P. J. and Ryland, J. S. (Eds.). 2017. *Handbook of the Marine Fauna of North-West Europe*. Second Edition. Oxford University Press. 800pp.

Severn Vision. 2017. Severn Vision Narrative Report. www.severnvision.org. 22pp.

Environmental Systems Ltd. & Nature Bureau Ltd., 2016. *National Network of Regional Coastal Monitoring Programmes of England – South West England (Hartland point to Beachley)*. *Ecological Mapping*. South West Strategic Regional Coastal Monitoring Programme

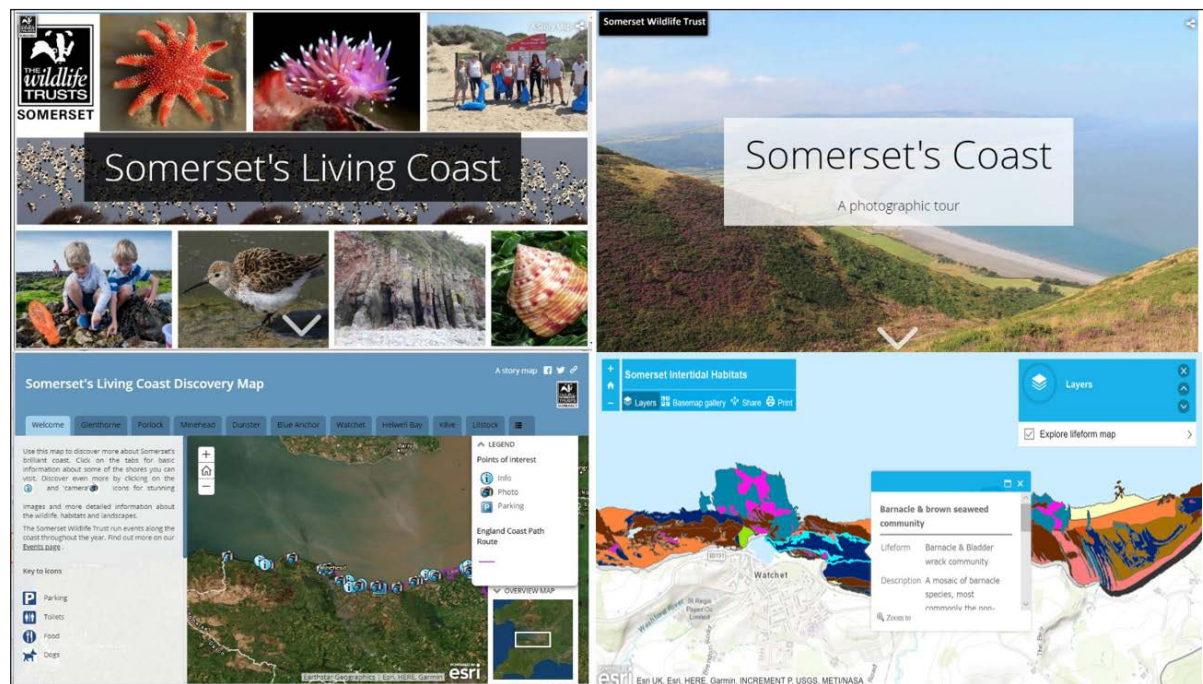


Fig. 5: Online engagement resource

Collecting Scotland's Offshore Fauna

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Introduction

Since graduating as a marine biologist in 1993, I have focussed on marine invertebrates, particularly those from intertidal and shallow subtidal habitats in Scotland. In hindsight, I have not given much thought to the extraordinary wildlife that is living just a little further from our shores. Although there are an estimated 4 million marine specimens in the care of National Museums Scotland, the collection has a similar bias. The opportunity to join two offshore research cruises in 2019 was unmissable, both personally and professionally.

The surveys

MRV *Scotia*, Scotland's main research vessel was used for both surveys. She operates from her home port in Aberdeen and accommodates a crew of 17 and up to 12 scientists.

In August I joined a team from the Joint Nature Conservation Committee and Marine Scotland Science engaged on a benthic survey of a 4000 square kilometre area of seabed known as the West Shetland Shelf. This area lies to the north of Scotland in depths of 70 to 150 metres (Figure 1) and was designated a Nature Conservation Marine Protected Area in 2014 to protect its wide variety of sand and gravel habitats. The aim of the survey was to gather data to monitor the condition of the MPA's designated habitats and associated species, which was achieved by a combination of multibeam bathymetry, drop-frame camera tows and grabs during 16 days at sea.

Two weeks later I re-joined MRV *Scotia* and Marine Scotland scientists for a 14-day survey

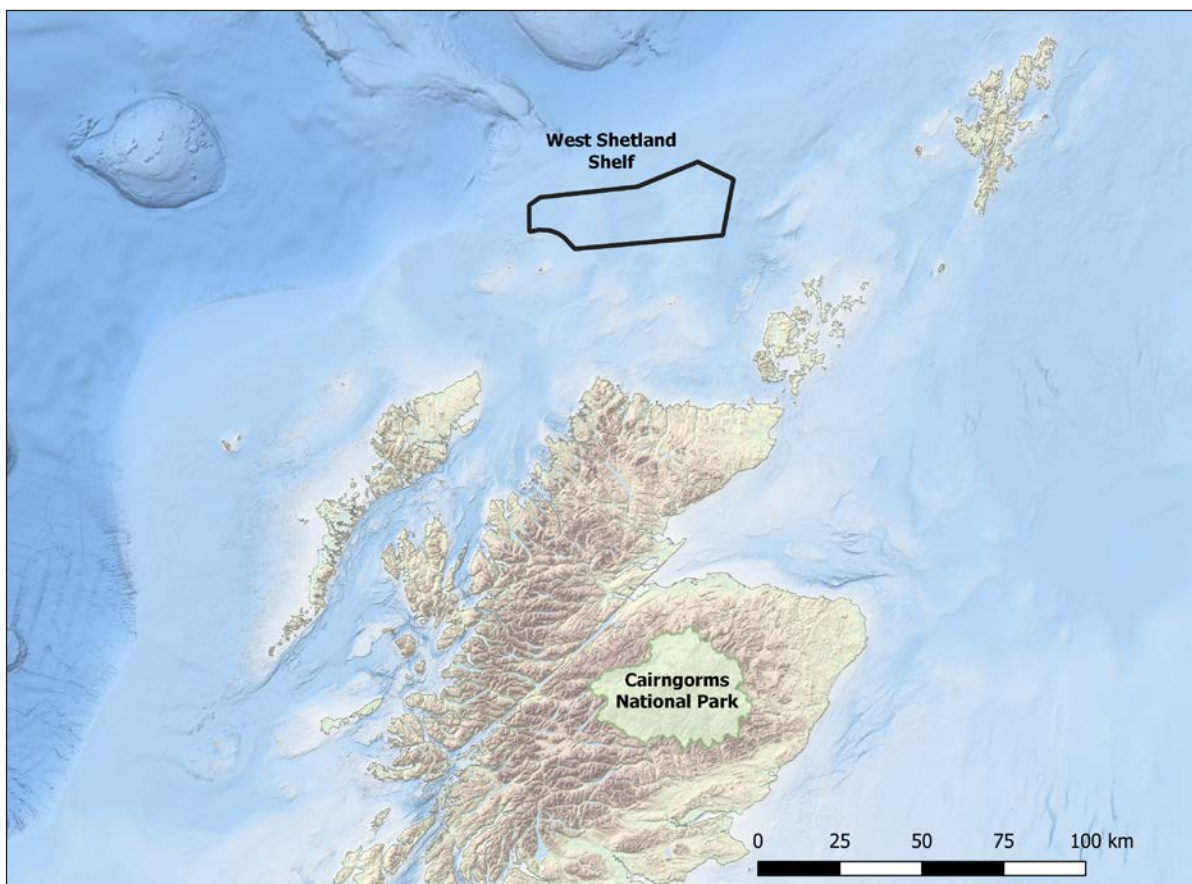


Fig. 1: Location of the JNCC/MSS West Shetland Shelf Survey, 2019 (Map ©Scottish Government, contains Ordnance Survey data © Crown copyright and database right (2019))



Fig. 2: A. Deploying the Hamon Grab from MRV Scotia; B. Sorting a grab sample; C. Cup corals and tusk shells collected for NMS; and D. Bryozoan morphotype collected for NHM. West Shetland Shelf, 70-150 m

of the continental shelf slope to the west of the Hebrides. This was part of a biannual survey programme to map and monitor the composition, distribution and abundance of bottom-living and semi-pelagic fish providing catch data that will inform management decisions. The main survey area extends

from Donegal to the Flannan Isles (55-59° N) and includes long-term monitoring transects down the slope with fixed trawl stations at depths of 500, 1000, 1500 and 1800 metres. An additional trawl station at 2000 metres was sampled where possible and on selected tows a ground gear bagnet was deployed for benthic sampling. Despite some minor disruption from the after-effects of Hurricane Lorenzo we were able to extend the survey to the Faroe-Shetland Channel (61° N) where the influence of Arctic waters has a marked effect on species composition.

The fauna

The West Shetland Shelf grab samples were washed through a 1 mm sieve on board and the residue is being sorted and identified by environmental consultants (Figures 2A-B). Failed grab samples (less than 5 litres



