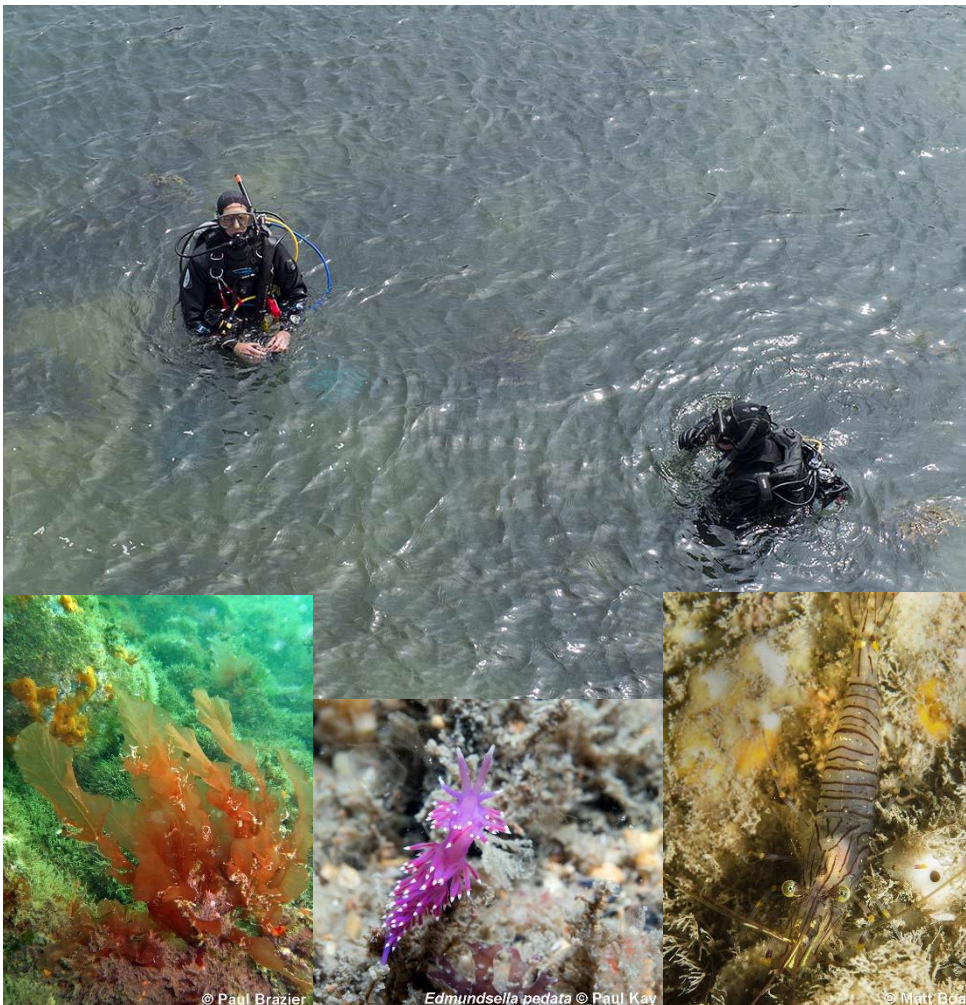




Seasearch Wales 2018 Summary Report



Report prepared by
Kate Lock, South and West Wales Co-ordinator
Lucy Kay, North Wales Tutor

Seasearch Cymru 2018

Cynllun gwirfoddol yw Seasearch sy'n cynnal arolygon o gynefinoedd a rhywogaethau morol ar gyfer plymwywr hamdden ym Mhrydain ac Iwerddon. Mae'n cael ei gydlynu gan y Gymdeithas Cadwraeth Forol.

Mae'r adroddiad hwn yn crynhoi gweithgarwch Seasearch yng Nghymru yn 2018. Mae'n cynnwys crynodebau o'r safleoedd lle cafodd arolygon eu cynnal ac yn nodi rhywogaethau a chynefinoedd prin neu anarferol a ddaethpwyd ar eu traws. Mae'r rhain yn cynnwys nifer o gynefinoedd a rhywogaethau â blaenoriaeth yng Nghymru. Nid yw'r adroddiad hwn yn cynnwys yr holl ddata manwl gan fod hyn wedi'i fwydo i gronfa ddata'r Cofnodwr Morol ac wedi cael ei ddarparu i Cyfoeth Naturiol Cymru i'w ddefnyddio yn ei weithgareddau cadwraeth forol. Mae'r data ar rywogaethau hefyd ar gael ar-lein drwy'r Rhwydwaith Bioamrywiaeth Genedlaethol.

Yn ystod 2018, parhaodd Seasearch yng Nghymru i ganolbwyntio ar rywogaethau a chynefinoedd â blaenoriaeth yn ogystal â chasglu gwybodaeth am wely'r môr a bywyd morol ar gyfer safleoedd nad oeddent wedi cael eu harolygu o'r blaen.

Mae data o Gymru yn 2018 yn cynnwys 78 o ffurflenni arolygwyr a 40 o ffurflenni arsylwyr, sef cyfanswm o 118 o ffurflenni.

Cyflwynwyd Seasearch yng Nghymru yn 2018 gan ddau gydlynnydd rhanbarthol Seasearch. Mae Kate Lock wedi cydlynu rhanbarth De a Gorllewin Cymru, sy'n ymestyn o aber Afon Hafren i Aberystwyth. Mae Holly Date wedi cydlynu rhanbarth Gogledd Cymru, sy'n ymestyn o Aberystwyth i Afon Dyfrdwy. Mae'r ddau gydlynnydd yn cael eu cynorthwyo gan nifer o diwtoriaid, tiwtoriaid cynorthwyol a threfnwyr plymwywr Seasearch gweithredol. Darperir arweiniad a chymorth cyffredinol gan Gydlynnydd Cenedlaethol Seasearch, Charlotte Bolton.

MAE SEASEARCH CYMRU YN CAEL EI ARIANNU GAN CYFOETH NATURIOL CYMRU A'R GYMDEITHAS CADWRAETH FOROL.



Seasearch Wales 2018

Seasearch is a volunteer marine habitat and species surveying scheme for recreational divers in Britain and Ireland. It is coordinated by the Marine Conservation Society.

This report summarises the Seasearch activity in Wales in 2018. It includes summaries of the sites surveyed and identifies rare or unusual species and habitat encountered. These include a number of priority habitat and species in Wales. This report does not include all of the detailed data as this has been entered into the Marine Recorder database and supplied to Natural Resources Wales for use in its marine conservation activities. The species data is also available online through the National Biodiversity Network.

During 2018, Seasearch in Wales continued to focus on priority species and habitats as well as collecting seabed and marine life information for sites that had not been previously surveyed.

Data from Wales in 2018 comprises a total of 78 Surveyor forms and 40 Observer forms, a total of 118 forms.

Seasearch in Wales in 2018 has been delivered by two Seasearch regional co-ordinators. Kate Lock has co-ordinated the South and West Wales region which extends from the Severn estuary to Aberystwyth. Holly Date has co-ordinated the North Wales region which extends from Aberystwyth to the Dee. The two co-ordinators are assisted by a number of active Seasearch Tutors, Assistant Tutors and Diver Organisers. Overall guidance and support are provided by the National Seasearch Co-ordinator, Charlotte Bolton.

SEASEARCH WALES IS FUNDED BY NATURAL RESOURCES WALES AND THE MARINE CONSERVATION SOCIETY.



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1. Seasearch and Sustainable Management of Natural Resources

The Environment (Wales) Act and the Wellbeing of Future Generations (Wales) Act provide the framework for NRW's work to pursue the sustainable management of natural resources as defined in the former, while maximising our contribution to the well-being goals set out in the latter.

Sustainable management of natural resources follows nine main principles. The planning and delivery of Seasearch and the application of its outputs all support the delivery of these principles:

Adaptive management – the selection of survey sites for Seasearch incorporates a prioritisation process (for example, focus on priority feature, gap filling or targeting potential priority habitat) which results in a suite of possible survey locations that can be dived according to weather conditions and any other considerations on the day. The data collected through Seasearch contributes to improving the evidence base for Welsh marine habitats and species and helps to inform all types of marine management decision-making.

Scale – Marine habitat data is required from around the whole of the Welsh coast. The delivery structure for Seasearch with two regional co-ordinators (one based in south-west Wales and the other in north Wales) enables Seasearch to operate effectively throughout the whole of this area. Working collaboratively with others, Seasearch can develop and deliver specific projects appropriate to a local or regional scale as required.

Collaboration and engagement – The annual programme of Seasearch activity in Wales is developed through collaborative discussions with Natural Resources Wales, Special Area of Conservation officers and regional biodiversity officers to ensure integration with local projects and other relevant initiatives such as projects relating to Section 7 species and habitats (Environment (Wales) Act 2016). In 2018 this included the Angel Shark Project with the Zoological Society London and Crawfish surveys in Pembrokeshire.

Partnering with marine centres, Wildlife Trusts, local authorities and others enables Seasearch to bring the subtidal world to non-divers and engage with them to show them what is on their doorstep. Seasearch uses public events (on the beach as well as indoor talks/displays) to highlight this and connect people to their local marine environment. Seasearch also works with local dive clubs and dive centres to promote Seasearch recording.

Seasearch engages with academic institutions to identify possible projects or areas of work where Seasearch can provide vocational training and/or data. Engaging people at an early stage of their life and career makes them into lifelong ambassadors with a high level of 'ocean literacy' and excellent job prospects.

Public participation – Volunteer involvement is at the heart of Seasearch, enthrusting a particular community of individuals to take part in a specialised citizen science project and make records of seabed habitats and associated wildlife. Volunteers can take part through organised events but are also encouraged and supported to undertake the recording on their own independent dives and/or with their dive clubs. Public participation engendered by Seasearch is wider than the community of scuba divers - the public and collaborative events that Seasearch is involved with establish connection with a much wider audience base and enthuse individuals to support Seasearch in other ways if they are not in a position to take part in the diving survey, or to become involved in other citizen science or

environmental initiatives. The information collected by Seasearch is publicly available through the NBN Atlas thereby benefiting a much wider audience than those directly involved in the project.

Evidence – Seasearch provides data to help support marine management in Wales. To ensure high quality data the QA process has been reviewed and relies on robust training and ongoing mentoring of volunteers and subsequent multi-level validation of the submitted data. In 2018 training materials were revised and a regional recorder development workshop was held in Wales to support volunteers maximise the value and accuracy of the data collected. Quality as well as quantity of data is absolutely critical to reach robust decisions capable of withstanding challenge.

Multiple benefits – Collaborative partnerships will maximise the benefits to us all - more data, more engagement, more people having a purpose to dive in Wales. Welsh diving is exceedingly popular with divers from outside Wales who will travel very large distances to enjoy it - visitors who spend money on accommodation, subsistence and socialising, thus increasing the socio-economic benefits to the local area.

Seasearch is expanding its series of photo-identification guidebooks to marine life in Britain and Ireland which provide a key national (UK) resource for identification of underwater species aimed at a general diving audience. A much expanded and fully revised Guide to Marine Life was published in 2018 along with a brand-new guide to Sea Squirts and Sponges. Plans for new guides on other common taxa (crustaceans, fish and echinoderms) are in the early stages. These are invaluable aids for both learning and engagement and they fill a gap between very basic and limited marine life guides and more technically complex taxonomic field guides, with the considerable benefit of providing *in situ* photographs of the animals and plants. Seasearch plays an important educational role in terms of providing opportunities for aspiring or qualified marine biologists to volunteer and gain valuable underwater survey skills by taking part in the marine recording. Few universities provide such opportunities and so for people with appropriate diving qualifications and experience, Seasearch enables them to develop and maintain practical surveying skills.

Long term – Information collected by Seasearch has helped inform decision making about one-off development applications as well as contributing to the body of knowledge being used for marine planning in Wales. Seasearch is able to contribute to monitoring of underwater habitats and wildlife to better understand the current status of particular species populations or to look at the consequences of human activities on marine habitats and improve understanding about impacts on seabed habitats and wildlife. Seasearch can collect data that helps monitor medium to long-term change in the marine environment in response to environmental changes and/or management decisions. Collaboration with the Angel Shark project, the crawfish surveys and previous surveys on seafans, native oysters, eelgrass beds and fan shells are examples of this.

Preventative action – The information collected by Seasearch contributes to collective understanding of the marine environment of Wales, helping identify the distribution and abundance of particular habitats and species. This information is essential to help inform sound decision making to avoid damage and degradation to Welsh seas and wildlife. The observation of seabed habitats, which are otherwise out of sight to most, can also help to highlight issues concerning marine wildlife and habitats that might otherwise be unknown and, if left, would lead to detrimental impacts on Wales' natural resources.

Building resilience – Data on marine habitats and species such as that collected by Seasearch is an essential component to help improve understanding of marine ecosystems and their functioning. It is only by continually developing this knowledge base alongside other information that it will be possible to gain some appreciation of the complexity and inter-connections of marine ecosystems that can be then used to inform sound decision making. It is vital that sound environmental principles are applied to ensure that (amongst other things) the diversity, abundance, connectivity and functioning of ecosystems are not degraded in order to contribute to building marine ecosystem resilience in the face of anthropogenic change.

2. Regional summaries 2018

2.1 South and West Wales Summary

2018 was an eventful year in South and West Wales. A list of target dive areas was drawn up at the beginning of the year in a meeting held with the Natural Resources Wales marine monitoring team leader and the Pembrokeshire Marine SAC Officer. It was agreed, when conditions allowed, to continue to aim for sites in St Brides Bay and the offshore islands. Weekend dive plans were kept flexible so that most sites could be selected based on the weather and tides.

A total of 11 survey days were planned and went ahead. All weekends were organised and run by Kate Lock. A good combination of experienced Seasearch divers along with some new keen divers participated on the surveys. This allowed a good quality of survey data to be collected and the new divers to gain experience and complete qualifications.

Four days of diving were completed at two sites established in 2017 for crawfish surveys. Surveys were repeated at each of these sites between May to October and a separate report has been produced.

Surveys were completed at Pickard Point and SE Sheep Island, both located in Pickard Bay. East Pickard Bay is a proposed location as a Marine Energy Test Area (META) and the data from the Seasearch dives has been provided to Marine Energy Wales.

