

South-West Marine Ecosystems in 2022 (The State of South-West Seas) Report for 2022



Seabirds numbers were affected (but not as severely as in northern parts of Britain) by the Highly Pathogenic Avian Influenza outbreak. Image: Isles of Scilly Wildlife Trust.



'New' species records for Britain in 2022. Here, the seaslug *Babakina andoni* in the Isles of Scilly. Also seen near Penzance in 2022. Image: Allen Murray.



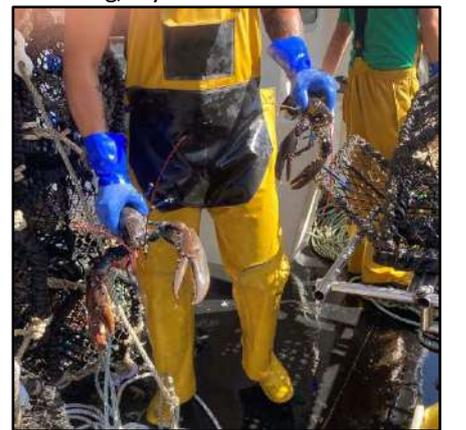
High numbers of Common Octopus, *Octopus vulgaris* were recorded/caught off western and southern coasts. Here in Falmouth Harbour. Image: Jamie Altenberg/Mylor Creek Shellfish.



Unusually high numbers of filter-feeding salps were recorded in the plankton during summer. (Here at Porthkerris. Image: Aaron Sanders.)



Recovering lost/discarded fishing gear and rubbish from the seabed continues. Here, in Plymouth Sound, the haul included 55 bikes. Image: Plymouth City Council.



A resurvey of lobster numbers in the No-Take-Zone off Lundy during the Lundy Marine Festival revealed about four times as many as in nearby fished areas. Image: Robert Irving.

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South-West Marine Ecosystems Report for 2022

A collation of observations made through the year from monitoring studies, harvested from social media, publications etc. and recorded by the editors of sections.

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

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1. Aim and objectives of the South-West Marine Ecosystems webinars, conference and reports

Bob Earll

In preparation for the 2022 SWME programme the steering group agreed a revised and more concise aim. *'The aim of the SWME model is to enable an annual report on the state of south-west seas and to build the social capital among organisations, networks and individuals active within this region.'*

The objectives of SWME were updated for the 2021 report and are as follows:

- 1. Communication & Networking** Through the annual conferences, [webinars](#), [website](#) and social media mailings, to build social capital to provide a networking opportunities for a wide cross section of people to meet, exchange views and build networks for the south-west's marine ecosystems.
- 2. Audience** To encourage collaboration between citizen scientists, researchers, scientists, managers, policy-makers and the public and to provide active support for existing networks enabling and building citizen science projects.
- 3. Regional resonance** To encourage links between researchers on science projects throughout the region's seas including the English Channel, Bristol Channel, Celtic Seas and the wider Atlantic Ocean.
- 4. The State of the South-West Seas** To report on the state of south-west ecosystems annually with a report covering a number of topics on **natural systems**: oceanography, plankton, seabed and seashore, fish, seals, marine and coastal birds, cetaceans, and **management topics**: MPAs, water quality, plastics, fisheries. This reporting will build on the use of a wide array of current indicators.
- 5. Ecology of marine species** To promote citizen science recording and research studies that focus on the ecology of marine species, planktonic, benthic and 'mobile' species (fish, birds, mammals, turtles) and the ecosystem that supports them. To understand the status of populations of marine species in the region's seas and how they are responding to environmental and anthropogenic pressures. To enable stories to be told about the ecology of our common species, their distribution, movements and numbers, and importantly to highlight the gaps in our knowledge.
- 6. Management of south-west marine ecosystems** To encourage strong relationships between policy makers and scientists; to promote science and the evidence base that underpins management of human activities in the coastal and marine environment with a view to supporting and promoting the health of south west's marine ecosystems.
- 7. Marine Education and Outreach** To highlight marine education and outreach programmes in the south-west. To support the development of new programmes that promote marine management and make use of marine science. To promote good practice in environmental education, interpretation, signage and outreach.

...and to come together to celebrate being part of the South-West Marine Ecosystem.

2. Introduction to the 2022 Report

Keith Hiscock and Bob Earll

Introduction

This is the ninth in the series of annual reports on the observations of species, ecology ecosystems and management for a specific year. For reporting on 2022, we benefitted from a strong series of webinars during March 2023 hosted by the Marine Biological Association, Exeter University (Penrhyn campus), University of Plymouth, the MMO and Devon Maritime Forum and from a conference at the Plymouth Marine Laboratory in April 2023. It remained, however, for the editors of separate sections of this report to draw-together events and news through the year, helped my monthly collations of observations by Paul Naylor. The webinars can be seen on the SWME YouTube Channel <https://www.youtube.com/channel/UCojA2OkFX0fM-oq7bVTofhQ>.

This report can be cited (but depending on the house style of where it is being cited) as:

Hiscock, K. & Earll, R. (eds) 2023. South-west Marine Ecosystems Report for 2022. *Marine Biological Association of the UK, Plymouth*. DOI: 10.17031/7kfv-tq71

We encourage you to cite the specific chapter/section and the editor of that section.

Thanks to the section editors and all the people who have contributed their observations, views and images. It is a fantastic collaboration.

The development of the SWME report

The report for 2022 has seen an expansion of the number of sections and an ever-stronger focus on conclusions that tell something of the 'State of South-West Seas'. The chapters often reflect the contributions of hundreds of recorders across the south-west many of whom have gone the extra mile to record and photograph and report their sightings. SWME demonstrates how citizen and professional science can work effectively together on many issues. Hopefully the SWME report will provide another source of feedback that encourages more people to take part in the overall effort. We now have a contact list for SWME of over 1250 people who will receive the links to this report. You can sign up on <http://swmecosystems.co.uk/>.

Making the links and interpreting change

Preparing the annual report makes the report editors especially think about how best to present observations and actions in a way that can inform and influence. We have continued to look for 'indicators' that summarize an often complicated picture. It's not easy and there are many flaws in converting observations and effectiveness of actions into measurements that are repeatable. Many of the observations and measurements reported give clues or conclusions on the 'state of south-west seas'. Making links between different aspects of reporting (for instance management measures and change in species abundances or oceanography (especially now rising temperatures) and increased/decreased abundance of species continues to be difficult and likely will be for some time to come. Often, it is looking for historical precedents, knowing about life history traits of species and understanding that other factors (such as ocean currents) may be relevant that may help to explain change.

'Using' the annual reports

In the introduction to the report for 2021, we listed and explained our thinking for the following headlines:

- Describing 'normal' patterns of events
- Population trends – up and down
- Marking major events and their effects
- Highlighting significant ecological and population changes including:
- 'Stand-out' observations – new novel and exceptional events
- Managing human activities in the south-west marine ecosystems

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- Acting to focus interest
- Telling stories about what we know and providing access for education and outreach

In the past year, we have worked to develop a more consistent structure to what we are doing. In March 2023, Keith Hiscock gave a presentation on 'Change, what change?' to the Porcupine Marine Natural History Society conference (PMNHS) in Bangor. The subsequent article (submitted to the PMNHS Bulletin) provides a vocabulary for change and describes different sorts of change – including emphasising the persistence that often exists in the character of marine communities and species. We promote the 'SWME model' wherever we can and featured in an article ('Networks for Nature') in the April edition of *The Marine Biologist* magazine.

What next?

During 2023, with financial backing of the Defra sponsored marine Natural Capital Ecosystem Assessment - Land Seas Interface Programme we have begun to explore whether the SWME Model can be applied to another English region. This is also having many benefits to SWME in helping think through what we have achieved and how we might develop.

Send your observations

We rely greatly on observations that you make. Do send a note of what you have seen and images to the relevant chapter editor.

3. Summary of conclusions

Topics include:

- **Oceanography.** Summer of 2022 was notable for the three heatwaves during July and August in the UK. These events heated the sea-surface layer up to temperatures around 20 C in the western English Channel, with notable warmth persisting until mid-October (>15 C). Contact: Tim Smyth tjsm@pml.ac.uk
- **Storms.** The patterns of storms in 2022 was *normal* and in the winter of 2022 & 2023 was unremarkable; unusually there were very few storms in the January – April period of 2023. The impact on natural systems, species and habitats was on the unremarkable side of normal. Contact: bob@bobearll.co.uk
- **Plankton.** The year was unremarkable for plankton, the main feature of note being unusually high numbers of salps (gelatinous filter feeders un-related to jellyfish) during June and July. While the plankton was ‘normal’ compared to other recent years, it aligns with a large-scale, long-term and radical change driven by climate, whose consequences we are exploring. Contact: Angus Atkinson (for general plankton): aat@pml.ac.uk & Jeanette Sanders (for observations of jellyfish): sea@seadreameducation.com ;  South Devon Jellyfish Survey
- **Shore and seabed marine life.** Observations through the year of seashore and seabed species and habitats have recorded the ‘usual’ range of events such as wash-outs of species after storms, strandings of oceanic species and a small number of NE Atlantic marine species new to Britain being found. There were range extensions or increases in local abundance of some warmer water species. There is a great deal of work going into seagrass survey and recovery projects in the south-west. Contact: Keith Hiscock khis@mba.ac.uk
- **Fish.** Reduced sightings of Basking Sharks continued the pattern of recent years. The fish world is full of surprises; and none so amazing as a Greenland Shark found dead on a beach in Newlyn; at almost 4m and 285 kg the immature female was estimated to be about 100 years of age. The shark was the third known to have stranded in Britain, and 5.4° of latitude or around 500 miles south of previous ones. Groupers are thought of as large fish of the tropics, but a small relative, the Comber, which used to be found every two to three years, is increasing in British waters with at least twenty recorded in 2022. Mackerel were notably late not arriving in south-west waters until September. Contact: Douglas Herdson Douglas.Herdson@btinternet.com & Simon Thomas, sharks and rays - patsmithdatabase@gmail.com
- **Turtles.** The number of turtles reported in the south-west in 2022 followed the national pattern in being one of the lowest on record. A cold-stunned juvenile Loggerhead, in November, was the first of several, most of which were found in early 2023. Contact: Douglas Herdson Douglas.Herdson@btinternet.com.
- **Marine and coastal birds.** Breeding seabird colonies in the South-West seemed to largely escape the worst effects of the Highly Pathogenic Avian Influenza outbreak. Breeding terns had a productive year across the region, whereas Kittiwakes had another poor year. Contact: Alex Banks alexbanks@gmail.com
- **Seals.** 70% of Grey Seals recorded were adults with pups representing less than 1% of all seals recorded with one swimming at least 800km in less than a month. Worryingly, issues wise there were 124 unique entangled Grey Seals, 24 new hooked seals (an emerging issue) and disturbance remains high with 1393 seals seriously disturbed in 223 incidents. On the plus side, and there was a second successfully weaned Common Seal. Contact: Sue Sayer - sue@cornwallsealgroup.co.uk
- **Whales, Dolphins & Porpoises.** Sightings of Minke, Fin and Humpback whales were above average in 2022 compared with recent years, and the data showed continued support for species-specific seasonal peaks in south west England. Twenty Humpback whales have been added to the new regional photo-identification catalogue, one of which has visited every year since 2019 and another that connects a full migration route. The seas around the South-West appear to be an important habitat for Bottlenose Dolphins, Common Dolphins and Harbour Porpoises and these species appear to be increasing significantly. Contact: Dan Jarvis - dan@bdmlr.org.uk Contact: Duncan Jones duncoliver@yahoo.co.uk Abby Crosby abby.crosby@cornwallwildlifetrust.org.uk
- **Marine Planning.** The Marine Management Organisation South West Marine Plan, which was formally adopted in 2021, is currently in the implementation and monitoring stages of the marine planning cycle. In 2022, a total of 24 implementation sessions took place nationally, with the participation of 23 attendees from the South West plan area. At present, ongoing monitoring surveys are being conducted to assess the effectiveness of the South West Marine Plan's use in 2022. The findings from these surveys will be included in the first South West Marine Plan Three Year Report, which will be published in 2024. Finally, in 2022, decisions on all 70 marine licence applications

submitted within the plan area were made in accordance with the policies of the South West Marine Plan. Contact Carli Cocciardi Carlotta.Cocciardi@marinemanagement.org.uk

• **Offshore wind.** There are now major assessments underway in the south-west to prepare for the deployment of extensive floating offshore wind in the region. There is acknowledgement that ambitious targets for offshore wind will have an impact on the marine environment and fisheries are now part of a wider conversation around Marine Spatial Prioritisation and the optimal use of the UK's seas. Contact: Alex Banks alexnbanks@gmail.com

• **Fisheries** The UK is moving towards an Ecosystem-Based Approach to Fisheries Management, a central tenet of which is to fully acknowledge and integrate humans within environmental management, acknowledging both our impact on and reliance upon ecosystems. One of the primary ecosystem services provided by the marine environment is the provision of food and we are increasingly aware of the great social, economic and cultural importance of fisheries historically and today, particularly in the southwest UK. In the same way that measuring the status of a top predator can be indicative of the health of an ecosystem, the long-term sustainability (or otherwise) of fisheries can be a useful indicator as to the state of the ecosystem. However, marine foodwebs are complex and the abundance of fish populations and the numbers caught or landed by fishermen can be affected by several interacting factors. Any inference regarding the state of an ecosystem or the success of management based upon trends in fisheries catch or landings must therefore be cognisant of the complexity of both the environmental and human dimensions of fisheries. Contact: Libby West - Libby.West@naturalengland.org.uk

• **Marine Protected Areas** Across the Devon, Cornwall and Isles of Scilly marine area (coastline to 12nm), 34% of the marine area is covered by an MPA designation. Conservation Advice has been completed for 98% of MPAs (up from 97% past year) and condition assessments completed for 15% (up from 7% the previous year). Significant progress was made in 2022 to implement fisheries management measures for offshore MPAs. Two sites in the SWME area Canyons MCZ, and South Dorset MCZ have byelaws in place to prohibit bottom towed gear. In 2021 there was an expectation that a SWME site would be proposed as a Highly Protected Marine Areas (HPMAs), however no SWME proposed HPMAs were put forward in 2022 for public consultation. Research within MPAs has focused on seagrass protection, restoration and estimating contributions to blue carbon. Over the duration of 2022 there were several Blue Carbon focussed events to share expertise and learning across the SWME. Contact: Siân Rees sian.rees@plymouth.ac.uk Ruth Williams ruth.williams@cornwallwildlifetrust.org.uk Jean-Luc Solandt - jean-luc.solandt@mcsuk.org Kate Sugar kate.sugar@naturalengland.org.uk

• **Water Quality.** It remains crucial to adopt a 'wholescape' approach when considering water quality; that is, to include river catchments and land-based sources of pollution. The ecological and chemical status of water quality in the south-west remained poor in 2022, similar to the previous year. There have, however, been slight improvements in Bathing Water Classifications. A notable increase in citizen science, public engagement, and, consequently, sewage storm overflow monitoring devices have increased from 89% to 91% coverage from 2021 to 2022 have continued to raise the profile of the poor water quality. Contact: Zuzana Dusza Zuzanna.Dusza@devon.gov.uk

• **Plastic pollution.** In 2022, over 138.7 tonnes of plastic litter was removed from the marine environment in the south-west. Whilst this is a decrease from the previous year, this still highlights the large amount washing up on our shores and the difficulty in dealing with this ever present and mobile problem. Many thanks to the 60,000+ volunteers for their time and efforts in removing this harmful pollutant. Contact: Zara Botterell z.botterell@exeter.ac.uk; Sarah Nelms s.nelms@exeter.ac.uk & Delia Webb deliawebb@btinternet.com Ruth Williams ruth.williams@cornwallwildlifetrust.org.uk

• **Seabed litter.** A small number of organisations work to remove lost or discarded material from the seabed. In one exercise within Plymouth Sound in 2022, the 'haul' of litter included 55 bikes. The greatest amount of material reported was fishing-related and included nets and pots. Adjacent to the shore and especially in the vicinity of harbours, piers and wharves, the discarded/dumped items include traffic cones, bicycles, tyres (lost fenders or discarded tyres) and supermarket trolleys. Contact: Keith Hiscock khis@mba.ac.uk

4. Oceanography Background conditions – Western Channel Observatory

Tim Smyth

Plymouth Marine Laboratory

Contact: tjsm@pml.ac.uk



The Western Channel Observatory (WCO) is an oceanographic time-series and marine biodiversity reference site in the Western English Channel (**Error! Reference source not found.**). In situ measurements are undertaken weekly at coastal station L4 and fortnightly at open shelf station E1 using the research vessels of the Plymouth Marine Laboratory and the Marine Biological Association. These measurements are complemented by PML's recognised excellence in ecosystem modelling and satellite remote sensing science. By integrating these different observational disciplines, we can begin to disentangle the complexity of the marine ecosystem. The WCO measures several key parameters important to the functioning of the marine ecosystem such as light, temperature, salinity and nutrients. Station L4 has some of the longest time-series in the world for zooplankton and phytoplankton, and fish trawls have been made by the MBA for a century. Station E1 has a hydrographic series dating from 1903.

Figure 4.1. Stations of the Western Channel Observatory

Overall conditions for the year – 2022

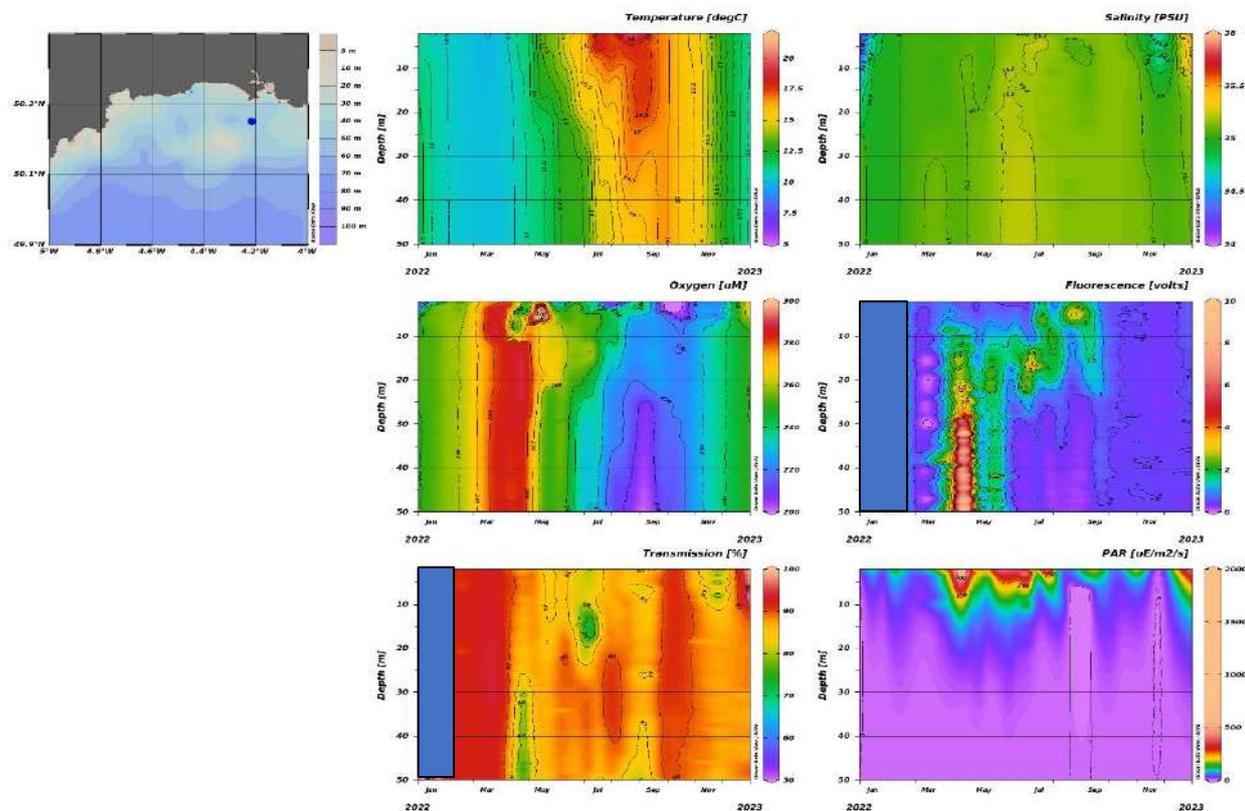


Figure 4.2. Conditions throughout the water column at station L4 during 2022 from individual profiles taken using a rosette sampler with multi-parameter “CTD”, deployed from the RV Plymouth Quest, apart from period September – December where the RV MBA Sepia was used.

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Vertical profiles for multiple parameters are taken using the RV Plymouth Quest sampling CTD rosette on a weekly basis at station L4 (Figure 4.). This is at fine enough resolution to observe the start of the thermal stratification of the water column in spring (typically April) and the breakdown in autumn (typically September).

The year started with relatively warm conditions throughout the water column (well mixed, apart from fresher water intrusions at the surface) with temperatures around 10.5 °C. This cooled to the minimum recorded temperature (for 2022) in early March of 10 °C. Stratification became established in late April / early May, with the maximum stratified state in mid-August (briefly: surface around 20.0°C; depths below 20 m around 17 °C).

Spring 2022 was notable for being relatively dry (<70% average rainfall) with periods of warmth in mid-late March, mid-April and most of May interspersed with shorter cold periods in late March / early April and the end of May. There were relatively light and variable winds, with some dominance from a SE quadrant. Summer 2022 was around 1.5°C warmer than average, with some areas of the SW receiving <50% of their average rainfall. Notable were the succession of heatwaves in early, and mid-July and again in mid-August. This was mirrored in the oceanographic conditions with around an average start to the stratified period, with the heatwaves giving the warmest, short-lived surface temperatures in excess of 18°C. Stratification was gradually eroded in mid-September and the water column finally became mixed in late September / early October (16.5 °C throughout).

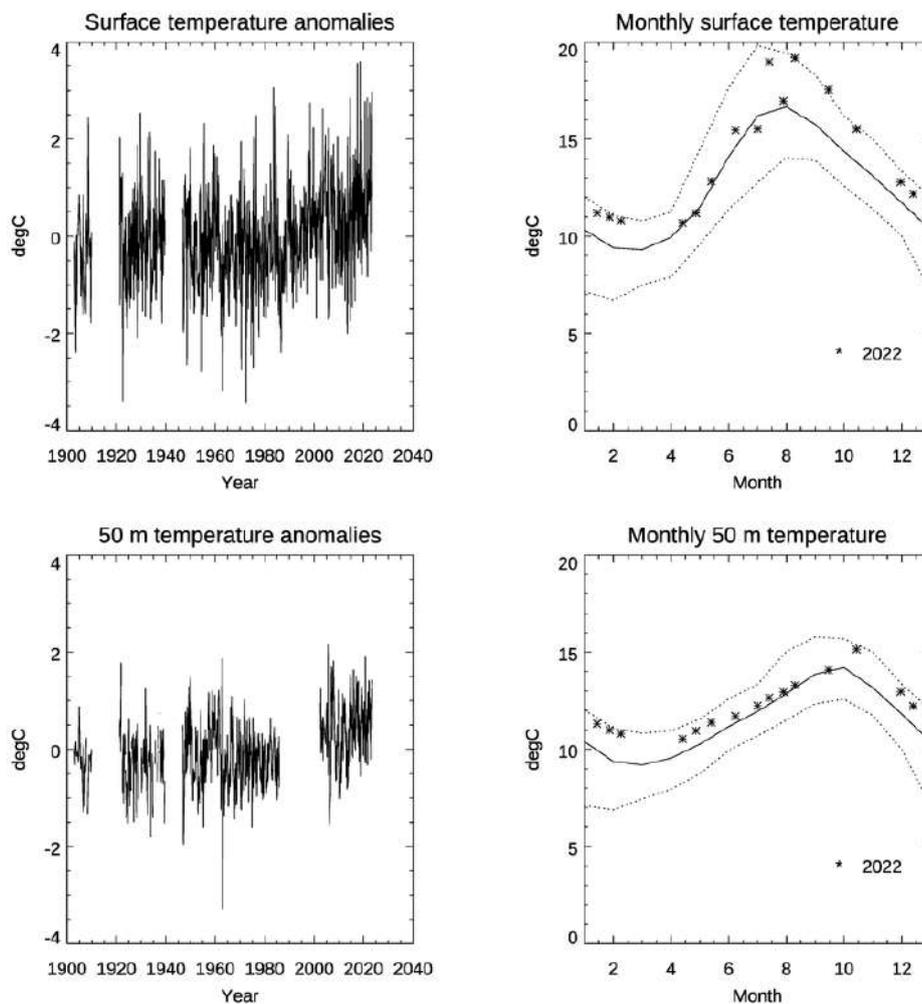


Figure 4.3. E1 temperature time-series and anomaly analysis. Solid lines show mean monthly temperatures, with dashed lines giving the standard deviation around the mean. Asterisks represent individual observations (n=15) made by the RV Plymouth Quest.

Figure 4.3 shows the temperature time-series anomalies made at station E1, which is one of the longest hydrographic series in the world.

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A few surface freshening events (see salinity plot) were observed in 2022 as a decrease in salinity below the background value of 35.2 PSU. These were particularly marked in January and November 2022 and not associated with any particular named storms. These are mainly driven by inputs from the Tamar Estuary as it responds to precipitation events within its catchment. Any summer-time events are usually confined to the upper few metres (giving the appearance of a lens) whereas winter events can penetrate the top 20 m or so of the water column. This is because of a combination of stratification and likely larger river flows in the winter months.

At the surface, E1 started 2022 above average and only reached a minimum temperature of just below 11°C (although there was no sampling in March). The spring and early summer posted temperatures around the long-term mean (at the surface). The distinct heatwave events in July and August were reflected in the oceanographic conditions, with temperatures approaching the highest recorded at E1 in July, with the highest recorded in the instrumented period in August (20°C) and September (17.5°C) with this persisting into October (15.5°C), with still some measurable stratification this late in the season. The stratification in September was still some ($\Delta T=$) 3.5 °C with the peak stratification in August (ΔT)>6°C. At 50m, temperatures were around average for the late winter - summer months until the breakdown in stratification during October vented warmer temperatures throughout the water column. The autumn and early winter were around a degree above the long-term mean.