Fig. 3: Holotype of *Ampharete oculicirrata*
©National Museums Scotland

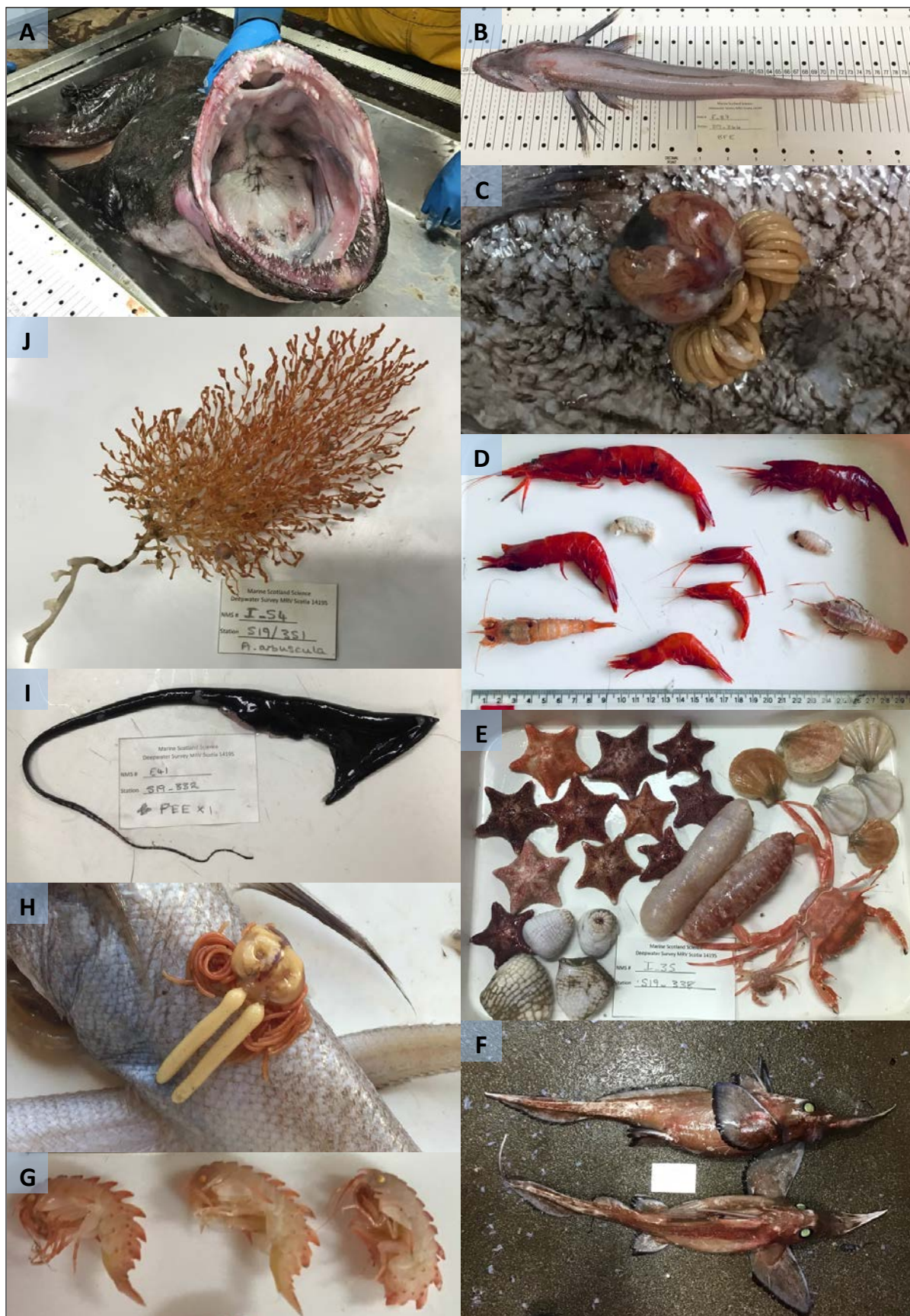


Fig. 4: Typical assemblage collected west of the Hebrides from a depth of 1800 m

of sediment collected) were used to select specimens for sequencing at the Natural History Museum's Molecular Collections Facility and for the National Museums Scotland collection. NMS specimens were narcotised using carbonated seawater, magnesium chloride or menthol prior to fixation to maximise the quality of the specimens (Figures 2 C-D). Polychaetes dominated the fauna but cup corals, tusk shells, amphipods and brittle stars were common.

A new species of polychaete, *Ampharete oculicirrata* Parapar, Moreira & Barnich, 2019, was collected from the area in 2017 and the type specimen is now housed in the

NMS collection (Figure 3) - *Ampharete* is a tube-dwelling worm that feeds by gathering particles of detritus with delicate thread-like tentacles and one of its peculiarities is that it has eyes near its anus as well as on its head (Parapar *et al.* 2019). Further new species are possible from this rarely sampled site and a voucher collection of every species collected during the survey will be deposited with NMS, contributing to a publicly accessible reference source for future research on marine fauna and providing part of the baseline for the assessment of change caused by climate change or other factors.



The second survey was dominated by mobile fish which were sorted into separate species, measured and weighed to allow calculation of catch indices and comparison with previous years. Over 150 species of fish were caught during the survey and the diversity of form was truly astonishing – light producing organs and large eyes for the detection of bioluminescence were common features of the fish; some had grotesquely large mouths to accommodate any size of prey item that they might encounter; and the jaws were commonly armed with ferociously hooked teeth to prevent the escape of any such prey (Fig 4). A representative collection of 285 fish specimens were frozen on board before being transferred to NMS for long-term preservation.

The invertebrates included crustaceans and a range of large and sparsely distributed animals from the surface of the seabed. Over 800 specimens were retained for incorporation into the NMS collection including species that previously had been absent or under-represented and stunning, display-quality individuals. My highlights included parasitic barnacles and copepods, large isopods and pycnogonids, impressively armoured amphipods, basket stars and vibrant deepwater shrimps. This material will be meticulously processed and incorporated into the collection for the benefit of current researchers and future generations of marine scientists. Some of these specimens will also appear in the forthcoming display *Scotland's Precious Seas* which runs at the National Museum of Scotland from 13 March-28 June 2020 to mark the Year of Scotland's Coasts and Waters.

Acknowledgements

Thank you to the Joint Nature Conservation Committee, particularly Joey O'Connor, for

the invitation to join the West Shetland Shelf Survey; to Marine Scotland Science, particularly Jim Drewery, for the opportunity to join the Deepwater Survey; and to all the crew and scientists of MRV *Scotia* Cruises 1219S and 1419S for such enjoyable, productive and enlightening opportunities to develop the collection at NMS.

Suggested Links

- <https://blogs.gov.scot/marine-scotland/2019/10/18/the-wonders-found-when-deepwater-sampling-1419s-survey-update/>
- <https://jncc.gov.uk/about-jncc/jncc-blog/tags/1219s>
- <https://www.nms.ac.uk/collections-research/collections-departments/natural-sciences/>
- <https://www.visitscotland.com/about/themed-years/coasts-waters/>

References

- Parapar, J., Moreira, J. & Barnich, R. 2019. A new species of *Ampharete* (Annelida: Ampharetidae) from the West Shetland shelf (NE Atlantic Ocean), with two updated keys to the species of the genus in North Atlantic waters. *European Journal of Taxonomy* **531**: 1–16.

Fig. 5 (left): Specimens from the continental shelf slope (clockwise from top left): A. Angler *Lophius piscatorius*, Linnaeus, 1758, 500 m; B. Deepsea lizardfish, *Bathysaurus ferox* Günther, 1878, 2000 m; C. Parasitic copepod on flat-nose codling, *Antimora rostrata* (Günther, 1878), 1500 m; D. Crustacean assemblage, 2000 m; E. Invertebrate assemblage, 500 m; F. Smallspine spookfish, *Harriotta haeckeli* Karrer, 1972, 1800 m; G. *Epimeriidae*, 600 m; H. Parasitic copepod on Gunther's grenadier, *Coryphaenoides guentheri* (Vaillant, 1888), 1500 m; I. Pelican eel, *Eurypharynx pelecyanoides* Vaillant, 1882, 1800 m; J. Bamboo coral, *Acanella arbuscula* (Johnson, 1862), 1000 m.

A sublittoral observation of 'feeding' behaviour by *Hermodice carunculata* (bearded fireworm) on *Pelagia noctiluca* (mauve stinger), in the Eolian Islands, southern Tyrrhenian Sea, Mediterranean, August 2019

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Sea-nature Studies

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Fig. 1: A cluster of fireworms, how can such a bouquet be ignored?

There is always something to see. Even on the last snorkel, before the ferry shudders free of the harbour wall and all you can do is gaze out through the salt-caked glass at the impossible blue.

Hermodice carunculata (Pallas, 1766), the bearded fireworm is, like the mauve stinger *Pelagia noctiluca* (Forsskal, 1775), much

maligned, and for similar reasons. Yes, if you think that its array of bristles and velvety colours are inviting you forward like the languid flop of a purring cat you will surely be taught the error of your ways.

I snorkelled a short distance out from the beach with my eyes fixed to the seabed below. In previous days I had controversially, spent some time carefully scooping up fireworms into my daughter's little hand-net and shifting these animals further offshore so they might escape the wrath of nearshore bathers. Their large size, 300mm to 500mm in length, and colouration makes it easy to spot these solitary animals as they move about (George & Hartmann-Schröder 1985; Simonini *et al.* 2018; Read & Fauchald 2020).

What hooked my attention today, in about 4-5m of water, was something I'd never observed previously, a writhing cluster of fireworms (Figure 1). What were they doing? Feeding? Mating? Was it some sort of territorial aggression / dispute? Is that last even possible in annelids? It turns out it is, at least in some cases, though not this one e.g. Roe 1975.

I made repeated dives down to observe more closely (what else is a biologist to do?). What was immediately clear was that there was another species present and this appeared to be the central focus of the worm-ball. A ragged specimen of *P. noctiluca* (Figure 2).

It's usual to see *P. noctiluca* in the water column but also, particularly after strong winds, you can find damaged examples rolling about the sea-floor. These might have been stranded and then washed back out to sea, pushed against coastal rocks or, targeted by bathers. Whatever the cause they are usually in various states of degradation, exacerbated by their inability to maintain their pelagic dance. This particular specimen did not look fresh and this no doubt aided its capture by a benthic omnivorous predator.

I was then lucky enough to observe a second piece of behaviour from a solitary fireworm that was perhaps no more than a metre or so from the worm cluster. (Figure 3).

Again, this was entirely new to me. A fireworm raising its anterior section up off the seabed



Fig. 2: Fireworms and the remains of a mauve stinger.

and wafting it back and forth, snake-like. This was as exciting as seeing the worm-ball! The obvious conclusion jumped into my head, it's searching, sensing, 'sniffing' and has detected something of interest nearby.

Predation then, right? We know the species is omnivorous, a predator that also feeds on carrion (George & Hartmann-Schröder 1985; Schulze *et al.* 2017). Job done, pack your bags and let's go home.

But wait. Let's not be hasty. What other questions might we ask and how well could we answer them? What if this harvest was reaping something else? Was it purely calorific value or is there an additional element here? Might we expect more observational evidence in the literature if such behaviour was triggered simply by the chance of a good meal? How much food value is there in a jellyfish snack, especially given the evidence which suggests they can no longer be considered trophic 'dead ends' (Milisenda *et al.* 2014; Stoner & Layman 2015; Barfield 2019)? What else could

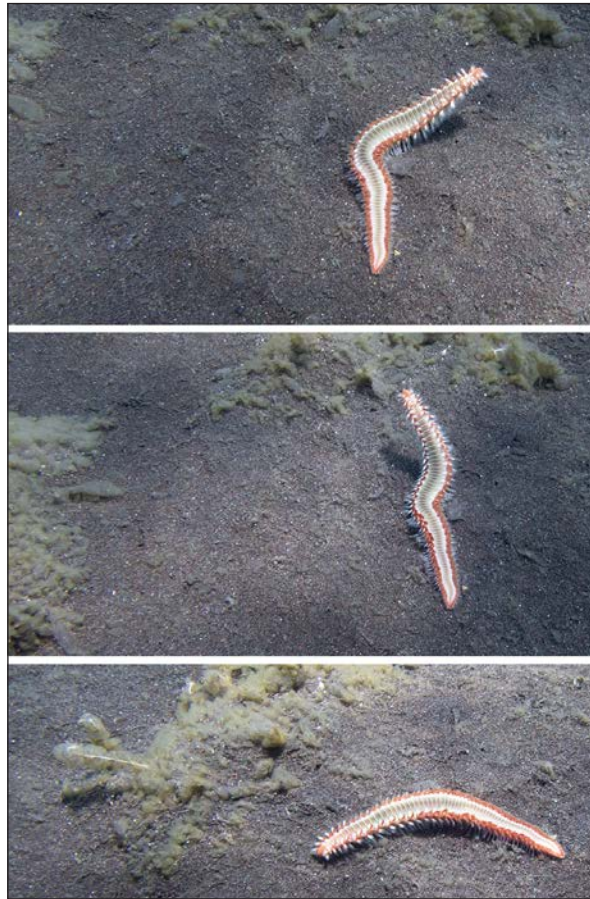


Fig. 3: What is this fireworm doing?

be incentivising this concerted and somewhat frenetic group behaviour?