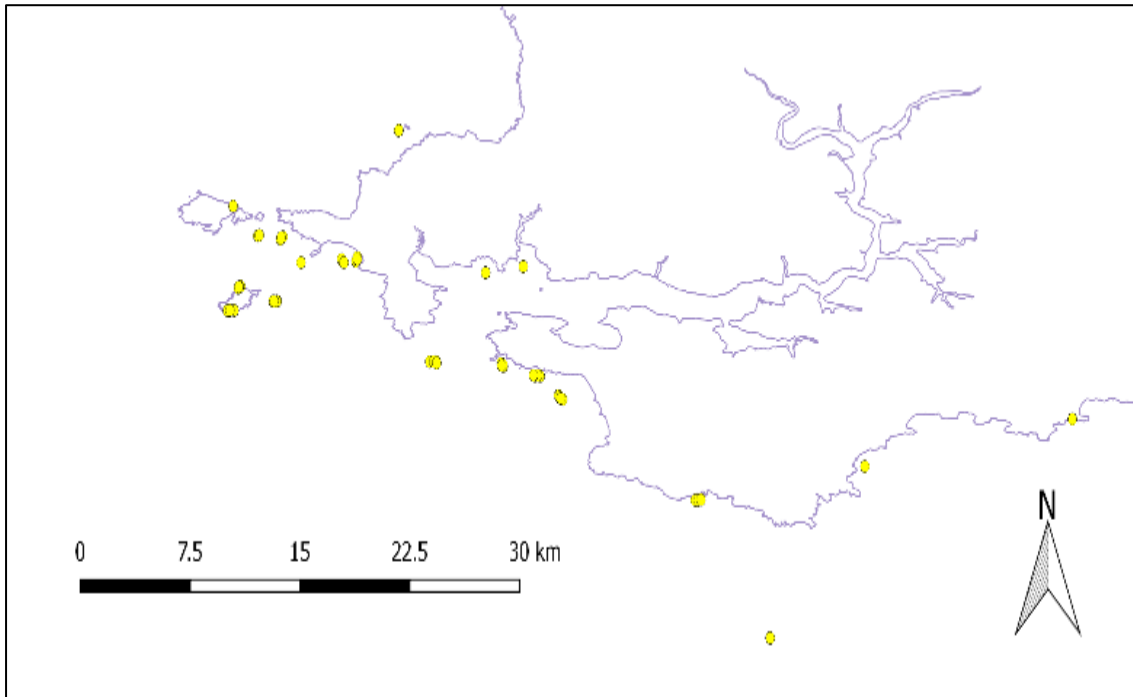
A dive was completed on the North Marloes Peninsula to verify historical records of the ross worm, *Sabellaria spinulosa*, it was found alongside Icelandic quahog, *Arctica islandica*.

A Nudibranch identification course and nudibranch focused diving was completed in June with shore diving at Martins Haven, contributing to the Skomer MCZ nudibranch 2018 survey.

A presentation was given by volunteer Blaise Bullimore at the Marine Conservation Society Annual meeting in Cardiff in November.

Seasearch survey dives were completed in the following locations:

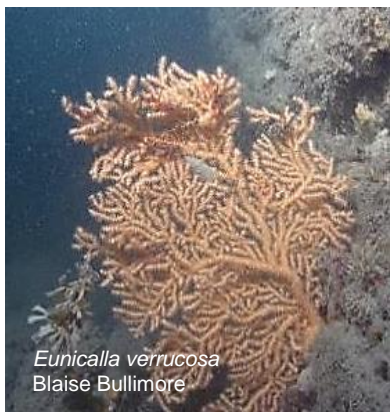
- Milford Haven waterway (2 sites)
- Skokholm (2 sites)
- Marloes Sands (2 sites)
- St Brides Bay (1 site)
- Skomer MCZ (3 sites)
- South Pembrokeshire (6 sites)



Highlights include nationally important species listed on Section 7, Environment Act (Wales) 2016 and species considered as rare, scarce or unusual records.

Nationally important species, Section 7 species and habitats, Wales Environment Act 2016

- Crawfish, *Palinurus elephas* recorded at 4 sites.
- Pink sea fan, *Eunicella verrucosa* at Skokholm and Marloes outer reef.
- Icelandic quahog, *Arctica islandica* at SAB2 North Marloes Peninsula.



EU Habitats directive, Marine Habitats Annex 1 reefs: Biogenic reefs

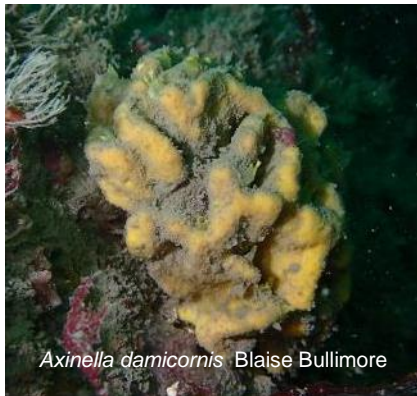
- Ross worm, *Sabellaria spinulosa* at SAB2 North Marloes Peninsula.

Nationally rare and scarce species, unusual records and those of limited geographic distribution

- Sponge species: Mashed potato sponge, *Thymosia guernei*, at Pickard Point, SE Sheep Island, Freshwater West reef and Marloes inner reef.
- Yellow staghorn sponge, *Axinella dissimilis* at Lindsway reef, Pickard Point, SE

Sheep island, Freshwater West reef, Montreal reef, Little Bay Point and Marloes inner and outer reefs.

- Brain sponge, *Axinella damicornis* at SE Sheep Island, Little Bay Point and Marloes inner and outer reefs.



- Nudibranch species: *Thecacera pennigera*, *Diaphorodoris alba*, *Eubranchus lineata* and *Doto floridicola* all recorded at Martins Haven, Skomer MCZ.
- Sea squirt species: The first record in Wales for *Didemnum pseudofulgens* was in 2012 at Long Point, Pembrokeshire but has since been recorded at other Pembrokeshire sites and in North Wales. In 2018 it was found at three sites: Linsway reef, Pickard Point and Montreal reef. The 'strawberry', 'Honeycomb' and 2-spot *Aplidium* species are all regularly recorded at South Pembrokeshire sites, they have been given temporary common names as they are still to be described and confirmed. In 2018 they were recorded at St Govans shoals and Elegug Stack.



- Sunstar, *Crossaster papposus* is a northern species only occasionally recorded in Pembrokeshire. A tiny juvenile was spotted on the Freshwater west reef.

2.2. North Wales Summary

Seasearch dives in North Wales during 2018 visited a variety of different sites by boat and shore diving and recorded a range of different habitats and species, including observations of unusual or less commonly recorded species.

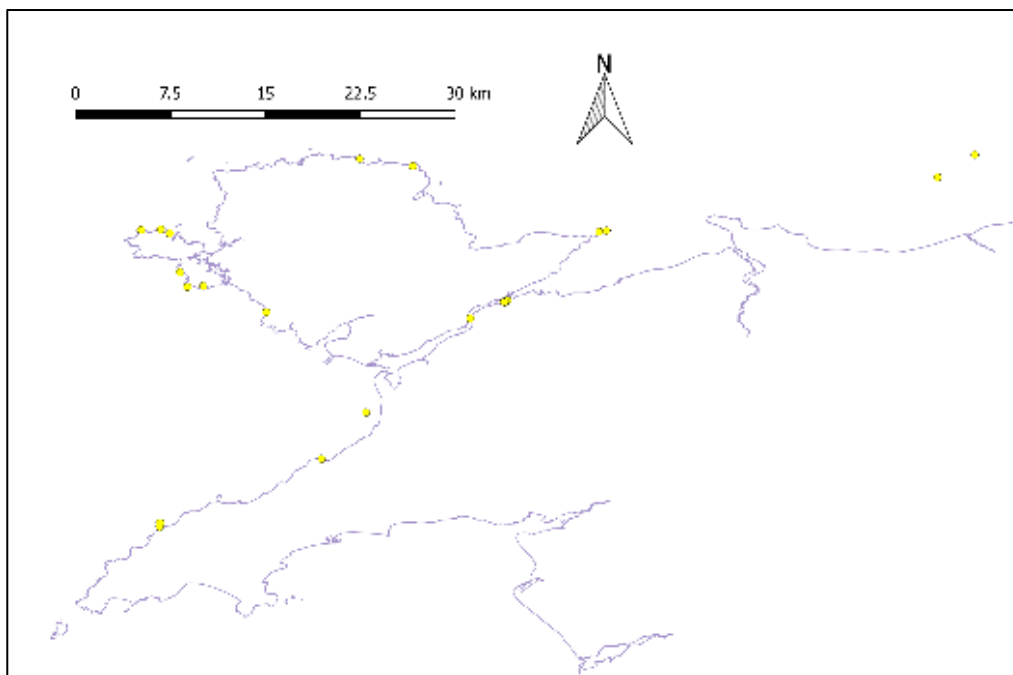
An initial list of target sites was identified early in the year through discussions between Natural Resources Wales, the National Seasearch Coordinator Charlotte Bolton and North Wales Seasearch Coordinator Holly Date. Limited boat availability has had an impact on the areas around the North Wales coast that can be more easily reached for Seasearch diving, and the weather played an inevitable part in influencing what happened and where. However, despite these constraints, a number of new sites were visited and, in celebration of Seasearch's 30th anniversary, two sites where Seasearch dives had taken place 30 years ago (near Porthysgaden and at Puffin Island) were revisited.

A total of 8 of the planned Seasearch survey days went ahead, including a very successful nudibranch weekend in the Menai Strait in June (more information on this is provided in section 4.2). The planned Seasearch days included boat and shore dives all of which were organised by Holly Date, with both experienced and new Seasearchers taking part. A number of Seasearch records were also submitted from independent Seasearch dives undertaken by individuals and by members of Chester Sub-Aqua Club. Unfortunately due to poor weather and visibility three dive weekends had to be cancelled in March, August and September as well as two individual dive days in March and April; these included Seasearch diving in association with the Angel Shark Project Wales, but as this project is continuing through 2019 there will hopefully be further opportunities to undertake Seasearch dives to contribute to the project.

Following on from a successful display of local underwater photographs and evening event of marine presentations organised by North Wales Seasearcher Carol Horne in 2017, Seasearch North Wales in collaboration with the North Wales Wildlife Trust and Co-Coast held a 3-month long marine display in the foyer of the main Gwynedd Hospital (Ysbyty Gwynedd) in Bangor from April – June 2018. Thanks go again to Carol for providing the impetus to get this to happen. The display included an exhibition of underwater photographs by local Seasearch divers showcasing examples of north Wales' marine wildlife and a seaweed display prepared by local Seasearcher Paul Brazier. Display cases in the foyer were used to highlight and promote a range of marine issues with the displays changed on a monthly basis; these included information about local Seasearch data, strandlines, litter, food products from marine species, art works inspired by and/or made from marine material (including marine litter) and information about the Co-Coast project. Seasearch North Wales also had a presence at Dutton's Dive Show at Vivian Dive Centre on 31st July.

Seasearch dives in 2018 were undertaken in the following areas:

- North and west Anglesey (9 sites)
- Menai Strait (5 sites)
- North Llŷn coast and Caernarfon Bay (4 sites)
- Liverpool Bay (2 sites)



Highlights from 2018 include some habitats and species listed on Section 7 of the Environment (Wales) Act 2016 and a number of species considered rare, scarce or unusual records.

Nationally important habitats and species, Section 7 species and habitats, Wales Environment Act 2016

- Seagrass bed *Zostera marina* (Rhoscolyn, south end of Holy Island, north-west Anglesey)
- Plaice, *Pleuronectes platessa*

Nationally rare and scarce species, unusual records and those of limited geographic distribution

Records of species more commonly found in the south and south-west of the UK:

- Mashed potato sponge, *Thymosia guernei* (East of North Stack, north-west Anglesey; this is the most northerly record in Wales for this species - a record of this species from a nearby site was made 2017)
- The sponge *Aplysilla rosea* (East of North Stack, north-west Anglesey)
- Yellow staghorn sponge, *Axinella dissimilis* (Hermione and Englishman’s Rock, north-west Anglesey)
- Brown seaweed – Dotted Peacock Weed *Taonia atomaria* (Englishman’s Rock, north-west Anglesey; north-east of Porthysgaden, north Llŷn Peninsula)



- Spiraled fan weed *Dictyota spiralis* – possible record (identification by an expert marine biologist from a photograph taken by one of the Seasearchers). No sample collected to confirm identification so currently recorded as an uncertain record (Caer Arianrhod, Caernarfon Bay)
- Indian feathers hydroid *Gymnangium montagui* (north-east of Porthysgaden, north Llŷn Peninsula)
- Potato crisp bryozoan *Pentapora foliacea* (north-east of Porthysgaden, north Llŷn Peninsula)
- Sponge crab *Dromia personata* (north-east of Porthysgaden, north Llŷn Peninsula)
- Dotted peacock weed *Taonia atomaria* (north-east of Porthysgaden, north Llŷn Peninsula)

3. Dive site descriptions

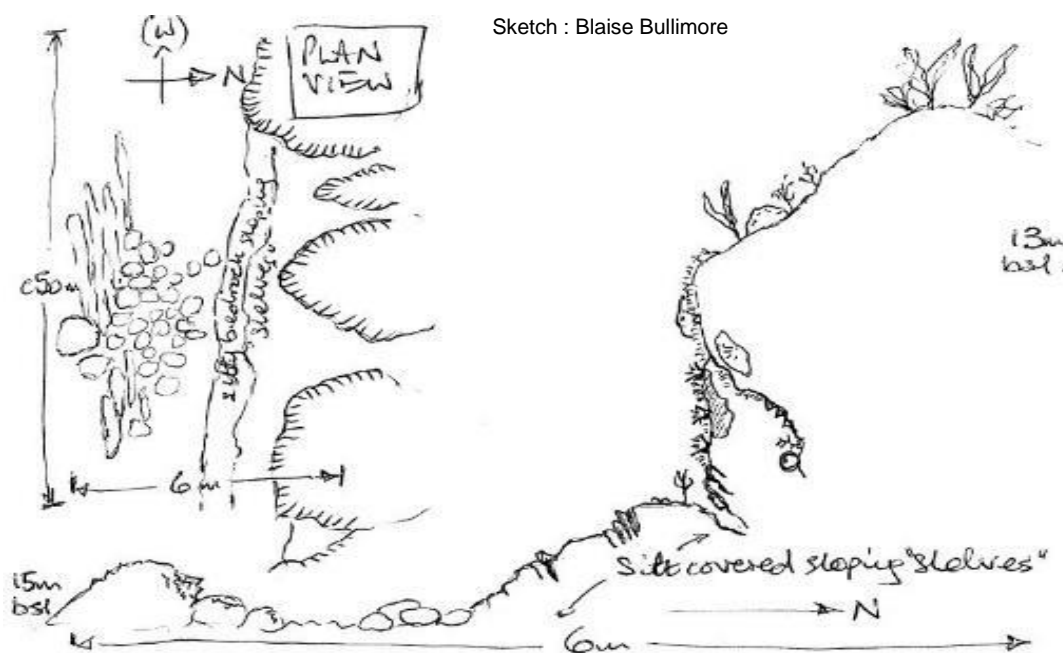
3.1 South and West Wales dive sites

3.11 South Pembrokeshire

The south Pembrokeshire limestone coast has been a focus for Seasearch dives over the past few years and during 2018 six sites were explored. Surveys were completed at Pickard Point and SE Sheep Island, both located in Pickard Bay between Sheep Island and Freshwater west. East Pickard Bay is a proposed location as a Marine Energy Test Area (META) and the data from the Seasearch dives has been provided to Marine Energy Wales. Dives were also completed at St Govans shoals three miles off St Govan's Head, Elegug stacks off the Castlemartin range and Freshwater west reef. An independent shore dive was completed on the west side of Lydstep Head.