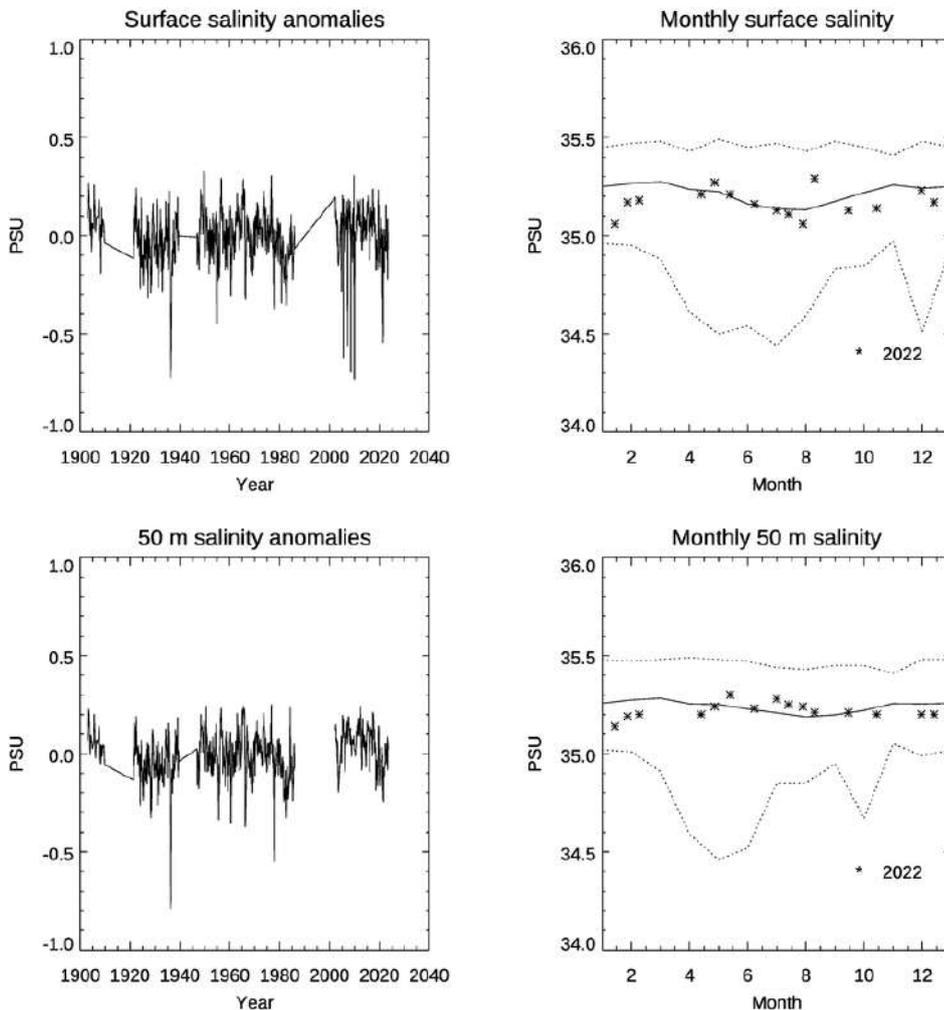


Figure 4.4. E1 salinity time-series and anomaly analysis. Solid lines show mean salinity, with dashed lines giving the standard deviation around the mean. Asterisks represent individual observations (15) made by the RV Plymouth Quest.

Figure 4.4 shows the salinity time-series made using the CTD profiler at station E1.

For almost the entire duration of 2022 the waters were around the long-term mean salinity throughout the water column apart.

5. Storms in 2022 and their impacts on the South-West marine environment

Bob Earll

Contact: bob@bob.earll.co.uk

Prepared by Bob Earll, with compilations of the storm data and wave height material from Tim Smyth (PML) Channel Coastal Observatory, other SWME thematic topic editors, Angus Atkinson, Keith Hiscock, Doug Herdson, Alex Banks, Sue Sayer, Dan Jarvis, Duncan Jones, Delia Webb & Zara Botterell.

Conclusions

The patterns of storms in 2022 was *normal* and in the winter of 2022 & 2023 was unremarkable; unusually there were very few storms in the January – April period of 2023. The impact on natural systems, species and habitats was on the unremarkable side of normal.

Introduction

Storms are a routine part the natural pattern of events in the south-west, and we are developing a clearer understanding of their impact on the coastal and marine environment. With climate change it is predicted that storms will increase in strength. This description covers 2022 and because the way we view the impacts of the winter storms spans the winter months of 2022 and 2023.

The patterns of storms in 2022 and the winter of 2022-2023 was ‘normal’ in the sense that their impact did not reach the extreme levels of storms in 2014 in relation to wave heights or frequency. Assessing the impact of storms is complicated, but *extreme* storms have both significant consequences for society and natural systems and they have a high media profile (see Footnote). By contrast with extremes, 2022, the winter of 2022-2023 seems to have been on the unremarkable side of a view of what is normal in relation to the effects of storms. We are getting better at describing and understanding the effects of storms.

Tim Smyth: The extraordinary things about winter 2021/22 was the succession of storms (Dudley, Eunice, Franklin) that occurred within the same week in February. Eunice was fairly exceptional (first red wind warning), but very short lived (as is often the case with storms).

Storm naming became confusing as all the other national Met Agencies have adopted this practice. UK / Ireland storms: (<https://www.metoffice.gov.uk/weather/warnings-and-advice/uk-storm-centre/index>)

- Malik (named by DMI) 29 January 2022
- Corrie 30 – 31 January 2022
- Dudley 16 – 17 February 2022
- [Eunice](#) 18 February 2022 (Red weather warning; Needles 122 mph)
- Franklin 20 – 21 February 2022
- [Mathis 31st March 2023](#)

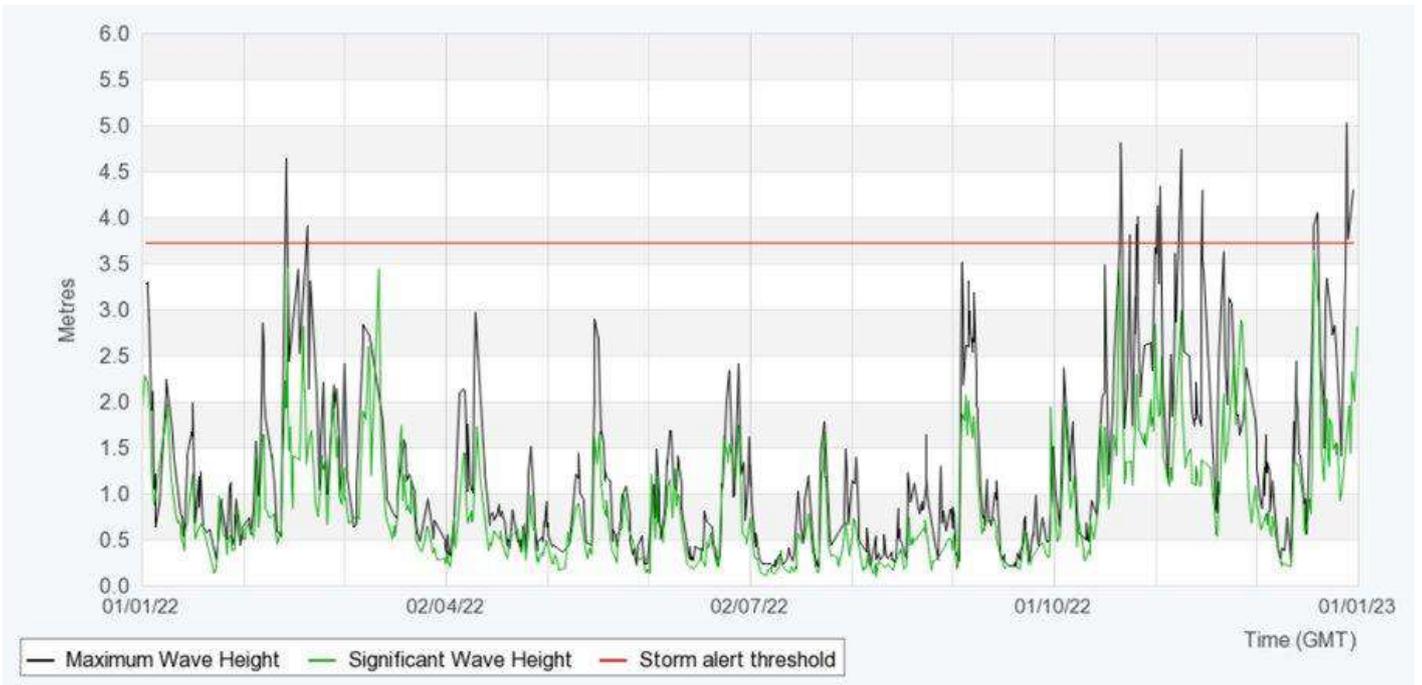


Figure 5.1. Wave heights – Looe Bay – prepared by Tim Smyth PML, Channel Coastal Observatory.

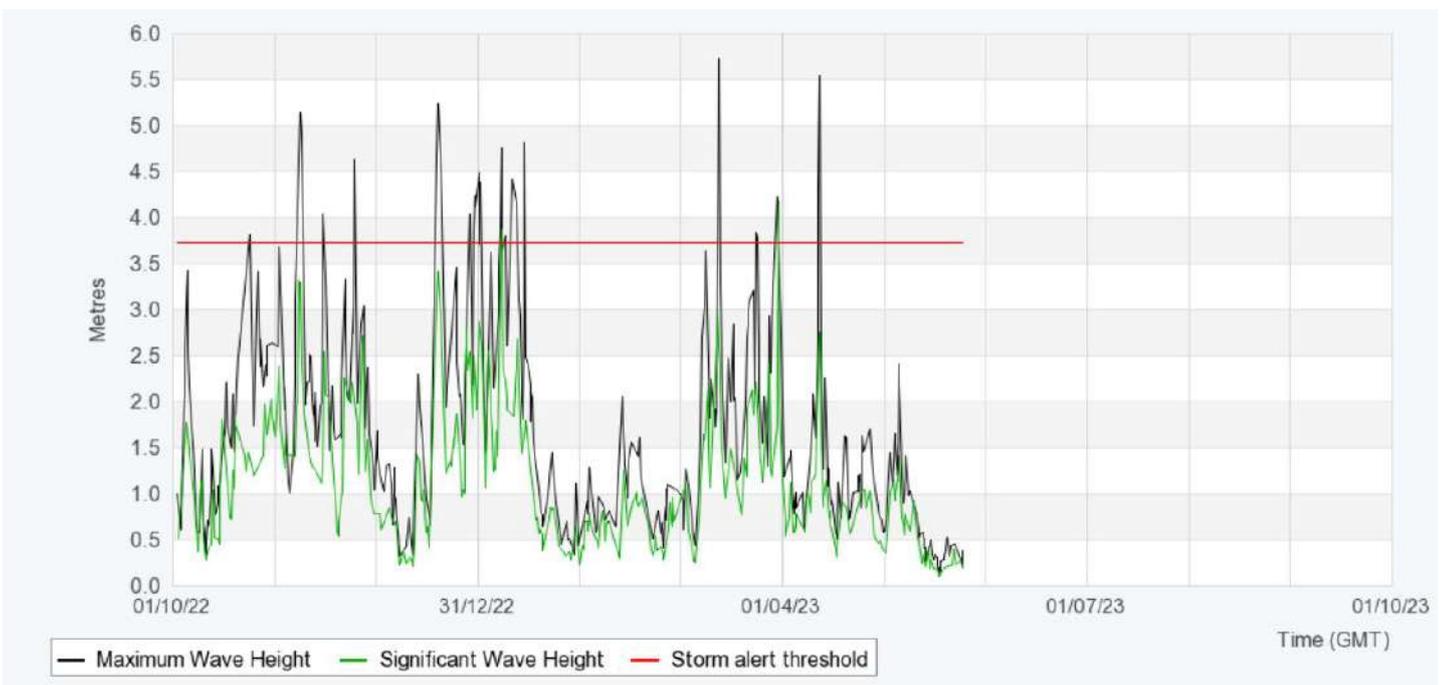


Figure 5.2. Winter 2022-2023 Wave heights – Looe Bay – prepared by Tim Smyth PML, Channel Coastal Observatory. See <https://coastalmonitoring.org/realtimedata/?chart=98&tab=waves>

Impacts of storms on the coastal and marine environment in the south-west

Oceanic species washed ashore. Angus Atkinson: Storms often produce strandings of the oceanic Portuguese Man of War *Physalia* and by the wind sailor *Velella* as well as drift material that has crossed the Atlantic. Again, this can provide interesting sampling opportunities for unusual marine species. Both species were washed up during 2022, but numbers were not exceptionally high.

It is important to note that storm damage to plankton probably arises from wave action and possibly high sediment loads, and that high wave heights are not always associated with locally strong winds and named storms. However, strong winds and high waves did co-occur during the exceptional and damaging winter 2013/2014 storms. While these caused large, short-term losses of larger plankton and particularly gelatinous forms, the plankton was highly resilient and recovered within a month or two <https://doi.org/10.1002/Ino.11613>

Seabed and seashore. Keith Hiscock: 2022 and the winter of 2022-2023 were unremarkable in terms of the effects of storms. The movement of beach sediments is a routine part of seasonal change but there were very few reports of this unlike during the extreme year of 2014. There were no reported 'washouts' of shallow benthic species; these often arise with easterly storms. An unusual find was a pink cuttlefish (*Sepia orbignyana*) on Marazion Beach, Cornwall on 19th February. The species was found following Storm Franklin and Storm Eunice. Observation - Constance Morris."

There is a post storm report on the coastal impact of storms [Eunice and Franklin on the Coastal Monitoring website for the south-west](#) on the National Coastal Monitoring site.

Fish. Douglas Herdson: Nothing to report.

Seabirds. Alex Banks: No news of any major seabird wrecks during the winter of 2022-23.

Turtles. Douglas Herdson: MCS have reported a higher frequency of turtles being washed ashore in UK and Ireland this winter 2022-2023 attributed to winter storms in the US but only three or four in the south-west.

Seals. Dan Jarvis from BDMLR records no major impact from these storms in early 2022 on marine mammal casualties - in particular with seals that would be most affected. The number of calls we received seemed fairly average during and after them on this occasion. Of course it's always worth noting that we have experienced major issues in the past when the storms occur earlier in the Grey Seal pupping season.

Sue Sayer (Seal Research Trust): With fewer and later severe storms in 2022, impacts were harder to record as they occurred post peak pupping season in 2022. Impacts on moulted pups are less obvious and harder to detect. Extreme weather events did impact seals in 2022, a single seven-minute hail storm caused 272 seals to stampede into the sea on 17/11/22 at West Cornwall. In September, 37 out of 70 seals had been seriously disturbed at West Cornwall during two back-to-back hammering rain showers, so it seems climate change induced extreme weather events are adding to already high levels of seal disturbance. At the West Cornwall haul out, eight rockfalls were recorded in 2022, compared to four in 2021, 1 in 2020 and 1 in 2019.

Cetaceans. Dan Jarvis and Duncan Jones: Although the storms were not exceptional we found that the sea states were raised for the majority of the time from September until December. Evidence for this is the number of boat trips we cancelled during September, October and November. We did our last trip on 14th October last year and normally we would be running trips until early November. We had trips booked but the sea states were too high for safe operation. My experience of the Autumn and winter was 'persistent storms' which, with regard to cetaceans, refers to:

- 1) Higher sea states reduce the likelihood of detection of marine mammals from the sea and shore and therefore observations will be reduced.
- 2) Less boats out on the water will reduce detections and will also reduce potential disturbance.
- 3) Higher wave heights and greater run off from rain will introduce nutrients into the coastal system through mixing and run off. This will intensify conditions at boundaries between water bodies and at hydraulic fronts and increase the likelihood of foraging success for cetaceans at these locations.

Plastic pollution. Delia Webb & Zara Botterell: An unremarkable year in relation to debris from storms. Sue Sayer has also pointed to storms leading to the loss of fishing gear which may be one of the sources of this pollution and its effects on seals.

Footnote

Extreme storm events can have major consequences both in terms of socio-economics and natural systems. We can refer to storms that are widely reported in the media such as for [storm Emma in 2018 which washed away 400m](#) of the Slapton road and when the railway [embankment was washed away at Dawlish](#) in 2014. Keith Hiscock compiled a report on the impact of the [2013-2014 storms of the nearshore marine](#) life which highlighted the range of species which can be affected. Most of the winter storms in the south-west come from that direction but in February 2021, [storm Darcy](#) from the east accompanied by very cold weather caused significant sediment movements and a major washout of deeper burrowing benthic species of bivalves, *Ensis* and *Cardium* on the beaches of the south coast of Devon and Dorset.

6. Plankton Observations 2022

Editors: Angus Atkinson, Andrea McEvoy, Claire Widdicombe, Amanda Beesley, Glen Tarran, Jeanette Sanders, Keith Hiscock

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Jeanette Sanders (for observations of gelatinous/stranded zooplankton): sea@seadreameducation.com;  South Devon Jellyfish Survey

Headline conclusions

- Unremarkable year overall and a normal one in relation to most jellyfish, ctenophores and surface-dwelling macroplankton plankton washed in after storms.
- However, unusually high numbers of filter-feeding salps were recorded during summer.
- Long-term monitoring shows 2022 as the continuation of a widespread, long-term, mainly summer decline in key elements of the food web (i.e. larger phytoplankton and copepods).
- Other members of the plankton are partially replacing the larger phytoplankton and copepods and work is ongoing to understand the causes and consequences of these changes.

Introduction

This chapter is divided into phytoplankton and zooplankton sections and uses data from three sources. First it describes the monthly records submitted to SWME and kindly compiled by Paul Naylor. Second, it describes the citizen science observations that form the South Devon jellyfish survey, which are compiled, presented and analysed by author Jeanette Sanders. Third, it describes the observations at the Western Channel Observatory south of Plymouth (see chapter 5 for its setting and physical context) which provide wider context.

Phytoplankton

Submitted phytoplankton observations

April

Keith Hiscock: Early arrival of the *Phaeocystis* bloom from about mid-April in Lyme Bay and out of Plymouth at least (seemed to be dying-away by the end of first week in May).

May

Christine Ingram reports fewer *Phaeocystis* – like globby particle while diving, as compared to previous years.

Western Channel Observatory phytoplankton report

The Plymouth L4 site forming part of the Western Channel Observatory ([Western Channel Observatory](#); see Chapter 5) is sampled at weekly resolution with samples at 10m depth examined quantitatively for phytoplankton under an inverted microscope. Author Claire Widdicombe has not yet sufficiently checked 2022 results to present plots of abundance, but the general assessment is that of a typical succession – Observations of weekly live phytoplankton (>20µm) net hauls show a familiar pattern of diversity and species succession at the L4 site, and the main observations from these are described below.

The year started with intermittent calm and stormy weather which allowed relatively large and diverse diatoms e.g. *Coscinodiscus* and *Thalassiosira* to flourish, as well as the relative newcomer *Asteromphalus flabellatus*. Early signs of the spring bloom were noticeable at the beginning of March when smaller chain-forming diatoms e.g. *Chaetoceros* became increasingly common. *Chaetoceros* chains were often found with small *Phaeocystis* colonies, containing 4-10 cells, attached to their spines or setae. This 'safe space' protects the developing *Phaeocystis* colonies from predation

by copepods and other zooplankton who preempt the spring bloom (also evidenced from an increase in copepod faecal material) and initially control the phytoplankton abundance and diversity before the spring bloom can finally take hold. In 2022 the spring bloom was observed to be in full swing in early April and comprising a highly diverse assemblage of diatoms, dinoflagellates and *Phaeocystis* (Figure 6.1a). Colonies of *Phaeocystis* continued to grow in size and biomass throughout April until they eventually sank out of the water column in early May.

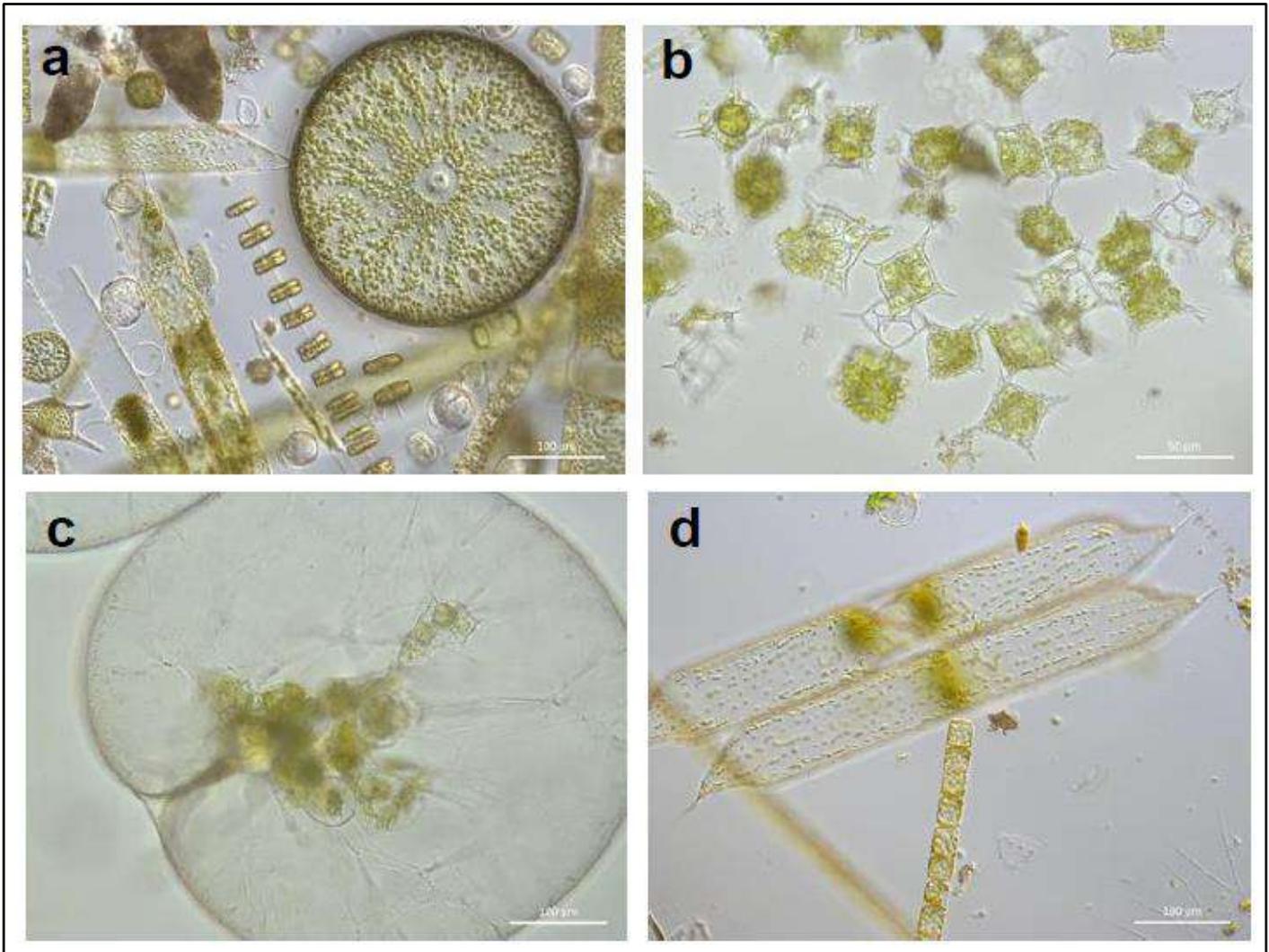


Figure 6.1. a. Microscope image showing the diverse assemblage of diatoms observed during April 2022. b. Following the summer heatwave, a bloom of silicoflagellates *Dictyocha fibula* were observed in August. c. *Dictyocha fibula* and other cells visible in the gut vacuole of *Noctiluca scintillans*. d. *Pseudosolenia calcar-avis*, a diatom first observed at the L4 site in September 2022. (Photos © Claire Widdicombe, PML).

A quick succession of species was observed over the unusually warm and sunny summer months, with dinoflagellates, coccolithophores and ciliates appearing to benefit most from the unusually high temperatures. In August, a notable bloom of the silicoflagellate *Dictyocha fibula* (Figure 6.1b) was found in very high numbers and dominated the content of the 20µm net samples. These were in turn eaten by larger dinoflagellates as seen by the spiny, siliceous skeletons packed inside the food vacuoles of *Noctiluca scintillans* (also known as ‘Sea Sparkle’) (Figure 6.1c). High winds at the beginning of September re-injected nutrients into the surface mixed layer allowing phytoplankton diversity to flourish again. Interestingly, species that are more typical of warmer or tropical waters were also observed and may be indicative of the influence of the Gulf Stream. These included the diatom *Pseudosolenia calcar-avis* (Figure 6.1d) and the dinoflagellates *Dinophysis hastata* and *Phalacroma mitra*. These new or rare taxa were observed for several weeks until conditions changed in November and an assemblage more typical of winter months was recorded.

The larger phytoplankton recorded above form characteristic blooms, but their biomass is dominated by cells of 20 micron or smaller. These are fully quantified by flow cytometry, and the weekly sampling resolution of L4 reveals the rapid evolution of dense blooms of these small cells. Given their importance, work is currently underway to incorporate the small fraction derived by flow cytometry into the reporting of ocean health to meet policy objectives. Based on flow cytometry data from 2022, *Synechococcus* sp., cryptophyte and *Phaeocystis* sp. abundances were similar to longer-term (post 2007) averages. Coccolithophores and LNA bacteria were above average abundance, whilst picoeukaryote and nanoeukaryote algae, along with heterotrophic flagellates were, perhaps below their long-term averages. The stand-out period for the year was the three weeks from 21 June - 11 July when there were three instances where coccolithophore abundance was at or above 1000 cells per mL at Station L4 (Figure 6.2). There was no such increase in abundance at Station E1, 26 km further offshore. There were similar increases in coccolithophore abundance at Station L4 in 2020 and 2018 at exactly the same time of year. Bacteria with relatively low nucleic acid content (LNA bacteria) saw their highest recorded abundance at L4 since the time series began in 2007 with an abundance over 3 million per mL. The closest abundance to 2022 was back in 2016 when 1.86 million cells per mL were recorded. Bacteria with relatively high nucleic acid were also different than previous years in that their abundance appeared to be much more variable throughout the year.