How about the acquisition of defensive chemical weaponry when maybe, you can't manufacture your own? What if your only chance to tool-up depended on finding and ripping out the expensive molecular products of a species that normally inhabits a different realm to you?

Imagine a chemical plume emanating from either the prey or those scavenging upon it or, perhaps an interaction of the two? A dispersing gradient, or perhaps more simply, a path to the source location? Does *H. carunculata* follow subtle changes in concentration of a particular agent and if so how do they recognise that agent? The wafting head appears to suggest the process is refined. Tracking first one way, then the other, to discern which way might be best to proceed.

But how? What do we know of chemoreception in polychaetes or, more specifically,

amphinomids? Where might their olfactory or gustative structures be found?

It is understood that important ecological functional responses such as those associated with defence, reproduction, recruitment and feeding depend on the detection of chemical cues. This is true for polychaetes and marine organisms more generally. Beyond this, details of exact mechanisms are lacking, though the nuchal organs are considered to have a sensory function as does the caruncle (Lindsay 2009).

In amphinomids the nuchal organs sit to either side of the caruncle (Lindsay 2009). In *H. carunculata* the caruncle extends back dorsally from the prostomium over four chaetal segments with six to eight lateral folds which may also have secondary folds (George & Hartmann-Schröder 1985). So, raising your head high to 'sniff' or taste the chemical current when something of value is detected nearby makes good sense. It would presumably offer the possibility of confirming that detection, as well as potentially enhancing the directional picture. Given the likely energetic cost of this the rewards would have to be of some value.

I'll be honest. We don't often visit Southern Italy in August. It's hot and everyone is on holiday. Even simple tasks become more arduous and fraught. But it provided a very useful perspective with regard to fireworms. I saw more than I encounter at other times of the year including a number of smaller ones, compared with previous experience. Certainly I saw the smallest examples of the species I've seen to date. Plenty of questions here for someone with a bigger temporal dataset, funding etc. In fact, Simonini *et al.* (2018) report that *H. carunculata*, 'has become increasingly noteworthy' in the Mediterranean with, 'sightings of 10–30-cm long specimens' increasing in shallow coastal waters.

Let's consider some other questions. What if you enter this world naked and defenceless? Automimicry would offer a certain amount of protection but it's not really a primary defence (Svenningsen *et al.* 2007). So the question is does *H. carunculata* make its own toxins at all or, does it rely entirely on harvesting them from other species?

Producing toxins is costly so if it relies completely on the latter mechanism we might anticipate that predation pressure on juveniles would be greater, given they could be less likely to have encountered a species from which to sequester any toxins? If I was a hungry predator I might be more likely to try eating small fireworms. But going forward we might want to set against that the fact that jellyfish populations are increasing which presumably could mean more food / toxins available for populations of fireworms?

The literature suggests the answers are currently unclear but evidence seems to indicate that *H. carunculata* may harvest toxins and potentially cannot make their own (Schulze *et al.* 2017; Stoner & Layman 2015). Gleib *et al.* (1995) found that *H. carunculata* that have fed on *Palythoa*, a white encrusting zoanthid that can form thick mats on dead corals and other hard substrata, subsequently contain high concentrations of palytoxin (PTX). However, they go on to suggest that the worms must have considerable resistance to PTX and speculate that this could disable its functional use as a predator deterrent. Simonini *et al.* (2018) note that the tufts of fragile dorsal chaetae which create the 'bearded' appearance, 'are filled with an uncharacterized toxin'.

On Abaco Island, which is part of the Bahamian Archipelago in the western North Atlantic Ocean, researchers have observed *H. carunculata* feeding on the jellyfish *Cassiopea* spp. (Stoner & Layman 2015). As in the example presented here, the authors reported multiple worms feeding on a single jellyfish, "wrapping their bodies either partially or completely around it". These authors also speculate that *H. carunculata* may be sequestering toxins from *Cassiopea* and other sources such as benthic cnidarians.

It's worth noting that during this activity the fireworms involved are very much exposed and occupied. However, since it is not unusual to see solitary fireworms moving around on the seabed this suggests a certain level of immunity to predation otherwise why not remain more hidden? Or do the benefits of feeding on species such as *P. noctiluca* outweigh the potential risks?



Fig. 4: End game, the mauve stinger is no longer visible and fireworms begin to depart.

In terms of reports of group feeding activity by *H. carunculata*, Simonini *et al.* (2018) found evidence of this for a number of species including upside-down jellyfish, *Cassiopea* sp., sun anemone, *Stichodactyla helianthus* (Ellis, 1768) and purple sea urchin *Paracentrotus lividus* (Lamarck, 1716). Clearly, *P. noctiluca* can now be added to this inventory.

Simonini *et al.* (2018) also reported fireworms, 'rushing towards' prey and attributed this to, 'their developed anterior sense organs'. The observations and images recorded here reinforce the possibility that this interpretation is correct.

Fireworms can consume a range of chemically-defended species, the selection varying depending on where they are found, presumably both on a local and global level. If they do sequester toxins do they focus on one particular species or do they, more simply, take what they can get? Simonini *et al.* (2018) note that the Mediterranean specimens of *H. carunculata* they studied consumed several chemically-defended organisms including *Asterina gibbosa* (Pennant, 1777) (starlet cushion star), *Coscinasterias tenuispina* (Lamarck, 1816)

(blue spiny starfish), the nudibranch *Cratena peregrina* (Gmelin, 1791) and the colonial star ascidian *Botryllus schlosseri* (Pallas, 1766). In addition the species is also cannibalistic in starvation scenarios.

As noted by other authors it would be valuable to understand more of the behaviour, population dynamics and importance of this species of amphinomid given its likely ability to weather the rapid changes occurring in the marine environment (Simonini *et al.* 2018; Stoner and Layman 2015). How will they respond to the tropicalisation of Mediterranean trophic structure (Encarnação *et al.* 2019; Simonini *et al.* 2018)? What species might benefit should populations of *H. carunculata* increase?

There are plenty of unanswered questions and / or uncertainty with regard to *H. carunculata* and its life history. For example, what are the principal predators of the species in the Mediterranean? How might these be identified? If *H. carunculata* does obtain its chemical defence from *P. noctiluca* could it be that some of the predators of this jellyfish might also be predators of fireworms to some degree? Milisenda *et al.* (2014) reported that

P. noctiluca was an important food resource for the commercially valuable fish, *Boops boops* (Linnaeus, 1758). These authors also identify two turtles, eight other fish and one crustacean that feed on *P. noctiluca* in the Mediterranean. This list might be a useful starting point. If you follow the *Boops boops* trail you find they are abundant around fish cages as is *H. carunculata*. That said gut contents analysis found no polychaetes in fish sampled from beneath the cages, perhaps because of the ready rain of pellets available to them (Arechavala-Lopez *et al.* 2011; Riera *et al.* 2014a; Riera *et al.* 2014b). However, some undescribed species of polychaete were identified from the guts of nearby populations of *Boops boops* (Arechavala-Lopez *et al.*, 2011).

If it turns out that *H. carunculata* do need to harvest toxins from external sources how often might they need to consume a mauve stinger for example, to top-up their defence system? How do they know? Or, would one such 'meal' be enough? Etc. etc.

One thing is certain, the *P. noctiluca* at the centre of the activity I witnessed was consumed, toxins and all (Figure 4).

References

- Arechavala-Lopez, P., Sanchez-Jerez, P., Bayle-Sempere, J., Fernandez-Jover, D., Martinez-Rubio, L., Lopez-Jimenez, J. A., & Martinez-Lopez, F. J. 2011. Direct interaction between wild fish aggregations at fish farms and fisheries activity at fishing grounds: A case study with *Boops boops*. *Aquaculture Research* **42**(7): 996–1010. <https://doi.org/10.1111/j.1365-2109.2010.02683.x>
- Barfield, P.D. 2019. An observation of feeding behaviour by *Pachygrapsus marmoratus* (marbled crab) on recently stranded, living *Pelagia noctiluca* (mauve stinger), in the Eolian Islands, southern Tyrrhenian Sea, Mediterranean, June 2018. *Porcupine Marine Natural History Society Bulletin* **11**: 51–52.
- Encarnação, J., Morais, P., Baptista, V., Cruz, J., & Teodósio, M. A. 2019. New Evidence of Marine Fauna Tropicalization off the Southwestern Iberian Peninsula (Southwest Europe). *Diversity* **11**(4): 48. <https://doi.org/10.3390/d11040048>
- George, J.D. & Hartmann-Schröder, G., 1985. Polychaetes: British Amphinomida, Spintherida and Eunicida. Keys and notes for the identification of the species. *Synopses of the British Fauna (New Series)*, No. **32**. Published for The Linnaean Society of London and The Estuarine and Brackish-Water Sciences Association by E. J. Brill/Dr. W. Backhuys, London, Leiden, København, Köln, 221 pp.
- Gleibs, S., Mebs, D., & Werding, B. 1995. Studies on the origin and distribution of palytoxin in a Caribbean coral reef. *Toxicon* **33**(11): 1531–1537. [https://doi.org/10.1016/0041-0101\(95\)00079-2](https://doi.org/10.1016/0041-0101(95)00079-2)
- Lindsay, S. M. (2009). Ecology and biology of chemoreception in polychaetes. *Zoosymposia* **2**(1): 339–367. <https://doi.org/10.11646/zoosymposia.2.1.24>
- Milisenda, G., Rosa, S., Fuentes, V. L., Boero, F., Guglielmo, L., Purcell, J. E., & Piraino, S. (2014). Jellyfish as Prey: Frequency of Predation and Selective Foraging of *Boops boops* (Vertebrata, Actinopterygii) on the Mauve Stinger *Pelagia noctiluca* (Cnidaria, Scyphozoa). *PLOS ONE* **9**(4): e94600. <https://doi.org/10.1371/journal.pone.0094600>
- Read, G.; Fauchald, K. (Ed.) (2020). World Polychaeta database. *Hermodice carunculata* (Pallas, 1766). Accessed through: World Register of Marine Species at: <http://www.marinespecies.org/aphia.php?p=taxdetails&id=129831> on 2020-01-05
- Riera, R., Sanchez-Jerez, P., Rodriguez, M., & Monterroso, O. 2014a. Artificial marine habitats favour a single fish species on a long-term scale: The dominance of *Boops boops* around off-shore fish cages. *Scientia Marina* **78**(4): 505–510. <https://doi.org/10.3989/scimar.04083.08A>
- Riera, R., Pérez, O., Rodríguez, M., Ramos, E., & Monterroso, Ó. 2014b. Are assemblages of the fireworm *Hermodice carunculata* enhanced in sediments beneath offshore fish cages? *Acta Oceanologica Sinica* **33**(4): 108–111. <https://doi.org/10.1007/s13131-014-0449-y>
- Roe, P. 1975. Aspects of life history and of territorial behavior in young individuals of *Platynereis bicanaliculata* and *Nereis vexillosa* (Annelida, Polychaeta) I. *Pacific Science*, **29**, 8.
- Schulze, A., Grimes, C. J., & Rudek, T. E. (2017). Tough, armed and omnivorous: *Hermodice carunculata* (Annelida: Amphinomidae) is prepared for ecological challenges. *Journal of the Marine Biological Association of the United Kingdom* **97**(5): 1075–1080. <https://doi.org/10.1017/S0025315417000091>
- Simonini, R., Maletti, I., Righi, S., Fai, S., & Prevedelli, D. 2018. Laboratory observations on predator–prey interactions between the bearded fireworm (*Hermodice carunculata*) and Mediterranean benthic invertebrates. *Marine and Freshwater Behaviour and Physiology* **51**(3): 145–158. <https://doi.org/10.1080/10236244.2018.1502031>
- Stoner, E. W., & Layman, C. A. 2015. Bristle worms attack: Benthic jellyfish are not trophic dead ends. *Frontiers in Ecology and the Environment* **13**(4): 226–227. <https://doi.org/10.1890/1540-9295-13.4.226>
- Svenningsen, T. O. and Holen, Ø. H. 2007. The evolutionary stability of automimicry. *Proceedings of the Royal Society B* **274**(1621): 2055–2063. <https://doi.org/10.1098/rspb.2007.0456>

Seasearch wins (another) award!