3.111 Pickard Point

Old red sandstone bedrock outcrops forming ridges lying in an east-west direction were the main feature of the site. The steep vertical faces were dominated in dense short bryozoan turf with both *Scrupocellaria spp* and *Crisia spp* Abundant. Large patches of encrusting sponges with Occasional erect sponges and cushion sponges including yellow staghorn sponge, *Axinella dissimilis* and mashed potato sponge, *Thyrosia guernei* were recorded.

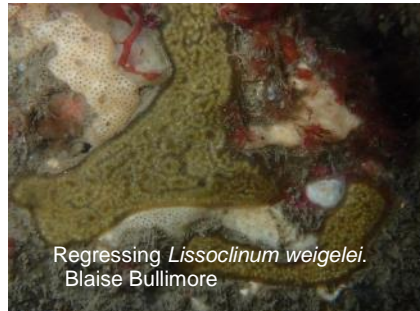


Broad gullies lay between the ridges, some gullies had heavily silted large rounded boulders whilst in other gullies coarse sand and pebbles with no life apparent were found. Some boulders were devoid of life and others had a scattering of barnacles, tubeworms and finger bryozoans, *Alcyonidium diaphanum*. Ascidian turf was also recorded in particular teapot seaquirt, *Polycarpa scuba*, *Mogula sp.* *Didemnum pseudofulgens* and colonies of regressing *Lissoclinum weigelei*.

Devonshire cup coral, *Caryophyllia smithii* was prolific, notable was the relatively high frequency of cup coral barnacle, *Adna anglica* and ginger tiny anemone *Isozoanthus sulcatus*, were found on silty ledges. The horizontal surfaces varied, some were heavily encrusted with similar life to the vertical rocks and occasional red algae, whilst other areas

were heavily silted and very little life present.

Crustacea and territorial fish species were found hiding in rock crevices, in the gullies and amongst the boulders. Crustaceans: European lobster, *Homarus gammarus*, edible crab, *Cancer pagarus*, velvet swimming crab, *Necora puber* and common prawn, *Palemon serratus*. Territorial fish species included: tompot blenny, *Parablennius gattorugine*, scorpion fish, *Talurus bubulis*, leopard spotted goby, *Thorogobius ephippiatus*, goldsinny wrasse, *Ctenolabrus rupestris*, ballan wrasse, *Labrus bergylta* and corkwing wrasse, *Symphodus melops*.

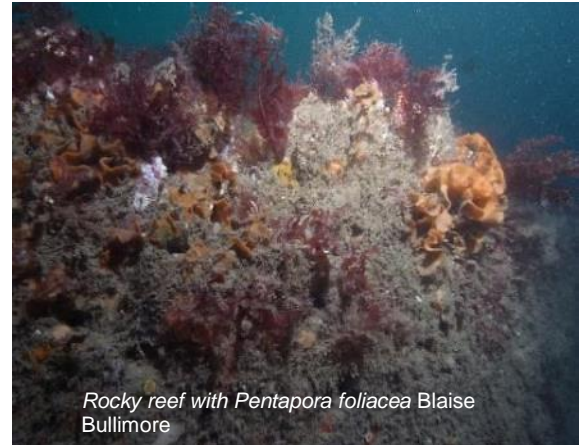
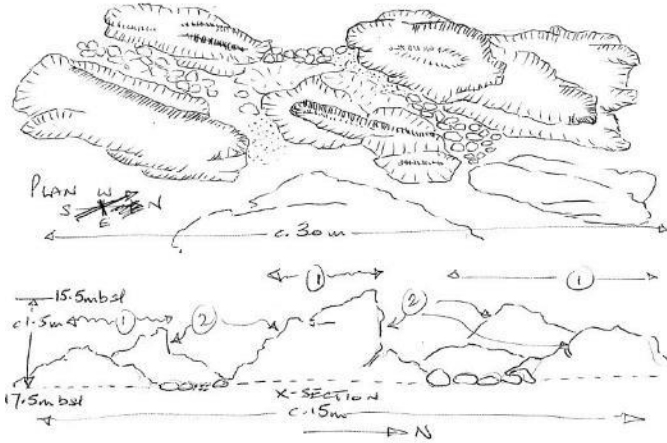


3.112 SE Sheep Island

Irregular low-lying old red sandstone rocky reef between 17.5 to 15m below sea level, located around 200m off south-west facing shore. The rock outcrops and ridges up to 1.5m height with broad shallow gullies filled with small boulders, coarse sand and gravel which appeared to support little life and were heavily silted.

The bedrock upward facing surfaces were dominated in red algae meadow interspersed with bryozoans, Occasional boring sponge, *Cliona celata*, common urchin, *Echinus esculentus* and Bloody Henry, *Henricia* sp. The shore vertical steep faces were densely packed with bryozoan turf, *Scrupocellaria* sp, white clawed sea moss, *Crisia* sp and potato crisp bryozoan, *Pentapora foliacea*. Erect sponges included the yellow staghorn sponge, *Axinella dissimilis*, brain sponge, *Axinella damicornis*, Chocolate finger sponge, *Raspailia ramosa*, *Stelligera stuposa* and *Stelligera rigida*. Notable too were several colonies of mashed potato sponge, *Thymosia guernei*. Few crustacean and fish species were recorded, with small numbers of edible crab, *Cancer pagarus* and velvet swimming crab, *Necora puber* and occasional small spotted catshark, *Scyliorhinus canicula*.

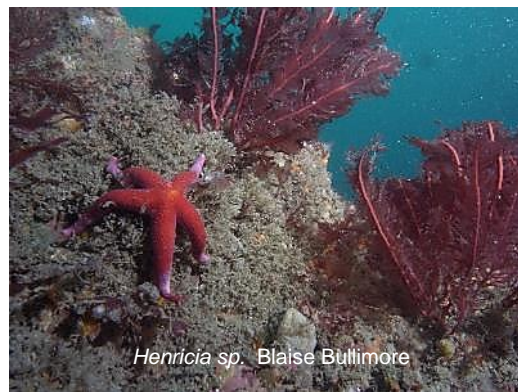
Sketch : Blaise Bullimore



Rocky reef with *Pentapora foliacea* Blaise Bullimore



Thymosia guernei Blaise Bullimore



Henricia sp. Blaise Bullimore

3.113 Freshwater west reef

Fingers of low-lying rocky reef around 1m high running east to west, topped with sparse forest kelp, *Laminaria hyperborea* and mixed red algae. Fourteen species of sea squirt were recorded including an Abundance of sand-encrusted *Polyclinid*, and both pinhead sea squirt, *Pycnoclavella aurilucens* and club sea squirt, *Aplidium punctum* were Common. The short vertical faces and small over hangs provided habitat for encrusting and cushion sponges including the black tar sponge, *Dercitus bucklandi* and mashed potato sponge, *Thymosia guernei*. Yellow staghorn sponge, *Axinella dissimilis*, Devonshire cup coral, *Caryophyllia smithii*, white striped anemone, *Actinothoe sphyrodeta* and tiny ginger anemone, *Isozoanthus sulcatus* were all recorded in low numbers. In crevices were double spiral tube worms, *Bispira volutacornis*, crevice sea cucumber, *Pawsonia saxicloa* and squat lobster, *Galathea strigosa*. Bloody Henry, *Henricia* sp., common starfish, *Asterias rubens* were recorded as Frequent and a single juvenile sunstar, *Crossaster papposus*. In the base of the gullies a thick layer of silt overlay bedrock along with areas of mixed sediments. Few animals were found but a black blenny, *Gobius niger* and the borrowing sea cucumber, *Thyone roscovita* were both recorded.



Crossaster papposus Emily Morgan

3.114 St Govans Shoals – 3 miles offshore

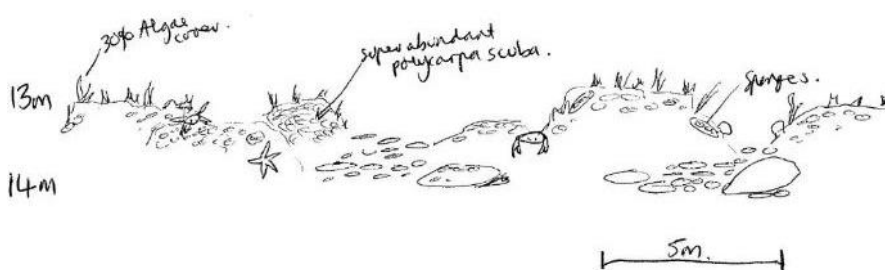
Wave-exposed limestone bedrock reef at 15 to 17m bsl. The reef was a jumbled system of undulating rock mounds and small gullies. The upward facing and steeply sloping rock faces had the same communities, dominated by an Abundance of oaten pipe hydroids, *Tubularia indivisa*, dead men's fingers, *Alcyonium digitatum* and encrusting sponge, *Myxilla incrustans* with *Jassa falcata* amphipods densely coating *Tubularia* stalks. Dahlia anemone, *Urticina felina* were Common and both white striped anemone, *Actinothoe sphyrodeta* and jewel anemone, *Corynactis viridis* recorded as Frequent. A scattering of sea squirt species were recorded with *Synoicum incrustatum* Frequent and notable the strawberry *Aplidium*. Scorpion fish, *Taurulus bubalis* and butterfly, *Pholis gunnellus* were both recorded as Common.



3.115 Elegug Stacks - Castlemartin Range

Low-lying rugged limestone reef raised into mounds around 1m high and 2-3m across with a distinct gentle slope to one side and an abrupt vertical face on the other. The gentle slopes and tops were covered in mixed red algae and an Abundance of sea squirt, *Polycarpa scuba* mixed with a scattering of other sea squirts (19 species) including the strawberry, honeycomb and caramel two-spot '*Aplidium*' species and snowflake sea squirt, *Didemnum maculosum* var. *dentata*. The vertical reef sides were similar but notable was difference in dominant sea squirt species with *Polycarpa scuba* being replaced by the gooseberry sea squirt *Dendrodoa grossularia*. On the steep walls and also under overhangs and cut-ins were black tar sponge, *Dercitus bucklandi* and *Hexadella topsenti*.

Sketch : Kate Lock



Small boulders and cobbles were found between the bedrock outcrops, rounded and scoured with pink encrusting algae and keeled tube worms. Some under-boulders were explored with brittle stars, *Ophiothrix fragilis* and small urchins, *Psammechinus miliaris* found. Other notable finds were the trumpet anemone, *Aiptasia couchii*, the sponge crab, *Dromia personata*.



Aiptasia couchii Ruth Sharratt



Dromia personata Sarah Bowen

3.116 Lydstep Head (west side)

This was completed as a shore dive with the entry point at the Lydstep caverns. Intertidal limestone bedrock and boulders were scoured by sand (0 to 5mbsl). Low lying rock was dominated in *Rhodothamniella* algae and some dense patches of other red algae including *Polyides rotundus*. Steep sides were dominated by barnacles and limpets, hermit crabs were numerous.

The upper infralittoral bedrock reef (5 to 8m bsl) was dominated by lush red algae turf, in particular *Plocamium* sp. and kelp on elevated upward-facing surfaces. Vertical sides were dominated by sea squirts in particular *Polycarpa scuba*, *Morchellium argus* and patches of caramel two-spot *Aplidium*. Daisy anemone, *Cereus pedunculatus* and massive sponges including boring sponge, *Cliona celata* and shredded carrot sponge, *Amphilectus fucorum* were recorded along with numerous spiny spider crab, *Maja brachydactyla* and velvet swimming crab, *Necora puber*. The reef was patchy and often surrounded by rippled sand with no life apparent, so low lying edges of the reef were scoured.



Polycarpa scuba and *Cereus pedunculatus*
Jon Moore

Extensive area of lower infralittoral bedrock (8 to 11m bsl) was found further offshore, with some patches of slightly rippled sand. Mixed red algae were found on tops of the reef with mixed animal turf of sponges, hydroids, sea squirts and anemones dominating all surfaces. Notable records were chimney sponge, *Polymastia penicillus*, sea squirt *Polycarpa scuba*, gooseberry sea squirt, *Dendrodoa grossularia* and baked bean sea squirt, *Distomus variolosus*, dead men's fingers, *Alcyonium digitatum* and dahlia anemone, *Urticina felina*. Some areas were dominated by hydroids, particularly antenna hydroid, *Nemertesia antennina* and in areas exposed to some scour *Sertularia argentea*.

3.12 Milford Haven Waterway

The Milford Haven waterway is a very active area with both commercial and recreation interest. Seasearch has completed many dives in the area looking at habitats and species of national importance: tidal rapid reefs, eelgrass *Zostera marina* beds and the native oyster *Ostrea edulis*. There are also high numbers of non-native species like the invasive slipper limpet *Crepidula fornicata*. Two sites were dived in the entrances of Milford Haven waterway in 2018: Lindsway reef located on the north side of Dale bay and Montreal reef, close to Little Castle Head in Sandy Haven bay.