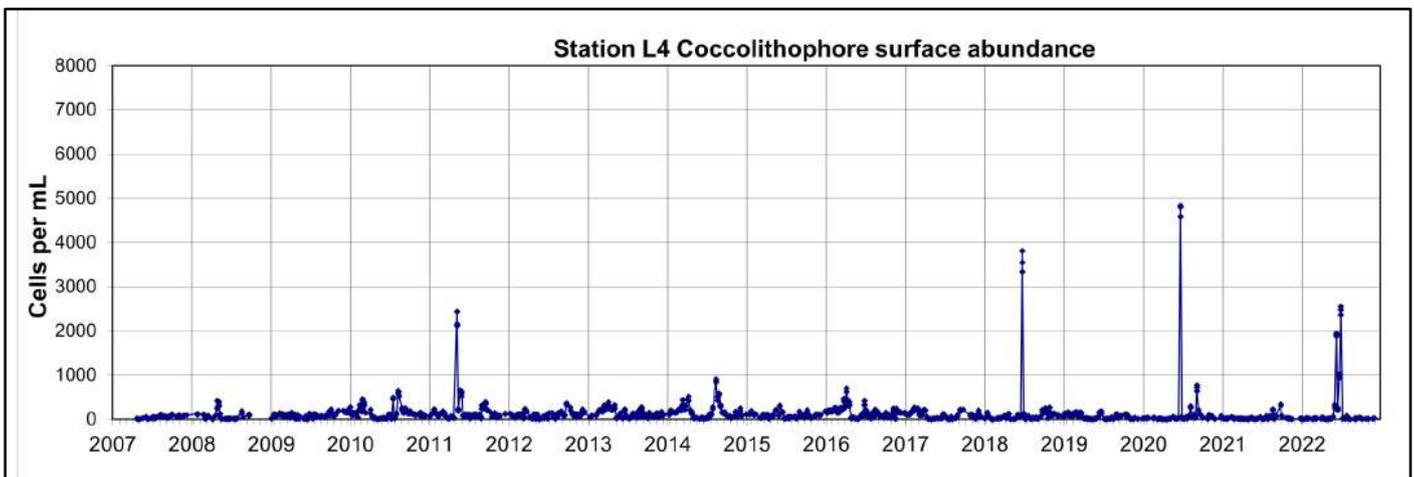


Figure 6.2. Weekly resolution time series of coccolithophores at the Plymouth L4 monitoring site. The coccolithophore bloom was very short and pronounced, occurring in June-July. Flow cytometry data courtesy of Glen Tarran.

Zooplankton

Submitted zooplankton observations

For a context of these 2022 observations, relative to those spanning the period 2019-2022, please see the following section 'South-West Jellyfish Survey'.

February

On 13th February, Wendy Amos reported Portuguese Man o' war (*Physalia physalia*) on Slapton Sands beach. On 17th February, Steve Trehwella found a tiny (c. 20 mm long) specimen in Dorset.

On 17th February, Steve Trehwella found a seabean ('hamburger bean') somewhere in Dorset.

March

Small Portuguese Man o' war being washed-up at Torcross on 12th March (Nigel Mortimer).

“Deadly sea creature....., sea beast,creepy tentacles,fearsome feelers”..... no, this is not something from Scooby-Do. Just some quotes from a report of a Portuguese Man o' war by the Mirror. It made a painful brush with a swimmer and dog, somewhere in Devon.

April

Physalia physalia washed-up in St Austell Bay (Western Morning News on 19th April) – a few other observations of small numbers of small individuals.

At the end of April, small (c 15 mm bell diameter) *Chrysaora isocheles* being seen but not large numbers.

May

Notes from Keith Hiscock: Small *Beroe cucumis* in very small numbers being seen in Plymouth Sound and Torbay at least throughout May.

Very small (c. 15-20 mm across the bell) compass jellyfish being seen early May through to small (c. 40-50mm across the bell) in late May – moderate numbers.

Note from Julie Hatcher, Dorset WT: “Something we noticed (and a few other divers mentioned) was the enormous bloom in comb jellies this year in Dorset from mid to end May. The main species was *Pleurobranchia pileus* – but also quite a lot of *Beroe cucumis* and *Aequorea forskalea*. I wonder if others noticed the same. A diver I know got a photo of a bloom of *Pleurobranchia* which really shows how dense (if patchy) they were and also Steve and I had a snorkel when there were tons of them (not an accurate measurement I know)”.

June

Robert Hurrell, EA, 16th June - Salps just outside the Fowey estuary tonight. Singles floating on the surface with two long curved pointed ends and a broad oval shape, A few chains of Salps just visible down under the surface. Also longer chain salps recently reported off Charlestown.

16th June - there were dozens, probably hundreds on the sea surface, each one a few cm long.

17th June - most in the surface film were this kind of shape [drawing made, showing their pointy ends and stomach] but now I know there are other species it's very possible I also saw a different much blunter ended species as well

23rd June - more salps at Fowey this evening

Charlie Smith: also saw and photographed salps in the Pentewan beach/ Charlestown area (Figure 6.3)

Heather Buttivant: – sent 7th July: I think the main thing I noticed last month is a large influx of salps. (Seen personally at: Readymoney, Fowey; Coverack, Lizard; Looe.). These were forming chains in the sea, then washing into the shore and pools, some still alive and swimming. Both the pointy and barrel forms seen (chain forming and solitary). Alongside the salps, there were crystal jellies, hydroid medusa and comb jellies washing in. ... it's the most salps I've ever seen! I'll attach a photo of a pointy one.

Taken 13/6/22 at Readymoney, Fowey.

July

Bob Earll: I'm not sure what would comprise a Compass Jellyfish swarm But when canoeing off Gwennap head, mid day on the 27th July we cruised through large numbers of them on both sides of the canoe – one every 3m on both sides for about 30 minutes. By contrast we saw none on three other canoe session of 10 hours total.

Keith Hiscock Portheras Cove (N. Cornwall) – *Physalia* being washed ashore early July. Sparse *Beroe cucumis* throughout July off Plymouth at least.

August

Reports of salps stranding in the Isles of Scilly– likely late August –

September

Andrea Hunt Facebook: Report of *Apolemia uvaria* siphonophore at Longships Cornwall.

October

14/10. *Apolemia* photo'd off south Cornwall – Keith Raven

November

30th November, *Physalia* washing-up in Portheras Cove (KH didn't keep record of observer)

End of November, the phylonect siphonophore *Apolemia uvaria* seen in various locations in Plymouth Sound by Bozena Johnson. The species had previously this autumn been seen off the Lizard. When it had been first seen in inshore UK waters in ?2008, published in 'Hiscock, K., Mapstone, G.M., Conway, D.V.P & Halliday, N. 2010.

Occurrence of the phylonect siphonophore *Apolemia uvaria* off Plymouth and in south-west England. JMBA Marine Biodiversity Records, 3, 4pp.' Example of sporadic occurrence on decadal time scales.

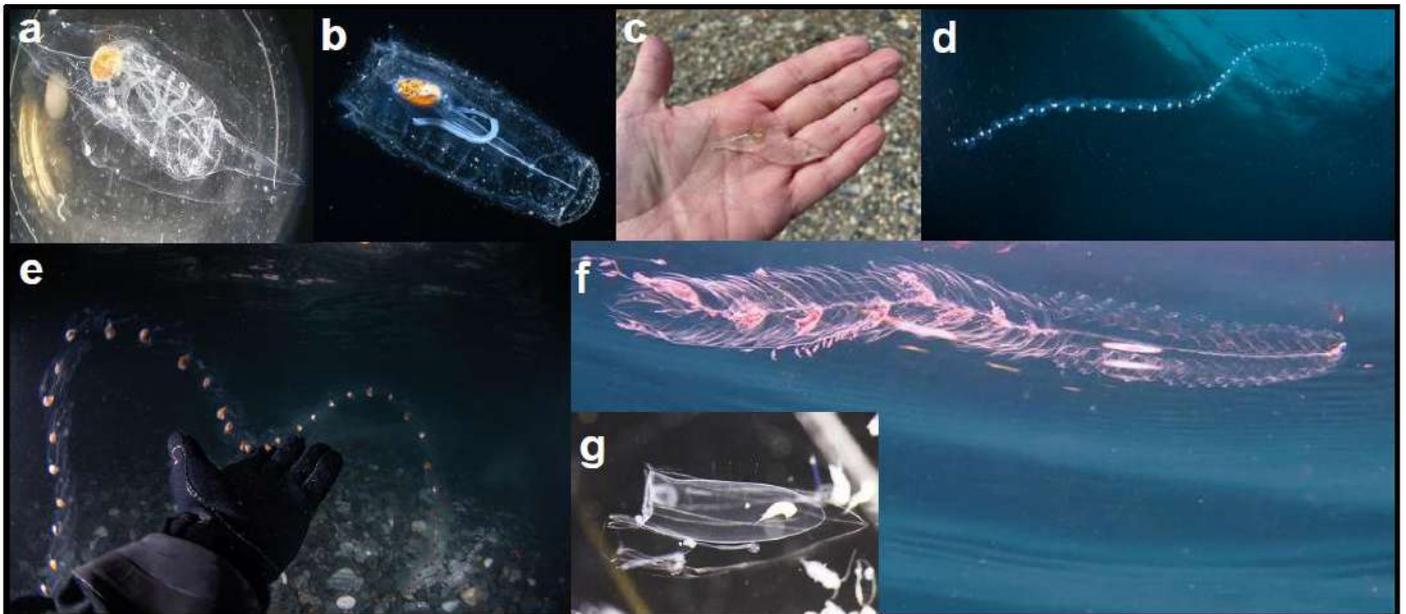


Figure 6.3. Clear gelatinous plankton are exceptions in the world of plankton since, unlike most taxa they are large enough to be regularly seen by swimmers and beachgoers. However there is remarkable diversity even within these. **a** Aggregate (sexually-reproducing, pointy-ended) life stage of the pelagic tunicate group known as salps (Photo by Amanda Beesley from salps collected at L4 in June-July, identified as *Salpa fusiformis*). **b**, solitary, asexual stage with barrel shape (Photo from Porthkerris, courtesy of Aaron Sanders) **c**, salp from the Pentewan beach/ Charlestown area, showing size. The opaque blobs are the stomachs of the individuals (photo kindly provided by Charlotte Smith). **d**, **e** aggregate chain at Porthkerris: great photos from Aaron Saunders. **f** also colonial, chain-forming and gelatinous are Siphonophores, cropped from a photo on Facebook by Bozena Johnson; **g** *Muggiaea kochi* photographed from L4 by Andrea McEvoy. However, siphonophores are not tunicates but a from a group of cnidarians, and thus more closely related to the familiar jellyfish. While salps capture prey by pumping water through and extremely fine meshed mucous net, the jellyfish and siphonophores tend to be more carnivorous in their feeding habits.

South-West Jellyfish Survey

A citizen science project: sightings of jellyfish / 'jellies' from around SW England reported by email (sea@seadreameducation.com) or by uploading details to a Facebook page (<https://www.facebook.com/SouthDevonJellyfishSurvey/posts>). Sightings are included in analysis if they have (i) date (ii) location and (iii) species (ideally with photo but accept expert comments).

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

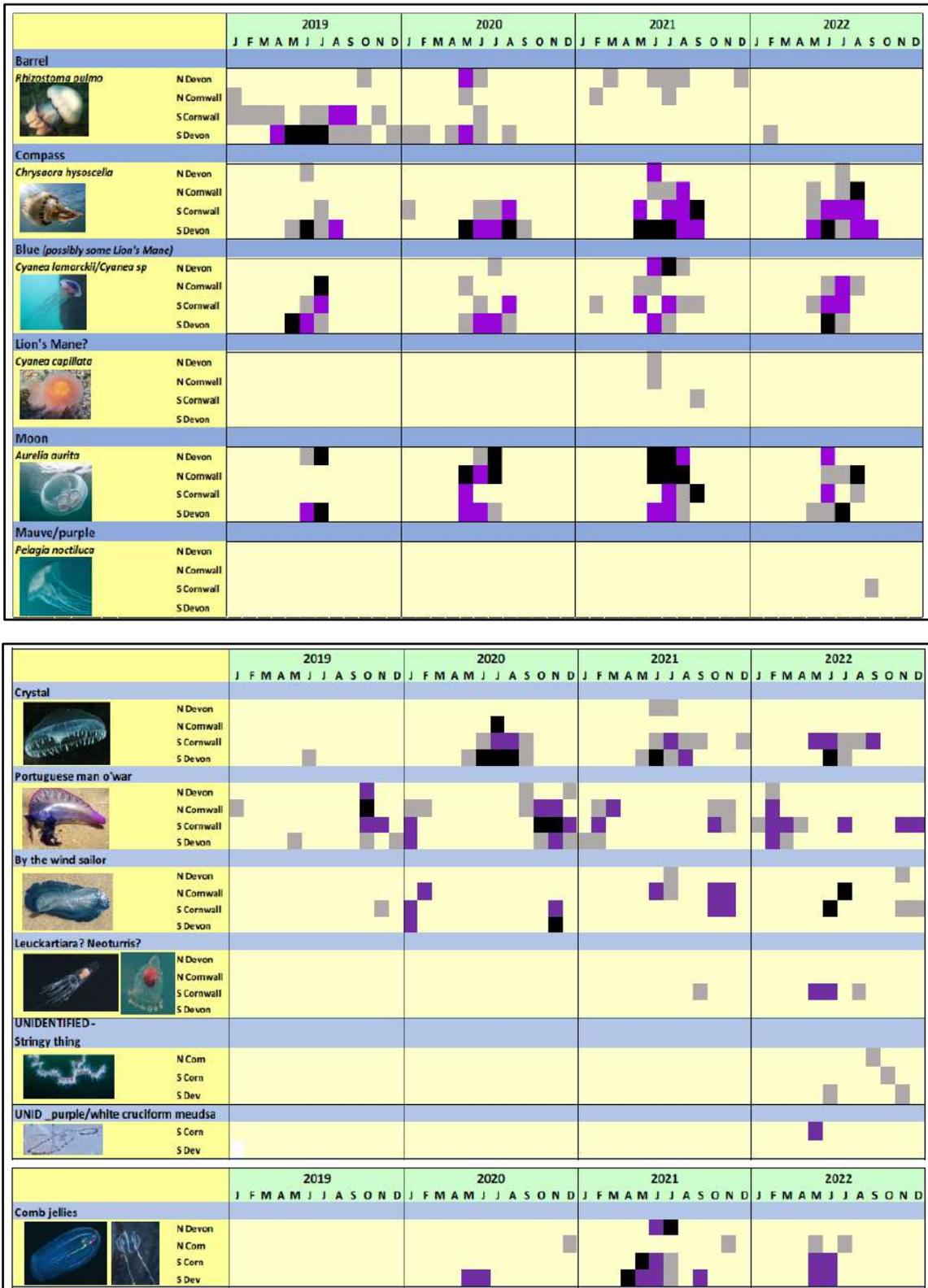


Figure 6.4 a&b. Results of the South-West Jellyfish Survey for records of gelatinous and neustonic species since 2019. **a** major jellyfish species recorded; **b** other jellyfish, neustonic species blown in after storms, rare species and Ctenophores. South Devon jellyfish survey results for 2019-2022. Species are shown down the left hand side. Time across the top. For each species, sightings are recorded from different areas of coast – From North Devon, travelling around coast of Cornwall and along the south coast to Devon border with Dorset. Vernacular names are given for some species. ‘Neoturris’ is most likely *Neoturris pileata* and ‘Stringy thing’ is *Apolemia uvaria*. Colours reflect max number reported by any one sighting in that month: lightest grey = max 5; purple = max between 6 and 50; Black = max >50.

Figure 6.4 illustrates abundance of observations for each of the main species or species groups through the year. Overall and taken in a comparative sense these plots show the relative fortunes of the major species between years. For example while it was a poor year for the large barrel jellyfish (and perhaps part of a sequence of low barrel jellyfish years) it was a relatively good year for compass jellyfish and Ctenophores.

Advantages: collects data over long time period and from a large area

Problems: data heavily skewed by strandings; may lack size of individuals and numbers seen; concentrates on larger individuals and misses many smaller hydrozoan species; lack of sightings does not infer absence of species. The dataset described here mostly relies on strandings and we do not really know: (i) how many there are, (ii) where the juvenile polyps are (iii) are numbers changing (iv) will climate change favour jellyfish, and (v) will we get invasive species? Trying to work on some of these questions by looking at eDNA and DNA testing of SETL plate fauna in marinas.

We need to verify identifications on social media – mostly are only included in our dataset if there are images, unless the record is from a person with known expertise. We do not usually get accurate numbers of individuals/size. We have included 'bits' of jellyfish as well as whole 'alive' individuals.

Western Channel Observatory zooplankton report

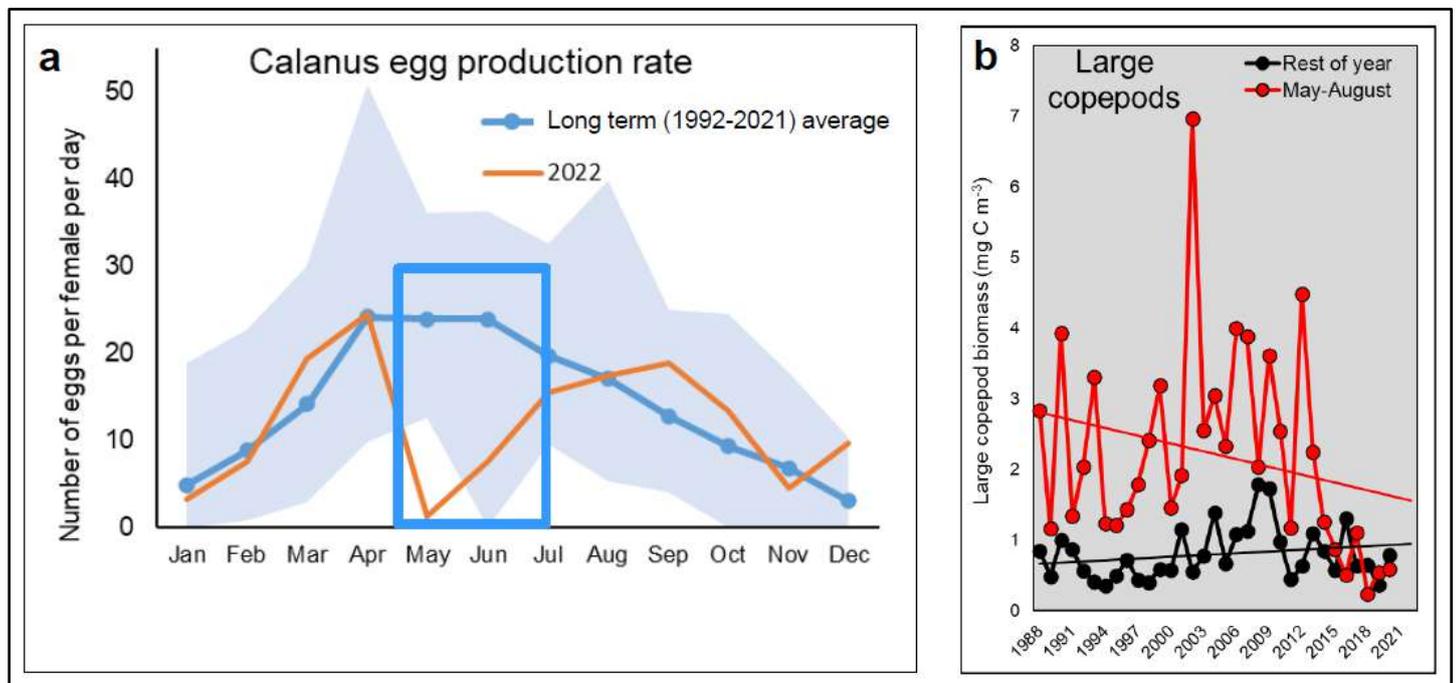


Figure 6.5. Major long-term changes in the summer plankton are illustrated by the copepod *Calanus helgolandicus*. **a** At the Plymouth L4 monitoring site, egg production experiments have been run on this species since 1992. In 2022 the rate of egg output per female was much lower in summer than the long-term mean, suggesting some kind of link to adverse food availability at this particular time of year. **b** The summer decline in egg production is concomitant with much lower numbers of large copepods since about 2015 (this group is dominated at L4 by *C. helgolandicus*).

In common with the phytoplankton, the zooplankton caught with weekly replicate 0-50 m full depth tows with a 200 µm mesh net did not show exceptional features during 2022, based on provisional analysis. *Muggiaea kochi* (Figure 6.3g) appeared in January and again in May, dwelling in neritic waters and considered a warm temperate species it is easily transported by ocean currents suggesting an incursion of warmer waters. The increase in salps in June-July was, however, unusual for this station, and Figure 6.3a shows one of the salps identified as *Salpa fusiformis*. A characteristic feature of salps is that they can filter very small (micron-size) particles out of seawater by pumping water through an internal filter. They can also increase rapidly with an alternation of generations between sexual and asexual forms, thereby causing salp “blooms” which can have major ecological and biogeochemical

consequences. Exactly how the summer conditions are changing and providing advantages for salps and disadvantages for the crustacean zooplankton such as copepods is a topic of active research.

The year marked a continuation of some worrying long-term trends in plankton that have now been reported widely across the NW European shelf and NE Atlantic. Several of the links in the classic food chain, namely copepods and larger phytoplankton, have shown substantial declines (Figure 6.5), whereas other taxa have partially replaced them. These declines appear to be a mainly summer phenomenon and their causes and consequences is a topic of active research.

7. The Seashore and Seabed

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Records of non-native species are included in a separate section below.

Records of fish species associated with seabed habitats are included in the section on fish.

Conclusions

- Observations through the year have recorded the 'usual' range of events such as wash-outs of species, strandings of oceanic species, a small number of NE Atlantic marine species new to Britain being found. **'Nothing unusual' for 'events'**.
- Seagrass (especially *Zostera marina*) have been the subject of significant studies especially in Plymouth Sound and the Tamar (*Z. noltei*) linked mainly to assessing their role in carbon capture and storage. Some studies have described extent of beds larger than previously thought and a very large *Z. marina* bed was located in St Austell Bay. **'Improvement' in knowledge of seagrass extent and importance of seagrass for carbon capture and storage.**
- There are observations of reductions in abundance (that may be 'noise' in the system): for instance, likely lower amounts of Plumose Anemones *Metridium senile*. **No conclusion about reduction in abundance of Plumose Anemones without long-term observations.**
- There is no massive increase of warm water species that might suggest significant climate change effects although the presence of significant numbers of Common Octopus, *Octopus vulgaris* and higher abundances of Montagu's Crab *Xantho hydrophilus* are notable. **'Slight increase' in extent and abundance of warm water species.**
- There were no additional non-native marine species recorded in south-west waters and the range and abundance of already present ones seems similar to previous years except that abundance of Pacific Oysters may have declined in some long-established 'hotspots' but abundance and extent of Red Ripple Bryozoan *Watersipora subatra* at Lundy at least has increased. Overall, a **'Negative assessment' for non-native species.**
- Surveys at Lundy during the Lundy Marine Festival revealed 'disappointing' numbers of species in some taxonomic groups (especially anthozoans, nudibranchs and ascidians) compared to records from the 1970s and 80s but a possible 'standstill' in the decline of the nationally rare Sunset Cup Coral *Leptopsammia pruvoti* with some signs of recruitment. **Overall, Lundy shore and seabed marine life in poor condition.**
- Re-survey of crustacean populations in the No-Take Zone at Lundy revealed about four times as many lobster, *Homarus gammarus*, as in nearby fished areas, pointing to the success of Highly Protected Marine Areas (HPMAs) in fish stock recovery and, notably, in an area smaller than the minimum size specified in the HPMAs consultation in 2022. **HPMAs are successful in improving fish stocks at least.**

Introduction

As always, a great deal of the observations and images included here have been harvested from social media postings. Observations of unusual species and/or abundances and/or behaviour and/or time of events will have been missed as they were not reported – send your observations to the chapter editor or to a reporting scheme including Seasearch and www.dassh.ac.uk/dassh.enquiries@mba.ac.uk. However, systematic surveys and sampling of seagrass during were a particular feature of 2022 and the surveys undertaken by Porcupine Marine Natural History Society members during the Lundy Marine Festival (see the Porcupine MNHS Bulletin) contributed new records for around the island including several additional non-native species whilst Seasearch surveys and surveys by groups such as Shorewatch, Coastwise North Devon and The Shores of South Devon drew attention to observations that help to track change.

'Events': wash-outs and strandings



Plate 7.1. A significant wash-out (the sort that may attract attention from the press) occurred of the burrowing sea urchin Sea Potatoes *Echinocardium cordatum*, at Dawlish photographed on 18 May (reported by Emma Griffin, The Shores of South Devon Group). *E. cordatum* seem particularly sensitive to anything that causes de-oxygenation and will leave the sediment and die. Such de-oxygenation may occur when a plankton bloom dies and May is the month for blooms of *Phaeocystis* sp. Image: Emma Griffin.

There were not the persistent strong winds seen in 2021 which created wash-outs of burrowing species. Paula Ferris (Coastwise North Devon) observes a mass stranding at Saunton of Common Starfish, *Asterias rubens*, (1000+) in early October 2022 together with small razor shells.

Algae (Non-native algae are in the 'Non-native species' section)



Plate 7.2. Kelp forests getting publicity including for carbon capture and storage. One 'angle' on the phenomenon of carbon capture and storage is the dedication, on 30th August, of: "An important marine forest off Plymouth [which is] is being dedicated to the Queen to mark her Platinum Jubilee." Here, off the Shag Stone at the entrance to Plymouth Sound. Image: Keith Hiscock.

Seagrass

Significant work has been undertaken in seagrass beds during 2022 including in Plymouth Sound, Torbay and St Austell Bay.

St Austell Bay. A series of very extensive beds of *Zostera marina* were surveyed for area covered, density and canopy height using sonar with ground truthing by Cornwall IFCA and especially for biodiversity by Cornwall Wildlife Trust (Crosby *et al.* 2023 and Jenkin *et al.* 2022). The CWT surveys also included areas of maerl. The work was funded as part of the G7 Legacy Project for Nature Recovery.

The work involved mapping historic datasets as well as much new survey, providing evidence to support strategic planning around marine nature recovery action for St Austell Bay. The bed was found to cover 359 ha, making it one of the largest known beds within the UK. Seasearch surveys recorded a total of 66 species within the maerl dive sites and a further 56 species within the seagrass dive sites. Recommendations include the need to undertake further surveys to assess currently unsurveyed extents and to protect the site from damaging activities such as bottom-towed fishing.