Sarah Bowen

Once more, the value of citizen science projects has been recognised and rewarded. In December 2019, Sarah Bowen and Genine Keogh (volunteer at St Abbs VMNR) represented Seasearch at the Nature of Scotland awards ceremony in Edinburgh. A glitzy annual event held in the Sheraton Hotel and now in its 8th year, the evening is described as an opportunity to recognise and celebrate 'nature's unsung heroes' (brochure wording). It was amusing to see people who would no doubt be happier in waterproofs and wellies gathered together wearing DJ's, kilts, sparkly dresses and unfamiliar high heels. Various comments to this effect were overheard during the course of the evening!

Categories of awards included Youth and Education, Food and Farming, Business, Community Initiatives, Political Advocate, Innovation, Coasts and Waters, Conservation Science and Species Champion. Entries were drawn from all over Scotland, from small local initiatives to larger projects supported by national organisations. Marine projects were well represented this year, and particular highlights for me were to see the Ullapool Sea Savers group shortlisted along with the winners - Sunnyside Primary School's 'Nae

Straw At Aw' campaign. Seeing children getting passionate about conserving the marine environment gives some hope for the future of our seas!

Seasearch was shortlisted in the Coasts and Waters category, sponsored by Scottish Water. There were three other groups in the category. They were 'Howden Rock Ramp', a ramp for migrating fish in West Lothian; a realigning of saltmarsh in the Firth of Forth managed by RSPB Skinflats and a project supported by Flora and Fauna International to establish a 'Coastal Communities Network' to help local communities meet their aspirations for marine protection and marine management.

We were in impressive company, and it was a complete shock to everyone to hear our names called out as the winners. Calum Duncan, head of Conservation for MCS in Scotland, was briefly speechless as we carefully picked our way from our table at the very back of the room to collect the award. Standing on stage, posing for photographs with Euan McIlwraith (BBC TV presenter) and Gordon Buchanan (TV presenter and wildlife cameraman) was a bit of a blur to be honest, but the photographic evidence can be seen along with a beautifully crafted trophy. Designed by Bryony Knox, a silversmith working in Edinburgh, it was created using timber from Abernethy National Nature Reserve and brass hazel leaves.



Fig.1: (left to right) Euan McIlwraith, Calum Duncan, Genine Keogh, Sarah Bowen, Andrew Walker from Scottish Water and Gordon Buchanan. (© Simon Williams Photography Edinburgh)

If you go down to the shore today...

Liz Morris-Webb

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....there's always a big surprise. That's what makes us Porcupines tick. It was Porcupine Dr Louise Firth who confessed her theory that she believes all Scuba hystrix must have started life as child 'collectors': stamps, shells, flowers, tea cards, dead bugs, eggs (not to be recommended today as it's illegal!), even snails (in my case I was upset when my teacher left the lid open and they all escaped in the school yard). I'm not sure whether it's collecting, doing 'natural history things', the close interaction I have with nature or the blue space that surrounds me but when I'm searching for species on the shore and collecting them for home pressings or confirmatory ID, it makes me happy and satisfied. Something about the natural history of the shore restores me and keeps me going back for more. We are lucky in our shared passion.

Our love for an intense closeness with the coast is shared with many others – e.g. fishers, anglers, winkle pickers, cocklers, coasteerers & kayakers. This has led me in a new direction as an aside to my natural history interests. Guided and assisted by several Porcupines' advice, I now find myself back at Bangor University finishing a PhD, running a project entitled 'What does gathering from the seashore mean to you?', supervised by Professor Stuart Jenkins and Dr Freya St John. In the words of one Bangor lecturer, effective conservation depends upon understanding people. However, I had no previous formal training in that field. I like people, and know a few, so here I am, learning new skills from the social sciences and doing my best to understand our largely unregulated intertidal small-scale fishing and hand-gathering communities. This time through a new lens, one which focuses on the people, their cultures, and crucially, the boost to human well-being that our shores appear to provide.

Many of you will wonder why this is important. Despite being the most traditional human fisheries, globally, hand gathering activities have largely eluded most forms of active management. However, times are changing, and governments are increasingly seeking to manage informal and recreational intertidal fisheries. I would argue that a robust understanding of the social and cultural values associated with any coastal activity, including hand-gathering activities, are key to developing appropriate, effective and sustainable co-management options. Catherine Kelly's paper entitled 'I need the sea, and the sea needs me' (2018) provides an interesting narrative on why both conservation and wellbeing agendas are underpinned by the core values of care, protection and sustainability. She goes on to suggest that using wellbeing as a research tool can help stakeholders to reflect on their activities and encourage their future custodianship of their environment.

My project aims to assess what people collect from the Welsh seashore and why, and explore whether their activities hold any wellbeing value for them. 'Wellbeing can be understood as how people feel and how they function, both on a personal level and a social level, and how they evaluate their lives as a whole' (NEF 2012), and includes many dimensions related to nature connectedness, identity and sense of place. I've spoken to commercial fishers of cockles, oysters and mussels, more informal gatherers of winkles and laverbread ('black gold', a well boiled seaweed delicacy of *Porphyra* sp.), bait collectors, natural historians, citizen scientists, foragers, foraging instructors, chefs, families and a surprising number of survivalists, all of whom enjoy collecting living species from our shores for a plethora of reasons (Figure 1). I am currently sitting in an office trying to unpick the 'reasons and wellbeing values' for people collecting 86 taxa (yes, 86!) from our coastal habitats (of which 69 are intertidal), and trying to get it to full publication quality in the coming months.

So, after reading this, if you go down to the shore today (for 'fun', in the pouring rain) you are sure of a big surprise. Possibly a whole new way of thinking about yourself. Reflect



Fig 1: What gathering from the Welsh seashore means to 23 collectors (2018). Participants were asked to 'sum up what gathering from the seashore means to you in three words'. Letter size represents frequency of the answer given. (all respondents gave written, signed permission to use their photographs for publicising the 'What gathering means' surveys. The survey, including collection of images and audio, was approved by Bangor University Ethics Committee, reference CNS2018EMW01).

on what really takes you there – is it simply to find that one creature or algae? For art? For exercise? Or is your collection of those seaweeds or shells related more to: giving you a sense of place (Poe *et al.* 2016); a good intense dose of connection to nature (Cox *et*

al. 2017); a reason to connect and share with people (other Porcupines) in an otherwise busy world (Dinero 2007); for 'good citizenship' by contributing your data to a bigger picture to contribute to conservation; for personal learning or for a sensory, restorative or mindful

"It was absolutely hammering down and blowing a hooley and it was a terrible day. But we still did it you know and its good to push yourself and get out there whatever the weather. And do things, it's exercise, it's fresh air and that can only make you feel better. Because otherwise you are just sat in the house. I mean I have gone through in past years, because of bereavement and things, a lot of depression and stuff like that. I feel on top of the world now, and again that might sound a bit dramatic... you know I have made new friends here... and we do surveys. Um, well we call them surveys, you know just finding things."

Amateur natural historian and citizen scientist, talking about a recent shore visit.

"My grandfather used to collect the periwinkles for years and years, then my dad collected winkles but mostly laver bread for about 50 years. My mum would mostly go with him. She is 85 and I had to stop her picking. I'm nearly 60 and could run there and back. It's the fresh air, we are never ill... got a torch on your head in November, you can't feel your hands, you don't have to do it, but I love doing it. My wife has been doing it for 10 years, my daughter and my son too sometimes."

Laver and winkle picker, Wales

experience that makes you a happier person. Enjoy this food for thought on your next shore visit.

Acknowledgements

Thank you to any Porcupines who took part in my survey (it is too late to take part if you didn't, but there may be a next time!). Also to the Porcupines who have fed my ideas and given me support throughout the project, especially Dr Sue Burton, and my supervisors for their ongoing support and keeping the faith!

This project would not have been possible without funding from Marine Ecological Solutions, Bangor University and a Knowledge Economy Skills Scholarship (KESS 2, Figure 2). KESS 2 is a pan-Wales higher level skills initiative led by Bangor University on behalf of the HE sector in Wales. It is part funded by the Welsh Government's European Social Fund (ESF) convergence programme for West Wales and the Valleys.

References

Cox, D., Shanahan, D., Hudson, H., Fuller, R., Anderson, K., Hancock, S. & Gaston, K. 2017. Doses of Nearby Nature Simultaneously Associated with Multiple Health Benefits. *International Journal of Research and Public Health* **14** (2): 172.

Dinero, S. 2007. Globalisation and development in a post-nomadic hunter-gatherer Alaskan village: a follow-up assessment. *Polar Record* **43** (226): 255–269.

Kelly, C. 2018. 'I need the sea and the sea needs me': Symbiotic coastal policy narratives for human wellbeing and sustainability in the UK. *Marine Policy* **97**: 223–231.

NEF, 2012. *Measuring well-being, a guide for practitioners*. <https://b3cdn.net/nefoundation/8d92cf44e70b3d16e6rgm6bpd3i.pdf>

Poe, M.R., Donatuto, J. & Satterfield, T. 2016. "Sense of Place": Human wellbeing considerations for ecological restoration in Puget Sound. *Coastal Management* **44** (5): 409–426.



The early origins of Porcupine

Stewart Angus

Scottish Natural Heritage, Inverness

On the Porcupine web site, Frank Evans gives part of the story of the origins of the Society.

The history actually goes back to a conference on biological recording in Dundee (Biorec 75) attended by three avid Scottish members of the Conchological Society. We were attempting to gain the agreement of the meeting to switch our marine mollusc recording from the National grid system to one based on a Lat/Long grid, as so many of our records were from offshore; not only do vessels record their position in Lat/Long, but sometimes the records were sourced beyond the range of the National Grid. The three were Shelagh Smith, Dave McKay, and myself. At that time, Shelagh was a volunteer mollusc taxonomist at the then Royal Scottish Museum (now the National Museum of Scotland) while Dave was a marine scientist with the Department of Agriculture and Fisheries Scotland (DAFS) Marine Laboratory in Aberdeen. I was a mere Zoology undergraduate at the University of Aberdeen. The role of this meeting, the grid issue, and the names of the trio, were mentioned in the very first article in the *Porcupine Newsletter*, written by Shelagh Smith in 1976.