3.121 Lindsway reef

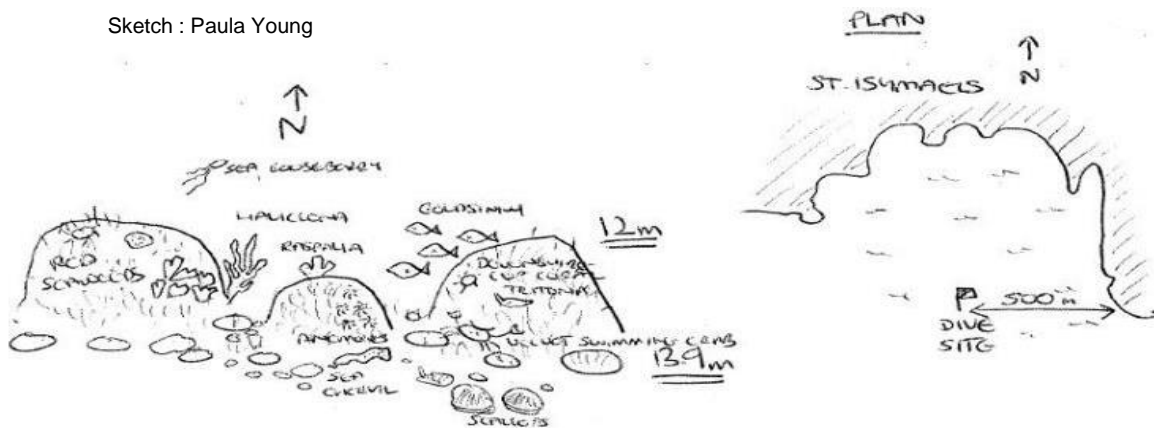
The reef was made up of low broken bedrock and boulders with angular cobbles between. Dense mixed red seaweed meadow was found on the tops of the rocks and boulders. The algae were heavily overgrown with bryozoans, in particular white clawed seamoss, *Crisia* sp, in addition to snowflake sea squirt, *Didemnum maculosum* var. *dentata*.

The steep vertical and over-hanging faces were dominated in colonial sea squirts, *Diplosoma spongiforme*, *Botryllus schlosseri* and *Didemnum pseudofulgens*, and small patches of the orange sea squirt, *Stolonica socialis*. Erect sponges included, yellow staghorn sponge *Axinella dissimilis* and *Stelligera stuposa*.



Crisia sp. encrusted Algae
Kate Lock

Sketch : Paula Young



There was around a 30-40% cover of silty bryozoan and hydroid turf that was unidentifiable except for some antenna hydroid, *Nemertesia antennina*. Fish species included bib, *Trisopterus luscus*, black goby, *Gobius niger* and both goldsinny wrasse, *Ctenolabrus rupestris* and ballan wrasse, *Labrus bergylta*.

3.122 Montreal reef

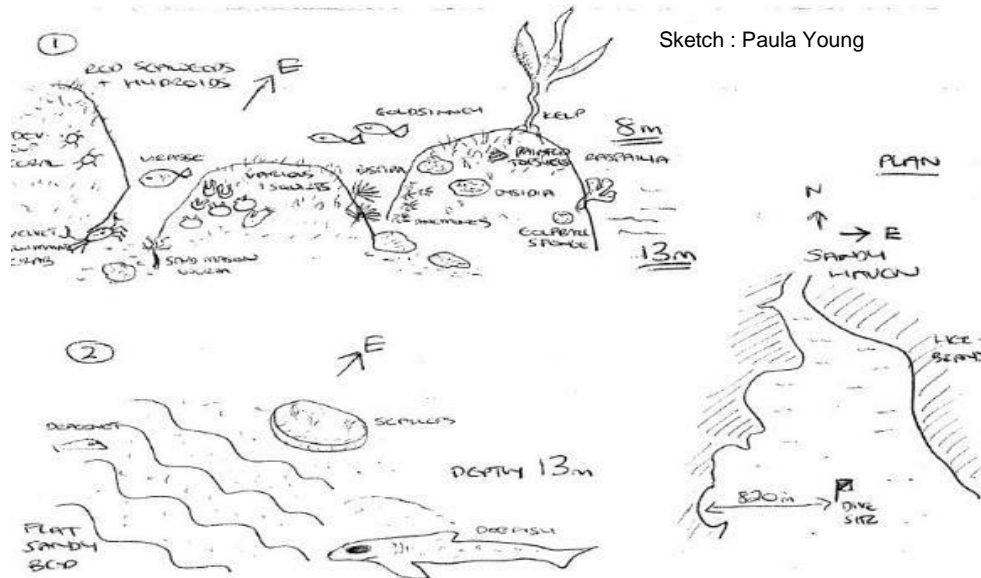
This site is close to Little Castle Head in Sandy Haven bay. Old red sandstone bedrock outcrops which were fissured and fractured in a near vertical orientation. Kelp park of forest kelp, *Laminaria hyperborea* with dense mixed red algae heavily encrusted with bryozoan sea mats *Membranipora membranacea* and *Electra pilosa*. The edges and rock faces were dominated in very silted regressed turf with small erect and encrusting sponges and solitary and encrusting colonial sea squirts. Erect sponges included yellow staghorn sponge,

Axinella dissimilis, mermaid's glove sponge, *Haliclona oculata* and *Stelligera stuposa*. Fifteen sea squirt species were recorded, notable was the sandy *Molgulids*, snowflake sea squirt, *Didemnum maculosum* var. *dentata* and *Didemnum pseudofulgens*.

Coarse sand and gravel was found between the bedrock outcrops with Occasional king scallops, *Pecten maximus* found.



Stolonica socialis Blaise Bullimore



Pecten maximus Emily Morgan



Ascidia mentula and *Tritonia lineata* Blaise Bullimore

3.13 Skokholm

Skokholm is an old red sandstone island located two miles off the Pembrokeshire coast. Seasearch dives are regularly completed at sites around the island and in 2018 the Lighthouse Ledges and Little Bay Point were explored. Additionally, reefs were surveyed off Marloes Sands, a beach on the mainland coast adjacent to Skokholm.

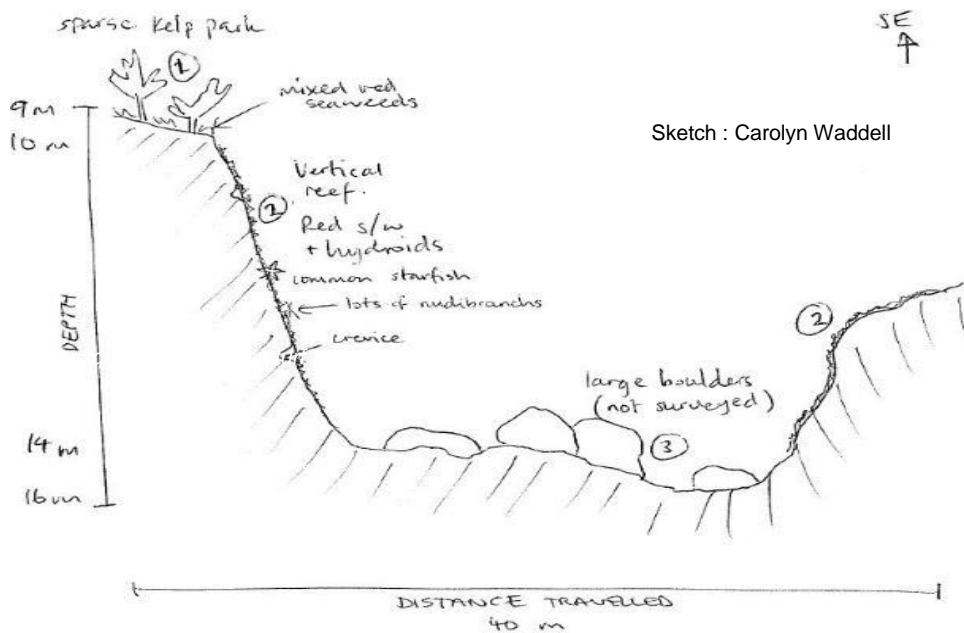
3.131 Skokholm lighthouse ledges

Sheer vertical bedrock walls were found from 9 to 14m bsl, with large boulders at the base at 16m bsl overlaying bedrock and following south offshore further undulating rock reef was found. The upper surfaces in the shallows were covered in a kelp park of forest kelp, *Laminaria hyperborea*, mixed red algae and Occasional common urchin, *Echinus esculentus*.

The vertical rock faces were thickly covered in short animal turf with occasional red algae.

Oaten pipe hydroids, *Tubularia indivisa* and club sea squirt, *Aplidium punctum* were the most dominant species along with antenna hydroids, *Nemertesia antennina* and *Nemertesia ramosa* and jewel anemone, *Corynactis viridis* and dead men's fingers, *Alcyonium digitatum* were both recorded as Occasional. Large colonies of elephants hide sponge, *Pachymatisma johnstonia*, small patches of mashed potato sponge, *Thymosia guernei* and shredded carrot sponge, *Amphilectus fucorum* was Common. Thirteen species of sea squirt were found with both *Morchellium argus* and 2-spot *Aplidium* both Common. Several nudibranch species were found including *Fjordia lineata*, *Fjordia chriskaugei* and *Zelentia pustulata*.

The scoured boulders and cobbles at the bases of the walls were not fully surveyed. Dahlia anemone, *Urticina felina* was recorded but other life was observed.



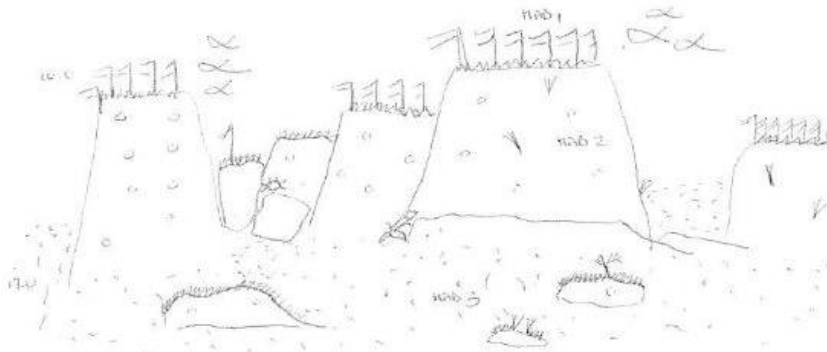
3.132 Little Bay Point

Kelp park of forest kelp, *Laminaria hyperborea* and mixed algae turf was found on top of the rocky reefs with sponges, sea squirts and hydroids mixed in. Steep vertical walls up to 5m height were found, dominated in bryozoan turf with *Scrupocellaria sp* Superabundant, *Bugulina flabellata* Common and *Cellaria sp.* Frequent. Rich sponge communities were present with erect sponges, *Stelligera stuposa*, *Stelligera rigida*, yellow staghorn sponge, *Axinella dissimilis*, brain sponge, *Axinella damicornis* and chocolate finger sponge,

Raspailia ramosa. Devonshire cup coral, *Caryophyllia smithii* were Common and hydroids included the antenna hydroids Frequent with *Nemertesia antennina* and *Nemertesia ramosa* both present. Occasional large patches of the yellow cluster anemone, *Parazoanthus axinellae* were found and on silty ledges the ginger tiny anemone, *Isozoanthus sulcatus*.

Small but well-defined horizontal ledges on the bedrock walls were influenced by coarse mobile sand. Erect sponges and hydroids were recorded on the ledges along with dead men's fingers, *Alcyonium digitatum*, finger bryozoan, *Alcyonidium diaphanum* and potato crisp bryozoan, *Pentapora foliacea*. Spiny starfish, *Marthasterias glacialis* and common urchin, *Echinus esculentus* were both found on the reef along with several crustacean species including Rare crawfish, *Palinurus elephas*.

Sketch : Emily Morgan



Parazoanthus axinellae Sarah Bowen



Pentapora foliacea Blaise Bullimore

3.133 Marloes Reef inner

An old red sandstone reef found off Marloes sands, steeply stepped with ledges from 15 to 19m bsl. Between 15-17m the tops of the reef were covered in a kelp park of forest kelp, *Laminaria hyperborea* with thick turf of mixed red algae and Frequent common urchin, *Echinus esculentus*. The steep faces, stepped ledges and overhangs animal turf dominated the surfaces with sparse red algae. Bryozoans dominated the animal turf with *Bicellariella ciliata* and white clawed sea moss, *Crisia* sp. both Common and finger bryozoan, *Alcyonidium diaphanum* Frequent. A scattering of sponge species were found in low numbers including the yellow staghorn sponge, *Axinella dissimilis* and brain sponge, *Axinella damicornis*, notable too was several colonies of mashed potato sponge, *Thymosia guernei*. Sea squirts included *Polycarpa scuba*, pin head sea squirt, *Pycnoclavella producta* and snowflake sea squirt, *Didemnum maculosum* var. *dentata*. A single



Maja brachydactyla & *Palinurus elephas* Kate Lock

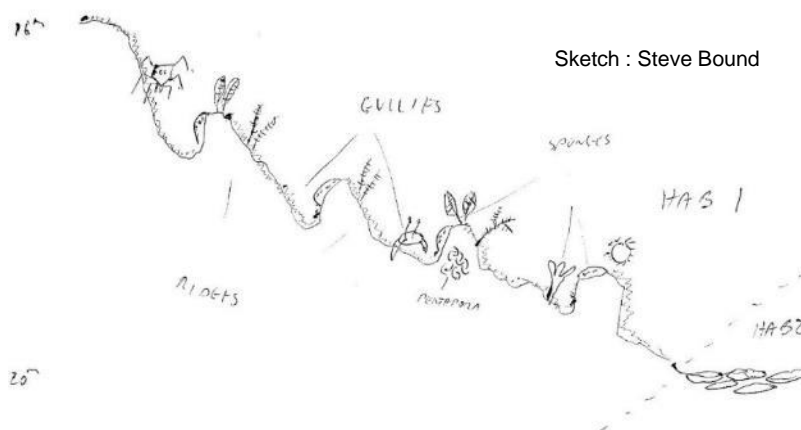
crawfish, *Palinurus elephas* was found along with other common crustacean species.