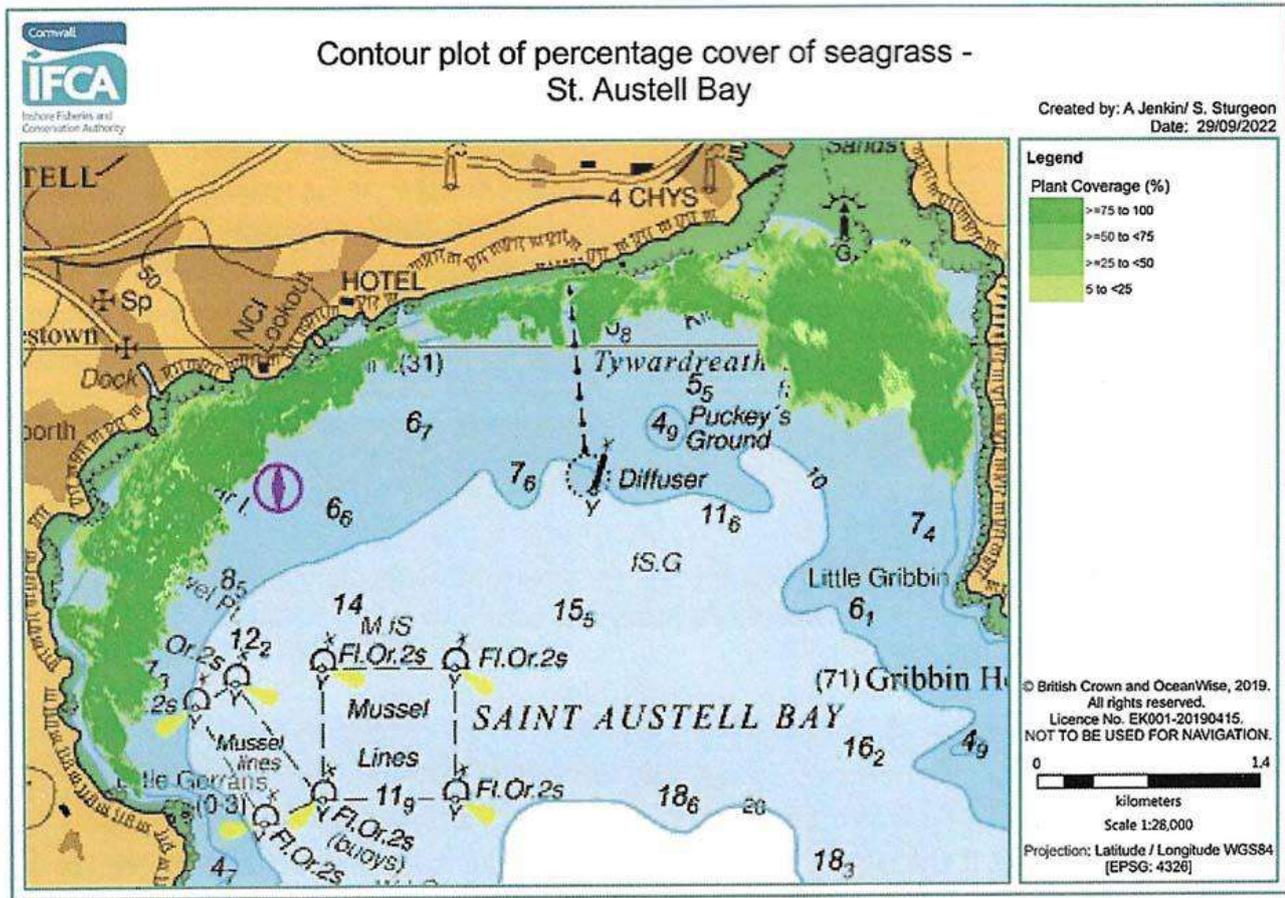


Plate 7.3. Contour plot of percentage cover of seagrass in St Austell Bay (Cornwall Inshore Fisheries and Conservation Authority) – one of several resource maps. Copied from Crosby *et al.* (2023) with permission.



Plate 7.4. Seasearch surveys. Here in Cawsand Bay on 21 May.

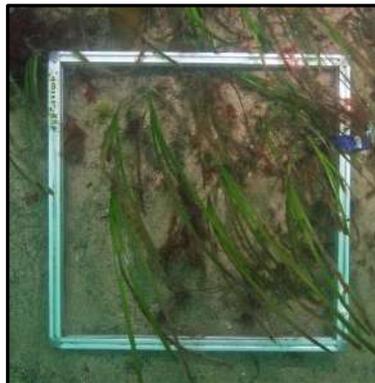


Plate 7.5. Measures of density. Here at Drakes Island on 25 May.

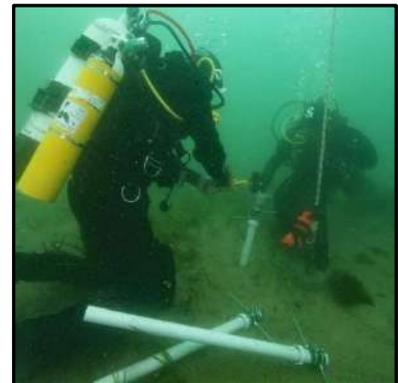


Plate 7.6. Coring to sample carbon storage. Here in Cawsand Bay on 21 May.

Survey activities in Plymouth Sound (Images: Keith Hiscock).

Plymouth Sound seagrass surveys and core sampling. There were extensive surveys in Plymouth Sound (especially in Cawsand Bay, north of Drakes Island and in Jennycliff Bay) to assess health of seagrass (*Zostera marina*) beds, document associated species, gather information on carbon storage and to assess the success of seagrass planting. (There is more information in the MPAs section.)

Tamar and Fal Ruan Estuaries (*Zostera noltei*). Work underway by Oliver Thomas (Plymouth University) has documented a gradual increase in the meadow extent over time using satellite and drone imagery with evidence of

possible causes, and the nature and magnitude of some of the ecosystem services (blue carbon and macro-benthos) exhibited by the meadows (oliver.thomas@plymouth.ac.uk). Similar observations of increase have been observed in the Fal Ruan Estuary (Cornwall Wildlife Trust).

Worms (Polychaeta and Nemertea)

Eumida fenwicki is a newly described (Teixeira *et al.*, 2022) species of polychaete worm found by David Fenwick in Newlyn Harbour and also known from Norwegian waters.

A few more individuals of the Featherduster Worm *Sabella spallanzani* (a warm water species) were identified in Plymouth Sound in 2022 after the initial find in November 2021.

In a 'demonstration' of how experienced (and sharp-eyed) taxonomists can boost numbers of known species from an area, 15 new polychaete taxa were added to the lists of intertidal taxa known from Lundy as well as 9 taxa that had not been recorded anywhere around the island previously (see Darbyshire, 2023). The total number of polychaete taxa recorded in six days in July 2022 was 53, compared to 115 from intertidal and subtidal studies up to 1974. For nemerteans, six species were added to the three already recorded from studies in the 1940s and 1950s. (Teresa Darbyshire and Patrick Adkins.) Some species were non-native and are reported later in this text.



Plate 7.7. *Tenuilineus albocinctus* is a nemertean new to the UK and recorded by David Fenwick from Western Cressars reef near Penzance (in 2020 but identification confirmed in 2022) and Marra Pool in Batten Bay, Plymouth. See: https://www.aphotomarine.com/worm_nemertean_tenuilineus_albocinctus.html. Image: David Fenwick.

Cnidaria (hydroids, anemones, corals but not including planktonic forms – see 'Plankton')

2022 was the ninth successive year that there was no significant 'outburst' of athecate hydroids in Plymouth Sound during spring. The most conspicuous of those hydroids are *Ectopleura larynx*, *Tubularia indivisa*, *Garveia nutans* and often *Corymorpha nutans*.



Plate 7.8. *Garveia nutans* at Firestone Bay in Plymouth Sound on 26 April. The brown entangled gelatinous material is the coating produced by *Phaeocystis*: a diatom that 'blooms' in May (but, in 2022, the outburst was early). Image: Keith Hiscock.



Plate 7.9. *Ectopleura larynx* on Ex-HMS Scylla on 27 March – one of the species that was 'missing' in Plymouth Sound but abundant in suitable habitats on the open coast. Image: Keith Hiscock.



Plate 7.10 and 11. Pink Sea Fans, *Eunicella verrucosa* continue to be in much lower numbers than in the 1970s to 1990s at Lundy. Both images are from Brazen Ward on 16 July. On the left, still-attached skeletons probably from the disease event in the early 2000s now fouled with bryozoans and hydroids etc. and providing an attachment point for the egg cases of Bull Huss *Scyliorhinus stellaris*. On the right, a healthy seafan but with entangled drift algae and Bull Huss egg case. Images: Keith Hiscock.

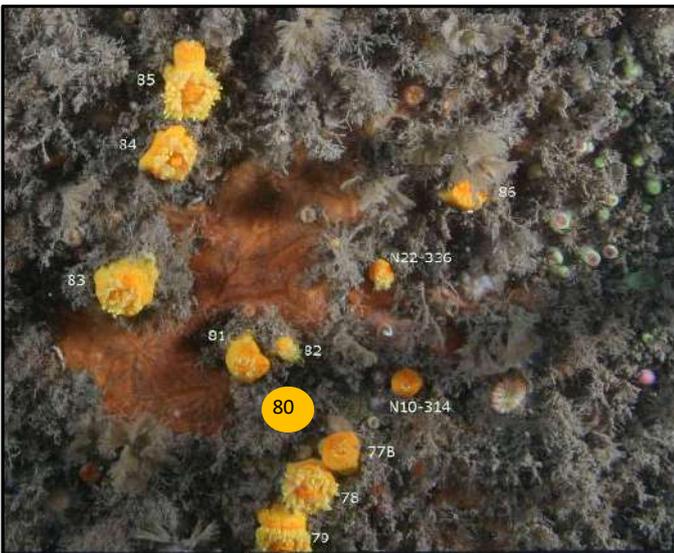


Plate 7.12. Sunset Coral, *Leptopsammia pruvoti*, at Lundy. The image shows a part of the mosaic of images with individual corals numbered to compare with previous years. Counts show a decline to about 30% of 1985 numbers but numbers seem to have stabilized (for the moment) and there are more little ones. The orange symbol (#80) represents a coral that had gone in 2022. 'Doom scenario' beginning to change? Numbers are designated from 2010. 'N10' = new in 2010; 'N22' = new in 2022. Image: Keith Hiscock.

(Comparisons by Robert Irving.)



Several divers have commented on the absence or low abundance of Plumose Anemones *Metridium senile* at locations where they were once common (for instance, the welding structure off the Breakwater Fort in Plymouth Sound, the wreck of the James Egan Layne in Whitsand Bay, The wreck of the *Robert* off Lundy). [What do you divers/photographers think?]

Plate 7.13. A cluster of Plumose Anemones *Metridium senile* at West Hoe in Plymouth Sound on 27 March 2011 but unlikely to see so many in recent years. Image: Keith Hiscock.

Crustacea (Non-native crustacean species are in the 'Non-native species' section)

Clibanarius erythropus (St Piran's Hermit Crab) (which was first reported in Britain in 1960, could not be found after 1985 and was found again in 2016), has continued to expand in abundance and extent along the coast with a now (in 2022) easterly known extent of Prawle (Steve Hawkins).

Xantho hydrophilus (Furrowed Crab or Montagu's Crab) continued to show a perceived increase in numbers across the south-west. (For 2021 at Kimmeridge it was noted that 11 were recorded in one day although, previously, only up to four or five in a year.)

There were many fewer observations of moulting aggregations of Spiny Spider Crabs (*Maja brachydactyla*) in 2022.

Crawfish (*Palinurus elephas*)



Plate 7.13. A 'line' of Spiny Lobsters *Palinurus elephas* east of Plymouth Sound on 24th August. Image: Keith Hiscock.

Very similar observations of Spiny Lobsters *Palinurus elephas* compared to 2021 (after their 're-appearance' in many areas in about 2014). Divers continue to see very small individuals through to mainly moderate-sized individuals but fishermen report very few with eggs. There were more reports of aggregations of spiny lobsters. See: <https://www.youtube.com/watch?v=FChJRbf-Ryk>.

Spiny Spider Crab, *Maja squinado*, moulting aggregations. There were fewer reports of moulting aggregations in 2022. One significant one from a 'usual' location was by Paul Burrige at Babbacombe on 26 June.

Terry Griffiths reports that there were a lot more Anemone Shrimps, *Periclimenes sagittifer*, at Babbacombe in 2022 and that they are now present through the winter. First recorded in Britain in 2007 and at Babbacombe in 2015

[Species associated with floating material are mentioned later.]

Mollusca

Cephalopods (octopus, cuttlefish and squid)



Plate 7.14. ‘Stumpy the octopus’ at Falmouth on 6 May 2022. Image: Jamie Altenberg/Mylor Creek Shellfish.

In contrast to 2021 when no sightings of live common octopus *Octopus vulgaris* were reported (there was a dead one on the Roseland Peninsula), 2022 saw an ‘outburst’.

Elle Hunt, writing in ‘The Guardian’ on 1 July indicates biggest number of sightings of Common Octopus, *Octopus vulgaris*, in over 70 years* and reports that fisherman Chris Chesterfield in one day in early June caught 260 kg of octopus (150 individuals) whilst, In a typical year, he would expect to catch half a dozen. Individuals were also reported from Babbacombe (Emma Nielson), in Brixham Harbour (Baz Drysdale) and in Plymouth Sound (Guy Heath).

*See: https://plymsea.ac.uk/id/eprint/1618/1/The_abundance_of_Octopus_in_the_English_Channel.pdf

There are several records and photographs of Common Octopus in south and west Cornwall – the challenge for 2023 is to see if any are brooding eggs (no confirmed sightings/images in 2022).

It also seems that the abundance of Northern or Curled Octopus was higher than usual in 2022.

Cuttlefish (*Sepia officinalis*) ‘arrived’ earlier than usual (usually late April) at Babbacombe in Torbay at least with individuals seen on 3 April (Charles Sheldrick) and eggs being photographed on 18 April (Sue Watson-Bate).



Plate 7.14. An unusual find: a Pink Cuttlefish. Marazion Beach, Cornwall on 19th February. The species was found following Storm Franklin and Storm Eunice. Observation and image: Constance Morris.



Plate 7.15. There were several reports of ‘shoals’ of small Cuttlefish along the south Cornwall, Devon and Dorset coasts in late summer. Here at Firestone Bay in Plymouth Sound on 2 October. Image: Steve Porter.

Other Molluscs



Plate 7.16. *Babakina anadoni* observed in the Isles of Scilly in late July by Allen Murray and later in 2022 near Penzance by Kymm Sandum. Image: Allen Murray.



Plate 7.17. *Corambe testudinaria*. Rockpool at Trevone. Observation and image: Charlotte Cumming.



Plate 7.18. *Discodoris rosi*. Observed off Stoke Point (east of Plymouth) on 25 September by Lucy Martin. Image: Lucy Martin

As usual, a 'crop' of rarely seen nudibranchs including *Babakina andoni* (a new record for Britain) and of *Discodoris rosi* observed at Lundy by Sarah Bowen and David Kipling on 19 July (the furthest north record for this species) and at Stoke Point east of Plymouth apparently with eggs on 25 September by Lucy Martin. Tamsyn Mann mentions seeing the species at Porthkerris in 2022 and a previous record was at the Eddystone in 2015 (Jan Davies). Shoresearch volunteer Charlotte Cumming found a specimen of *Corambe testudinaria*, an onchidorid nudibranch, in a rockpool at Trevone – a first UK record. Joining the usual 'crop' of infrequently found sea slugs, Heather Buttivant found *Aeolidiella glauca* at Lizard Point, Cornwall and Eddie Ricard found *Cadlina pellucida* from just outside of Plymouth breakwater.

Paula Ferris notes, for North Devon Coastwatch, there were sightings of a couple of nudibranchs not seen for a few years – *Palio nothus*, *Thecacera pennigera* and, a new record, *Aeolidiella glauca*, all on one occasion at Crow Point.

Steve Trehwella has been posting end of December on the 'The Essential Guide to Beachcombing' Facebook page – lots of washed-up stuff including "It's confirmed that the sea slug I found on an old toilet brush washed up on Chesil is indeed *Fiona pinnata* , it's taken me over 15 years to find it , the brush was covered in goose barnacles , thimble jellyfish tubes , and various tropical oysters".

Non-native species

There were no additional (for the UK) non-native species reported in the south-west in 2022 (John Bishop).



Plate 7.19. *Grateloupia turuturu*



Plate 7.20. *Undaria pinnatifida*



Plate 7.21. *Corella eumyota*

Surveys undertaken by 'The Shores of South Devon' group report increased abundances (particularly relevant to the Teign and Torbay area) in 2022: *Grateloupia turuturu* continues to rapidly increase its distribution at Teign Estuary mouth at Shaldon. Wakame, *Undaria pinnatifida*, is now greatly increasing at sites in Torbay around Shoalstone (Brixham) and not seeming to be experiencing any significant die-back in the colder months. Numbers and

distribution of *Corella eumyota* have greatly increased at Corbyn Head and Livermead in south Devon (Mike Puleston). Similarly for *G. turuturu* and *U. pinnatifida* together with *Caulacanthus okumarae* in Cornwall (Matt Slater).

For North Devon, Paula Ferris (North Devon Coastwatch) observes: we have a major influx a few non-native species and a steady trickle of others. In places: *Austrominius modestus* is now dominant, *Sargassum muticum* abundant, and *Caulacanthus okumarae* rapidly dominating from the upper shore down at Saunton at least. Slipper Limpets (*Crepidula fornicata*) are now found on most shore visits in ones and twos and a local fisher reported them abundant sub-tidally on whelks. Other single animals found in 2022 were *Colpomenia peregrina* (more in 2022 than previous years) and *Botrylloides violaceus*. Not found in North Devon yet are *Grateloupia turuturu*, *Watersipora subatra*, *Styela clava*. *Perophora japonica* was found intermittently and Pacific Oyster (*Magallana gigas*) numbers probably decreasing with none seen in 2022

Keith Hiscock has collated records of non-native marine species found at Lundy during the Porcupine Marine Natural History Society Bioblitz in July (Hiscock, 2023). There were two species of algae that were additional to previous records: *Dasyisiphonia japonica* and *Melanothamnus harveyi* and the sub-species *Codium fragile* subsp. *fragile*. Red Ripple Bryozoan, *Watersipora subatra*, had become more extensive since first being found in 2021 but previously occurring Devil's Tongue seaweed *Grateloupia turuturu* and Pacific Oysters *Magallana gigas* were not found.



Plate 7.22. Australian Barnacle, *Amphibalanus improvisus*, recorded in past few years including at Greenway Boathouse and a few at Steamer Quay in the Dart. In the Teign, under the A380 road bridge, at the water treatment works and at a site further downstream. (Mike Puleston, John Bishop and Christine Wood). Image: Mike Puleston from the A389 road bridge on the Teign.



Plate 7.23. Red Ripple Bryozoan *Watersipora subatra* on seagrass in Falmouth Harbour during August. Image: Matt Slater.

David Fenwick reports two specimens of the non-native amphipod *Quadrinemaera* sp. – two in a rock crevice at Bovisand Beach on 19 April. The only place *Quadrinemaera* (presumably in GB) has been reported is at Long Rock and Penzance (also by David Fenwick).

Strandings [not including free-living ocean drifters ('jellyfish' including *Physalia physalia* and *Velella velella*) but including stalked barnacles and Violet Sea Snails]

There were many reports of strandings that included marine life through the year such as goose barnacles attached to a variety of substrata but especially fishing floats and plastic containers including bait boxes. Goose barnacles provide a habitat for cryptic species such as Columbus Crabs and various other crustaceans such as the isopod *Idotea metallica* and amphipod *Caprella andreae* whilst plastics may be colonised by hydroids, bryozoans, molluscs and barnacles especially. 'Curiosities' include seeds (such as sea beans) that have drifted across the Atlantic.

Violet Sea Snails, *Janthina janthina*, are a pelagic species that float on a raft of bubbles and feed on jellyfish. They are occasionally found on the shore having been washed-in. Seen in the Isles of Scilly and west Cornwall in early July and

in the Isles of Scilly in December with a comment from the Isles of Scilly “This summer we had a big influx washing up on the beaches.”



Plate 7.24. A Columbus crab, *Planes minutus*, found amongst goose barnacles in the Isles of Scilly on 23 November. Image: Dulcie Fairhurst.



Plate 25. Hamburger bean from Dorset on 17 February. Image: Steve Trehwella.



Plate 7.26. Violet sea snails, *Janthina janthina*, collected from a beach on Bryher in the Isles of Scilly in early December. Image: Dulcie Fairhurst.



Plate 7.27. Pelagic caprellid amphipods, *Caprella andreae*: lots of these were found living on a fishing buoy along with Common Goose Barnacles. 19 November. Image: Steve Trehwella.

Much more about species found on the strandline in ‘The Essential Guide to Beachcombing and the Strandline’ book and Facebook page.

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8. Fish and reptiles

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Conclusions

- The fish world is full of surprises; and none so amazing as a Greenland Shark found dead on a beach in Newlyn; at almost 4m and 285 kg the immature female was estimated to be about 100 years of age. The shark was the third known to have stranded in Britain, and 5.4° or around 500 miles south of previous ones.
- Groupers are thought of as large fish of the tropics, but a small relative, the Comber, which used to be found every two to three years, is increasing in British waters with at least twenty recorded in 2022.
- There was an increase in reports of Thresher Sharks.
- Large numbers of Atlantic Bluefin Tuna in local waters, but the shoals were not as huge as the last few years.
- Seahorses appeared to be overwintering in inshore waters.
- Steven's Goby is increasing and has been proven to be breeding in coastal areas.
- Seldom seen species recorded in the region during 2022 included Mediterranean Moray Eel, Sailfin Dory; Red Scorpionfish, Norway Bullhead, Pandora, Spotted Bass, Scale-rayed Wrasse and Oceanic Pufferfish

Cephalochordates



Lancelet (*Branchiostoma lanceolatum*). Although this is not a rare animal and not a fish it is very rare for divers to get a sighting, let alone an *in situ* photograph so it is worth highlighting in this report. This image was taken by Becky Gill on a maerl bed in St Austell Bay in October before the Lancelet wriggled swiftly into the maerl sediment.

Plate 8.1. A Lancelet (*Branchiostoma lanceolatum*) in St Austell Bay. Image: Becky Gill.

Fish: Elasmobranchs

Common Thresher (*Alopias vulpinus*)

There was a marked increase in the number of *A. vulpinus* reported in the Western Channel Observatory (WCO) in 2022, with 12 fish known to be hooked off Plymouth during the summer and early autumn, including 3 in one day off Rame Head. The fish seemed to be present as they migrated from the eastern English Channel and additional fish were hooked off Looe and Falmouth. Paul Woodman, skipper of the Looe charter boat, *Bee Cool* released a 90 kg thresher on the 29th of September. An adult thresher was found stranded at Perranporth Beach on 7th December.

[Shark Angling Club of Great Britain (SACGB); Pat Smith Database]

Basking Shark (*Cetorhinus maximus*)

There were sporadic sightings of *C. maximus* in the WCO during 2022. The first sighting of 2022 was on the 9th April off Berry Head, with most sightings occurring during April and May, and a smaller number of reports during July and August. The last fish sighted inshore was on the 28th August off Bossiney Cove; while one was seen in the Western Channel in mid-September.

[ORCA; India Lewis via Shark Trust; Samantha Barnes, via Seawatch.]

Shortfin Mako (*Isurus oxyrinchus*)

Although still a rare visitor to the WCO, there were two reported sightings of *I. oxyrinchus* during 2022. Murray Collings, skipper of Looe charter boat, *Swallow 2*, reported one swimming in his chum slick during August, and around the same time another was reported south of the E1 buoy (50°02.6'N; 4°22.5'W).

[Murray Collings]

Porbeagle (*Lamna nasus*)

There were few *L. nasus* reported in the WCO during 2022 unlike previous years. There were numerous fish reported off North Cornwall and the Celtic Deeps during the spring and early summer of 2022.

[Shark Angling Club of Great Britain (SACGB); Pat Smith Database]

Blue Sharks (*Prionace glauca*)

Across the Western English Channel (WEC) there were 1449 Blue Sharks (*Prionace glauca*) caught and released in 2022, down from 2959 in 2021. The effort was reduced from 503 to 409 trips giving a nominal Catch Per Unit Effort of 3.54 *P. glauca* / trip down from 5.88 sharks per trip in 2021. However, one vessel out of Penzance caught and released 66 in a single day.

Extensive algal blooms hampered the fishing in 2022 and during the peak of a bloom in mid-July there were no sharks caught from the ports of Plymouth and Looe for eight consecutive days.

Again, large male *P. glauca* appeared in the WEC with fish up to 8 foot long reported. There were also numerous reports of female sharks with fresh bite marks, suggesting that mating continues to occur in these waters.

There were numerous young *P. glauca* reported in August with several year 0+ fish reported.

[Shark Angling Club of Great Britain (SACGB); Pat Smith Database]

Spurdog (*Squalus acanthias*)

There were large numbers of Spurdog (*Squalus acanthias*) present in the east and west of the WCO during 2022. Exceptionally large (11 kg) female fish were encountered in small groups (the species segregates sexually) whilst there was evidence of spawning aggregations in some areas during the autumn months.

[Kieren Faisey; Cornwall Wildlife Trust/Marine Strandings Network, Simon Thomas.]

Greenland Shark (*Somniosus microcephalus*)



Plate 8. 2. Greenland Shark, Newlyn, 13th March 2022. Image: Rosie Woodruffe.

On the morning of 13th March, a Greenland Shark was found dead, but seemingly in good condition, washed up at Newlyn, Cornwall. It was carried out to sea by the tide before it could be recovered for examination, but fortunately re-found two days later floating in Mount's Bay and brought ashore. It then went to the Cornwall Marine Pathology Team for necropsy.

The same individual (recognisable by the presence of small scars at the origin of the first dorsal fin) had live stranded on rocks on Île de Ouessant (Brittany) on 7 March 2022. After 20 minutes it struggled out to sea, swimming poorly (on its back at times).

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

The necropsy showed it to be an immature female with immature ovaries. It measured 3.95 m from tip of snout to tip of tail and weighed 285 kg. No claspers of any size were seen. It had initially live stranded, with evidence of sand in the stomach. It had not fed recently and there were possible signs of septicaemia. Further Investigations showed it to have been suffering from meningitis. This is believed to be the first report of meningitis in this species.