Frustrated by events, the three of us got together in another room and decided to go our own way with marine mollusc recording in a new organisation. Further discussions took place at a nudibranch meeting in Edinburgh, when various names were discussed before a decision was made to copy the Challenger Society and name the new Society after one of the vessels that carried out the surveys that laid the foundations for the study of the marine environment in the UK and Scotland in particular. David Heppell suggested that Porcupine would be a good name, as it emphasised the importance of the non-terrestrial nature of the marine environment. When asked why it was called Porcupine, Shelagh enjoyed telling people it was because it had been "formed by three prickly people". There is no question that the credit for forming what Porcupine became should go to Shelagh – she took our joint idea and sold it magnificently, notably at the 11th European Symposium on Marine Biology at Galway in 1976. Frank gives joint credit with Shelagh to David Heppell, who was Shelagh's manager at the RSM.

The author thanks Dave McKay for comments on an earlier version of this note.

References

Evans, F. 2020. *A History of the Porcupine Marine Natural History Society*. <http://pmnhs.co.uk/a-history-of-the-porcupine-marine-natural-history-society-2>.

Smith, S. 1976. *Porcupine Newsletter* 1(1) <http://pmnhs.co.uk/wp-content/uploads/2011/11/001-PNV1N1NOV76.pdf>

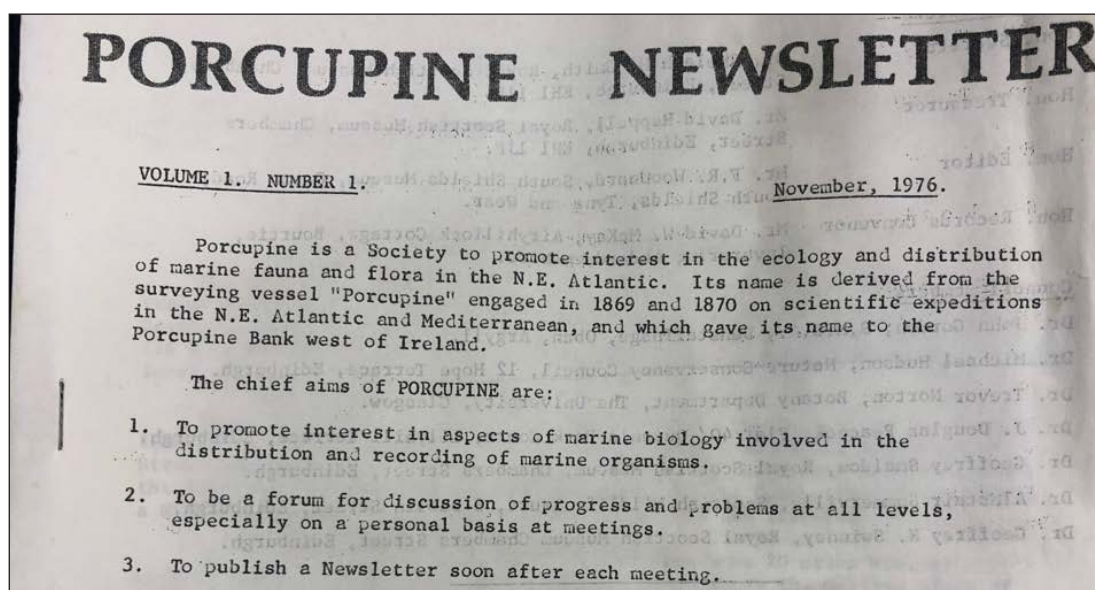


Fig 1: First page of the very first Porcupine Newsletter where the aims of the Society were laid out.

A look back

Porcupine Newsletter March 1980, p160–162

[This is a reprint of an article by Peter Davis about dredged material from the HMS Porcupine expeditions from 1847 to 1872. <http://pmnhs.co.uk/wp-content/uploads/2012/04/PNV1N9MAR80.pdf>]

Collections of material from the dredging expeditions of HMS Porcupine in N.E. England

*Peter Davis
Keeper of Natural Sciences, Sunderland Museum*

Edward Killwick Calver (1813-1892) was in charge of the Royal Navy Hydrographic Department's survey of the north and east coasts of England and Scotland from 1847 to 1872 during which time he produced charts of nearly the whole of the eastern coasts. He lived in Sunderland (at 16 Roker Terrace) from 1858 – 1874, being appointed as Staff Commander of the surveying vessel HMS 'Porcupine' on 8th August 1863. His principal achievements were in surveying and his observations on the improvement of tidal harbours and estuaries, yet there can be no doubt that his expertise during the Porcupine voyages of 1869 and 1870 contributed greatly to the success of these exploratory deep sea dredgings. Calver's ability with the dredge, and his innovation of the 'hempen tangles' (teased out hemp attached to the dredge bag which picked up many invertebrates missed by the dredge itself), coupled with an obvious sympathy for the biological objectives of the voyage made him a much respected member of the expedition - indeed Wyville Thomson (1874) mentions his contribution on a number of occasions.

During his years in Sunderland Calver became a much respected member of the community – 'the name of Captain Calver was as familiar as any household word in Sunderland, and the gallant officer himself was a conspicuous figure in the public life of the town' Anon, 1894) - not only for his surveying work, but for that of a philanthropic character, notably his efforts in raising subscriptions for the Workmans Hall at Monkwearmouth, Sunderland.

Nor surprisingly, his movements were followed with interest by the local press, including the departure of HMS 'Porcupine' from Sunderland on 8th April 1869, and the return on 25th April, 1870. Following his return from the 'Mediterranean' voyage of the 'Porcupine' in October 1870 Calver gave a public lecture (30th October) on 'The Wonders of the Great Deep'. This obviously aroused considerable interest, and an account of the lecture, supplemented by information from the preliminary expedition reports, made front page news in the Sunderland Times (12th November 1870).

This public interest may have spurred Calver to donate his collections from the voyage to Sunderland Museum (the latter had been established as one of the first local authority museums in 1846 when the Sunderland Corporation took charge of the collections of the Sunderland Natural History & Antiquarian Society (established 1836). Unfortunately no record exists in the Museum accession registers of Captain Calver's donation and consequently there is no list of the number or identification of specimens received or when they were received. However, the collection was on display at the opening of the present Museum building in 1879 - 'between the windows are a series of handsomely glazed cases, beautifully adapted for interesting specialities in natural history. The centre case of this series placed in the middle of the east wall contains the results of Captain Calver's celebrated Porcupine Expedition. These are arranged for the purpose of showing the different forms of life found in the ocean to the depth of 2,000 fathoms. (Sunderland Daily Echo, Thursday 6th November 1879). Further reference to the collection is made in the Sunderland Library Circular (1910).

The collection as it now exists (1979) is perhaps the remnants of a much more extensive one. It consists of 72 lots of specimens, the majority of which are stored in glass-topped pill boxes, and complete (in most cases) with full data. The majority are foraminiferal oozes (36 lots), the Mollusca (13), echinoderms (8), corals (5) and Crustacea (4) being less well represented.* Very few of the specimens had been identified, although it is hoped that this

situation can be remedied in the near future. In searching through the collections for this material, a number of specimens were found which could have been part of the Calver collection, but which have lost data following exhibition, perhaps an indication of a larger initial donation.

Not all the 'Porcupine' material came direct from Calver to the Museum. On 17th January 1907 the Edward Backhouse collection (some 20,000 natural history specimens) was presented to Sunderland Museum by the Trustees of Mrs K. Backhouse. Edward Backhouse (1808 - 1879), a less well known member of a distinguished family of naturalists, had the time and money (the Backhouse Bank was established in Sunderland in 1816) to indulge his passion for natural history. It is not known if Calver and Backhouse were close acquaintances, but their philanthropic interests must have brought them together. Whatever the relationship, a number of specimens from the Backhouse collection, mounted in typical fashion on glass plates, feature Edward Backhouse handwriting stating 'The gift of Captain Calver R .N . ' and 'from the voyage of the Porcupine 1869'.

The history of the 'Porcupine' material at the Hancock Museum in Newcastle upon Tyne is less well known. An entry in the Accession Register for 1903 reads; ' Acc . 2/03. Davison, C. A collection of Foraminifera, chiefly mounted as microslides, and a large series of samples of Foraminiferal oozes from the Porcupine dredgings (1869) . Formerly belonged to donor's father, 7.1.03'. A written label accompanying part of the collection reads 'small packages containing dredgings from the Atlantic by HMS Porcupine during the summer of 1869. See Chapter 3, p.82 of The Depths of the Sea by Prof. C. Wyville Thomson. Chas. Davison Coll.' . Initial research into the identity of Charles Davison (or Davidson) has proved fruitless, although it must be suspected that his father is the Davidson mentioned as being an officer on the 'Porcupine' (p 83 of Depths of the Sea). A search of naval records held at the Public Records Office, Kew , is planned which may reveal more about the collector.

The Davison Collection has been found to be an extensive one,* stored in three main lots.

These are:

- a collection of 133 microscope slides , mainly of Foraminifera, many of which have lost the specimens formerly associated with them,
- 45 packages (re-stored in polythene tubing) of foraminiferal oozes, and
- 153 lots of specimens, principally bottom deposits, stored in an assortment of pill boxes, glass jars and glass vials.

As with the Calver collection, the majority of specimens have full associated data, including exact position, depth and bottom temperature. The handwriting on the Davison and Calver collections is comparable in certain instances.

* Complete lists of the specimens, with associated data, are available from the author.

Although the survival of the material from the 'Porcupine ' expeditions in the north east of England is notable, it is of some concern that for 110 years the collections have remained un-worked and un-noticed .

References

- Anon, 1894. *Captain Calver*. Dodo's Almanac. Sunderland.
- Anon, 1910. *Ref. to Calver*, p 386. The Sunderland Library Circular.
- Dawson, L. S. 1855. *Memoirs of Hydrography*. Eastbourne.
- Thomson, C. Wyville, 1874. *The Depths of the Sea*. Macmillan.

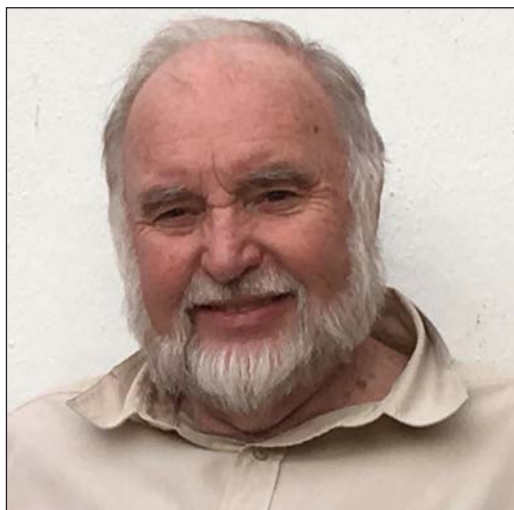
Has anyone worked on the Porcupine material since this article was written?