3.134 Marloes Reef outer

Rocky reef with undulating rock ridges and gullies from 15 to 20m bsl. Animal turf dominated the reef with sparse mixed red algae also found on the tops of the ridges. Massive sponge species: elephants hide sponge, *Pachymatisma johnstonia* and boring sponge, *Cliona celata* were both Common. Erect sponges included yellow staghorn sponge, *Axinella dissimilis* and brain sponge, *Axinella damicornis* along with chocolate finger sponge, *Raspailia ramosa*. Antenna hydroids *Nemertesia antennina* and *Nemertesia ramosa* were both Frequent and oaten pipe hydroids, *Tubularia indivisa* were Occasional on current swept ridge tops. Bryozoan turf was prolific with white claw sea moss, *Crisia sp.* and *Cellaria sp.* being the dominant species. Notable were Occasional potato crisp bryozoan, *Pentapora foliacea* and pink seafan, *Eunicella verrucosa*.

Low numbers of crustacean and fish were found with butterflyfish, *Pholis gunnellus* and scorpion fish, *Taurulus bubulis* both recorded.

Cobbles were found at the base of the reef, but this area was not surveyed.



3.14 Skomer Marine Conservation Zone

Skomer MCZ is managed by Natural Resources Wales, its dedicated team of marine scientists have established a programme of littoral, sublittoral and oceanographic monitoring.

Although habitat and species records are considerable for the MCZ, it has been identified by the MCZ management plan that these need continued updating with new records. In 2018 Seasearch surveyed the Bench located at the south side of Jack Sound and a mixed sediment site offshore from the North Marloes Peninsula where there were historical records of Ross worm *Sabellaria spinulosa* and a request was made to verify this record.

The Skomer MCZ team completed a Nudibranch diversity survey in 2018 and to assist in this Seasearch completed shore dives at Martins Haven recording nudibranch species over one weekend.

3.141 SAB2, North Marloes Peninsula

Coarse sand and broken shell gravel at 25m bsl. Occasional ocean quahog, *Arctica islandica* were found just under the surface along with Occasional edible crab, *Cancer*

pagarus and hermit crabs, *Pagarus bernhardus*. Most life was found encrusting large empty ocean quahog shells including tubeworms, bryozoans, hydroids, sea squirts and sponges. Species included the sponge chimney sponge *Polymastia penicillus*, anemones *Sagartia troglodytes*, finger bryozoan, *Alcyonidium diaphanum* and the sea squirts *Polycarpa pomaria* and *Pyura microcosmus*. The most notable record was the ross worm *Sabellaria spinulosa* and an octopus *Eledone cirrhosa* hiding in a shell.



Eledone cirrhosa Kate Lock



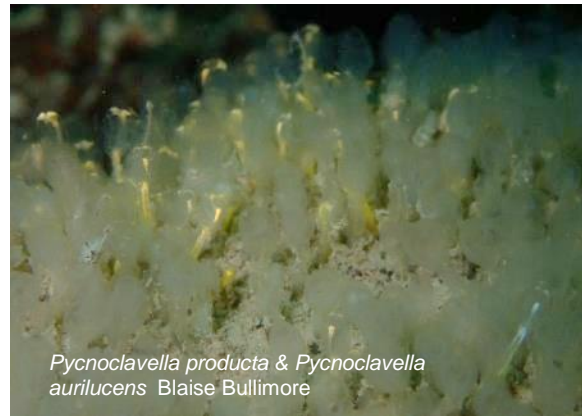
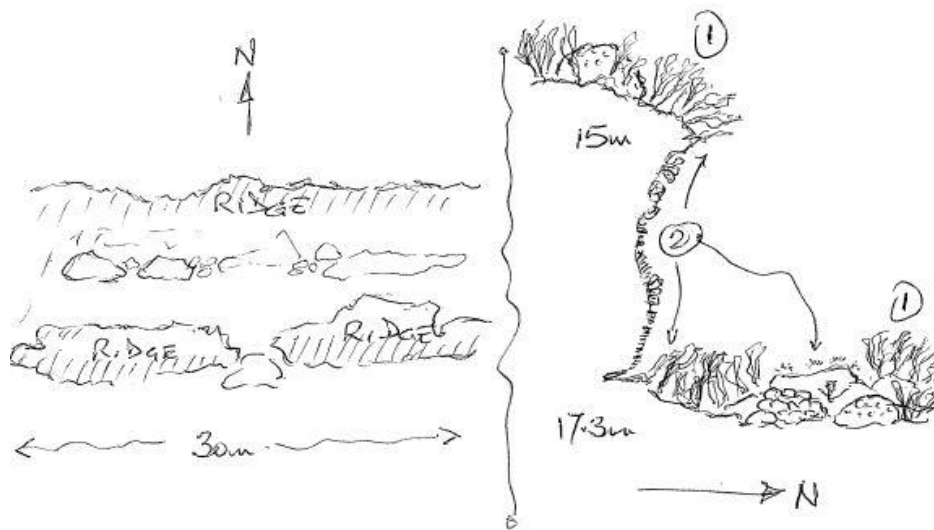
Sabellaria spinulosa Kate Lock

3.142 The Bench

A rugged reef located at the southern end of Jack Sound. The reef was composed of steep vertical faces, over hangs and ledges. The horizontal ledges were covered in a thick red algae meadow mixed with brown algae, *Dictyota dichotoma* and occasional forest kelp, *Laminaria hyperborea*. The algae were heavily encrusted in bryozoan seamats *Membranipora membranacea* and *Electra pilosa*. Mixed in too were pin head sea squirts, *Pycnoclavella producta* and *Pycnoclavella aurilucens*, snowflake sea squirt, *Didemnum maculosum* var. *dentata* and massive sponges, shredded carrot sponge, *Amphilectus fucorum* and elephants hide sponge, *Pachymatisma johnstonia*. Scattered potato crisp bryozoan, *Pentapora foliacea* and patches of orange sea squirt, *Stolonica socialis* were also found.

The vertical and overhanging bedrock was dominated in sea squirt species as found on the horizontal surfaces. Hydroid species included the antenna hydroids, *Nemertesia ramosa* and *Nemertesia anteninna* and *Aglaophenia pluma*. Devonshire cup coral, *Caryophyllia smithii* were Common and dead men's fingers, *Alcyonium digitatum* Frequent. Wrasse species were found and a sighting of a bull huss, *Scyliorhinus stellaris*.

Sketch : Blaise Bullimore



3.143 Martins Haven shore dive

A NudiblitZ weekend event was organised at Martin's Haven along with a nudibranch identification course with specialist Bernard Picton. The event supported a nudibranch survey in the Skomer MCZ, which is completed every 4 years. Seasearch has previously supported the survey in 2010 and 2014.

Thirty-two divers took part in the event and 29 species were recorded including rare and scarce in the UK: *Doto floridicola*, *Diaphorodoris alba*, *Eubranchus linensis* and *Thecacera pennigera*. The full species list is included in the Skomer MCZ Nudibranch diversity survey 2018 report.



Diaphoridoris alba Emily Morgan



Eubranchus farrani Emily Morgan



Doto floridicola Hayden Close



Eubranchus linensis Hayden Close

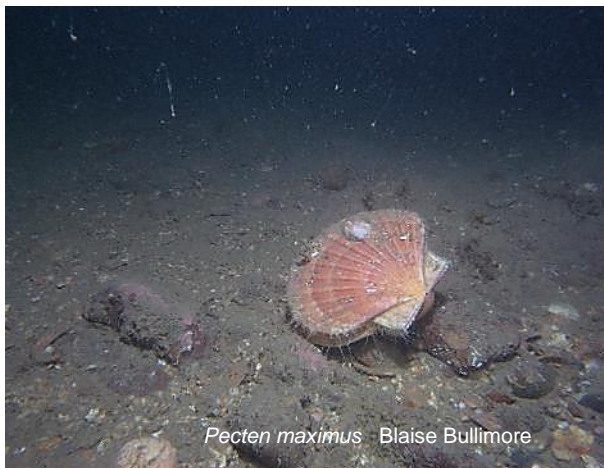
3.15 St Brides Bay

St Brides Bay is a large bay with Ramsey island marking the northern end and Skomer island the south. Seasearch survey diving has targeted many sites in the bay over the last 15 years, red sandstone cliffs and headlands, small islands and islets, off shore reefs and mixed sediment plains are all features of the bay. In 2018, one site was surveyed in the southern area of the bay adding to the data for this area.

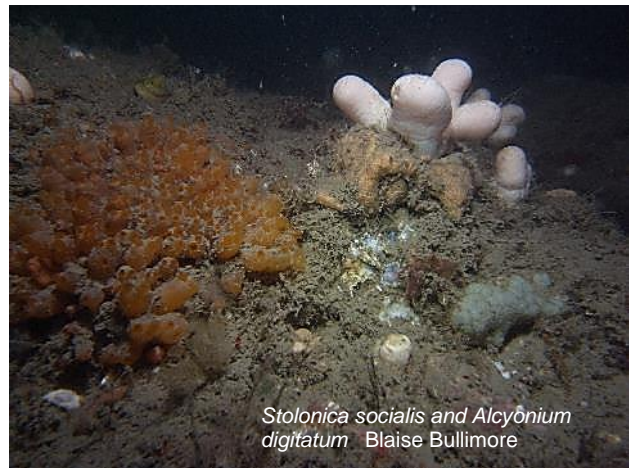
3.151 SW Stack Rock

A low-lying rocky reef standing 0.5m high at 19-22m bsl. The rocks were heavily encrusted in barnacle species and a scruffy bryozoan and hydroid turf. The antenna hydroid, *Nemertesia antennina* and herringbone hydroid, *Halecium halecinum* were both Frequent along with the orange sea squirt, *Stolonica socialis* and dead men's fingers *Alcyonium digitatum*. The finger bryozoan, *Alcyonidium diaphanum* was Common and both bryozoan *Crisularia* (formerly *Bugula*) *plumosa* and *Cellaria* spp. recorded as Frequent. A small number of nudibranch species were found including *Acanthodoris pilosa*, *Favorinus bianus* and *Goniodoris nodosa*.

Between the rocks coarse shell gravel was found including broken up old oyster and scallop shells with occasional live king scallop, *Pecten maximus*.



Pecten maximus Blaise Bullimore



Stolonica socialis and *Alcyonium digitatum* Blaise Bullimore

3.2 North Wales dive sites

3.21 Anglesey – north and west coasts

In 2018, Seasearch dives collected data on seabed habitats and species at a number of locations around the north and west coasts of Anglesey, further expanding our knowledge of the marine life around the island. As in 2017, Anglesey received most attention from Seasearch dives in 2018, largely due to the availability of dive boats and accessible shore dive locations. Sites dived on organised Seasearch weekends were chosen to fill gaps in existing survey effort, but the prevailing weather conditions on the day sometimes dictated where it was possible to survey. Nine sites were explored in 2018 with 5 of these being surveyed as a result of independent shore dives. The sites visited in 2018 are described below in an order that runs in a westerly direction from Porth Eilian (located in the eastern part of the north coast). Dives in the Menai Strait between the south side of Anglesey and mainland North Wales are presented in section 3.22 of the report.

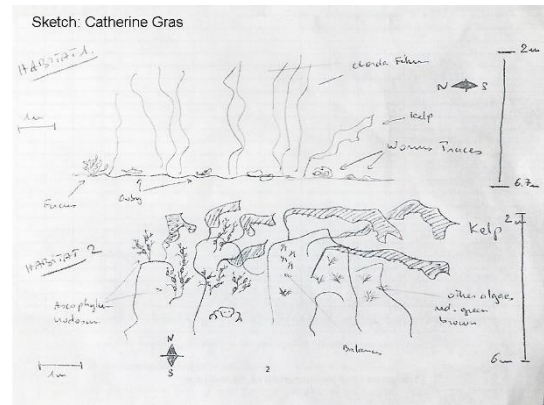
The main human impact observed at the sites visited was human debris of various sorts including a traffic cone, plastic and tin items and marina debris at Newry beach, old rope at Porth Eilian, and fishing line, fishing weights and a couple of lost lobster pots at the Hermione and Porth Tre Castell (Cable Bay).

3.211 Porth Eilian

This small bay just to the west of Point Lynas (the north-easternmost point of Anglesey) provides a relatively sheltered (if generally silty) opportunity for a shore dive. Shallow bedrock reef gave way to a mainly flat seabed of mixed ground with occasional boulders at 1.68m BCD. *Laminaria hyperborea* kelp forest dominated the shallow rocky reef with an understory of mixed red seaweeds. Fish species such as ballan wrasse *Labrus bergylta* and tompot blennies *Parablennius gattorugine* were recorded on the reef areas. Burrowing anemones *Cerianthus lloydii* were present in the mixed ground together with mobile species such as dragonets *Callionymus* sp. and shrimp *Crangon* sp.

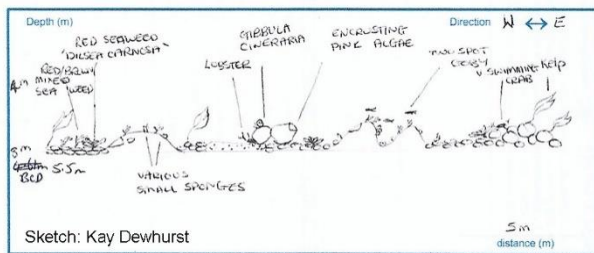
3.212 Bull Bay

The shallow bay at Bull Bay on the north Anglesey coast can be accessed as a shore dive and provides a mix of shallow infralittoral habitats including areas of shallow infralittoral cobbles, pebbles and sediment and rocky outcrops. *Laminaria hyperborea* kelp forest with mixed red and brown seaweeds dominated the rocky reef areas with stands of bootlace weed *Chorda filum* and signs of infauna in the adjacent areas of cobbles, pebbles and sediment. The dive at this location was undertaken at relatively high tide providing an opportunity to dive over the submerged intertidal area which supported brown shore seaweeds including egg wrack *Ascophyllum nodosum* and serrated wrack *Fucus serratus*.