The Greenland Shark is a large, slow growing, long-lived species that is late to mature (about 150 years for females) and has limited reproduction and recruitment. They are known to live at least 400 years and grow to 7m. Hence, it is thought that this individual would have been about 100 years of age.

The head of the specimen was retained, preserved and is accessioned in the Natural History Museum, London, UK (BMNH 2022.3.30.1).

This is the third reported stranding of this species in Britain, and the only one south of the Tyne.

(Barnett, J.EF., *et al.* (2023) The first report of meningitis in a Greenland Shark (*Somniosus microcephalus*). [Journal of Comparative Pathology](#), Volume 203, 31-35.)

[Rosie Woodruffe/ZSL; James Barnett/Cornwall Marine Pathology Team; Sam Iglesias; Yves Desaunay; Alexandra Rohr/APECS; Rafael Banon Diaz; Juan Carlos Arronte; David Ebert]

Marbled Electric Ray (*Torpedo marmorata*)



Plate 8. 3. *Torpedo marmorata* from off Start Point on 11th February 2022. Image: Owen Malia

A Marbled Electric Ray was captured on 11th February by Owen Malia skipper of Dartmouth-based charter boat *Outlaw*. 20 miles SE of Start Point. There were two leeches attached.

[Simon Thomas; Owen Malia]

Common Stingray (*Dasyatis pastinaca*)

The Common Stingray is rare in the south-west, being more frequent east of the Isle of Wight. One was caught in crawfish nets off Newquay in August, and another in the south of Lyme Bay in October. They are also caught near the mussel farm off Sidmouth.

[Ben Lowe, Nathan Coxs; Ross Parham]

Pelagic Species

Atlantic Bluefin Tuna.

Atlantic Bluefin Tuna (*Thunnus thynnus*) (ABFT) were again seen in good numbers from August onwards. Some being seen in Torbay and Lyme Bay until February 2023.

A tuna was seen breaching off the Stones Reef, Godrevy, Cornwall at the end of January 2022 would have been a straggler from the previous year's stock.

Surprisingly, one of the first for the year was seen in King Point Marina, Millbay, Plymouth on 28th July.



Plate 8.4. Bluefin Tuna catching a Garfish off Land’s End on 10th September. Image: Constance Morris.

Off Cornwall the first summer sighting of was on 26th July, and the last on 25th December. Generally, in small numbers, frequently one or two, with some large shoals in August, September and October. Similarly, around the Isles of Scilly, they were observed from 4th August, until 12th October, commonly in low numbers, but with a shoal of up to 150 in mid-August. At times they were seen to be feeding on Garfish.

Along the south coast of Devon tuna were plentiful, but more spread out than 2021 and lacking the huge shoals of the previous year. Small groups of up to six tuna were seen off Berry Head in November. The last sightings were in February 2023, which is unusually late.

CEFAS’s Catch And Release Tagging (CHART) programme for Atlantic Bluefin Tuna used 25 angling charter boats along the south coast to bring alongside 1113 tunas to be measured and 1090 of these were marked with ‘spaghetti’ tags.

On 22nd September, a Bluefin Tuna hooked and brought alongside Kieren Faisey’s charter boat *Unleashed*, was of abnormal size for British waters. It measured over 3 metres nose to fork and was rotund; using the standard (CHART) formula it was estimated to be at least 545 kg. Previous large tuna were in the 300 – 385 kg range. This notable fish was revived and released boatside.

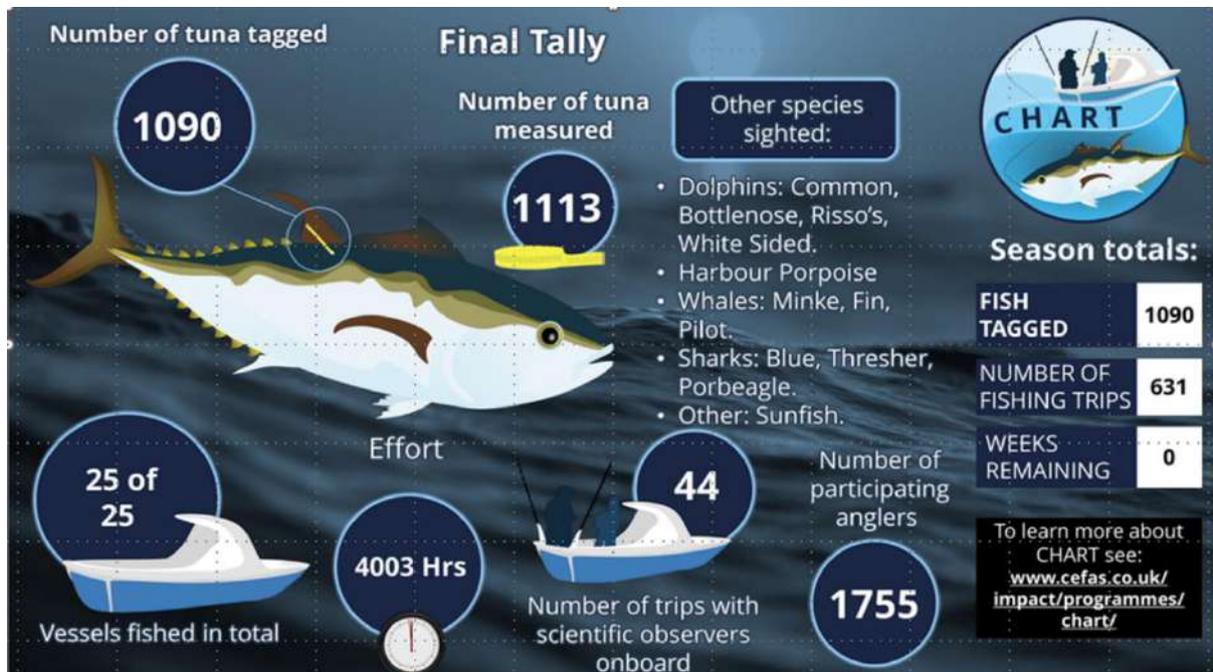


Figure 8.1. Results and Statistics from the 2022 CEFAS/CHART tagging programme for Atlantic Bluefin Tuna. CEFAS

[Environment Record Centre for Cornwall and the Isles of Scilly; Ross Parham; Isles of Scilly Bird and Natural History Review; Duncan Jones/Marine Discovery; CEFAS-CHART; Iain Hibbert; Kieren Faisey/Unleashed Fishing Charters; Rupert Kirkwood; Mike Langman.]

Other Tunas

An Albacore Tuna (*Thunnus alalunga*) was videoed swimming in Mayflower Marina, Plymouth, on 1st August. There was also a report of a shoal off the Lizard around the same time.

Two juvenile Bonitos (*Sarda sarda*) were caught off Falmouth in mid-August, and several were found off Beer, East Devon, in September.

[Ross Parham; Tom Stamp; John Sherlock/Exmouth Journal.]

Garfish



Plate 8.5. Garfish, Land's End, September 2022. Image Constance Morris

There were numerous Garfish (*Belone belone*) in the latter part of the summer off Land's End. These included large shoals, which the Bluefin Tuna were seen predated. In September anglers were catching them off East Devon, while others were catching large numbers from the Mount Batten Breakwater, Plymouth, which were feeding on sprats.

There was a report Short-beaked Garfish (*Belone svetovidovi*) being caught off Weymouth in October. The snout was significantly short, but this appeared to be the result of a healed injury, and so unlikely to have been this species.

[Constance Morris; John Sherlock/Exmouth Journal; Douglas Herdson; Tom Stamp; Jens de Vrieze.]

Skipper



Plate 8.6. Atlantic Saury, Westward Ho!, 23RD May 2022. Image: Rob Durrant.

An Atlantic Saury or Skipper (*Scomberesox saurus*) of about 22 cm was found apparently freshly stranded at Westward Ho!, North Devon, in May.

[Rob Durrant]

Flying Fish

There were several reports of flying fish (Exocoetidae) from the Celtic Deep, off Wales and in the south-west of England in August.

[Keith Hiscock; Simon Thomas.]

Small pelagics

'Baitfish'

In late September, Start Bay was full with thousands of wheeling Gannets and gulls feeding on small fish.

CEFAS PELTIC 2022 and other reports

CEFAS's eleventh autumn PELTIC survey studying the pelagic ecosystem of the western English Channel and Celtic Sea took place in October. Unfortunately, due to poor weather and other circumstances only 10 days of survey work was possible, instead of the planned 35 days. It covered the south coast from Portland to Land's End.

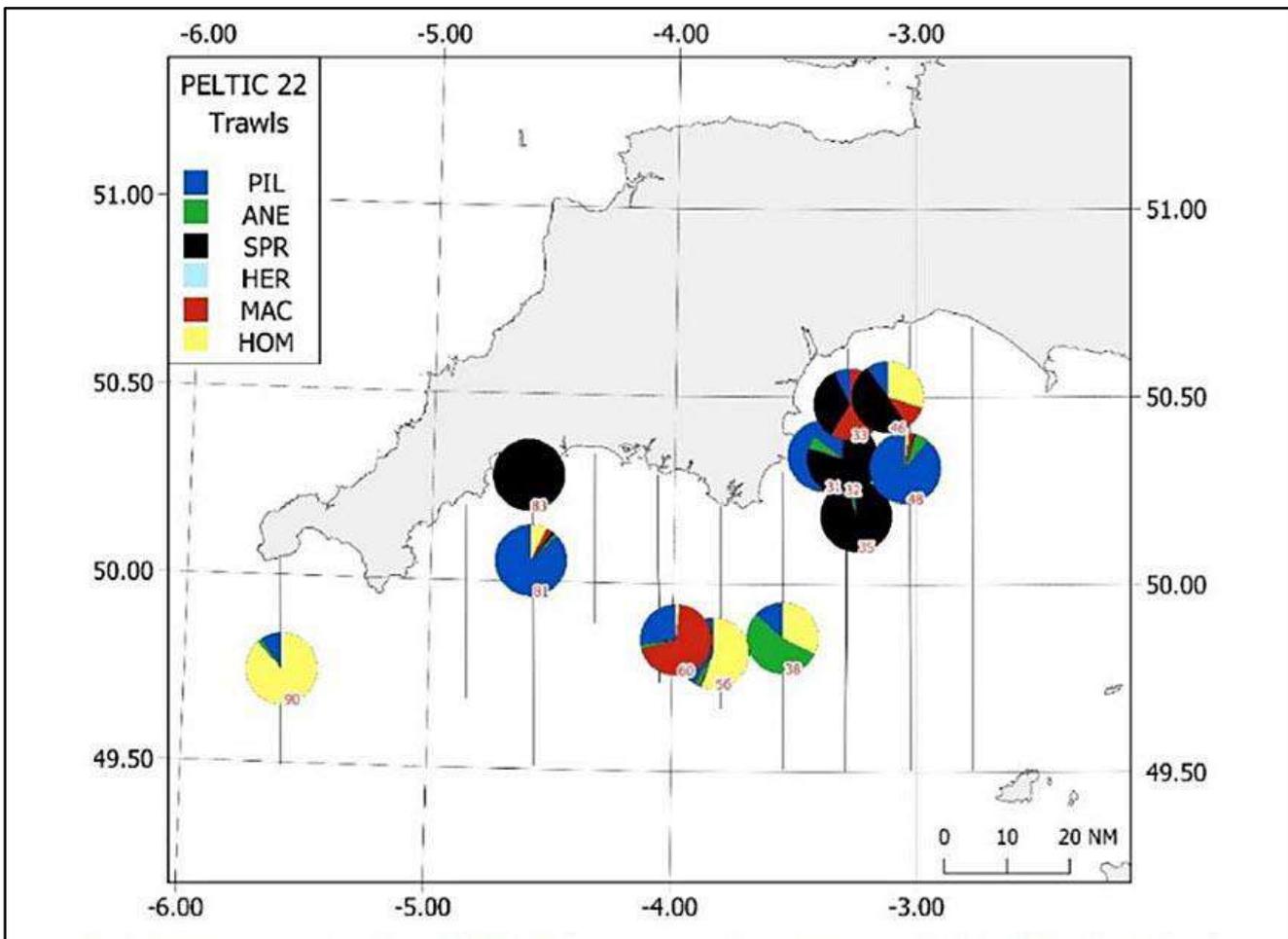


Figure 8.2. Overview map of the adjusted PELTIC22 survey area. Acoustic transects (black lines) and trawl stations (pie charts) with relative catch composition by key species. Three letter codes: PIL = Sardine, ANE = Anchovy, SPR = Sprat, HER = Herring, MAC = Mackerel, HOM = Horse Mackerel.

Sprat (*Sprattus sprattus*) were about their average biomass. They were abundant in Plymouth Sound in September.

Sardine (*Sardina pilchardus*) was, as usual, the most abundant small pelagic fish species in the survey area, probably with a slight increase in biomass. The stock was dominated by 0 group fish, but some age 2 cohort were present. The numbers of sardine eggs and larvae were lower than in previous years. Commercial catches of sardine were similar to recent years, indicating that the stocks are probably stable.

Dories

The amount of John Dories seemed to be down, but a number of large ones of up to 2.6 kg were caught by anglers.

The sailfin or silver dory (*Zenopsis conchifer*) caught off Cornwall in May was the 17th found in British waters.

[Richard Michael Coombs, Ross Parham; Simon Thomas.]

Seahorses

At least 70 seahorses were recorded in the south-west in 2022. This is an increase from the previous year when 50 were registered in Dorset, Devon and Cornwall, but whilst this could indicate an improving situation for these fish, it could be a reflection of increased observer activity.

A striking feature is that, while it had commonly been thought that they retreated to deeper water in the stormy winter period and returned inshore in late spring, seahorses were observed in shallow water throughout the year. Interestingly, a spiny seahorse was found on Bournemouth Beach on 31st December **2021**, and returned to the sea alive.

18 short-snouted seahorses (*Hippocampus hippocampus*) were recorded; along with 51 spiny seahorses (*Hippocampus guttulatus*) and one unidentified one (*Hippocampus* sp.). No *H. guttulatus* were seen in Devon.

Chloe and Chris Brown who are studying *H. guttulatus* in Weymouth Bay are developing a photographic register which allows them to recognise individual fish by their pattern of spots.

[Seahorse Trust; Environment Record Centre for Cornwall and the Isles of Scilly; Patience Saunders; Cornwall Wildlife Trust/Marine Strandings Network; Devon Live; BBC News online; Steve Trehwella; Natural England.]

Deep-snouted Pipefish (*Syngnathus typhle*)



Plate 8.7. Deep-snouted Pipefish (*Syngnathus typhle*) in Portland Harbour Dorset. Image: Craig Pinder.

The Deep-Snouted or Broad-Nosed pipefish appears to be rarely recorded despite divers and snorkelers spending considerable time in seagrass beds, the pipefish's preferred habitat. There are 79 records on the NBN Atlas (<https://nbnatlas.org/>) and even fewer (28) in the JNCC public snapshot for Marine

Recorder (<https://hub.jncc.gov.uk/assets/b9934e31-39b6-41f9-9364-d1e93db68307>). Craig Pinder recorded this fish from seagrass beds in Portland Harbour, Dorset in January, March and May. It is very likely under-recorded given its excellent camouflage and habit of moving in perfect unison with the seagrasses and algae around it.

[Craig Pinder]

Scorpionfish

In April a Red Scorpionfish (*Scorpaena scrofa*) was caught by a Brixham trawler. Although rare (about two in three years), this is the commoner of the two species that can occur in Britain (the other being *Scorpaena porcus*, the Small-scaled or Black Scorpionfish).

[Ross Parham; Simon Thomas.]

Gurnards

[The first Streaked Gurnard (*Chelidonichthys lastoviza*) for Southampton Water was found in February.]

An angler caught the British record Grey Gurnard (*Eutrigla gurnardus*) of 1.16kg, 20 miles south of Start Point in April.

[Robin Somes; Ross Parham]

Sculpins or Bullheads



Plate 8.8. Norway Bullhead (*Micrenophrys lilljeborgii*), Newquay, Cornwall. Image: Matt Slater.

There were a number of reports of the small Norway Bullhead (*Micrenophrys lilljeborgii*) from the area in 2022. There were three records from Dorset waters in July and August: two on wrecks and one on a *Sabellaria spinulosa* (Ross Worm) reef. There was also a Cornish record from a rocky reef off Newquay. Again, this is another fish which is probably under recorded and is most likely to be identified as a juvenile Long-spined Sea Scorpion (*Taurulus bubalis*). Further, the common name of Norway Bullhead suggests a northern

distribution and therefore could be dismissed as a possibility as being out of range. There are good records for this fish as far east as Dorset, from Pembrokeshire, the Channel Islands, and numerous records from the French coast of western Brittany as well as a number of Scottish records. This shows that it is likely to be widely distributed in our area. The records for this fish, most from divers, demonstrate the great value of affordable digital cameras in species recording.

[Lin Baldock, Matt Slater, Sarah Bowen]

Serranids

In October a 25 cm Sotted Bass (*Dicentrarchus punctatus*) was caught and released by an angler on the Isle of Wight. The only confirmed records of this species that I am aware of are from Jersey in 1996 and Clacton in 2000, although a few years back there were unconfirmed reports of them in the Kingsbridge Estuary.



Plate 8.9. A Comber (*Serranus cabrilla*), photographed on The Bizzies (Falmouth Bay) on 2nd October 2022. Image: John Blackwell.

The Comber (*Serranus cabrilla*) is one of the smallest members of the groupers which is relatively common from southern Africa to the Mediterranean. However, until recently it was an uncommon fish in British waters, only occurring occasionally. It has become more frequent in the last few years, but 2022 was exceptional with at least 20 being encountered. The majority were seen in the vicinity of the Channel Islands, but they are also getting commoner off Cornwall and Devon. The first one photographed underwater in Britain was seen off the

Bizzies in October.

Table 8.1. Combers *Serranus cabrilla* in the South-West in 2022.

Date	Location	Comments
23/06/2022	Just off Alderney harbour	c.17 cm, in 10m water. Dazza Trent

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

28/06/2022,	Around the Channel Islands	c. 227g, in 18-20m water. Spot on Charters, Ross Parham
30/08/2023	Off Looe	Sara Woodley
29/06/2022,	Around the Channel Islands	c. 113g, in 18-20m water. Spot on Charters, Ross Parham
29/06/2022	Just east of Sark	Dazza Trent
June and July	Around Sark	A further 8 to 10 Combers. Spot on Charters, Ross Parham
16/09/2022	Off Plymouth	Madalein Bradshaw, MMO
17/09/2022	West of Hands Deep	Mirage Charters, Dave Uren
19/09/2022	Brendon's, SW of Hand's Deep	Mirage Charters, Dave Uren
29/09/2022	West Rutts, Bigbury Bay	Mirage Charters, Dave Uren
2/10/2022	The Bizzies, Falmouth Bay	Photographed underwater, John Blackwell
2022	Plymouth Sound	Bill Hewitt and Peter Hewitt
2022	Bigbury Bay	Bill Hewitt and Peter Hewitt

[Shaun Graham, Robin Somes; Richard Lord; Dazza Trent; Matt Slater; Madalein Bradshaw; Chris Webb; Simon Thomas.]

Sea Breams

The semi-pelagic sea bream, the Bogue (*Boops boops*) is becoming fairly widespread. Fish were found off Weymouth and Portland in January and December. Most caught in British waters are around 25 cm, but in April a notable large one of 38 cm and 600 g was caught near the Eddystone light.

The formerly rare Couch's Sea Bream (*Pagrus pagrus*) is now fairly well established in Dorset, Devon and Cornwall. They were photographed in the Fal, and what would have been a new record fish of at least 4.28 kg was caught off Penzance in April. It was gravid, and in line with modern sea angling practice returned alive, and consequently not eligible for a record.

In July three anglers were fishing from separate boats within 200 m of each other in the upper Kingsbridge Estuary. One was targeting Couch's bream, while two were catching Gilthead Bream (*Sparus aurata*).



Plate 8.10. A Pandora, off Plymouth, on 17th September 2022. Image: Ray Evans.

The Pandora (*Pagellus erythrinus*), whilst always rare, was until 1997, commoner than Couch's bream but is now rarely seen. Hence it was unusual to have one caught in Plymouth Sound, close to the Mount Batten breakwater.

[Wayne Copperthwaite; [Lee Selby](#); Madalein Bradshaw; Kieren Faisey/Lo Kie Adventures; Mike Etheridge; Ray Evans; Bob Earll.]

Red Bandfish

The Red Bandfish (*Cepola macrophthalmia*) is usually found in deep mud in sheltered waters, such as Plymouth Sound, but it was most unusual to have one caught by a kayak angler at South Pool in the Kingsbridge estuary in June.

[Mike Puleston]

Wrasse

Scale-rayed Wrasse (*Acantholabrus palloni*) is a less well-known wrasse in British waters, on which Mike Markey has undertaken a study. Jonathan Couch found two in the 19th century, but then none were reported until three in 1986,

singles in 1992 & 2011 and two more in 2016. Hence it is most notable that a further two were caught in 2022. In September an angler captured one south of Looe, and in October at Godrevy one turned up in a crab pot at 90m north west of Godrevy Island, north Cornwall.

Baillon's Wrasse (*Symphodus bailloni*) continues to be reported by Seasearch divers from Poole and Weymouth Bays.

In April a male Corkwing Wrasse (*Symphodus melops*) was observed tending two nests a couple of metres apart, under Swanage Pier.

[Lin Baldock, Murray Collings; Mike Markey; Ben Lowe.]

Blennies



Plate 8.11. A pair of Black-faced Blennies (*Tripterygion delaisi*) in Portland Harbour, Dorset. Image: Craig Pinder.

The Black-faced Blenny (*Tripterygion delaisi*) was reported to be absent from its haunts in Devon (Babbacombe and Plymouth Sound) by Terry Griffiths. Paul Naylor did not record any on the south Devon coast but did observe a courting pair at Porthkerris, Cornwall in October. This contrasts with the situation in Dorset where fish were recorded in Portland Harbour as early as the middle of January with displaying pairs present towards the end of April. By June Craig Pinder was reporting up to 10 breeding pairs at a site off Sandsfoot Castle in the sheltered northwest part of Portland Harbour. Breeding pairs were noted under Swanage Pier during the first week of May.

They were also common last year at the Ecrehous, which is some six miles off Jersey.

This species is common at some sites in Dorset and it is possible that it is now considered 'normal' and consequently sightings are not diligently reported.

[Craig Pinder, Jacob Broughton-Venner, Lin Baldock, Paul Naylor, Terry Griffiths; Nicolas Jouault]

Montagu's Blenny (*Coryphoblennius galerita*) is a small blenny rarely reported by divers or rock poolers. It has a south-western distribution but with wide gaps in its apparent range. It was recorded from Dorset sites at Bournemouth Pier in January and was present at Swanage Pier in its normal haunts on most visits through to early October.

Paul Naylor is continuing his long-term study of Tompot Blennies (*Parablennius gattorugine*) in Wembury Bay, Devon, where he has shown individuals are recognisable by their distinctive skin markings. The study now includes a second shallow reef location with several rocky crevices inhabited by males that are visited by egg-laying females. Males typically retain a crevice territory for two to three years, with one individual keeping his for an impressive seven years. Other behavioural observations, including males engaging in rapid swimming behaviour when approached by a female, and younger males using alternative 'sneaker' tactics to fertilise eggs before becoming 'bourgeois' territory-holders themselves, have been reported in the *Journal of Fish Biology* (Naylor *et al.* 2023, **102**, 542-545).

Variable blennies (*Parablennius pilicornis*) were recorded at Firestone Bay, Plymouth by Paul Naylor and by other divers there. Individuals were seen by Paul Naylor at Firestone Bay on every dive between May and October. Males were guarding eggs in early May with eggs present at least into July. Paul is studying the significance of the various colour forms this blenny shows. Mike Markey reported a male guarding eggs in the middle of July in Weymouth Bay, Dorset and a number of small individuals were reported on deeper reefs in the eastern part of Lyme Bay in July and August. This blenny is now a regular sight on Dorset's Lyme Bay reefs and is becoming commoner east of Portland Bill and in Portland Harbour. In June Keith Hiscock reported seeing many fewer Variable Blennies in 2022 than in previous years around Plymouth.

[Lin Baldock, Paul Naylor, Mike Markey; Keith Hiscock]

Dragonets



Plate 8.12. Displaying male Reticulated Dragonet (*Callionymus reticulatus*) in Cawsand Bay, Cornwall. Image: Mike Markey.

The Reticulated Dragonet (*Callionymus reticulatus*) is consistently confused with the much more widely occurring Common Dragonet (*Callionymus lyra*) and there are few reliable records for *C. reticulatus* around the south-west though it is known from the Helford and Fal Estuaries. Chris Lewis has developed a reliable technique to distinguish females and immature males of these two species which measures the relative proportions of the saddle marks on the back of the fish. Adult males can be reliably distinguished by colour and the form of the dorsal fins.

[Chris Lewis, Mike Markey]

Gobies

The Giant Goby (*Gobius cobitis*) appears to be frequent around the south-west with a report of a large individual in a rock pool at the back of a cave. Matt Slater continues with his interest in recording this species around the Cornish coastline. At least eight were recorded from rock pools on St Agnes, Isles of Scilly, but these need to be confirmed.

Couch's Goby (*Gobius couchi*) continues to be recorded from Dorset in Portland Harbour and environs with reports in early May (very few gobies of any species seen on that occasion) and in July from the northwest sector of Portland Harbour by Craig Pinder, the first report by any observer from the harbour other than myself, and a sighting from just outside the port on silty, boulder reef. The lack of reports for this goby from this very popular venue for underwater photographers is surprising. This rare species is probably being confused with other more common *Gobius* species namely the Rock Goby (*Gobius paganellus*) and the Black Goby (*Gobius niger*) and therefore considered to be of "no interest".



Plate 8.13. Steven's Goby with eggs, Plymouth Sound, May 2022. Image: Paul Naylor.

Steven's Goby (*Gobius gasteveni*) is being monitored by Paul Naylor at a site in Firestone Bay, Plymouth on rocky reef at a depth of about 12m. A male was recorded guarding eggs in late May and fish were seen on virtually every dive from May to December with the first record in early May.

Matt Slater reported that Steven's Goby is common in Falmouth Bay as well as in the Fal and Helford estuaries. He also noted many individuals in St Austell Bay near a mussel farm in a

habitat of maerl-rich sediments and low rocky reefs.