We would love to hear from you if you have any details of the work and/or the specimens!

OBITUARY

Dr David Erwin OBE

Bob Earll



The late 1970's saw a blossoming of interest in the UK's marine life, its study and conservation, often inspired by new discoveries that were being made through diving. The formation of Porcupine and the Marine Conservation Society were products of this period. David Erwin and I attended the first Porcupine Annual meeting together in Edinburgh in 1979. He was a perfect fit for a Porcupine member, being highly versed in museum procedures as Head of Botany & Zoology at the Ulster Museum, a marine biologist who had trained under Pat Boaden at Queens University and someone who had a wide interest and knowledge of natural history. He had set up the museum diving group who were transforming the Ulster Museum's marine collections.

In 1976 he and I collaborated on a project called the Species Recording Scheme (SRS) which was the first time sports divers had been asked to record the common marine species we see in our seas. It was the most successful project of Underwater Conservation Year (1977) with over 400 cards being returned that year and eventually over 1200 cards were received. It was the precursor of Seasearch. We produced the first of the colour picture guides (mini-print sets) for SRS, and this led to a series of guides to seven different groups (1978-87); Bernard Picton was a huge source of images for these guides. David later produced the *Guide to Inshore Marine Life* (IMMEL Publishing, 1987) which was one of the first books to entirely use colour photographs of our common marine species.

David helped me and many others on their career paths; our collaboration on the Species Recording Scheme project enabled me to get the job for the Underwater Conservation Programme (UCP, 1978). Throughout his life he helped develop many organisations including the Marine Conservation Society and the Ulster Wildlife Trust and his wide array of skills including management, planning and computing were invaluable. David was a scientist by training and he wrote often about the seabed communities of Strangford Lough, not least for his PhD thesis. At the Ulster Museum he led the Northern Ireland Sublittoral Survey (NISS) (1982-86) along with Bernard Picton, a long-time colleague, and they were joined by Christine Howson and David Connor. This pioneered a wide range of techniques used later by JNCC in its Marine Nature Conservation review (MNCR).

One of the products of this team was the Species Directory (1987), a coded listing of the UK's marine flora and fauna. The Victorian marine biologists who described our marine flora and fauna were well known to David since they had routinely dredged for specimens in Strangford Lough. In 1974 I had compiled a species list of the Shetland fauna (2,000+ records) based on the dredging reports of the British Association in the mid-1800s. On a walk in 1985 we discussed how there must be huge overlap in these listings and why not produce one listing for the UK. With funds from BP

(John Hartley) and WWF-UK (Chris Tydeman) the project was set up through MCS. Christine Howson working with a coded species list based on the Ulster Museum's work and engaged many group experts including many Porcupines to produce a UK listing. It was a great collaborative effort and was completed in 10 months.

"The Species Directory lives on, first as the basis of the European Register of Marine Species, then the World Register of Marine Species. The principle developed by us at the Ulster Museum, Marine Conservation Society and Christine Howson, of providing a list to the world expert in a group and asking them to correct it, rather than employing inexperienced data entry staff to compile a list, proved to be a robust strategy and the current database, WoRMS, is the most complete and accurate listing of species names in existence. Other initiatives have come and gone but none have been as successful." Bernard Picton.

It is no understatement to say that David Erwin was at the heart of putting marine conservation on the map in Northern Ireland. One of his strong passions was the protection of Strangford Lough. He was a powerful advocate and media personality and his film 'Down Under Down' (1978) was a catalyst in raising awareness and the eventual declaration of Strangford Lough as one of the few Marine Nature Reserves. Conservation is more than just science. It is about using information in order help protect the environment. He wasn't afraid to speak truth to power and in 2004 was instrumental in the eventual ban on scallop dredging in Strangford Lough. He was a huge character, an enabler, a brilliant networker, very talented but perhaps most effectively a leader with clarity of vision. He got things done and his legacy lives on in many ways. He will be sorely missed.



Dave Erwin with a favourite curio

Spinach Worms in South Wales

Vicki Howe

For me it all began on a gloriously sunny day in March 2003. I believe, but my memory is shoddy, it was my first Porcupine field trip. I was slightly bemused at what could be so exciting on such a uniform, pebbly beach yet I followed the 35 odd Porcupines down to the edge of the saltmarsh and waited for someone to enlighten me. It was then I 'found' the green Spinach Worm. Individually they are non-descript and difficult to see but as a colony the vivid green mass is easy to spot in the bright sunshine. Taking a closer look reveals a mass of individual green "sausages" which seem to disappear if there is any disturbance of the water or substrate. Spinach Worms, containing symbiotic 'green algae', are self-contained systems, needing only sunlight and inorganic nutrients.

The spinach worm, *Symsagittifera roscoffensis* (Graff, 1891) (Acoela, Symsagittiferidae) is abundant at its type location around Roscoff, France and the nearby Channel Islands but it is known from only one site in the UK mainland – Aberthaw beach, near Cardiff – where it was first recorded (Mettam 1979) more than 40 years ago by Chris Mettam, a long-standing member of the Porcupine Society. Chris led the Porcupine field trip in 2003 (Mettam 2003) and more recently (Mettam 2019) presented

a poster at the Porcupine Conference in March 2019, updating the situation. Their distribution seems to be unchanged.

According to Chris, he was only inspired to record the presence of *S. roscoffensis* (then known as *Convoluta roscoffensis*) after hearing a presentation at the very first Porcupine Conference in 1977, which had the theme of 'Symbiosis'. Sheelagh Doonan talked of her research on the Spinach Worms of the Channel Islands. She was very surprised to learn that they were also found in Wales and arranged for an electron microscopic examination of some Aberthaw specimens, leading to the discovery that more than one kind of symbiont was involved.

At Aberthaw, the worms are abundant only in a narrow strip of sand at the base of a cobble bank, where nutrient enriched water drains from an adjacent saltmarsh. They are social animals. Dense aggregations of worms form patches of dark, spinach green, which may allow self-shading when the sun is too intense. They form lines, head to tail, when disturbed before retreating into the shelter of the sand. This is fun to observe as they literally just disappear - no evidence that there was any living creature this high up on the foreshore.

Chris has monitored the population at irregular intervals since 1977. During the October



Fig. 1: The shore at East Aberthaw (left) and how a population of spinach worms appears by the boulders (right)

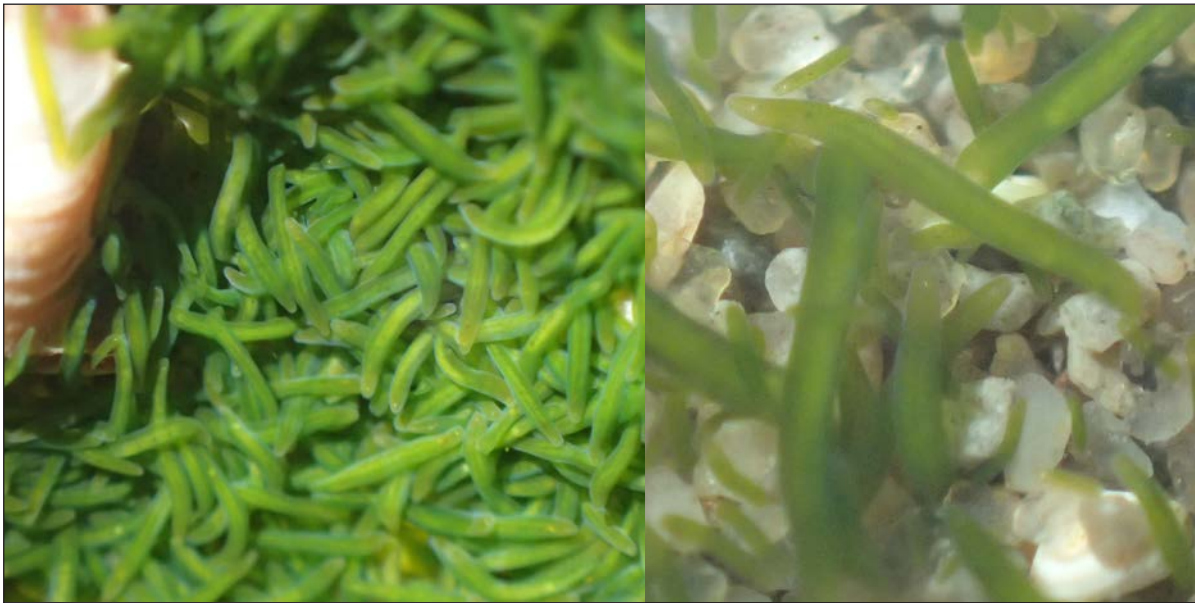


Fig. 2: Close-up views of the spinach worms

2003 Porcupine visit, the visible colony was contained in an area of one square metre. When I visited the shore with him in October 2016, also on a gloriously sunny day, we found a number of patches of the Spinach Worm by following a line at the base of the cobble bank. This time the visible colony was not limited to one single patch as noted in 2003. The worms, however, appear not to have spread to nearby locations. Presumably, a convergence of variable environmental conditions makes the site uniquely favourable at present.

This site (a northern outpost for the spinach worm) is semi-estuarine but with generally high salinity. Aberthaw power station warms the sea and seepage of water draining the salt marsh pools maintains a nutrient enriched flow throughout the tidal cycle. However, the physical environment of the cobble bank is less stable and makes the habitat precarious. Since the early 2000s, a new sand dune system, now securely vegetated, has accumulated at the seaward end of the saltmarsh (Mettam 2019). This may have prevented the longshore drift of sand from reaching the base of the cobble bank – exposing the underlying clay and creating an unsuitable habitat for the worms to spread, hence the worms are found only on a limited stretch of the beach.

No other large organisms share the habitat with spinach worms – we had a good look! But less than a metre seawards, the worms

are replaced by green seaweeds and littorinid snails; beyond that is a boulder beach all the way to low water. No spinach worms have ever been found on this part of the beach.

Although there is not great species diversity at Aberthaw, the anticipation of finding these little green worms is worth the steep, slippery steps and the likelihood of finding little else. In fact, on a clear day, the views of the Severn estuary, the lack of other humans and the possibility of finding the odd fossil in the carboniferous limestone boulders all make an explore here a satisfying escape from the ‘office’.

On our visit in 2016 we recorded the long shore distribution of the worm, recording every 10m. We also recorded the salinity from the flowing seep. Abundance was recorded as: ‘some large patches’; ‘thin patches only’; ‘none seen’. It is now 2020 so it is time for another visit – anyone care to join us?

References

- Mettam, C. 1979. A northern outpost of *Convoluta roscoffensis* in South Wales. *Journal of the Marine Biological Association of the U.K.* **59**: 251–252.
- Mettam, C. 2003. Porcupine Field excursion to Aberthaw 16th March 2003. Comments on the list of species recorded at Aberthaw. *Porcupine Marine Natural History Society Newsletter* **13**: 12–16.
- Mettam, C. 2019. *Spinach Worms at Aberthaw near Cardiff: 40 years on. A precarious hold in a changing world.* Poster at Porcupine Conference, Cardiff, March 2019.