3.213 Star of Hope

Small pieces of pottery and some other small remains hint at the presence of the former wreck of the Star of Hope, but the flat seabed at this site comprised mainly cobbles and pebbles, with occasional boulders and some sand and gravel at 4m - 5.5m BCD. *Laminaria hyperborea* kelp park and mixed red and brown seaweeds (including *Delessaria sanguinea* and *Heterosiphonia plumosa*) dominated the habitat. Seaweed

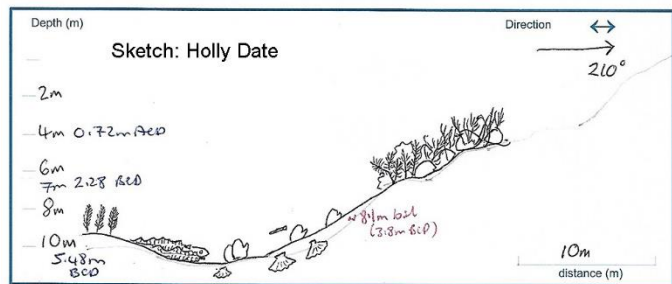


species recorded included the brown sea fern weed *Halopteris filicina* which is a species found predominantly on southwest and western coasts of the UK. Some short faunal turf species (sponges, hydroids, bryozoans and snakelocks anemones *Anemonia viridis*) were present on the larger rocks together with some mobile species (including prawns *Palaemon serratus*, velvet swimming crabs *Necora puber* and small fish such as dragonets *Callionymus* sp., leopard spot gobies *Thorogobius ephippiatus* and two-spot gobies *Gobisculus flavescens*).

3.214 Newry Beach (Holyhead Harbour)

Newry beach is a popular shore dive due to its accessibility and sheltered aspect within the confines of Holyhead harbour. Whilst it is often viewed as a poor weather dive option, the site provides an opportunity to dive on a range of seabed habitats that support some species not commonly seen elsewhere in Wales including a number of non-native species.

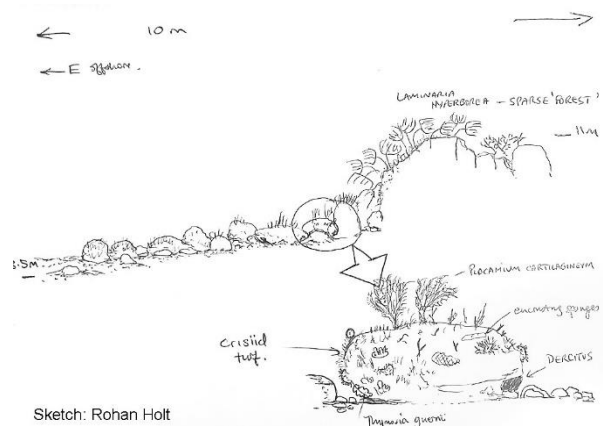
A sloping seabed of cobbles, pebbles occasional boulders and mixed ground extended from the lower shore into the shallow sublittoral to about 2.28m BCD, then leading into a soft mud habitat to about 5.5m BCD. The shallow rocky habitat supported sugar kelp *Saccharina latissima* with lots of mixed red seaweed and some green *Ulva* sp. An individual plant of the non-native brown wire weed *Sargassum muticum* was recorded attached to a cobble. Two-spot gobies *Gobiusculus flavescens* and grey topshells *Steromphala cineraria* were present amongst the seaweeds and a number of lesser spotted catsharks *Scyliorhinus canicula* were seen.



On the mud, shell remains and small stones provided an attachment point for small clumps of fluted sea squirts *Ascidella aspersa* and there were quite a large number of harbour crabs *Liocarcinus depurator* and common hermit crabs *Pagurus bernhardus* present. Slightly deeper on the mud habitat from about 4m BCD slender sea pens *Virgularia mirabilis* were present; this is one of the few sites in Wales where this species is recorded (as a result of the sheltered conditions created by the establishment of the harbour). It is also unusual that they occur in such shallow water.

3.215 East of north Stack

Infralittoral and circalittoral bedrock and boulder reef extending from 1.7m – 8m BCD. In shallower water the upper faces of the bedrock and boulders supported *Laminaria hyperborea* kelp forest with mixed red and brown seaweeds (with the more abundant species being *Delessaria sanguinea* and *Heterosiphonia plumosa*). The brown sea fern weed *Halopteris filicina* was also recorded here. In some areas, including at the base of the bedrock walls there were areas of boulders, cobbles and pebbles that were also dominated by mixed red and brown seaweeds with *Plocamium* sp., *Desmarestia aculeata* and occasional *Halidrys siliquosa*.



Ridges and gullies up to 1.5m high had vertical and steeply sloping reef walls which supported mixed red seaweeds and a mixed faunal turf of sponges, bryozoans and ascidians. A range of sponge species were recorded, including frequent *Dysidea fragilis*, *Raspailia ramosa*, *Amphilectus fucorum* and *Dercitus*



Necora puber © Matt Boa

bucklandi. The southern species mashed potato sponge *Thymosia guernei* was also recorded here (the most northerly location for this species in Wales) as was the south and western sponge species *Aplysilla rosea*. Bryozoans were a common component of the faunal turf with crissid species common. A variety of different ascidians were recorded including *Ascidia mentula*, *Dendrodoa grossularia*, *Perophora listeri* and *Diplosoma* sp. which were sometimes common or frequent. Occasional fissures in the rock faces provided a habitat for swimming

crabs *Necora puber*, squat lobsters *Galathea* spp., and other crustaceans.

Occasional goldsinny wrasse *Ctenolabrus rupestris* were recorded as well as gobies (two-spot *Gobiusculus flavescens*, leopard spotted *Thorogobius ephippiatus* and *Pomatoschistus* sp.) and dragonets *Callionymus* sp,

3.216 The Hermione

The Hermione was an iron barque which ran ashore in thick fog between Porth-y-Garan and Raven's Point near Treaddur Bay in 1890. Some remains of the vessel can still be seen spread over a relatively large area of seabed. Steep bedrock reef adjacent to the wreck extended from around 1m - 10m BCD with *Laminaria hyperborea* kelp frequent on the shallower, upward-facing surfaces. The steeper parts of the wall were dominated by bryozoan turf (dominated by *Flustra foliacea*, *Scrupocellaria* sp., *Crisularia/Bugulina* spp., and *Crisia* spp.), sponges (massive and encrusting forms) and sea squirts (*Didemnum maculosum* var. *dentata* was recorded as abundant). Some red seaweeds were present on the less steep parts of the rock walls although not in particularly good condition due to the time of year of the dive in October; the most abundance species recorded were *Delessaria sanguinea*, *Heterosiphonia plumosa*, *Phycodrys rubens*, *Calliblepharis ciliata*, *Phyllophora crispa*, *Mastocarpus stellatus* and pink coralline crust.



Didemnum maculosum var. *dentata* © Matt Boa



Hemimycale columella © Paul Brazier

One pair of divers found a small cavern at about 9m BCD which sloped gently upwards to 6m BCD, but it was quite silted and only supported limited growth of a small number of sponges and a few mobile species such as velvet swimming crab *Necora puber* and leopard spotted gobies *Thorogobius ephippiatus*.

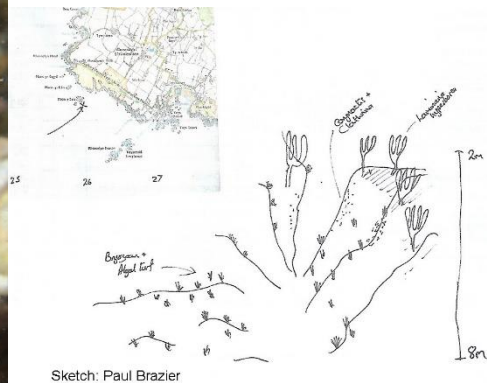
The steep bedrock reef led into an area of more gently sloping seabed of bedrock, boulders and metal remains of the wreck between 3m – 11m

BCD. Proportions of wreckage and natural seabed habitat were variable across the site,

but both rock and wreckage were covered in dense red and brown seaweeds (dominated in some areas by *Phyllophora* sp. and *Dictyopteris polypodioides*) and bryozoan turf. Sponges and hydroids were also a notable part of the fauna in the wreck 'habitat' with frequent *Dysidea fragilis*, *Aglaophenia* sp. and *Nemertesia antennina*.

3.217 Englishman's Rock

Bedrock reef gullies between 3m – 13m BCD with areas of silty bedrock and boulders between 5m - 9m BCD. Thin and sporadic *Laminaria hyperborea* kelp park was present to about 6m BCD with a dense understory of mixed seaweeds, including *Delessaria sanguinea*, *Phyllophora pseudopalmata*, *Phyllophora crispera*, *Mastocarpus stellatus*, *Phycodrys rubens*, *Corallina officinalis*, and pink coralline crust. Bryozoans, boring sponge *Cliona celata* and dead men's fingers *Alcyonium digitatum* were conspicuous components of the fauna.



The rock gully walls were dominated by sponges (predominantly *Cliona celata*) with bryozoans (*Flustra foliacea*, *Crisulina/Bugulina* spp. and *Crisia* spp.) and cnidarians (the dominant species being dead men's fingers *Alcyonium digitatum*, antenna hydroids *Nemertesia antennina*, elegant anemones *Sagartia elegans* and dahlia anemones *Urticina felina*). The more southern species yellow staghorn sponge *Axinella dissimilis* was recorded in this habitat.

A less steep area of silty bedrock and boulders between 5m – 9m BCD supported a faunal turf dominated by the bryozoan *Scrupocellaria* sp., hydroids (*Aglaophenia pluma*, *Nemertesia antennina* and *Abietinaria abietina* which were all frequent) and, in patches, abundance jewel anemones *Corynactis viridis*. Barnacles *Balanus crenatus* were abundant. Some red and brown seaweed were also present including the more southern western species dotted peacock weed *Taonia atomaria*.



A number of mobile species were recorded at the site including Bloody Henry starfish *Henricia* sp. and common starfish *Asterias rubens*, crustaceans *Necora puber*, *Maja brachydactyla*, *Cancer pagurus* and *Hyas* sp., molluscs *Goniodoris nodosa*, *Aplysia punctata*, *Calliostoma zizyphinum* and *Mytilus edulis* and fish (corkwing wrasse *Crenilabrus melops*, ballan wrasse *Labrus bergylta*, rock cook *Centrolabrus exoletus*, long-spined sea scorpion *Taurulus bubalis* and gobies *Pomatoschistus* sp).

3.218 Rhoscolyn Bay

Rhoscolyn provides a shallow, south-facing bay at the southern end of Holy Island, NW Anglesey. The dive covered an extensive area of shallow rippled fine sand with many netted dogwhelk *Tritia reticulata* and lug worm casts *Arenicola* sp. to a depth of just over 1m BCD. Lots of small juvenile flatfish were seen on the shallow sand. Patches of seagrass *Zostera marina* were present. There are rock outcrops in the bay and isolated patches of bedrock and cobbles were encountered on the dive



which supported *Laminaria hyperborea* kelp park on the upper surfaces and mixed red and brown seaweeds with the red seaweed *Heterosiphonia plumosa* most abundant. The non-native brown seaweed wire weed *Sargassum muticum* was frequent on the cobbles.



3.219 Porth Tre Castell (Cable Bay)

Porth Tre Castell is a south-west facing bay on the west coast of Anglesey. A shallow rocky reef with some mixed ground and shell gravel was present to a maximum depth of 2.8m BCD. *Laminaria hyperborea* kelp forest and mixed red seaweeds were dominant on the reef with ballan wrasse *Labrus bergylta*, small spotted catshark *Scyliorhinus canicula* and spiny spider crab *Maja brachydactyla* present. There were signs of life in the sediment amongst the rocks.

3.22 Menai Strait

This narrow sea channel separating the island of Anglesey from mainland north Wales provides unusual marine habitats with its very sheltered, narrow central section that is subject to particularly strong tidal flow, and areas at the north-east and south-west ends of the Strait that widen out and provide areas of sediment and mixed ground as well as rocky reef habitat. The Strait marks a fault zone carved out by glaciers and it separates the complex bedrock geology of Anglesey from the similar-aged, but apparently unrelated, rocks of North Wales. The geology along the Strait is very varied providing contrasting rock habitat along the length of the channel, with a substantial area of limestone at the north-east end that forms limestone bedrock reef on the Anglesey coast and nearby islands, such as Puffin Island. All of which provide variable substrates for marine life.



Tubularia indivisa © Paul Brazier

In 2018, five sites were visited in the Menai Strait. Organised Seasearch dives in the Strait focused on locations near Menai Bridge in the central part of the Strait as part of a nudibranch weekend in June (see section 4.2), and at Puffin Island at the north-east end of the Strait which was the location of some of the first Seasearch dives in North Wales 30 years ago. An additional site, not far from the National Trust property of Plas Newydd in the western half of the Strait was surveyed as part of a dive independent of organised Seasearch events. The Menai Strait sites visited in 2018 are described below in an order that runs from west to east along the Strait.

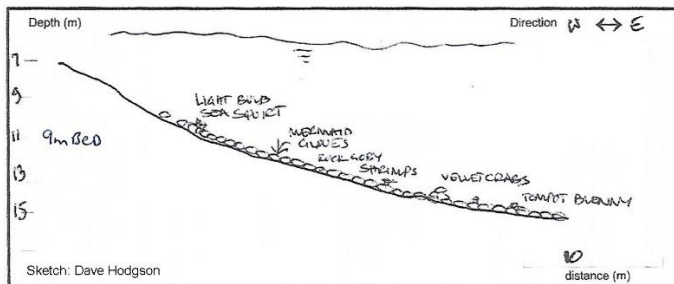


Aeolidiella glauca © Lucy Kay

A limited amount of human rubbish was recorded from the sites in the Strait, with most at the Suspension Bridge (angling line and weights and other debris).

3.221 Former anchor chains of the HMS Conway

A sloping seabed between about 8m – 12m BCD with a mix of bedrock, boulders, cobbles and pebbles and wreckage in the form of old anchor chains where the training ship HMS Conway used to be moored. Shredded carrot sponge *Amphilectus fucorum* was the most abundant species recorded attached to the rocks and anchor chains, but mermaid's glove sponge *Haliclona oculata*, light bulb sea squirts *Clavelina lepadiformis*, antenna hydroids *Nemertesia antennina* and the bryozoan *Crisularia plumosa* (previously *Bugula plumosa*) were also present and recorded as occasional.