Guillet's Goby (*Lebetus guilleti*) continues to be recorded from Dorset with two reports from maerl-rich sediments in Weymouth Bay in June and July. This is typical habitat for this goby in the county, a species greatly under recorded because of its small size (<2cm). Guillet's Goby was illustrated in the 2021 report.

[Matt Slater/Cornwall Wildlife Trust; Isles of Scilly Bird and Natural History Review; Paul Naylor; Luke Walker New; Lin Baldock; Craig Pinder; Richard Yorke]

Blackfish

Two 'fair sized' Blackfish (*Centrolophus niger*) (combined weight 2.16 kg.) were landed to Plymouth Fish Market in mid-September. They had been caught by F.V. Kelly of Ladram in hake nets in the Celtic Sea, south of Ireland.

[Mark Heslop]

Triggerfish

At least 77 Grey Triggerfish (*Balistes capriscus*) were reported as seen in the area in 2022 compared with 38 in 2021. It was a relatively good year for them, and these numbers are obviously an underestimate of a fish that was regularly caught by anglers and spearfishermen. Most reports came from the Plymouth area and both coasts of Cornwall.

One of the first sightings was of one attacking a diver's camera, off Plymouth on 17th June. A few were seen along the coasts at this time, but the majority were encountered in July and August, with the last live sighting in the middle of September (about the same time as in 2021).

Anglers were said to have caught several around Sutton Harbour, Plymouth, early in the season. In the Yealm Estuary one angler caught and released 18 in a single day in August; one was seen swimming around in this area in September.

One was found dead stranded at Porth, Newquay, in January and another at Polzeath. No more dead strandings were reported until one was found at Perranporth in November. Subsequently, in December there were six found on beaches in north Cornwall, one at Porthcurno and one in Paignton, Devon.

Triggerfish are traditionally considered to disappear or probably die off in early winter, returning to inshore waters in June or July. However, there have been two separate reports of triggerfish probably overwintering in British waters, one from Fowey Harbour and the other from Sutton Harbour, Plymouth. This seems a subject worth further investigation, and I would be happy to receive any such reports, and signs of breeding should also be looked for.

[Nick Collins; Plymouth Sound Divers; Kieren Faisey; Cornwall Wildlife Trust/Marine Strandings Network; Tracey Williams; Emma Kenyon/UK Triggerfish Project; Coral Smith/Devon Wildlife Trust; Mike Crane; Leigh Clarke; Cathy Turtle; Peter Cole; St Agnes Marine Conservation Group; Keith Hiscock; Alix Harvey.]

Pufferfish



Plate 8.14. Oceanic Puffer Fish *Lagocephalus lagocephalus*, Towan beach, Newquay, 19 November 2022. Image: Constance Morris.

An Oceanic Pufferfish (*Lagocephalus lagocephalus*) was found on the shore at Towan Beach, Newquay in November. They turn up every few years, singly or in small numbers, often in autumn. This is the third in the south-west in the last four years.

[Constance Morris]

Fish parasites



Plate 8.15. A rare sighting of a fish louse (*Anilocra* sp) on a Rock Goby (*Gobius paganellus*). Portland Harbour, Dorset. Image: Craig Pinder.

The large Fish Louse *Anilocra* sp. increasingly infests populations of various fish species, wrasse in particular. Reports from divers, snorkelers and anglers would suggest that the numbers are increasing. Craig Pinder found levels of between 5-10% infested fish (mostly Corkwing Wrasse, *Symphodus melops*) in seagrass beds in Portland Harbour, Dorset in March, April and June. It was also recorded on Sea Stickleback (*Spinachia spinachia*) and Rock Goby (*Gobius*

paganellus). Small individuals of the isopod are often found on the Two-spotted Goby (*Pomatoschistus flavescens*) where it was noted that the proportion of fish carrying an isopod increased from winter through spring under Swanage Pier.

[Craig Pinder, Lin Baldock]

Turtles

Information from: BDMLR - British Divers Marine Life Rescue; ERCCIS – Environment Record Centre for Cornwall and the Isles of Scilly; IoSBNHR – Isles of Scilly Birds and Natural History Review; IoSWT – Isles of Scilly Wildlife Trust; MCS – Marine Conservation Society; MSN – Cornwall Wildlife Trust, Marine Strandings Network; MTR - British Isles & Republic of Ireland Marine Turtle Strandings & Sightings.

Conclusions

- Amongst the fewest turtles recorded in the area for many years.
- A cold-stunned juvenile Loggerhead was the first of several, most of which were found in early 2023.

Report

Table 8.2. Turtles reported in the south-west in 2022. ERCCIS – Environment Record Centre for Cornwall and the Isles of Scilly; MSN – Cornwall Wildlife Trust, Marine Strandings Network; IoSWT – Isles of Scilly Wildlife Trust

Date	Record no.	Turtle species	Location	Status	Comment
18/03/2023	T2022/04 to 06	Unidentified	Off St Anthony's Head, Portscatho	Alive swimming	Three, possibly Leatherbacks, seen from the shore. Lyn Hawken, via Seawatch Foundation.
02/04/2022	T2022/15	Leatherback	Portmellon, Mevagissey	Dead decomposed	MSN. Too decomposed to identify to species.
11/08/2022	T2022/13	Leatherback	The Manacles, Cornwall	Alive swimming	Seen from boat and dived. Brendan Godley and Nicola Weber
20/09/2022	T2022/14	Leatherback	Bristol Channel	Alive, entangled	Found entangled in pot ropes and released by the fisherman. Coral Smith, Wembury Marine Centre, DWT
16/11/2022	T2022/12	Loggerhead	Church Cove, Gunwalloe, The Lizard	Live stranding	A juvenile male 28.5 cm, cold stunned with large number of goose barnacles attached to the rear of the plastron. Died on the

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					10th of December due to malnutrition. Mrs J M Pearson, via MSN
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Reports of strandings and sightings of marine turtles in British and Irish waters in 2022 were one of the fewest of recent years. Only the ‘Covid Year’ of 2020 being lower.

Similarly, the count from the south west was one of the lowest on record with seven turtles reported in the region, three of them in a single sighting. Apart from one juvenile Loggerhead (*Caretta caretta*), they were all Leatherback



Turtles or Leatherbacks (*Dermochelys coriacea*). This is the normal pattern, but different from 2021, when there were more ‘hardshell’ turtles (Loggerhead and Kemp’s Ridley (*Lepidochelys kempii*)), than Leatherbacks.

Plate 8.16. Young Loggerhead Turtle, Gunwalloe, Cornwall, 16th November 2022. Image: Steve Matchett/ Blue Reef Aquarium.

The 28.5 cm cold-stunned Loggerhead in December was one of the first of a number that were found during last winter. It was remarkable in having a large number of goose barnacles, weighing 230g, attached to the rear of the plastron. This was amazing on a 457g turtle.

Table 8.3. Numbers of turtles reported in south-west England and in Britain and Ireland from 2017-2022.

	South-West England			Britain and Ireland		
	Leatherback	Other and unidentified*	Total	Leatherback	Other and unidentified*	Total
2022	3	4	7	8	7	15
2021	3	5	8	19	14	33
2020	4	1	5	9	5	14
2019	13	1	14	13	5	18
2018	17/18	2	19/20	17	2	19
2017	8	5	13	28	9	37

*Many unidentified turtles were probably Leatherbacks

9. Marine and Coastal Birds South-West

Edited by Alex Banks, with contributions from Richard Archer, Rosie Ellis, Mark Grantham, Vickie Heaney, Sophie Lake, Paul St Pierre, Ruth Porter and Claire Smith.

Contact: alexnbanks@gmail.com

Conclusions

- Breeding seabird colonies in the South-West seemed to have **largely escape the worst effects of the Highly Pathogenic Avian Influenza outbreak** which badly affected seabirds in other regions of the UK.
- Nonetheless, some **dead and dying birds were washed up on beaches in Cornwall and Scilly**, with about 400 dead gannets recorded on land and at sea. Surviving gannets with 'oily' black irises were observed, which is emerging as a feature of previous infection in gannets surviving the disease.
- **Little Terns at Chesil Beach had the most productive year in living memory**, with between 1.1 and 1.6 chicks per pair thanks in part to dedicated conservation action. Other terns in Dorset (Sandwich, Common) also had reasonably productive breeding seasons.
- **Mixed results from Scilly**, where Manx Shearwaters continued to recover but storm-petrels faced setbacks from mammalian predation.
- **Productivity on Lundy was relatively poor** from the Guillemots, Fulmars and Puffins monitored, although Puffin distribution seems to be expanding since rat eradication.
- Apart from at Lundy, **Kittiwake productivity was very low** at all sites monitored in Devon and Cornwall and the species can be considered as highly vulnerable in the South-West.
- Numbers of **Guillemots and Razorbills were generally stable or increasing** across the region, with new peaks on the Dorset cliffs.
- Impressive counts of post-breeding Shearwaters in Cornwall, including an incredible **10,000 Great Shearwaters** passing Bass Point in October 2022.

Introduction



Plate 9.1. Recovering a dead Gannet, the victim of HPAI, in the Isles of Scilly. Image: Isles of Scilly Wildlife Trust.

Regular seabird productivity monitoring at the Isles of Scilly, Lundy, Straight Point, (Devon), Portreath (Cornwall), Brownsea Island, Lodmoor, Abbotsbury and Chesil Beach (all Dorset) continued in 2022. Abundance monitoring also took place at Berry Head (Devon) and the Purbeck Cliffs (Dorset).

In the non-breeding season, the long-running [Wetland Bird Survey](#) 'Core Count' scheme surveying birds mainly at roost on high tides, continued to cover the majority of important estuarine and coastal sites in the South West. In winter 2021/22, the Helford, Kingsbridge, Fowey and Hayle Estuaries were surveyed at low tide.

Luckily, most seabird breeding colonies in the South-West were spared the worst of the impacts of the 2022 Highly Pathogenic Avian Influenza (HPAI) outbreak. The disease severely

impacted populations of Great Skuas, Gannets and Sandwich Terns in more northerly colonies, and by the time it reached southern areas many birds had finished breeding and dispersed. However, 397 Gannets were reported from Cornwall beach strandings and site wardens in August and September, as well as 44 dead Herring Gulls. A handful of other species (six Guillemots, two Shags, two Fulmars, single Puffins and Razorbills) and a few unidentified birds were also recovered. The true scale of impact will only be understood once planned surveys of key colonies are completed in 2023.

[AON = Apparently Occupied Nests]

Nesting seabirds

A summary of abundance and productivity records from across the South-West is shown in Tables 8.1 and 8.2. Regional experts provide a breakdown of the 2022 breeding season in the sections below. (Future SWME reports will start to provide trend information once the national seabird census, Seabirds Count, publishes its results).

Isles of Scilly

Vickie Heaney, Seabird Ecologist, Isles of Scilly Wildlife Trust

Manx Shearwaters

The Manx Shearwater breeding population has increased from 22 pairs in 2013 (pre- rat eradication) to at least 82 pairs in 2022 (post- rat eradication); recently developed site-specific methodologies have allowed us to increase this estimate to 145 Apparently Occupied Burrows.

Breeding performance was near identical to 2021, with 56 ‘star-gazing’ chicks recorded (29 St. Agnes, 27 Gugh). Again, no fledging was recorded at the sub-colony on Bryher or Peninnis, St. Mary’s, with rat presence.

35 wooden nest boxes were installed on Annet early in the year and it is hoped that shearwaters and/or possibly storm petrels will occupy them in future, with the option to deploy remote cameras and follow nesting attempts more closely.

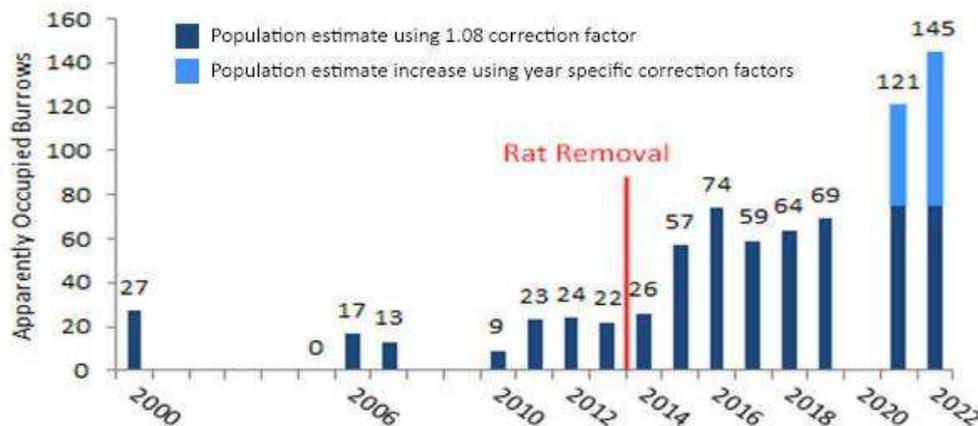


Figure 9.1. Changes in the abundance of Manx Shearwaters on St Agnes and Gugh, Isles of Scilly.

European Storm Petrels

Recorded breeding again on St. Agnes and Gugh (first records 2015, post rat eradication). However, the population appears to be much reduced following recent domestic cat predation (first seen 2019) and no calling chicks were recorded in 2022 (11 in 2021).

An incursion of rats was discovered on Round Island in January 2022 (previously recorded rat free in 2015.) Although the rats were successfully cleared before the breeding season, a later breeding survey for storm petrels found that the number of apparently occupied sites was reduced from 172 in 2015 to just 11 in 2022.

Lesser Black-backed Gulls

The LBBG colony on Gugh supported 399 pairs (875 in 2006, but regularly around 400 since 2012, and 397 in 2021).

Drone surveys using a local contractor on Gugh were successful for breeding numbers and fledging counts. No adverse behavioural reaction observed at 30 m drone height.

Productivity was high (1.35 chicks per pair).

Herring Gulls

Selected sub-colonies on Samson and in Hugh Town, St. Mary's were monitored as usual. Productivity of 0.41 chicks per pair on Samson (n = 32) and 1.65 chicks per pair in the Hugh Town rooftop sub-colony (n = 17).

Kittiwakes

The return of 11 breeding pairs on the east side of Gugh after no breeding attempts at all in 2021. However, just four chicks fledged; 0.36 chicks per pair.

Fulmars

At selected sub-colonies Menawethan (n = 35) and Daymark (n = 51) productivity was below average, ranging from 0.34 to 0.45 chicks per pair, though a bit lower than 2021.

Common Terns

After 18 pairs laid on the south end of Annet in 2021, the first successful nesting since 2017, no pairs bred in 2022.

Cornwall

Mark Grantham, Chairman, Cornwall Bird Watching & Preservation Society.

Looe Island

Limited recording continued:

Cormorant – 45 AON (third highest count); shag – 16 AON (highest ever count); Great Black-backed Gull – 72 AON (lowest since 2017) with 69 chicks ringed as part of ongoing monitoring; herring gull – 128 AON (highest ever count, previous was 123 in 2020); oystercatcher – 21 AON (joint highest ever with 2017 and 2018) but <10 chicks fledged.

Mullion Island

Cormorant – 69 AON (slightly down on 2021); Great Black-backed gull – no nest count and no ringing due to HPAI restrictions and inclement weather.

Kittiwake colonies

Porthmissen – 203 AON (549 individuals) on 6th June, but only 48 AON by 6th July and colony abandoned by 28th July (328 AONs in 2021).

Western Cove, Portreath – Max count of 455 in June, with over 250 AONs, but very late and limited egg-laying. Of just 56 monitored nests (lowest total since 2016), two failed to lay, 38 failed at the egg stage, 16 failed at the chick stage. Colony abandoned soon after failures.

Trewavas Head – The two main sites failed again (fourth year running) with the newer site at Trequean holding <15 AONs, fledging no chicks. Some birds had occupied a new site <1km along the coast (Parc Trammel), with at least 25 AONs late in the season.

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Trequean Zawn held local birds ringed as chicks in 2015 (2), 2016 (2) and 2018, and adults ringed in 2013, 2016 and 2018. Also French chicks ringed in 2011 (later moved to Parc Trammel) and 2014.

Parc Trammel also had French chicks ringed in 2013 and 2014 (first sightings in Cornwall).

Lundy

Rosie Ellis, Warden

Puffins

A lower survey effort this year resulted in only 128 active burrows counted (63% decrease from 2021). Numbers likely still stable or increasing (a full survey in 2023 will allow this to be confirmed). Puffins still appear to be spreading away from Jenny's Cove with more being seen elsewhere along the West Coast and North End.

Fulmars

27 occupied sites (34 in 2021). However, 14 chicks fledged (16 in 2021) at 0.52 chicks per pair (0.47 in 2021).

Kittiwakes

A small success story for kittiwakes at Aztec Bay: the number of fledged young in 2022 was 66 (19 in 2021) at 0.63 chicks per pair.

Guillemots

A poor breeding year at St Mark's Stone. 138 confirmed active nests (94 less than 2021) with only 56 fledged young (82 fewer than 2021), a productivity rate of just 0.39 chicks per pair.

Herring Gulls

315 AON were recorded in 2022, up from 248 in 2021. However, this still represents a 59% decline from the year 2000 (762 AON).

Lesser Black-backed Gulls

119 AON were recorded in 2022, up from 91 in 2021. However, this still represents a 73% decline from the year 2000 (443 AON).

Great Black-backed Gulls

The population seems largely stable, with 43 AON recorded in 2022.

Mainland Devon

Ruth Porter, Natural England

Straight Point, Exmouth



Plate 9.2. A Raven amongst kittiwake nests at Straight Point in south Devon. Image: Ruth Porter.

It was another extremely poor breeding season for the kittiwakes at Straight Point. A raven was seen preying eggs in the early part of the season, and many nests were abandoned. Birds were more successful in less accessible nest locations.

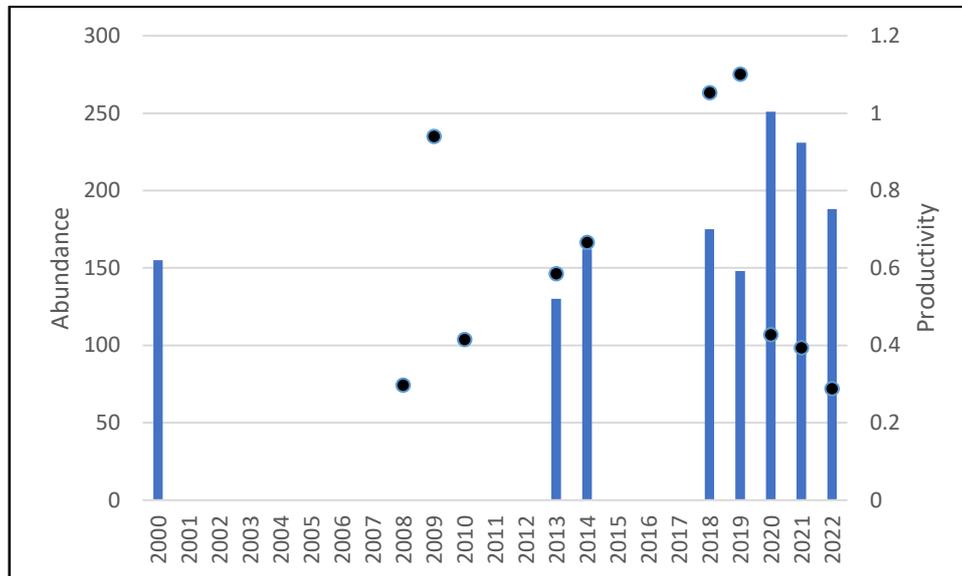


Figure 9.2. Abundance (AON) and productivity (chicks per pair) of breeding Kittiwakes at Straight Point, Exmouth.

Dorset

Richard Archer, Conservation Officer, RSPB

Tern colonies in Dorset had a productive year in 2022, with notable breeding successes for little terns at Chesil Beach, Sandwich terns at Brownsea Island and common terns at Abbotsbury.

Brownsea Island

A largely productive year at this colony, for all species other than common tern. Sandwich Tern – 227 AON, 0.92 chicks per pair; Common Tern – 156 AON, 0.51; Black-headed Gull – 217 AON, 1.59 chicks per pair; Herring Gull – 2 AON, 1.00 chicks per pair; Great Black-backed Gull – 16 AON, 1.13 chicks per pair.

Abbotsbury

Common Terns: 100 pairs nested with productivity excellent at 1.20 chicks per pair – a big increase from the 25 pairs and 0.80 chicks per pair in 2021, largely owing to some habitat management work.

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

Black-headed Gulls: approx. 25 pairs nested, raising 2.00 chicks per pair.

Lodmoor

Common Terns: 64 pairs nested with productivity at 0.86 chicks per pair.

Chesil Beach

Little Terns: Between 40 and 49 AONs were recorded (including some individuals re-laying). Productivity was extremely high, at 1.1 – 1.6 chicks per pair (meaning 55 – 60 chicks fledged). Compared to, for instance, 0.05 chicks per pair in 2021, this was a fantastic result for the colony and testament to the dedication and hard work of all involved to enable the terns to breed.

Purbeck Cliffs

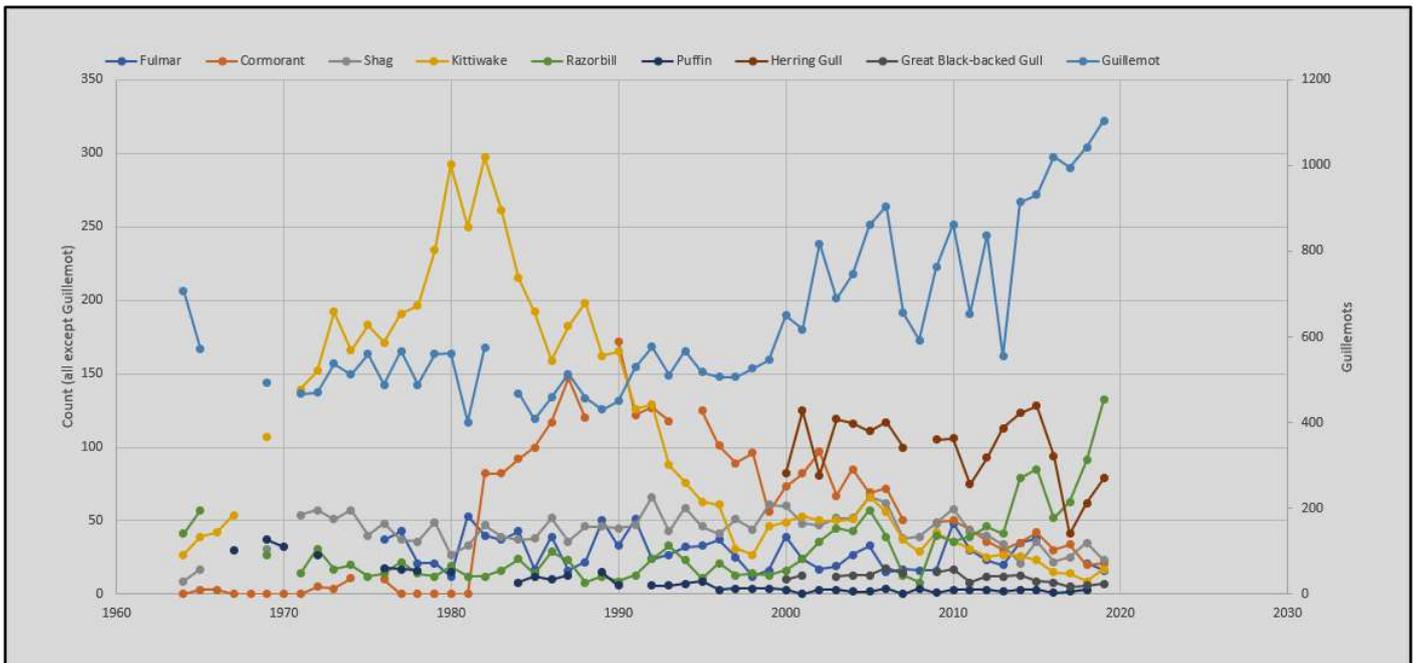


Figure 9.3. Summary of breeding seabird population changes between Old Harry and St Aldhelm's Head in Dorset. From: Lake, 2022.

Footprint Ecology carried out a survey of the coastal cliffs in Dorset (Lake, 2022):

- Both Guillemot and Razorbill reached new peaks (1652 and 194 respectively).
- 40% increase in Herring Gull nests (since lowest ever number recorded in 2021).
- A handful of Great Black-backed Gull nests, notably at Ballard (again, lowest ever record was 2021).
- A marginal increase in Fulmar (to 18% of peak count in 1981 and 4 of 13 historic sites occupied).
- Partial Cormorant count suggests upturn in 2022 (lowest ever nest count in 2021).
- Shag numbers steady-ish at around 50% of peak count but no nests at Blackers or Gad Cliff for the first time.
- Decrease in Kittiwake nests to 12 – the second lowest (following marginal increase 2019-2021).
- Puffins seem stable at c. 2 breeding pairs – but no sub-adults returning to colony noted, as usual.

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

Table 9.1. Count data for south-west counties held by SMP database for 2022. PU: Atlantic Puffin; GU: Common Guillemot; CN: Common Tern; F.: Northern Fulmar; GB: Great Black-backed Gull; CA: Great Cormorant; HG: Herring Gull; KI: Black-legged Kittiwake; LB: Lesser Black-backed Gull; MX: Manx Shearwater; RA: Razorbill; SA: European Shag. CN, CA, GB, HG, BH, KI, LB SA – Apparently Occupied Nests; F. – Apparently Occupied Sites; GU, RA – individuals; PU – individuals on the sea; MX – Apparently Occupied Burrows.

	PU	GU	CN	F.	GB	CA	HG	KI	LB	MX	RA	SA	Total
Cornwall		112		34	72	45	182	203			86	42	776
Looe Island				3	72	45	129					14	263
Mawgan - Bedruthan				18								19	37
North Cornwall 3		112						203			86		401
Park Head to Porth Mear				13			53					9	75
Devon		829			49		343	188	119			44	1572
Berry Head 1		739											739
Bolt Tail 1					3		6					20	29
Lundy					43		315		119				477
Ore Stone		90											90
Soar Mill Cove - Bolt Head					3		22					24	49
Straight Point								188					188
Isles of Scilly	36		0	47	192		66	11	406	269	4	98	1129
Annet	36		0	37	188		17		5		4	98	385
Gugh			0	0	4		31	11	399	80		0	525
Hugh Town							15						15
St Agnes			0	10	0		3	0	2	65		0	80
St Helen's										124			124
Grand Total	36	941	0	81	313	45	591	402	525	269	90	184	3477

Table 8.2. Productivity data (chicks per pair) for south-west counties in 2022. Where >1 measure from a site, average is presented. Green cells show rates exceeding national average values, red below national averages, orange at (or very near) average values (Horswill & Robinson 2015). Abbreviations are as in Table 10.1.