Chasing Coral – Netflix

Year: 2017

Director: Jeff Orlowski

Available on: Netflix free to stream or to rent on Amazon Prime

Rotten Tomatoes Score: 88%

Film review by Cat Oliver

If you're looking for an adventure packed to the brim with marine life then this documentary will deliver. The film follows a quest by underwater photographers to document mass tropical coral bleaching events. It sounds quite hard hitting, and I'm not going to lie; it is, but there's an element of calmness that comes with this film that is lacking in other climate change disaster documentaries. The one-and-a-half hour film is scattered with spectacular visuals and time-lapse photography that tell a powerful story about coral bleaching around the world. The film nicely details coral reef ecosystems and their functional roles using beautiful visual explanations where it's hard not to 'ooh and aah'. For those who want pretty pictures backed up by quantitative figures then this documentary also provides plenty of evidence. The credits at the end of the film are full of esteemed coral reef scientists and global conservation bodies; in fact a total of 500 people came together over three years to make it happen. The facts regarding coral bleaching events aren't difficult to believe with the evidence provided in the film.

For Porcupine members, I'm sure that you will revel in the marine ecology and technical

conundrums when it comes to putting research questions into practice in the field. Questions such as how to film continuously underwater for months on end with a lens that doesn't get dirty, or how to get the data from the enclosed camera system 20 metres below the surface, or how to get through airport security with vast amounts of camera equipment. Well the answers come in the form of rotational wiper arms for high tech camera bubbles, complicated data wires and whittling plastic off travel boxes carrying equipment to reach the airline luggage threshold weight. Many of us have faced similar challenges on fieldwork and it's very easy to sympathise with the team and the problems they run into.

Perhaps my favourite element of the documentary is that it follows an underwater photographer, nicknamed "coral nerd" in his quest to document these events and educate people along the way. He is so clearly passionate about corals that it's inspiring to watch. He spent years of his life as a youth watching Dr John Vernon's ("coral guru") films about coral ecology on the Great Barrier Reef and was lured into everything to do with them. Sound familiar?

I'd give this documentary a solid 7.5/10.

It's worth watching on different levels. You can enjoy the magnificent visuals, but it also comes with a powerful message about coral bleaching events.

Find out more about the film here, including ways to watch it: www.chasingcoral.com



APHOTOMARINE – David Fenwick

http://www.aphotomarine.com/sitemap_photographic_categories.html

Website review by Tammy Horton

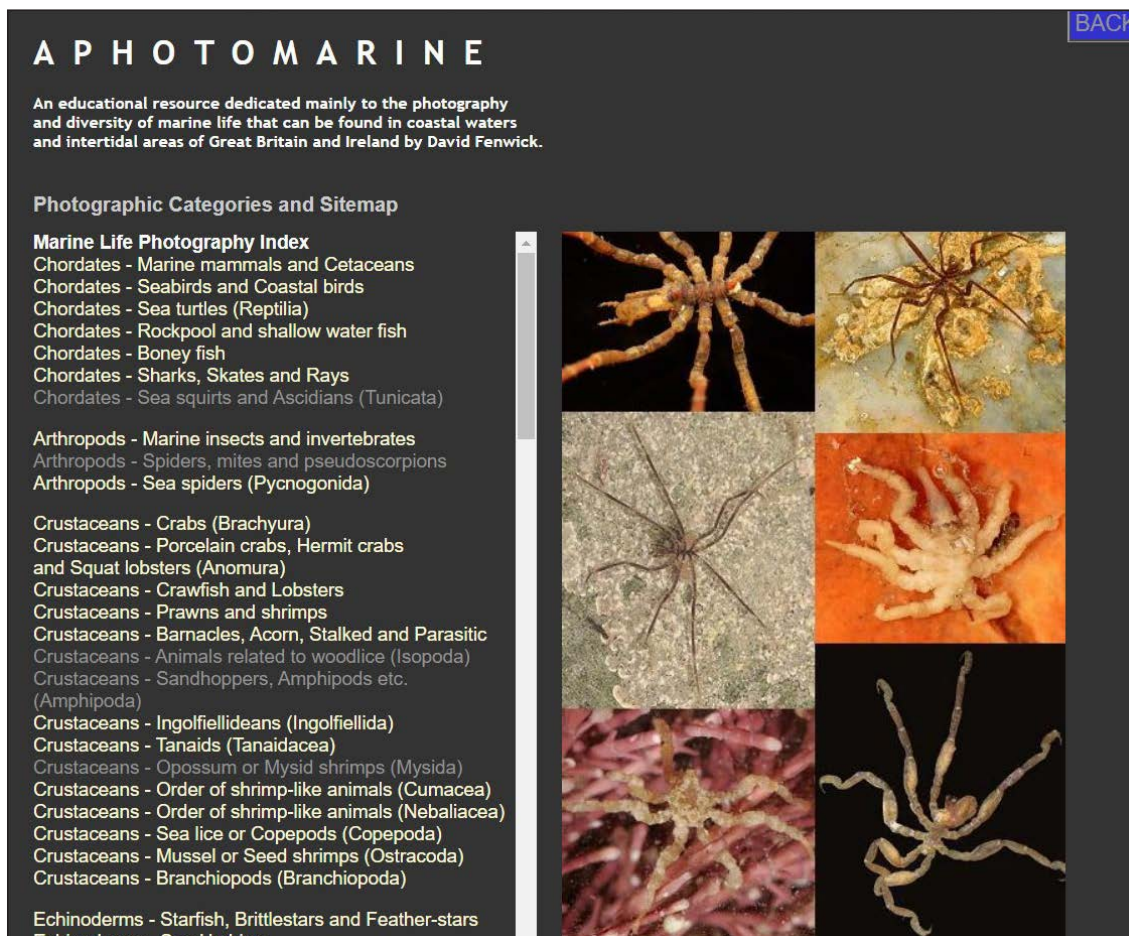
This fantastic website introduces itself in a rather understated way as:

“An educational resource dedicated mainly to the photography and diversity of marine life that can be found in coastal waters and intertidal areas of Great Britain and Ireland”

It certainly is an absolutely superb educational resource for anyone interested in the flora and fauna of our waters and is thus a great site for all Porcupines. I have made use of David's photographs both for my own identification purposes and also for illustrating lectures for undergraduates. The photographs are of excellent quality and incredibly numerous, providing different views of the same animal in many cases and often including close-up

views of identifying characters. In addition, David provides clear and detailed associated information about the specimen in each series of photographs. This usually includes information about where the specimens were collected, the sex and/or life stage of the photographed specimen, the particular view for each photo (dorsal/ventral etc), how the specimen was identified (refers to keys used etc.) and sometimes also a habitat photo.

David provides plenty of information to help you navigate the site – and believe me you can get somewhat side-tracked viewing far more than you intended to and getting 'lost' amongst the critters! There are over 1,400 web pages on the site and these contain over 10,000 images!! Once you have navigated to your taxon of choice, simply click on the species name and another page will open with the many photographs available for that taxon. The key element in navigating the website is using the site's own 'BACK' button. This button appears in the top right corner of each page and has a blue background. This



takes you back to the main index within a few clicks so you can begin exploring again if you get side-tracked.

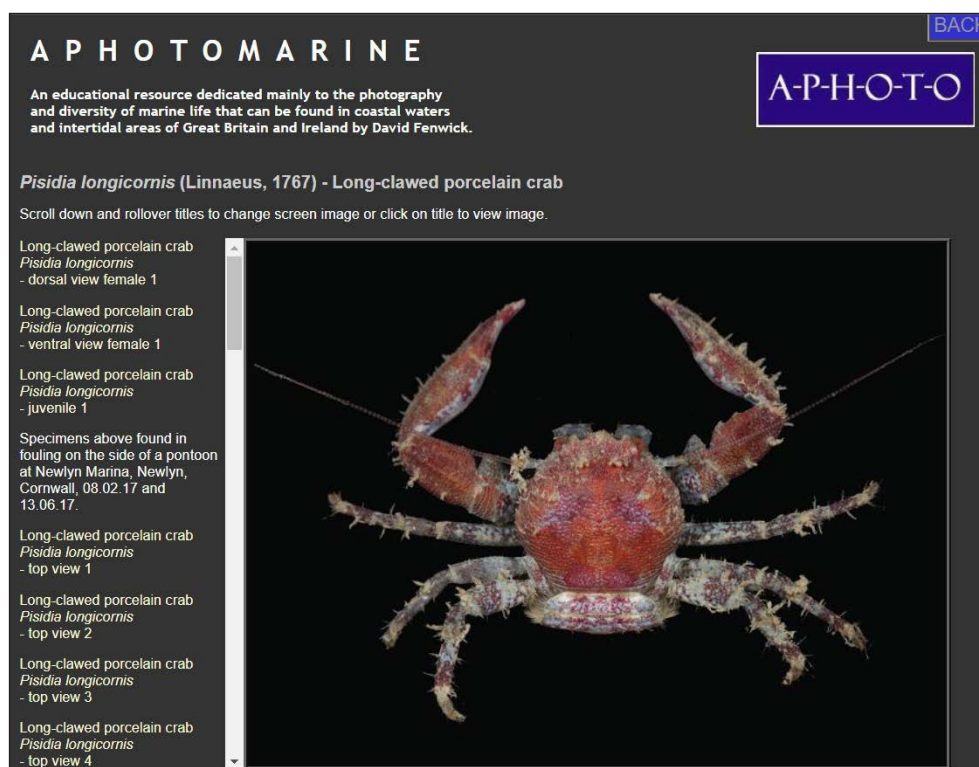
The subject matter on the website is divided into clear categories from the main homepage. There are two major headings 'Marine Life Photography' and 'Landscape and Maritime Photography'. The first of these is followed by an extensive breakdown into various taxonomic groups, from Chordates to Porifera, and towards the bottom of the list the various seaweeds and algae. There are even sections for the marine plankton, protozoa, fungi and bacteria. There is a new section covering sampling methodology which goes into great detail and will be incredibly useful for anyone who wishes to discover how to sample and what sort of equipment is needed to collect from a range of different habitats.

While Porcupines are generally focussed on the flora and fauna, the 'Landscape and Maritime Photography' section is equally interesting with some truly stunning shots of marine habitats, of sunrises/sunsets and the power of the sea, of maritime industry, maritime heritage and archaeology (such as cannon

ball collecting (!) – yes, I just got side-tracked again!), and so much more to explore!

David provides clear copyright statements and contact details to request usage of any of the images. It is clearly stated that the free use of images by children of school age for homework etc., is allowed without seeking permission, which I think is a wonderful opportunity. Equally, David allows use of the images for 'educational purposes' although permission is needed for such usage. This is entirely fair and I have always found that David is very happy to allow such usage once permission is requested (via email). The inclusion of David's photos has certainly benefitted my students as there are species on this website that are rarely photographed.

This truly is an invaluable resource! I suggest you get on over to David Fenwick's wonderful world of APHOTOMARINE, and be prepared to lose yourself there for a while - Enjoy!



How I became a Porcupine

This month, instead of our usual 'How I became a marine biologist...' we asked some of our council members, past and present, to reflect on the Society and its Council and share what it means and has meant to them; some are recent members, some have been members since the Society began, some work in a marine profession, others are only able to indulge their passion in their free time, but all are united by a love of the sea, marine life and talking about it to other people.