Sketch: Dave Hodgson

Amphilectus fucorum was the most abundant species recorded attached to the rocks and anchor chains, but mermaid's glove sponge *Haliclona oculata*, light bulb sea squirts *Clavelina lepadiformis*, antenna hydroids *Nemertesia antennina* and the bryozoan *Crisularia plumosa* (previously *Bugula plumosa*) were also present and recorded as occasional.

Small fish (tompot blenny *Parablennius gattorugine*, butterfish *Pholis gunnellus* and gobies) were present as were occasional crustaceans such as velvet swimming crab *Necora puber*, edible crab *Cancer pagurus*, European lobster *Homarus gammarus*, squat

lobsters *Galathea* sp., hermit crabs and shrimps.

3.222 Menai Suspension Bridge, Menai Bridge

The tide-swept rocky substrates by the Menai Suspension Bridge on the Anglesey coast were surveyed as part of a nudibranch survey weekend over the 9th & 10th June (see section 4.2). Just to the east of the Suspension Bridge a flattish area of cobbles and small boulders between 0.5m – 2.5m BCD were dominated by barnacles (*Balanus crenatus* superabundant) and also supported a thin turf of hydroids (*Sertularia cupressina* frequent) and seaweeds (*Delessaria sanguinea* frequent) together with some sponges (the purse sponge *Grantia compressa* was most abundant but there were also occasional *Esperiopsis fucorum*, *Halichondria panicea*, *Haliclona oculata*, *Leucosolenia* sp. and *Scypha ciliata*), bryozoan crust and frequent dahlia anemones *Urticina felina*.



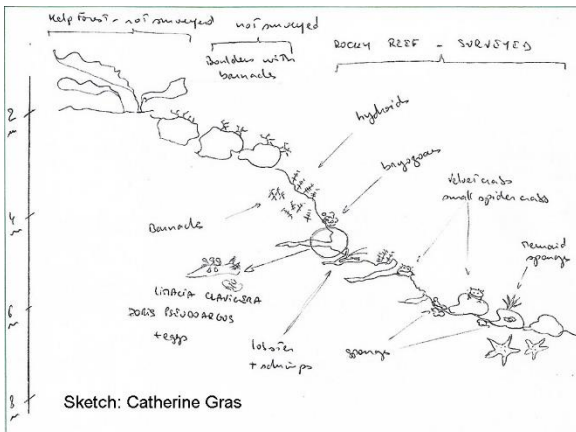
Parablennius gattorugine © Catherine Gras



Hydroids and sponge © Catherine Gras

Between 1.3m – 10.5m BCD a generally more steeply sloping seabed of bedrock with boulders and cobbles with some pebbles and gravel supported a denser fauna than the shallower cobbles and small boulders, and was dominated by sponges, hydroids and bryozoans. Slight variations in the seabed habitat, slope and aspect in relation to tidal flow influence the type and nature of the species present within a localised spatial scale with the conditions in some parts of the Strait favouring extensive sponge growth. Breadcrumb sponge *Halichondria panicea*

and shredded carrot sponge *Amphilectus fucorum* were common and there were frequent large clumps of hydroids (some of which were particularly tall); *Abietinaria abietina*, *Sertularia cupressina* and *Kirchenpauaria pinnata* were particularly abundant with the helter-skelter hydroid *Hydrallmania falcata* also being a conspicuous part of the fauna. Some areas also supported the growth of oaten pipe hydroids *Tubularia indivisa*.



Sketch: Catherine Gras



Jorunna tomentosa © Paul Brazier

Bryozoans were dominated by bryozoan crusts and *Crisia* spp. with both the larger hornwrack *Flustra foliacea* and finger bryozoan *Alcyonidium diaphinum* frequent. Quite a

few dahlia and daisy anemones *Urticina felina* and *Cereus pedunculatus* were observed, generally found in pockets of shell gravel that had accumulated between the rocks.

The rock reef provided many holes and fissures which were frequented by small fish and crustaceans. Butterfish *Pholis gunnellus* were the most numerous of the fish species seen and there was a variety of crustaceans with velvet swimming crabs *Necora puber*, shore crabs *Carcinus maenas* and small edible crabs *Cancer pagurus* most abundant but also occasional scorpion spider crabs *Inachus* sp., European lobster *Homarus gammarus* and prawns. Barnacles *Balanus crenatus* were common in the bedrock, boulder and cobble habitat.

3.223 Perch Rock, Menai Bridge

Perch Rock breaks the surface just offshore from the Menai Bridge slipway. The Seasearch records from 2018 were for the southern side of the rock facing the channel of the Menai Strait which was surveyed as part of a nudibranch survey weekend over the 9th & 10th June (see section 4.2). Below a narrow zone of *Laminaria hyperborea* kelp and red seaweeds which was not surveyed, the bedrock reef formed by Perch Rock sloped steeply between about 3.5m - 12m BCD, descending in a series of irregular small steps with ledges and vertical faces and many fissures before flattening out as a very gently sloping plain of cobbles and pebbles.

The bedrock reef was covered with a dense faunal turf of sponges, hydroids and bryozoans. Breadcrumb sponge *Halichondria panicea* was common and the shredded carrot sponge *Amphilectus fucorum*, purse sponges *Grantia compressa* and *Sycon ciliatum* and the



Hydroids and sponge © Catherine Gras



Young *Taurulus bubalis* © Yo-Han Cha

mermaid's glove sponge *Haliclona oculata* were recorded as frequent. The

hydroids were dominated by *Abietinaria abietina*, *Hydrallmania falcata*, *Kirchenpaueria pinnata*, *Sertularia cupressina* and *Sertularella* sp. with the bryozoan hornwrack *Flustra foliacea* also present in some abundance. There were many skeleton shrimps



Polycera quadrilineata © Paul Brazier



Hydrallmania falcata & sponge © Catherine Gras

(Caprellidae) attached to the sessile fauna. A few sea squirts were present, including the pin head sea squirts *Pycnoclavella stolonialis*, *Polyclinum aurantium*, light bulb sea squirt *Clavelina lepadiformis*, *Molgula* sp. and the star sea squirt *Botryllus schlosseri*, but none in any particularly high abundance. Butterfish *Pholis gunnellus* were quite numerous but only a few other fish species were recorded. Common starfish *Asterias rubens* were also quite numerous.

3.224 Puffin Island north-west side

Puffin Island at the eastern end of the Menai Strait was the site of one of the earliest North Wales Seasearch dives 30 years ago and was visited as part of the planned events to celebrate Seasearch's 30th anniversary.

Part of this site comprised a slope of silted limestone bedrock and boulders extending to 11.5m BCD which supported only a limited fauna of mainly sparse sponges (*Amphilectus fucorum*, other encrusting sponges and *Sycon ciliatum*) and anemones (plumose anemones *Metridium dianthus* and elegant anemones *Sagartia elegans*). At the deeper end of the rock habitat was a much flatter area of fine sand and mud with abundant burrowing anemones *Cerianthus lloydii*, many of which had clusters of amphipod tubes (possibly *Jassa* sp.) around the column. Other species recorded in the sediment habitat were peacock worms *Sabella pavonina*, the sand brittlestar *Ophiura albida* and dragonets *Callionymus* sp. The nudibranchs *Crimora papillata* and *Edmundsella pedata* were also seen.



Cerianthus lloydii & amphipod tubes © Paul Kay



Phoronidae © Ruth Sharratt



Crimora papillata © Ruth Sharratt

In a shallower part of this site between 1m – 2m BCD the habitat comprised small boulders interspersed with cobbles and pebbles which supported red seaweeds (including *Plocamium* sp., *Dilsea carnosa* and *Chondrus crispus*), sponges, hydroids and bryozoans. The boulders were interspersed with pebbles, gravel and sand which extended to 2.5m BCD and this had a sparse fauna including gobies and hermit crabs and occasional burrowing anemone *Cerianthus lloydii* and dahlia anemone *Urticina felina*. Horseshoe worms (Phoronidae) were recorded in both the shallower and deeper rock habitats at this site.

3.225 Puffin Island north-east end

At the north-east end of the island, bedrock and boulder reef between 2m – 3.5m BCD supported mixed red and brown seaweeds and a mixed faunal turf of sponges, hydroids and other cnidarians, bryozoans and ascidians. *Plocamium* sp. was the most abundant seaweed recorded with *Heterosiphonia plumosa*, *Delessaria sanguinea*, and *Dictyota dichotoma* present but not in any great abundance. Several sponge species were recorded with shredded carrot sponge *Amphilectus fucorum* frequent and other species occasional (including breadcrumb sponge *Halichondria panicea*, boring sponge *Cliona celata*, spiky lace sponge *Leucosolenia* sp., volcano sponge *Haliclona viscosa*, chocolate finger sponge *Raspailia ramosa* and *Stelligera rigida*). Dead men's fingers *Alcyonium digitatum* were quite numerous with a few individual anemones and some hydroids present. In slightly deeper water adjacent to the shallow bedrock and boulders between 3m – 4.5m BCD, cobbles and gravel supported occasional burrowing anemones *Cerianthus lloydii*.



Sloping limestone bedrock with some boulders and patches of stable muddy coarse sand extended to 7m BCD with some sponges, bryozoans, sea squirts and a few red seaweeds on the rocks. The sediment habitat had many anemones with *Sagartia troglodytes* common, dahlia anemones *Urticina felina* frequent and a few individual *Sagartiogeton undatus*.



3.23 North Llŷn

The lack of charter dive boats covering the Llŷn Peninsula has made it much more difficult to plan Seasearch boat dives in this area in recent years. However, in 2018 one of the planned Seasearch days was able to get to sites close to Porthysgaden on the North Llŷn coast and Caer Arianrhod in Caernarfon Bay, using a charter boat from the Menai Strait. Independent shore dives were also completed for the former site of Trefor Pier and also at Porthysgaden bay. The sites dived in 2018 are described below in an order that runs from north-east (inner Caernarfon Bay) to the south-west along the North Llŷn coast. Despite the limited number of sites visited a number of interesting species observations were made.

Only a limited amount of human debris was recorded on the dives: a lobster pot and some rope close to Porthysgaden and a few pieces of plastic bag and a fishing weight from the dive in Porthysgaden bay.

3.231 Caer Arianrhod

Arianrhod is a female figure in Welsh mythology. Her palace, Caer Arianrhod, is said to be connected with the off-shore reef of the same name in Caernarfon Bay that was the location for this Seasearch dive. The seabed comprised mainly large and small boulders with a mix of cobbles, pebbles, stone and shell gravel and coarse sand between 1.5m – 3.9m BCD. A dense covering of brown, red and green seaweeds formed a floral meadow dominating the rocky reef with bootlace weed *Chorda filum* and pod weed *Halidrys siliquosa* being the

most abundant larger seaweeds and a dense understory of smaller brown seaweed (such as *Dictyota dichotoma*) and red seaweed (including *Heterosiphonia plumosa* and *Dilsea carnosa* and unidentified Rhodophyta recorded as common). There is a possible record of the spiralled fan weed *Dictyota spiralis* from this site identified from a photograph – this would be the first record of this species in Wales.



Diplosoma listerianum © Ruth Sharratt



Gobiusculus flavescens © Paul Kay

A limited variety of sessile and mobile species were recorded but not in any abundance apart from the small gastropod molluscs *Lacuna* sp. which were common. Other mobile fauna included fish (two spot gobies *Gobiusculus flavescens*, rock goby *Gobius paganellus*, greater pipefish *Syngnathus acus*, fifteen spined stickleback *Spinachia spinachia* and plaice *Pleuronectes platessa*), crustaceans (scorpion spider crabs *Inachus* sp. and common hermit crabs, *Pagurus bernhardus*) and the Arctic cowrie *Trivia arctica*. Sessile fauna was limited to a few sea squirts (light bulb sea squirts *Clavelina lepadiformis* and colonial species *Didemnum maculosum* and *Diplosoma listerianum*), small hydroids and snakelocks anemones *Anemonia viridis*.

Adjacent to the reef was an area of sand which was not surveyed in any detail but which supported a few mobile species (crustaceans, molluscs and small fish).

3.232 Trefor Pier

The old pier at Trefor used to be a favourite shore dive in North Wales but in 2017/2018 the pier was removed as it had become unsafe. A few remaining parts of the wooden structure still remain on the seabed but much less than had been present previously.

The main habitat was a relatively flat, shallow seabed down to 2m BCD of cobbles, pebbles and sand together with a few small boulders. The predominant marine life was seaweed attached to the stones and the remains of the pier that are on the seabed. Bootlace weed *Chorda filum* was dominant with a variety of red and tufty brown seaweeds and a small amount of pod weed *Halidrys siliquosa* and sugar kelp *Saccharina latissima*. A very limited sessile fauna was recorded which included small amounts of the star sea squirt *Botryllus schlosseri* and light bulb sea squirt *Clavelina lepadiformis*, snakelocks anemone *Anemonia viridis* and bryozoans *Crisularia/Bugulina* sp.

The sandy areas had some sandmason worms *Lanice conchilega* and lugworms (casts of *Arenicola* sp.) as well as netted dog whelk *Tritia reticulata*. The pier had always been a haven for tompot blennies *Parablennius gattorugine* and this species was still present. Fish were the most numerous and varied animal species recorded with the species seen including small spotted catshark *Scyliorhinus canicula*, juvenile pollack *Pollachius*

pollachius, snake pipefish *Entelurus aequoreus*, a conger *Conger conger*, corkwing wrasse *Symphodus melops*, small gobies *Pomatoschistus* sp., plaice *Peuronectes platessa* and juvenile flatfish. Velvet swimming crabs *Necora puber* were common and prawns *Palaemon serratus* were also present.

3.233 North east of Porthysgaden

Two nearby but slightly different locations were surveyed at this site. One had a bedrock seabed between 10m – 11.5m BCD with shallow gullies which had some boulders, pebbles and shell gravel in them; most of the loose rock was covered in marine life with little evidence that the substrate was particularly mobile. The rocky reef was covered in a



Haliclona viscosa © Paul Kay

luxuriant faunal turf dominated by bryozoans and hydroids with sponges, sea squirts and mixed red and brown seaweeds. The brown seaweeds *Dictyota dichotoma* and *Dictyopteris polypodioides* were quite abundant together with a range of red seaweeds including *Delessaria sanguinea*, *Calliblepharis ciliata*, *Dilsea carnosa*, *Heterosiphonia plumosa* and *Plocamium* sp. The more south-western species dotted peacock weed *Taonia atomaria* was also recorded at this site.