	GU	PU	F.	KI	CN	BH	HG	LB	GB	TE	AF	SA	MX	TM
Devon														
Lundy														
St Marks Stone	0.41													
Jenny's Cove		0.17												
Aztec Bay				0.63										
Gannet's Rock			0.52											
Straight Point				0.29										
Dorset														
Abbotsbury					1.20	2.00								
Lodmoor					0.86									
Chesil Beach											1.30			
Brownsea Island					0.51	1.58	1.00		1.13	0.93				
Isles of Scilly														
St Agnes & Gugh				0.36				1.35					0.39	0.00
Hugh Town							1.47							
Menawethan			0.34											
Samson							0.45							

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

St Martin's			0.45											
Cornwall														
North Cornwall 3 (Porthmissen)				0.00										
Mawgan - Bedruthan												2.26		
Park Head to Porth Mear			0.62											
Trewavas Head				0.38										
Portreath				0.00										

Noteworthy sightings of non-breeding birds

A good year for Shearwaters in Cornwall:

Balearic Shearwater – Peak count of 458 past Porthgwarra on 30th September.

Sooty Shearwater – Peak count of 36 past Lizard Point on 3rd September.

Cory's Shearwater – Early record of 88 on 27th June, then peak count of 366 past Porthgwarra on 24th July.

Great Shearwater – Pearly autumn peak count 652 past Lizard Point on 24th July, before an exceptional 10,325 past Bass Point on 22nd October.

Barolo / Macaronesian Shearwater – One reported past Bass Point on 22nd October.

Reference:

Horswill, C. & Robinson R. A. 2015. Review of seabird demographic rates and density dependence. *JNCC Report No. 552*. Joint Nature Conservation Committee, Peterborough.

Lake, S. (2022) Purbeck Seabird Survey 2022. Footprint Ecology/National Trust.

10. Seals across the south-west

Sue Sayer MBE

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Authors: Sue Sayer MBE, Kate Williams, Anthea Hawtrey-Collier, Sharon Trew and James Barnett; Gareth Richards; Katrina Davis, Thomas Stone and Julian Branscombe; Rosie Ellis, Lucy Mortlock, Chloe Woolfenden, Eleanor Grover and Dean Woodfin Jones; Dr Mel Broadhurst-Allen; Sarah Hodgson; John Arnott.

Conclusions: State of SW Marine Ecosystems Seal Indicators: Cornwall

- The **range or sphere of migration** of seals from Cornwall now links to the Isle of Man (450km north), NW Wales, SE Ireland, SW and S Wales, the Isles of Scilly, NW France, N France, S France (800km south), N and S Devon, Dorset, Belgium and Holland (650km east).
- **Seal population** – undetermined as open population across the entire Celtic Sea.
- **Cornwall seal demographics** – 70% of seals were adults and most adults were males (56%). White coated pups under 3 weeks old represented 1% of all seals. There were more south coast pups in 2022.
- **Second Common Seal pup** successfully weaned in Cornwall in 2022 by same mother as in 2021.
- **Second recorded Walrus** in the southwest (2021 Isles of Scilly and 2022 Hampshire)
- **Entangled seals:** 124 unique entangled seals were recorded in 2022 with 23 being observed in a single survey – the most on any single survey since records began. Two plastic ringed seals were identified – one repeatedly in Cornwall and one on Lundy.
- **Disturbance:** In total, serious level 3 disturbance affected a total of 1,393 seals in 2022 from a minimum of 1 seal per incident to maximum of 272 in a single seven- minute hailstorm at in west Cornwall suggesting that climate change is adding to already high levels of disturbance.
- **Tagged seals:** 181 different tagged seals were recorded back in the wild in 2022, around 2% of all seals observed. British Divers Marine Life Rescue’s Seal Pup Hospital in Cornwall admitted 108 seals.
- **184 dead seals** were recorded by Cornwall Wildlife Trust’s Marine Strandings Network including 86 white coated or moulted pups. Four dead seals were identified by SRT – two adult females and two ex-rehabilitated seals.
- **Post mortems** were completed on 32 Grey Seals by the James Barnett and the Cornwall Marine Pathology Team with 10 cases of infectious disease, 10 trauma and seven ‘other’ causes, including three cases of unexplained emphysema (2 of which had been found alive but unresponsive).

Cornwall and Devon seal report

Author: Sue Sayer MBE and CSGRT volunteer survey team sightings@cornwallsealgroup.co.uk



The Seal Research Trust (SRT) has been monitoring seal activity around the SW since 2000. As a multi award winning, evidence based marine conservation charity, SRT has partnered with numerous public, private and voluntary organisations regionally, nationally, and internationally to champion seals. Without the generous support of our funders (Aspects Holidays, Brigstow Institute, Bowgie Inn, Carbis Bay Estate, Hairstory, Mungo Lils on the Hill, Our Only World, Ourselves, Polzeath Marine Conservation Group, Seal Protection Action Group and Smartie Lids on the Beach) SRT would not exist. In 2022, SRT made good progress towards being self-funding thanks to a combination of donations, fundraising, online shop sales and a Wild Seal Supporter and Adoption Scheme. [Please see SRT’s 2022 Annual Report.](#)

Communication, conservation actions and consultations

In 2022, SRT completed 632 activities for 27,857 beneficiaries. SRT submitted 29 public consultations and campaigned with the Seal Alliance to get seal disturbance made illegal and flying rings replaced with solid discs. SRT

featured in 39 different media events from the BBC National News (on entanglement) to multiple regional TV, radio, and press articles. [SRT's YouTube channel hosts some of the presentations made](#) in 2022.

SRT used our unique disturbance data to campaign to get seal disturbance made an offence (as it is with whales and dolphins), either by adding seals to the Wildlife and Countryside Act or by adding the word 'disturbance' to the Conservation of Seals Act. The Joint Nature Conservation Committee have already made the former a recommendation, but this has yet to be ratified by government.

Research reports and projects

The SRT team collated data to write reports including 6 Carracks to St Agnes boat survey reports by Sarah Millward; 4 St Agnes to Trevoze boat survey reports by Mike Taylor; 4 Polzeath Photo ID Project boat survey reports by Sarah Millward and 9 Looe Island Seal Photo ID Project reports by Martin Gregory. In addition, SRT published an Annual Report for 2021 along with the SW Marine Ecosystems Report on Seals for 2021, both written or collated/edited by Sue Sayer; a People Protecting Precious Places report by Katie Bellman, as well as a Green Recovery Challenge Fund project evaluation report written and submitted by Sue Sayer. SRT also finally completed an evaluation report for the LUSH Cosmetics funding for the boat PIP surveys. Dr Mel Broadhurst (Channel Isles volunteer) compiled a 2021 Census report and, in addition, Mairi Young prepared a summary for the North Cornwall Hub for 2020 and Catrin Ferguson wrote a summary for the North Devon Hub for 2020.

Seal data



Plate 10.1. Cornwall SRT Common Seal Serena and her second successfully weaned pup by Rupert Kirkwood

There were 29 Common Seal sightings (down from 85 in 2021) with the second successfully weaned Common pup recorded (Plate 9.1) All other records were of Grey Seals.

Seal data from 4718 discrete surveys (13 every day) was collected by 263 different

volunteers across 362 locations. An average of 10 seals were recorded per survey with a max of 519 seals on a single survey (down from 557). 70% of seals were adults of which 56% were males and 44% females. White coated pups were recorded 530 times at 40 locations (including 46 sightings at 15 south coast sites). White coated pups represented just over 1% of all seals observed.

SRT's Photo ID (PID) Hubs continue to be highly productive, processing an incredible 121,756 photos. This enabled SRT to generate a total of 12,107 seal identifications of which 87% were re-identifications (which is surprisingly consistent compared to 87% in 2021 and 86% in 2020). This included a new maximum of 150 different individual seal identifications in a single survey (8 more than the previous total in 2021) that were confirmed by two experienced volunteers. Over 100 different seals were identified on four separate surveys all at the West Cornwall site. Of all the seals re-identified, seven were seals first added to the PID catalogues back in 2000 (four males S6/S7/S11/DP2 and three females S3/S4/S5) and four were seals that were first identified in 2001 (all females S16/S26/S31/S32). In total 3,765 unique seals were identified in 2022. Nine seals from four sites were identified 20 or more times and most of these were from the Lizard, Roseland, and North Devon, as a reflection of the extremely frequent survey effort at these sites (all are surveyed on multiple days every week) and utterly incredible ID processing Hubs.

In 2022, Cornwall had an extraordinary seal visitor. Seal 'number 75', a female moulted pup, was rescued near Biarritz, rehabilitated by Biarritz Aquarium and released there on the 12/05/22. By 08/06/22 she was swimming in Mounts Bay where she was photographed by Andrea Hunt. Seal 75 had swum an incredible 800km in less than a

month. Seals from Cornwall have now been linked to the Isle of Man (450km north), Northwest Wales, Southeast Ireland, Southwest and South Wales, the Isles of Scilly, Northwest France, Northern France, Southern France (800km south), North and South Devon, Dorset, Belgium, and Holland.

Key Issues

Entangled Seals

Seals having experienced or still experiencing entanglement were recorded 860 times during 419 surveys up to a maximum of 23 different individuals in a single survey – recorded on 13/01/22 at West Cornwall by Sue Sayer and Kate Hockley. Ten or more different entangled seals were recorded 12 times: all at West Cornwall during the year. This is the highest number of entangled seals recorded in a single survey since our records began. In total, 124 unique entangled seals were identified from our catalogues (down from our all-time high of 134 in 2021).

A new entanglement issue that emerged in late 2021 continued to be observed in 2022 – that of seals being hooked in line mostly from the local sustainable inshore mackerel fishery. In 2022, 24 different seals were recorded as hooked, ranging from apparently single hooked adult seals to moulted pups in need of rescue. One pup had 22 hooks removed by BDMLR. SRT's long-term seal data shows that peak seal numbers have shifted earlier from March/April to December/January. In contrast, the mackerel fishery has moved later in the year, from starting in the summer to commencing in November. This has created a temporal and spatial overlap between the mackerel fishery and peak seal numbers that never used to occur. This has presumably caused this new and emerging issue.

'Flying ring' (entangled) seal 'sightings' remain few in the SW, with a notable and frequently sighted exception – DP1905 'Commuter'. This adult male was identified 20 times in 2022 at three different north coast sites between West Cornwall and Pentire. His head appeared to be very short for his age and he had a hideous trauma wound around his blue plastic ring noose.

Disturbance

Serious level 3 disturbance is described as seals leaving the land by tombstoning or in a stampede and entering the sea; crash diving at sea; displacement from sea areas where humans were present or seals being fed. There were 223 serious disturbance incidents in 2022. In total, level 3 disturbance affected a total of 1,393 seals in 2022, from a minimum of one seal in one incident to an horrific maximum of 272 seals on 17/11/22 at West Cornwall stampeding into the sea in a single incident. This was caused by a seven- minute hailstorm. In September, 37 out of 70 seals had been seriously disturbed at West Cornwall during two back-to-back hammering rain showers, so it seems climate change induced extreme weather events are adding to already high levels of seal disturbance.

20 or more seals were seriously disturbed stampeding into the sea on 14 different occasions at four different sensitive seal sites in North Cornwall, Pentire and West Cornwall. At the North Cornwall sites 66 seals were recorded stampeding on 20/03/22 by Malcolm Baker, whilst at Pentire, 24 seals stampeded into the sea on 8 October recorded by Andy Rogers.

Where possible disturbance incidents were routinely followed up by members of SRT's newly formed volunteer Conservation Team. Case studies of disturbance and data continue to be shared with various statutory agencies including the Cornwall Inshore Fisheries and Conservation Authority, Natural England, Operation Seabird and DEFRA. In November 2022, the Marine Management Organisation Marine Spatial Planning Team requested SRT disturbance data as part of their SW Marine Plan Evaluation. SRT's collated data from 2014 to 2022 showed an increase in serious seal disturbance incidents from 123 to 306 and seals seriously disturbed increased from 999 to 1,673.

Whilst disturbance case studies are routinely shared in the majority of talks delivered by SRT, specific disturbance data has been presented to a variety of organisations including the Cornwall Marine and Coastal Code Group, RENEW Parliament Conference, Plymouth University, The Welsh Police Mammals and EPS Wildlife Crime Group, various governing bodies such as British Canoeing, and Kernow Hang Gliding and Paragliding Association, as well as enforcement agencies such as Natural England, Marine Partnership Against Wildlife Crime, and Wildlife LINK. As part

of SRT's awareness raising work in 2022, four letters were written to a newly created Marine Operators mailing list. Each letter championed and clarified best practice around seals in the southwest.

Climate Change

Seals are already experiencing first-hand the effects of climate change. Extreme weather events wash maternally dependent white coat pups away from their mums to die of starvation. With fewer and later severe storms in 2022, impacts were harder to record as they occurred post peak pupping season in 2022. Impacts on moulted pups are less obvious and harder to detect. Along with rising sea levels (15cm in Cornwall in the last 100 years) storms mean safe, sensitive seal sites on beaches, islands and caves are lost and coastal erosion rates are accelerating. A major rock fall at a key haul out in North Cornwall in March 2022 prevented seals from using this key habitat for up to three months, displacing hundreds of seals to other key sites. Our more frequent hammering rain and pounding hail showers were observed to add to already high levels of seal disturbance. Storms also rip up fishing gear which is lost, adding to seal entanglement rates (already the second highest rate for phocid seals anywhere in the world). Flooding fills the sea with sediment making it harder for seals to see, feel and find their food, especially for young seals struggling to teach themselves to feed. Warming seas are changing the timing of peak seal haul out numbers, and shifting the now shorter pupping season even earlier so it now overlaps with peak holiday season. Warmer water encourages more toxic algal blooms releasing domoic acid which seriously impacts seal nervous systems (Hall and Frame. 2010). All of this means more seals get into trouble and need human help through people management, rescue, rehabilitation and, for the lucky ones, release. [Watch 'Sea Change: Seals' film here.](#)

Pollutants

The Debs Foundation PCB Project: Vet pathologist James Barnett partnered with the Cetacean Strandings Investigation Programme to get seven samples taken from dead adult male seals in Cornwall sent off to CEFAS for PCB analysis by CEFAS. The results showed six of the seven seals sampled had PCB levels above the low threshold for toxic effects including three above the high threshold for toxic effects. This suggests that these seals might have had reduced reproductivity and be potentially immunosuppressed.

Rescue, rehabilitation and release by Dan Jarvis from British Divers Marine Life Rescue (BDMLR)

Contact:

BDMLR's Seal Pup Hospital in Cornwall admitted 108 seals this winter (August to April), which is an increase on the year before. This is partly due to logistical and staffing issues at the Cornish Seal Sanctuary and RSPCA West Hatch at times during the season that resulted in BDMLR taking in more than under normal circumstances, so actually the number of admissions overall was quite average in comparison.

BDMLR seem to be getting more calls about animals that do not need assistance, highlighting that awareness of what BDMLR do when a potential seal in distress is seen is increasing. Disturbance may be an increasing issue too, as some moulted pups have been healthy animals on public beaches that required monitoring. However, when volunteers have been monitoring seals this winter, it has been noticeable that the response from members of the public has been largely positive and that on a number of occasions people have been putting dogs on leads before even being asked to. So, it seems that awareness of the advice that BDMLR and the Seal Alliance have been sharing has been getting through, which is great news.

Photo identified ex rescue, rehabilitation and released seals by SRT

SRT 2022 data included 807 sightings of 181 different rear flipper tagged, rehabilitated seals (around 2% of all seals observed) from all around our southwest coast. Most of these tagged seals would have been released in North Devon or from the northwest/southwest Cornish coast but there were three notable exceptions. '75' (see above) and 'Christine' were released in France, and 'Crater' who was finally tracked down by the Roseland Hub Coordinator Kerstin Hartmann was released from Courtown in SE Ireland. Crater had 17 IDs on the Roseland in 2022. A maximum of 13 different ex-rehabilitated seals were recorded on one survey on 11/02/22 at West Cornwall by Sue Sayer and Kate Hockley. In 2022, 10 or more ex-rehabilitated seals were recorded in the same survey on four occasions – all at West Cornwall.

Dead seal strandings by Anthea Hawtrey-Collier and Sharon Trew, Cornwall Wildlife Trust Marine Strandings Network (CWTMSN)

In 2022, 184 dead seals were recorded by CWTMSN around the Cornish Coast. This is down from the 2021 total which was the highest number of dead seals recorded since 2000. Of the dead seals that could be aged (n=135), 21% were adults, 15% were juveniles, 50% were moulted pups and 14% were white coated pups. Of the adults that could be sexed (n=17), 29% were male and 71% were female. Adult deaths peaked between Jan and May (moulted season) as well as in September and October (pupping season); Juvenile deaths peaked in January and February (moulted season) and November (late pupping season). Moulted pup deaths peaked between December and April (key times when energy reserves will be low, and pups needed to have learned to feed effectively) and in July and September. White coated pup deaths peaked between August and October (peak pupping season).

Photo identified dead seals by SRT

In partnership with the Cornwall Wildlife Trust Marine Strandings Network in 2022, two adult females – Black Wall and Tulip were both identified from their carcasses. Black Wall had been recorded since 2006, so it had been interesting to see from her ID photographs how the wound she developed on her back had progressed over time, before healing. She was also post mortemed, with findings that suggested she could potentially have been live bycaught. Tulip was a celebrity seal having been first identified back in 2002. She was likely nearly 30 years old, which is the average life expectancy for a female Grey Seal. She contributed to informing knowledge of Grey Seal behavioural science. Having lost her own pup (on Ramsey Island or somewhere nearby), Tulip had the instinct to nurse and wean another pup separated from its mother in a storm on the island of Skomer (having never been identified there before). Incredibly the last live sighting of Tulip was towards the end of January when she looked fit and healthy, and by 09/02/2022 she was dead – it just goes to show how looks can be deceiving. Two additional dead tagged ex-rescue, rehab and released seals were also identified as Whipcord and Jurgen.

Post Mortem Examinations by James Barnett Cornwall Marine Pathology Team in 2022

32 seals examined post mortem. Sex: 10 females, 22 males. Age: 5 adults, 1 juvenile, 25 moulters, 1 pre-moult pup. Primary conditions found: infectious (10), trauma (10), others (7), not established (5).

Notable cases:

Three cases of unexplained emphysema were seen in adult Grey Seals. In each case, there was extensive pulmonary and mediastinal emphysema which could not be explained by any underlying infectious cause, and which could not be attributed to, for example, agonal changes or acute heart failure. Two animals were found alive but moribund and the third had only very recently died before being found.

One adult male, found alive but moribund and subsequently euthanased, had been caught up by the Seal Mammal Research Unit on Ramsey Island, south Wales, in April 2019, when it weighed 139kg. It had since lost 40kg. It had excessive tooth wear, an infected oronasal fistula and encephalitis which would have explained the animal's moribund state on the beach. The one juvenile Grey Seal, a male, had pyothorax with associated pericarditis and pleuritis. The origin of this was unknown but haematogenous spread (via the circulation) is considered most likely with the seal also having meningitis.

The main findings in moulted seal pups included three cases of starvation/hypothermia, three cases of bronchopneumonia and bronchitis associated with the lungworm, *Otostrongylus circumlitus*, three cases of osteomyelitis, arthritis and cellulitis secondary to trauma, two cases of mandibular fracture and osteomyelitis secondary to trauma and two cases of perforated gastric ulcer caused by ascarid worms and leading to peritonitis.

The one pre-moult pup had been euthanased in November 2021, frozen and then examined at the annual student demonstration at the University of Exeter, Cornwall Campus in March. The pup had an oronasal fistula and extensive destruction of the nasal turbinates.

Gower seal report

Author Gareth Richards: Gower Seal Group



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Seals are highly mobile and those present in the south-west may migrate extensively. Information from outside of the south-west can also give context to what is being seen in the region encompassed by SWME reports. Reports from outside of the SWME region are therefore included - at least until other areas develop their own analogous reporting schemes to SWME.

Site and surveys

Gower Peninsula is situated near Swansea on the South Wales coastline. Designated in 1956 as the UK's first ever Area of Outstanding Natural Beauty (AONB), Gower extends south-west into the Bristol Channel and Celtic Sea. Much of the coastline is designated as Sites of Special Scientific Interest (SSSI) with many sensitive seal haul out sites situated within these areas. Unfortunately, none of these SSSI's include protection for any species of seal within its notifications.

The main surveyor, Gareth Richards, has conducted photographic identification at one sensitive haul out site on behalf of Gower National Trust since September 2019. Although the entire coastline of Gower has seals present, sightings are intermittent, therefore Gareth focusses his work at one main survey site. Gower photographic catalogues support the Seal Research Trust's ongoing SW England/Celtic Sea seal survey database. This data is used to inform/influence relevant organisations locally and nationally.

Gower's seals are primarily the Atlantic Grey Seal (AGS) species although in October 2021, a local British Divers Marine Life Rescue (BDMLR) medic tended to a Common Seal pup found alone on a local beach. The pup was assessed as healthy and released; an uncommon visitor to Gower. No further sightings of Common Seals have been made since.

Six surveys took place between 3 July and 25 November recording a total of 80 seals of which 95% were on land. 69% were adults and of these adults, 84% were females and 16% males. One seal was entangled, and five records were of tagged seals. Seven serious level 3 disturbance events were recorded in August. Our main disturbance events have occurred from the seaward side with kayak, SUP, jet ski and pleasure boat users getting far too close resulting in resting seals being flushed into the sea. To date, Gower catalogue contains 187 North Atlantic Grey Seals with identifiable pelage markings and many more with non-discernible markings.

Entanglement in ghost netting continues to be a problem with one entangled seal being observed within 2022. Gower Seal Group, National Trust and other local groups conduct regular beach cleans; however, such detritus continues to plague our coastline.

Two adult male seals live stranded but died shortly after, and an additional one dead adult female stranding all of whom were examined, photographed, and reported to Marine Strandings Network Wales (MSN). No Post Mortem Examinations were carried out on any of these animals therefore the cause of death is unknown. Seven white coat pups were found dead at various locations around Gower and subsequently reported to the MSN.

During the period 2022/2023, five AGS pups were assessed by local BDMLR medics with only one being successfully rehabilitated, initially at the BDMLR Hospital then transferred to the Cornish Seal Sanctuary. Despite this seal (named Wasabi) suffering a serious rear flipper infection which was later amputated, he was successfully released back to the wild on 13th January 2023. This was believed to be only the third full rear flipper amputation within the UK. This is a great example of the skill, care and dedication of all staff involved in Wasabi's care. Two further pups were assessed and euthanased, with an additional two pups assessed, monitored, and released back to the wild. The availability of places at rehabilitation centres has been a real problem during this recent period as our nearest centre (RSPCA West Hatch) has suffered reduced capacity and opening hours. Fortunately, this has now been addressed and we look forward to working closely again during 2023. It was pleasing to observe several ex-rehabilitated seals visiting Gower. Some were positively identified by their tag as ex RSPCA rehabilitations with two whose identification tag numbers were not clearly visible. All were looking well and enjoying their visit to Wales. These identifiable seals were visitors from North Devon, Pembrokeshire, and Lundy Island.

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

Several seals with injuries or malformations have been spotted and, although there are obvious challenges in movement on land they appear to be in reasonable health and coping.

Covid significantly increased footfall on Gower with many following a 'staycation' approach to their leisure and holiday times. With the return of 'normal' living practices it is anticipated that visitor numbers may reduce slightly as foreign holiday opportunities arise. However, it will be interesting to see if this is true as recent weekend activity has been lively across Gower with high footfall in the popular locations. Many of these popular locations include areas of sensitive seal haul out sites therefore it is probable that the high levels of seal disturbance will continue as observed during the summer season of 2022.

Continuing a local campaign to eradicate the use of flying rings on Gower has been a priority with retailers and users being targeted. We have concentrated efforts on dog grooming businesses for staff to have direct conversations with clients on these popular dog toys. One success resulted in 600 vet practices across the UK withdrawing these items from sale. This was achieved by default, as the Clinical Director of one veterinary practice was an audience member during one presentation where the flying ring threat was highlighted and necessary photos being shown. As a result, she ensured that all items were withdrawn immediately.

A robust UK Seal Alliance 'Watching Seals Well' leaflet campaign and signage has been adopted by Gower Seal Group supported by Gower National Trust, National Coastwatch Institution, local shops, cafes and hotels. Over 50 presentations have been delivered by Gower Seal Group to inform and educate the public and a successful Mini and Junior Seal Ambassador Schools Programme being implemented. Operation Seabird locally was launched in 2022 with active attendance at multiple events attended by volunteers.

Overall, the seal numbers on Gower have remained constant with a greater number of females than males visiting these shores. An increase in dead seals being found coincides with challenging and changing sea conditions during the latter part of 2022. Rougher sea conditions are certainly taking its toll on smaller seals which I believe is replicated in other UK regions.

Finally, Gower Seal Group are proud to be active members of the UK Seal Alliance Strategy Group and Welsh Mammal Strategy Group. These networks are crucial to creating workable strategies with like-minded people. Sharing information, good and bad practices, challenges, specific areas of concern in an open and honest environment is the key to continuing success.

North Devon seal report

Author Kate Williams: Seal Research Trust

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Surveying of Grey Seals around the North Devon coast continued through 2022 producing the 13th year of survey data for this area. The survey team was boosted by some new recruits, which will secure the ongoing collection of data.

Seal numbers were consistent with previous years with most seals recorded being adult female and seen in peak numbers through the summer months before dispersing to pup. Seals that spend their summer months in North Devon have been recorded with pups in West Cornwall and also recorded there post pupping.

At the end of 2022 there were 514 different seals in the North Devon photo identification catalogue. Of these 431 were female (84%). The number of seals in the catalogue and the number added to the catalogue each year does not indicate population size. This site is part of a network of sites connected by seals across the Celtic Sea, so the numbers vary because different seals are identified each year.