Fiona Crouch
Council member



Sarah Bowen
Council member



Jon Moore
Stepped down as Treasurer
in 2019, now a council
member



Paul Brazier
Previous council member



Tammy Horton
Honorary Web-officer



Susan Chambers
Chairman
(due to step down in 2020)



Frances Dipper
Stepped down as Secretary
in 2019. Not currently on
Council.



Fiona Ware
Honorary Treasurer



Cat Oliver
Council member: student
representative



Peter Barfield
Previous council member



Angie Gall
Previous council member



Matt Green
Council member



Read on for Part 1 of our 'exposé' on how many of those people who run this Society for you, our members, found their way here and stayed. Part 2 to come in the next issue!

Following this article are two new posters that we hope to distribute to encourage new members and promote the Society. The posters are freely downloadable from our website at <http://pmnhs.co.uk/why-not-join-us> for anyone who feels that they can post them somewhere appropriate to help us in this purpose. (Please ensure you are not contravening any local/organisational rules on displaying such posters before you do so).

It was the year that the conference was held in Swansea. We'd heard about a marine biology Society via Kate Lock, the Seasearch co-ordinator for West Wales at the time. Since it was reasonably local and there was the chance of fieldwork at Worms Head, David and I jumped at the chance to attend. And if I recall correctly, David gave a talk on nudibranchs, and how ID of unusual species had got so much easier with a combination of digital cameras and the Facebook ID groups set up by Bernard Picton.



I was working on a UK wide citizen science project and thought with all the knowledge, skills and geographical spread of Porcupiners they might be willing to help. So I went to my first conference in Bangor (2007 I think) and not only recruited some help with the project but had a fantastic time with amazing people so decided to join.



How did you come to join Porcupine?

I have no idea how (or even when) I first became a Porcupine although someone like Bob Earl is probably to blame. All I do know is that it was a very long time ago, possibly even BC (Before Children). My 'prickliness' (Porcupine participation) has varied over the years but has definitely increased of late. But that's probably because I'm now part of the GOW set (grumpy old women).



I attended my first meeting in Edinburgh, in 2001, and I was immediately hooked! I was blown away by how friendly the Society was, how easy it was to talk to everyone, how interesting the conference was, and how much fun I had – all for the bargain price of just £18



I knew of Porcupine for some time, but what ultimately made me join the Society was the chance to meet up with and learn from like-minded people. I was particularly interested in the field meetings, where it was like a big happy family sharing the experience.



I have only been a member since 2017 but I went to my first PMNHS conference around 20 years ago encouraged by my then boss at National Museums Scotland and our retiring Chair Susan Chambers. I have attended conferences fairly frequently since then but I think I decided the time was right to join in 2017 because I thoroughly enjoyed the Plymouth Conference and was keen to participate more formally in the Society.



**What
has
been the best part
about being a
Porcupine?**

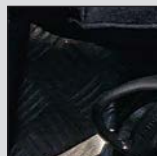
Every Bulletin, meeting and conference is an education and a delight, not least because you're among people with such a wealth of knowledge, diversity of perspectives and grounded nerdiness that you can't help but have your own thoughts and ideas enriched and nurtured.



For me it's the people, currently I'm an early career PhD student and I've found it useful talking to people about their fields of work and play and piecing the parts together about the marine ecological sector.



Meeting friendly like-minded marine natural history enthusiasts, the breadth of knowledge of fellow members, the diversity of topics covered by the conferences and bulletins and exciting field expeditions!



I expect this is going to be similar for everyone – meeting and getting to know lots of keen marine naturalists, each with a different set of knowledge and skills and characters.



Going to places that I did not know or not on the normal holiday route anyway and realising how wonderful our small island is for marine biology.



The opportunity to meet up with like-minded people who have a love of our wonderful marine world and are keen to discover more. Membership has given me the opportunity to attend meetings and fieldwork trips in all corners of the UK and Ireland, visiting places I might not have been to otherwise. There is a vast knowledge resource amongst members, and Porcupines are generous with their time and expertise.



I volunteered to join the Council as an Ordinary Member soon after becoming a Porcupine. I am fortunate because Council Membership is valued by my employer so that was part of my motivation but it was a very easy decision because I knew the Council Members were a great bunch of people and I wanted to get more involved. I took on the position of Honorary Treasurer in 2018 when Jon Moore stepped down after an impressive 27 years in the role!



I was invited/coerced by the late, great Roger Bamber and elected in 2005. Been here ever since!



How did you come to be on the Porcupine Council?

I haven't been on the Council for long, at the Cardiff 2019 conference I asked to join as a student representative. I have benefitted so much from being involved with the Society, I wanted to try and raise awareness of Porcupine to other students in similar situations to me.



After being a member for a few years, it was an obvious step to join the Council and also to put more into the Society by organising an annual conference in my home area.



I was asked by Fiona Crouch and Jon Moore. I said yes as I wanted to be involved to help support the society and hoped to input in a positive way!



I wanted to entice the Porcupines to the Isles of Scilly for a field meeting to increase the marine records, particularly in the proposed Marine Conservation Zones. I was invited to join the Council to organise this and other field meetings. The Isles of Scilly benefited from being scoured under and above water by about 30 Porcupines and Conch Soc members and we had an amazing time.



It feels great when something exciting and interesting, like a new idea for a conference or field meeting, develops organically from our discussions and to know that I have been part of that.



I think our day-to-day working lives can sometimes leave us feeling a little unfulfilled or unsatisfied, even if we're lucky enough to be working in the marine field. Being on the Council helps to offset that sense a bit because it gives you the opportunity to be part of something seeking purely to increase understanding and knowledge of marine natural history and this can be fun, interesting, collaborative, inspiring, challenging, focused and unique.



What is the best bit about being on the Council?

I loved having an insight into how the Society works and my suggestions were often met with enthusiasm. We'd often meet in different cities and I looked forward to these 6 monthly reunions when we got to shape the future of the Society and to catch up with fellow Porcupines.



Supporting the work we do for members. Also looks good on your CV :-)



The other Council members. They are all interesting people who have a lot of knowledge and skills to share and I have learnt so much. It restores your faith in human nature to meet people who are generous with their time and energy.



The very best part of being on the Council in various roles over a many years (with short breaks) was making such good friends with other Council members through the Council meetings. When I was in the role of editor of the (then) Newsletter, it also gave me many useful marine contacts through badgering people to write up their papers from the annual conference. The worst part (yes I know that was not one of the questions!) was when Council meetings went over schedule beyond my limits in terms of needing sustenance!





PORCUPINE MARINE NATURAL HISTORY SOCIETY

We are fascinated by the ecology and distribution of marine flora and fauna of the North East Atlantic and the Mediterranean. If you are interested in marine life then join us at our friendly annual conference, shore based and diving field meetings.



To find out more or to become a member visit:



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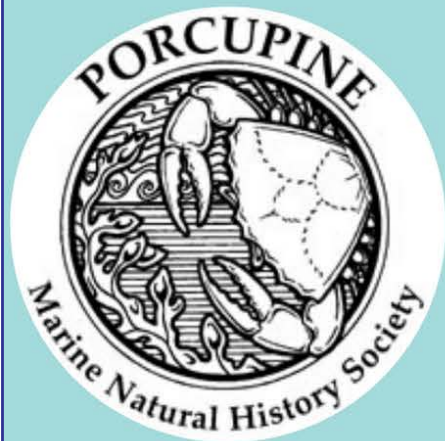


PL



MG

Photos: Paula Lightfoot (PL) & Matt Green (MG)



Thinking of joining PMNHS?

What's in it for students?

- ▶ Gain knowledge and develop interests about marine life
- ▶ Meet and network with like-minded people
- ▶ Share ideas, present and get useful feedback at a friendly annual conference
- ▶ Learn from experienced naturalists on field meetings around the UK.



Student membership is £10/ year which includes online subscription to the biannual bulletin. For more info: <http://pmnhs.co.uk/pay-for-membership-online>

@PorcupineMNHS
 www.pmnhs.co.uk

Porcupine Marine Natural History Society
 PorcupineCouncil@pmnhs.co.uk

Instructions to authors

Although we can deal with most methods and styles of presentation, it would make our editorial lives easier and speed up publication if contributions to the *Bulletin* could follow these simple guidelines. Please submit material in electronic format where possible either by e-mail or CD.

Title, Author(s) & Address(es)

Title should be concise, informative and in bold type. Include author(s) names each with one full Christian name. In multiauthored contributions, the last name is separated by an ampersand, e.g., John Smith, David G. Jones & Susan White.

Include any institution/place of residence & contact details to appear with your name at the beginning of your article. Multiple author addresses can be linked to authors by superscript numerals.

Text

- Times New Roman font, 12pt, single line spacing, saved as a Word document (.doc/.docx)
- Use bold to highlight headings but do not use any Word 'styles' to format text. Avoid using headers and/or footers where possible.
- Reference tables & figures in the text as Figure 1, Table 1 etc. and in legends as Table 1: , Fig. 1: (individual parts A, B etc should be described also).
- Indicate where figures should be placed e.g. Insert Fig.1 here (send image files separately to text)

Illustrations (Figures and Plates)

- Photographs: greyscale or colour (RGB) JPGs or TIFFs with a resolution of 300 pixels per inch and maximum width of 16 cm. Save at **high quality** (very important).
- Line drawings (particularly maps): EPS (preferred) or TIFF files. If it is a detailed map which will need the full page width, save it with a width of 16 cm. Maps with complicated colouring schemes are difficult to interpret in print – please consider using easily distinguished symbols instead.
- Graphs, histograms, etc. can be supplied as line drawings, or Excel files, each saved as a separate sheet

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For each illustration, photo etc. submitted, please provide: Filename, Caption, Photographer (if appropriate) and please be aware of any copyright issues.

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Scientific names

Latin names should be italicized. The entire scientific name should be given in full the first time it is mentioned, but thereafter the genus can be abbreviated — except at the beginning of a sentence. Authorities for taxa follow standard taxonomic guidelines, with a comma before the date; e.g., *Zeuxo holdichi* Bamber, 1990; *Melinna albicincta* Mackie & Pleijel, 1995; *Neanthes irrorata* (Malmgren, 1867).

References

- Do not leave a line space between references. Journal titles should be cited in full.
- Citations in text:Brown & Lamare (1994)...or... (Brown & Lamare 1994)..., Dipper (2001)... or...(Dipper 2001).
- The main reference styles are as follows:

Brown, M.T. & Lamare, M.D. 1994. The distribution of *Undaria pinnatifida* (Harvey) Suringar within Timaru Harbour, New Zealand. *Japanese Journal of Phycology* **42**: 63–70.

Dipper, F.A. 2001. *Extraordinary Fish*. BBC Worldwide Ltd, London. 96pp.

Ellis, J.R., Lancaster, J.E., Cadman, P.S. & Rogers, S.I. 2002. The marine fauna of the Celtic Sea. In J.D. Nunn (Ed) *Marine Biodiversity in Ireland and adjacent waters. Proceedings of the ECSA Conference, 26-27 April 2001*. Ulster Museum, Belfast. pp. 83-82.



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