The dense bryozoan turf contained a variety of different species including *Crisia* sp., *Crisularia/Bugulina* spp., *Flustra foliacea*, *Alcyonidium diaphanum* and there were colonies of the potato crisp bryozoan *Pentapora foliacea*. The antenna hydroid *Nemertesia antennina* was common in places and club sea squirts *Morchellium argus* and light bulb sea squirts *Clavelina lepadiformis* were frequent. The southern yellow feathers hydroid *Gymnangium montagui* was also recorded as being present.

A wide variety of sponges were present, most recorded as occasional, rare or present apart from *Dysidea fragilis* which was frequent. The sponges included boring sponge *Cliona celata*, volcano sponge *Haliclona viscosa*, *Haliclona simulans*, crater sponge *Hemimycale columella*, spiky lace sponge *Leucosolenia* sp. and purse sponge *Sycon ciliatum*. Tompot blennies *Parablennius gattorugine* were frequent and the crustacean fauna included the sponge crab *Dromia personata* which is a more southern species.



Sponges © Ruth Sharratt

The seabed at the second site comprised large and small boulders with cobbles, pebbles, and gravel between 11m – 12m BCD. There were similarities in the flora and fauna between the two locations, with a high diversity of encrusting sponges and wide variety of bryozoans highlighted by the Seasearch recorders.

3.234 Porthysgaden bay

The south-west facing bay has rocky reef on each side with a mix of cobbles and pebbles

with sand between. The dive was predominantly on the cobble, pebble and sand area down to a depth of about 1m BCD. Red seaweeds were dominant on the cobbles and pebbles with some branching sponges and dahlia anemone *Urticina felina*. Spiny spider crabs *Maja brachydactyla* were common and there were numerous grey topshells *Steromphala cineraria*. Dragonets *Callionymus* sp., catshark *Scyliorhinus* sp., tompot blenny *Parablennius gattorugine* and wrasse were present but not in high numbers.

3.24 Liverpool Bay

3.241 Wreck of the Resurgam

The Resurgam was an experimental, steam-powered submarine designed to carry three people. She sank in 1880 whilst on tow from Birkenhead to Gosport following an initial breakdown on her way there under her own power. The wreck of the submarine was discovered in 1996 and is now a protected wreck and a licence is required to dive her. Seasearch dives in 2018 were undertaken by Chester Sub Aqua Club (SAC), led by Seasearch tutor Wendy Northway with the aim of the data collected being compared to a survey carried out in 1998. A separate report of the diving has been prepared by Wendy which explains that most of the species observed in 1998 were seen again in 2018 but some additional species were recorded in the recent survey.



Metridium dianthus © Marion Dykes



Trisopterus luscus © Mart Holloway

The wreck is almost intact and sits on the seabed at about 10m BCD. The dominant species were plumose anemones *Metridium dianthus* which covered the upper structure of the wreck with some barnacles and what look like the tubes of the worm *Polydora* sp. on the part of the hull closer to the seabed. The structure of the wreck had attracted a shoal of bib and poor cod *Trisopterus* sp., and tompot blenny *Parablennius*

gattorugine and conger *Conger conger* were seen along with some crustacean species such as velvet swimming crab *Necora puber* and edible crab *Cancer pagurus*.



Cancer pagurus © Mart Holloway



Conger conger © Marion Dykes

The surrounding seabed comprised sand and pebbles with a few cobbles, empty shells (mostly bivalves) and shell fragments. There were many common starfish *Asteria rubens*, green sea urchins *Psammechinus miliaris* and dragonets *Callionymus* sp. and burrowing anemones *Cerianthus lloydii* were common. A few sandmason worms *Lanice conchilega* and sand brittlestars *Ophiura ophiura* were present. Lesser spotted catshark *Scyliorhinus canicula* and eggs, butterfish *Pholis gunnellus* and sea scorpion *Taurulus bubalis* were also seen. Wendy's report noted that it would be interesting to undertake a more extensive survey on the seabed surrounding the wreck.



3.242 Wreck of the Calcium

The Calcium was a British cargo ship that struck a mine whilst on passage from Fleetwood to Llanddulas on the North Wales coast and sank in December 1940. The vessel lies upside down on the seabed in about 12m BCD. The shallowest part of the wreck was at around 10m BCD. The dominant cover on the wreck was plumose anemones *Metridium dianthus* together with some common starfish *Asteria rubens*. The surrounding seabed of sand and gravel provided a habitat for hornwrack *Flustra foliacea*, peacock worms and antenna hydroids *Nemertesia antennina* but only in low abundance. A small number of mobile species were seen including hermit crabs, scorpion fish, and butterfish.

4. Specialist surveys

4.1 Pembrokeshire Crawfish survey

Crawfish, *Palinurus elephas*, are an important predator on rocky reefs and are a key component of the 'Reef' feature of the Pembrokeshire Marine Special Area of Conservation, PMSAC. Unfortunately, they have been in decline since 1960 due to a dramatic increase in fishing for them both by potting and collection by scuba divers, as outlined in a report based on historical diver records in Wales (Lock, 2010).



Crawfish are an identified species that needs protection and was on the UK Biodiversity Action Plan species list – which has now been superseded by the Environment Act (Wales) Section 7 list of priority species. At the Marine Biodiversity Restoration and Enhancement task and finish group in 2016 set up by Welsh Government, crawfish were identified as the 4th species/habitat in need of suitable projects. Numbers of crawfish are currently very low in the UK but they are still seen, in low numbers, in Wales at sites around the Pembrokeshire coast and the Llyn Peninsula.

Crawfish have been recorded by Seasearch divers in Pembrokeshire since the project started in 1995. In 2010 Seasearch completed surveys at sites in north Pembrokeshire to establish baseline information on the number and size of crawfish and to identify habitat preferences. Repeat surveys at these sites were planned in both 2013 and 2014 but weather conditions did not allow these to take place. In 2017 it was decided by Seasearch to identify suitable sites in close proximity to Milford Haven and are thus easily accessible by dive charter boats which should minimise cancellations due to weather. Two sites were identified, and a survey day was completed using the methods established in 2010 (Jones 2012), recording the abundance of both crawfish and commercial crustacean species. Site information for Crawfish data is sensitive and access restricted by Natural Resources Wales

In 2018 four further survey days were completed at the sites and a full report has been completed (Lock, 2019). The two surveyed sites have been identified as suitable habitat for crawfish with regular sightings by divers, but the numbers recorded during the survey are very low in contrast to higher numbers recorded by divers during the 1970's and 1980's (Lock, 2011). Crawfish were recorded from early May to October with higher numbers recorded in the late May, July and August surveys.

A healthy number of juvenile animals were found which is encouraging as it shows new

recruits are entering the population. There were a good range of adult sizes again indicating a good age distribution in the population.

The survey methods followed those established in Jones 2012. These worked well on this survey although improvements in measuring carapace length is recommended to allow better comparisons with other studies.

The survey data and report will be used to inform:

- A crawfish local biodiversity action plan (in partnership);
- Management of the Pembrokeshire Marine Special Area of Conservation (SAC);
- Current status of crawfish distribution and abundance in the UK, National Biodiversity Network (NBN Atlas);
- A crawfish regeneration project plan of action for Pembrokeshire.

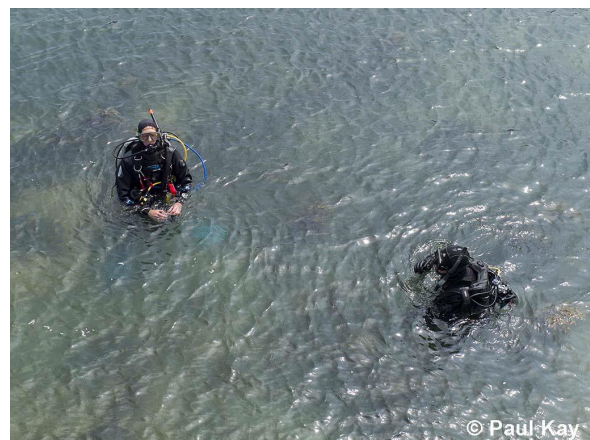
This work was supported by funding from



4.2 Menai Strait nudibranch survey

Reflecting on the successful nudibranch surveys completed at Skomer every few years it was decided to run a nudibranch-focused Seasearch weekend in the Menai Strait over the 9th and 10th June as part of the North Wales Seasearch events in 2018.

The purpose of the weekend was to focus on two sites that could be accessed by shore diving – Perch Rock and the Menai Suspension Bridge which are described in sections 3.222 and 3.223. The aim was to undertake Seasearch dives and complete Observer and Surveyor forms, and also to take photographs of nudibranchs and other species for identification and gather some limited samples of sea slug foodstuffs (hydroids) to work through in an impromptu lab set up at the nearby Anglesey Arms, Menai Bridge which was the base for the weekend. Our thanks go to the Anglesey Arms for supporting the event by providing part of their restaurant space to accommodate divers, ID books, microscopes and sample trays.



The weekend started with an introductory talk on the Saturday morning about nudibranchs and the logistics for the day, before relocating to the chosen shore dive site. There was one dive a day to coincide with slack water which was around the middle of the day. Divers later reconvened at the Anglesey Arms to go through pictures and write up Seasearch forms. Local Conchological Society recorder Ian Smith

provided invaluable help identifying nudibranchs in the samples collected and also those that had been photographed by Seasearchers. Additional data from an independent dive at Perch Rock undertaken on the 8th June by local Seasearchers to collect some hydroid specimens for the weekend was also incorporated into the overall data. A separate report for the weekend has been prepared by local Seasearcher Paul Brazier, and the information below is taken from this report.

Overall, 22 species of nudibranch were recorded:

- *Placida dendritica*
- *Dendronotus frondosus*
- *Doto hydrallmaniae*
- *Doto koenneckeri*
- *Doto pinnatifida*
- *Doto* sp B
- *Doto* cf. *millbayana*
- *Ancula gibbosa*
- *Onchidoris muricate*
- *Limacia clavigera*
- *Polycera quadrilineata*
- *Doris pseudoargus*
- *Geitodoris planata*
- *Jorunna tomentosa*
- *Microchlamylla gracilis*
- *Facelina auriculata*
- *Facelina bostoniensis*
- *Edmundsella pedata*
- *Cuthonella concinna*
- *Eubranchus vittatus*
- *Eubranchus exiguus*
- *Aeolidiella glauca*



One of these, *Placida dendritica*, is a sacoglossan (not a nudibranch), an algae-eating sea slug. Most of the nudibranchs were observed on and amongst hydroids. The most challenging to identify were various *Doto* spp. A species that had not been recorded previously was the dorid *Geitodoris planata*, a species that can be under-recorded as it is easily confused with the sea lemon *Doris pseudoargus*.

The nudibranch weekend was very successful, and it is hoped to be able to run something similar in future years.

5. Training and data

5.1 Training and qualifications

In South and West Wales there was one Observer course run in March 2018 by Kate Lock with 8 participants at Marloes, Pembrokeshire with shore training dives at Martins Haven. Two divers, Joanne Prosser and Mark Barnard, followed on to complete their Observer qualification. In North Wales an Observer course was run in March 2018 with 4 participants (unfortunately two people dropped out the day before the event).

A 'Surveyors development workshop' was run in south west Wales by Kate Lock in January 2018 with 16 people attending. This workshop was the first of its kind to take forward ideas developed by Seasearch co-ordinators and divers who had identified that development workshops could be an excellent way to improve quality of survey forms. The workshop proved to be an excellent forum to discuss ideas and improve skills and provide a better understanding of the how the information on the forms is used. Materials and ideas from the workshop will be shared and used with other co-ordinators to use in their regions.

An introductory Marine ID course for divers was run by Kate Lock in March 2018 at Cardigan Bay Marine Wildlife Centre. The course was organised by Cardigan Sub Aqua Club and the aim was to inspire some of their divers to do some recording – particularly of crawfish and sea fans and other notable findings. Some of their club are active Seasearchers and the hope is that more will want to take part.

In June 2018 a 'Nudiblizt' weekend was run with a Nudibranch course run in Marloes, Pembrokeshire with nudibranch focused diving at Martins Haven. Thirty-two participants took part with divers travelling from all over the country and students from Imperial College London and Oxford University dive clubs. The weekend was run by Kate Lock with European nudibranch expert Bernard Picton.

5.2 Forms

In 2018 72 forms were completed in South and West Wales; this is a lower number than is usual for this region and was due to four days of diving focused on Crawfish surveys at 2 known sites so only group forms were completed for these. The form total breaks down as 20 Observation forms (28%), and 52 Survey forms (72%). The high percentage of survey forms is due to the excellent number of trained divers that have completed the Surveyor level in the area. This helps ensure high quality level of recording for the dives. These divers also regularly buddy up with new divers training for their Observer and Surveyor qualifications and provide their experience and help.

In North Wales in 2018, 46 forms were completed with 26 of these being Survey forms and 20 Observation forms. The fewer forms in 2018 is due to the loss of a number of the planned dive days and weekends during the year due to poor weather. A total of 25 Seasearchers took part in the North Wales Seasearch diving in 2018. Several of the Observation forms were completed as part of people's qualification dives for Seasearch Observer.

All data has been entered onto Marine Recorder and is available on the JNCC National Biodiversity Network Atlas. Crawfish data is entered onto Marine Recorder but is

tagged as sensitive data following Natural Resources Wales' guidelines; access to this data is therefore restricted.

6. Acknowledgements

Many thanks to all the Seasearch volunteers that have taken part and supported Seasearch in Wales during the 2018 season.

In South and West Wales thanks are also due to Jen Jones for Seasearch project support and Blaise Bullimore for help with diving logistics. Thanks goes to our fantastic dive boat skippers Andy Truelove, Atlantic Blue and Tim Smith-Gosling, Eva Ann whose seafaring skills and local knowledge helps the teams safely dive in locations that would not otherwise be possible.

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We would also like to thank Charlotte Bolton, Seasearch national co-ordinator for support throughout the year, providing maps for this report and proof reading the text.

Photo credits

South and West Wales: Blaise Bullimore, Kate Lock, Emily Morgan, Sarah Bowen, Ruth Sharratt, and Hayden Close.

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