Seal photo identification:

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

From January to April few seals were seen. In May a lot of the regular females started to arrive, including 583 Freckles c dot. Added to the catalogue in June 2020, Freckles, a young adult female, has become a regular on the haul out arriving in early May and staying until late October. June was a busy month for tourists with tripper boats from Ilfracombe touring the north coast sometimes on an hourly basis. Knowing that the entertainment of their customers relies on seeing seals they are usually careful with their approach, and it is unusual for the seals to be disturbed. Disturbance is more often caused by the unexpected approach of small craft, in particular kayaks that hug the coast and appear suddenly, surprising the seals. The regular tripper boat visits continued right through the summer. Seal numbers peaked at the end of July and into early August. An adult male seal was present for five weeks from the 24th of August. Males on the haul out are unusual, but this male made himself at home, he had a good pelt pattern which made him quite easy to identify. October had an unusual peak in numbers. Analysis of the photo IDs showed this to be mostly seals that had been seen and identified earlier in the year, so not seals passing through the area. A closer look at the photos showed that about half of the females appeared to still be pregnant and half were thin, having returned after pupping. Seal sightings dropped off in November. One adult female, a regular in North Devon, was seen several times on a winter haul out beach in West Cornwall.

Lundy seal report

Authors: Rosie Ellis, Lucy Mortlock, Chloe Woolfenden, Eleanor Grover and Dean Woodfin Jones

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The Atlantic Grey Seal population has been monitored annually on Lundy since 2011 and to a varying degree beforehand. Previously, the surveys have been carried out by the Conservation Team throughout the breeding season in order to understand the distribution, population dynamics and productivity of this iconic Lundy mammal (Jones, 2017). In 2016 the survey method was reviewed to enable the data collected at Lundy to contribute to wider seal population assessments, such as the Sea Mammal Research Unit (SMRU) national seal surveys.

The highest count of seals within the survey period was from a full island survey on the 9 October: 206 (137 females, 21 males, 6 weaners, 9 pups and 31 animals of undetermined sex). This was reduced from a record high count in 2021 of 244 despite including the west coast of the island, rather than just the usual east coast observation points. This did not include the caves where there are many seals pup at this time of year, for example, the boat survey of 2020 which found 4 pups in one cave alone.

Although a considerable 16% drop from the highest count of 2021, deductions on actual population abundance changes should be made cautiously: wind and sea state heavily affect the location and detectability of individuals.

	DATE	TOTAL	MALE	FEMALE	JUV	WEANER	PUP	UNKNOWN
1	17/08/2022	101	6	95	0		0	
2	25/08/2022	112	5	60	1		0	32
3	31/08/2022	87	7	33	0		1	33
4	06/09/2022	60	3	44			4	10
5	15/09/2022	160	8	80	2		5	64
6	22/09/2022	162	4	83	1		18	30
7	01/10/2022	183	5	122	2	2	10	40
8	09/10/2022	206	21	137	0	6	9	31
9	14/10/2022	196	8	156	11	1	1	19
10	17/10/2022	161	7	113	1	2	4	33
11	25/10/2022	154	2	138	0	5	3	8

Similar to previous surveys, the majority of animals around the island within each survey were females, although the distinction between male/female/juvenile and unknown can be highly subjective and vary between recorders, with

male numbers being considerably lower than last year's numbers likely to be a reflection of this. The distribution of seals around Lundy is heavily influenced by both weather and sea state. The lowest count of 60 this year being a low tide of only 2.75m with seas reported as choppy despite the SW wind direction. The highest number of animals hauled out in the 46 sub-sections (Jones, 2017) within the survey period was again from Threequarter Wall Bay – here 52 individuals were counted on two occasions. Approximately 54 pups were recorded on Lundy this year. This is down from last year's record breaking 62 but still above the 2020 figure of 50. The first report of a pup was on the west coast near the Battery in section BAT by Islanders Rob and Sue Waterfield who were kayaking on the 14 August (2021 was 21/08/21). The first photographed mum and pup were sighted on 23 August on Ladies Beach by Rosie Ellis. The size of the photographed pup together with the west coast sighting indicates the first pupping on the island was near to 10 August. Easterlies during the pupping season caused shifts by white coat pups and deaths with ten sightings of dead pups. In some instances, this could be the same dead pup itself being shifted by tides, so caution should be used before deducing a rise in mortality rates. Nevertheless, reported pup fatalities were up from last year despite the lower sightings numbers and closer to 18% than last year's 10%. The last alive white coat pup sighting was on the 25/10/22 in Devil's kitchen, giving a pupping season comparable to last year's (21 August to 21 October).

Entanglement

Three cases of entanglement were recorded in 2022 (There were three in 2021, eight in 2020, Three in 2019 and six in 2018) although none on the surveys themselves. Unfortunately, despite the distress caused to the seal there is nothing the conservation team can do to free seals in these circumstances and the only thing we can do is regular beach cleans on our accessible beaches to attempt to prevent entanglement in the first place. The island has also gained plastic free status, is balloon free and does not sell the open flying ring toys which are an often cause of entanglement.

Disturbance

Of the 11 surveys, two recorded dive boats were present and no disturbance was documented on the 11 surveys themselves. The easterlies did push a number of pups and weaners into the Landing Bay, the designated 'recreational zone' of the MCZ bringing increased chances of disturbance. The marine festival generated connections with Natural England, the University of Plymouth and the University of Exeter with the island supporting four masters students this summer. One Researcher focused on disturbance comparison of a dive boat site in Gannets Bay (GB) and quieter bay Mouse Hole and Trap (MHT). Throughout 52 hours of surveying, mostly targeted for when snorkel boats were in the area, 259 individuals were flushed, and flushing was also observed by seal watching boats (Kendall, 2022). The report clearly shows seals shifting away from GB in favour of MHT when dive boats are present. It also shows that our snapshot of each bay during the seal survey undertaken by the conservation team was not sufficient to determine the level of disturbance. This report focused on snorkel trips and did not cover seal boat trips and dive trips. The snorkel safaris run by the conservation team in the Landing Bay did not flush any individuals, and one September session was stopped when a male in the sea was exhibiting snorting behaviour. The snorkelers left the water, all given refunds and the male and a female went on to mate. The new accreditation scheme is now live and certification can be gained by completing training modules and associated quizzes on a Google Classroom, see www.northdevonbiosphere.org.uk/accreditation-scheme to enrol.

Engagement

During the three times a week "Above and below the waves" wildlife talk, and guided walks, the public were educated about our marine wildlife and issues of disturbance. This year we were also joined by Rob Wells for a Marine Festival talk about the seals of the southwest as a whole as part of our Marine Festival. Many thanks to Rob and all our Ambassador volunteers that help with our walks and talks. A huge thank you to all who submitted seal counts and disturbance records in 2022. Special thanks to Angus Croudace for his hard work, determination and skill to find every last pup. Finally, a massive thank you to Sue Sayer, Kate Williams, Rob Wells and all of the volunteers from the Cornwall Seal Group Research Trust for all their amazing work with regards to training volunteers, taking and processing masses of photographs for the island's identification catalogue and for their general and endless

kindness and passion for these wonderful marine mammals. A further congratulations to Sue Sayer for her well-deserved MBE, announced in 2023's new year's honours list.

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Isles of Scilly seal report

Authors: Data by Katrina Davis, Thomas Stone (Oxford University OU), Julian Branscombe (Isles of Scilly Wildlife Trust IOSWT) and written by Sue Sayer MBE

Contact: katrina.davis@biology.ox.ac.uk

In September 2022 over four days (22-25 September), Oxford University staff and students conducted Unmanned Aerial Vehicle (UAV) based surveys with input and advice from the IOSWT and SRT. These boat-based surveys covered all key seal areas of the archipelago including the Western Rocks and Annet, the Norrards and Eastern Isles. Photographic data was captured by Mavic 2, Mavic 2 Enterprise Advanced, and Mini 2 UAVs. At each island location, the UAV was launched from the boat on the opposite side of the island to the seal haul out areas and flew at heights above 40m over the seals.



Plate 10.2. Two images from the UAV of a colony of seals in the Isles of Scilly. The left image is an infrared image that shows more clearly the individual seals.

In total 606 seals were recorded. Of these seals 82% were on land with 18% seen in the sea. Seals were not aged and sexed, although white coated pups were recorded and totalled 95 (16% of all seals recorded.)

Previous SRT surveys between 2008 and 2017 on the Isles of Scilly show considerable interannual and intra annual variation with a minimum count of 331 seals (2010) and a maximum count of 763 seals (2010).

Channel Isles seal report

Author: Dr Mel Broadhurst-Allen, Alderney Wildlife Trust

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Channel Islands

Several organisations across the Channel Islands actively record seals through the 'Channel Island Network'; a collaborative project which aims to assess seal abundance and distribution (primarily Grey Seals), headed by the Groupe Mammalogique Normand. Seal sightings and other notable highlights for each island (Alderney, Guernsey and Jersey) are given below.

Alderney

Seal sightings and notable highlights

The Alderney Wildlife Trust continues to complete boat-based marine mammal observation surveys across Alderney. A total number of eight surveys were completed this year, within the island's Ramsar Site, where a haul out of seals are known to habit. From these surveys, a total number of 256 Grey Seal (*Halichoerus grypus*) individuals were recorded, which included male (26% present) and female (70% present) individuals (4% unknown). The size of the 'colony' varied during 2022, ranging from 16 – 54 individuals. AWT also collates sightings from members of the public, for which 95 Grey Seal sightings were submitted to the AWT.

Strandings

For 2022, one live Grey Seal was recorded hauled out on the island's commercial harbour slipway (17 November, Braye Bay) on Alderney. The island's Harbour Authority closed off the slipway to the public to help reduce any disturbance, from where the seal left on its own accord a day later.

Guernsey

Seal sightings and notable highlights

The States of Guernsey, Agriculture, Countryside and Land Management Services undertake the boat-based marine mammal observation surveys across Guernsey. For 2022, three surveys were completed again within the island's Ramsar Site. Information from these surveys comprised of 81 Grey Seal sightings, primarily adults.

Jersey

Several organisations across Jersey record and collate seal information including the States of Jersey, Jersey Marine Conservation, BDMLR (Jersey), commercial and recreational boat operators/owners. Through the recording app, Epicollect, approximately 25 – 30 seals were sighted. Several boat-based surveys were also completed during 2022, but quantitative information is yet to be provided.

Strandings

The BDMLR (Jersey) recorded one live seal pup (which is under the care of the GSPCA, under the name Shakespeare) and five dead pups that Autumn. Two Jersey pups rescued in 2021 (named Eliza and Aurore) were successfully released by the GSPCA. The BDMLR also monitored a large bull in April 2022, which stayed on a very busy beach, during his moult. The beach was closed for a week until he left safely.

South Devon seal report

Author: Sarah Greenslade, The Seal Project

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Our seal surveys take place in South Devon year-round, both from land and sea. Most of our surveying is carried out within the wavebarrier on MDL Marina in Brixham, which we've been surveying since 2018. Seals haul out here mostly throughout the winter months. Many are returning seals who are increasingly less reactive to the disturbance and noises around them. New seals to the area are more obvious because they are more alert than the other seals. From our surveys, seals hauled on manmade structures outweigh the seals recorded on natural haul outs. This could be because manmade sites are easier for us to observe, but sightings of seals on manmade structures have increased. Seals are certainly being seen within the River Dart more frequently and we've made a number of contacts who are happy to inform us of sightings, especially of one we know to be entangled. We also secured a

grant from Dartmouth Town Council for a small rib to enable us to survey the river better. And have a webcam on a property monitoring the pontoons, which Grey and Common Seals use more regularly than we'd realised. 'Tangled' was first seen by us in March 2022, and she's been seen in Dartmouth, Brixham, Salcombe, and the River Dart on numerous occasions including Boxing Day. She looks to have gillnet around her neck, but when we first saw her we could see the rubber banding which holds the weight to the gillnet around her neck, this is clearly now much tighter. Between ourselves and BDMLR we are doing our best to keep track of her movements in the hope she can be helped before it's too late.

2022 Highlights

In January, Charlie Powell from ITV Westcountry Weather called to ask 'if I was free that afternoon', and that evening he presented the weather from Brixham, showing the hauled out seals in the background with an interview with me beforehand outlining best practice!

We then moved onto the BBC – with BBC1's Countryfile filming an episode called 'Brixham' which not only included The Seal Project but also the BDMLR, which we three of The Seal Project trustees, and one of our volunteers were part of, and the fourth of our trustee's took part as her other project, Seadream Education. A proper family affair! This was aired in early November 2022, and is still available on BBC's iPlayer.

Throughout the year we have had five pups monitored successfully, and held a number of talks at clubs, and schools and attended a number of shows and taken part in some conferences, live and online. It's hard to top that but we did get some fantastic news towards the end of 2022. Myself and SRT had put forward details of our Brixham Marina seal surveys from 2020 to the Devon Wildlife Trust. We found out that not only had this artificial structure been given County Wildlife Status (along with all the other Devon sensitive seal sites recommended by us and SRT). This is a first for an artificial structure, but one that MDL Marinas are planning to replace the entire wavescreen. The best part being that they would like to make it "good, if not better, for the seals"!! This was amazing news and when I met with Steve from MDL every seal was exactly where I needed them to be! We are hoping to meet up again shortly.

Dorset seal report

Author: Sarah Hodgson Dorset Wildlife Trust

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The Dorset Seal project was set up by Dorset Wildlife Trust (DWT) in 2014. By recording casual seal sightings data and photo identification work, we have been learning more about the Grey and Common Seals that visit the Dorset coast. Alongside this research, DWT has been raising awareness of these iconic marine species and promoting codes of conduct to reduce anthropogenic impacts.

Seal sightings and species

In total 208 seal sightings were reported to DWT in 2022, which is 22% lower than 2021. It should be noted that these are casual sightings records rather than from effort-based surveys so annual fluctuations may not necessarily be indicative of a decrease in seals as observer effort will vary. Grey seals accounted for the majority of the sightings (61%). 23% of seals recorded were common Seals and the remaining 16% were not identified to species. Seals were spotted along the Dorset coast throughout the year; however, most sightings were recorded during April-May and July-August. There were very few seals observed during June, with only five sightings reported. In April, three Grey seals were observed resting at a recently established haul out. As far as we know, the site has only been in regular use for the past couple of years. All three of the seals have previously been recorded in Dorset and were matched to our photo identification catalogue. The seals were able to rest undisturbed which was crucial as the larger female was pregnant. In May, we received a sightings report and some images from a member of the public. The seal that they spotted was identified as one nicknamed 'Butterfly' and has only been seen in Dorset once before, in 2015. This individual has also been matched to the South Devon catalogue and has been spotted at several locations there.

Research reports and projects

After some disruptions over the past few years, the remote monitoring of a Common Seal haul out in Poole Harbour was re-established in 2022. A trail camera was set up overlooking the haul out, on a timelapse function taking an image every 5 minutes during daylight hours. The cameras were deployed continuously from mid-May to end October. In addition to collecting data regarding the usage of the haul out, the images also give a valuable insight into the sources, levels, and frequency of disturbance at the site. This data is currently being analysed and will be used to help inform future management and engagement plans.

Key Issues

Disturbance continues to be an issue for seals in Dorset. When collecting *ad hoc* sightings data, evidence of disturbance or interactions with seals is also being recorded, whether that was instigated by the observer or the seal. In 2022, at least 14% of sightings reported to DWT featured disturbance or interactions. This figure could be higher as this data is not being consistently recorded at present. Some of the incidents involved juvenile seals. A juvenile Grey Seal undergoing its annual moult was resting on one of the busiest beaches in the region, Bournemouth, resulting in crowds of people surrounding the animal and getting very close. BDMLR volunteers attended to monitor the seal and keep members of the public back. Another inquisitive juvenile Grey Seal has been spotted regularly interacting with paddleboarders and kayakers. Whilst we share guidance on responsible seal watching there's still a lot of misinformation being shared, particularly on social media.

Management or conservation actions

During 2022, Dorset Police launched Operation Seabird. As part of the operation, engagement events were held at slipways along the Dorset coast with other agencies including the MMO, Southern IFCA and HM Coastguard amongst others to raise awareness of marine wildlife around the coast and what to do when encountering marine mammals. DWT volunteers attended events and were able to engage with personal watercraft users and promote the Watching Seals Well guidelines. The Operation Seabird events were also a great opportunity to network with other agencies, share ideas and information and find out what we can do to support each other's work. DWT was also invited to attend a The Planet Purbeck Festival community event with a stand. These are a great opportunity to engage with the local community. Many visitors said that they had seen seals locally but didn't know much about them or how to report sightings.

Rescues, rehabilitation & release

In 2021, an underweight Common Seal pup was rescued by BDMLR medics from Portland. The seal was looked after by the RSPCA at West Hatch and they were able to release it at a site along the Dorset coast in January 2022 once it had gained sufficient weight. There haven't been any confirmed sightings in Dorset since its release. Another Common Seal pup, which was rescued from St. Ives in 2021 and taken to West Hatch was released by the RSPCA/BDMLR in West Dorset in April 2022. The young male, 'Wool', was re-sighted near Kimmeridge Bay in August 2022 thanks to the tag on its rear flipper.

Strandings and PMEs

DWT received reports of four dead seals along the Dorset coast in 2022. Three of these were Grey Seals, whilst the other wasn't identified. There were no obvious signs of entanglement or trauma, however, none of the carcasses were retrieved for post-mortem examinations so the cause of death is unknown.

Solent seal report

Author: Data by John Arnott and summarised by Sue Sayer MBE

Contact: john.arnott@uwclub.net

Chichester Harbour

Seal counts took place between 24 May and 5 September. Common Seal numbers ranged from a minimum of 30 on 24 May to a peak of 55 on 21 July. Grey Seal numbers ranged from a minimum of 14 on 8 August and 5 September to

a peak of 20 on 24 May. The majority of seals seen were adults of both species. Common Seal pups (n=25) were recorded on 22 June, 6 July and 21 July.

Langstone Harbour

Seal counts took place between 26 May and 8 August. Common Seal numbers ranged from a minimum of one on 8 August to a peak of nine on 6 July. No Grey Seals were recorded. The majority of seals seen were adults. Common Seal pups (n=4) were recorded on 6 July and 21 July.

Newtown National Nature Reserve

Three seal counts took place on 29 April, 21 July and 9 August. Common Seal numbers ranged from a minimum of one on 21 July to a peak of four on 29 April and 9 August. Grey Seal numbers ranged from a minimum of 2 on 9 August to a peak of seven on 29 April. The majority of seals seen were adults of both species. No pups of either species were recorded.

Summary of all three sites

The Common Seal population estimates since 2016 have ranged between 49 (2018) and 52 (2017) with the 2022 estimate being 56 (having been 57 between 2019 and 2021). Unique Common Seal pup numbers were the highest recorded in 2022 (n=14) compared to a previous high of nine back in 2016 (having been eight and seven between 2018 and 2021).

Combined data from the three different sites

Common Seals appear to have an increasing trend between 2016 and 2022, whilst Grey Seal number appeared to increase between 2016 and 2021 when they plateaued, only to decrease slightly in 2022.

There was a single sighting of an 'out of habitat or vagrant' species in the SW – a walrus in Calshot, Hampshire in December 2022.

Reference

Hall, A.J. & Frame, E. 2010. Evidence of domoic acid exposure in harbour seals from Scotland: a potential factor in the decline in abundance? *Harmful Algae* 9 (5), 489-493. <https://doi.org/10.1016/j.hal.2010.03.004>.

11. Cetaceans: Baleen whales (Mysticetes)

Edited by Dan Jarvis, British Divers Marine Life Rescue.

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Data contributed by Cornwall Wildlife Trust, Environmental Records Centre for Cornwall and the Isles of Scilly, Marine Discovery Penzance, Padstow Sea Safaris, Newquay Sea Safaris, AK Wildlife Cruises, Organisation Cetacea, Dorset Wildlife Trust, Durlston Marine Project, Isles of Scilly Bird and Natural History Review, Happywhale, Scottish Humpback ID Facebook group, ORCA Ireland, Irish Whale and Dolphin Group and South-West Marine Ecosystems compiled observations.

Summary.

- 2022 was a record year of sightings for Minke whales in south-west England for the second year running. They were mainly seen around Cornwall and the trends identified in previous SWME reports for seasonal peaks in spring and summer continue to be upheld.
- Sei whales were entirely absent in 2022, which is not surprising given their historical lack of known presence in the region.
- Fin whale reports were slightly down on 2021, but still well above average. They were present mainly around the Isles of Scilly in winter, with a small summer peak, which is again a trend identified via SWME report compilation that continues to be upheld. These peaks coincide with humpback and minke whale peaks respectively, likely indicating that these are especially food-rich times for Fin whales.
- Humpback whale sightings were down on 2021, though that was an exceptional year. As with Fin whales, most records originated around the Isles of Scilly in winter, which is once again a trend identified from SWME annual reporting. There is also a growing evidence base that the habitat in the south and east areas of Scilly are important to Humpback whales, given that most observations of them are in these locations. The south-west UK Humpback whale photo-identification catalogue has been created in the last year and has jumped from six to 16 individuals, largely from historical records with good quality photos sourced from social media. Three whales were re-identified in 2022 and one whale sighted in 2022 was added.

Overall sightings.

Sightings data were influenced heavily by where reporting effort was highest. The sightings mainly come from boat operators in Mount's Bay, Fal Bay, Newquay Bay and Padstow Bay, as well as routine land-based surveys and ad hoc sea watches carried out by Cornwall Wildlife Trust's Seaquest Southwest scheme where sightings are collated by the Environmental Records Centre for Cornwall and Scilly (ERCCIS). As such, these records provide a picture where baleen whale activity could be perceived as high but may not actually be the case were similar levels of effort data were available from other areas. Therefore, it must be noted that the conclusions presented here are skewed by a comparative lack of data available for this report from other regions in the south-west and organisations unable to share their data. Additionally, across the SWME reports the only consistent comparable dataset available has been that of ERCCIS, with inconsistent contributions from other organisations that make it difficult to have a fully comparable report each year. Efforts are being made in the background to try to address this inconsistency in future and improve the quality and consistency of reporting.

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

From the comparable ERCCIS data, there were fewer sightings of baleen whales overall in 2022 compared with 2021, but they still remain above the historical average for Minke, Fin and Humpback whales (Figure 11.1).

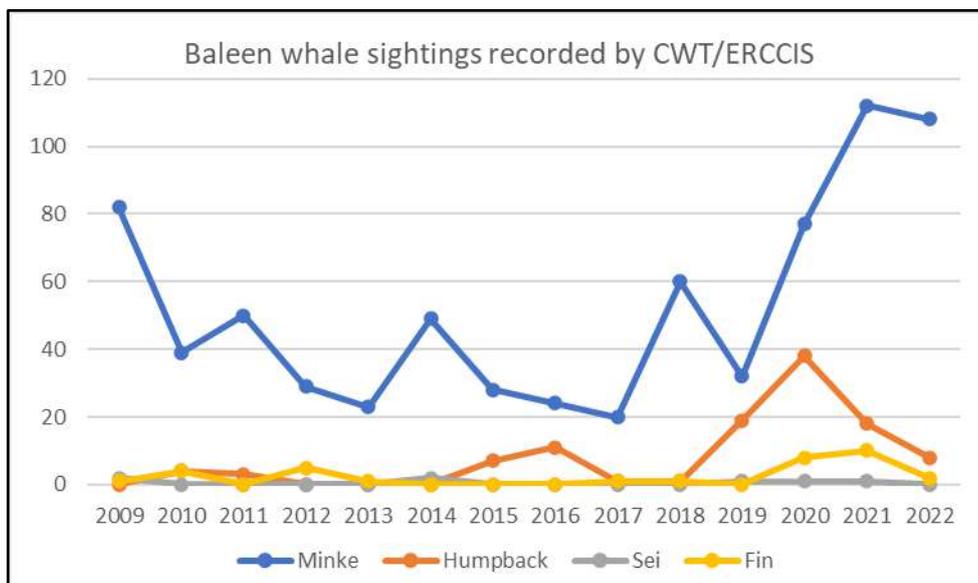


Figure 11.1. Baleen whale sighting recorded by ERCCIS in 2022.

Adding the other data available to the editors for this report, particularly from the Isles of Scilly Bird and Natural History Review where multiple baleen whale records were noted, the data shows that overall minke whale sightings were slightly ahead of last year's record, while Fin, Sei and Humpback whale sightings had decreased (Figure 11.2). More than half of the records for Fin and Humpback whales came from the Isles of Scilly.

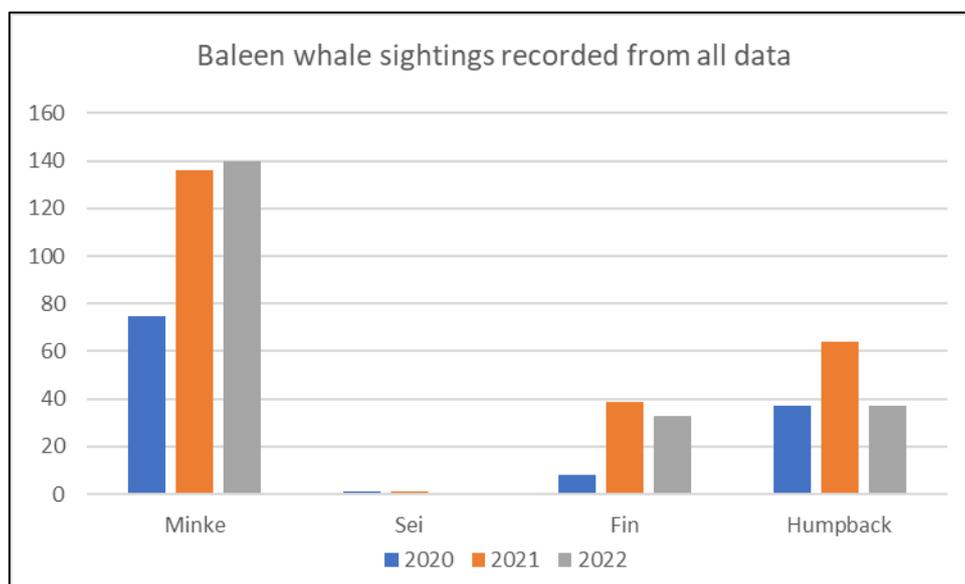


Figure 11.2. Baleen whale sightings recorded from all available data in 2022.

The distribution of sightings tended to focus more to the south and west of Cornwall, with more sporadic sightings on the north coast and coinciding largely with the months of operation of the tour boats that contribute their data to ERCCIS, which is generally Easter to October (Figure 3).

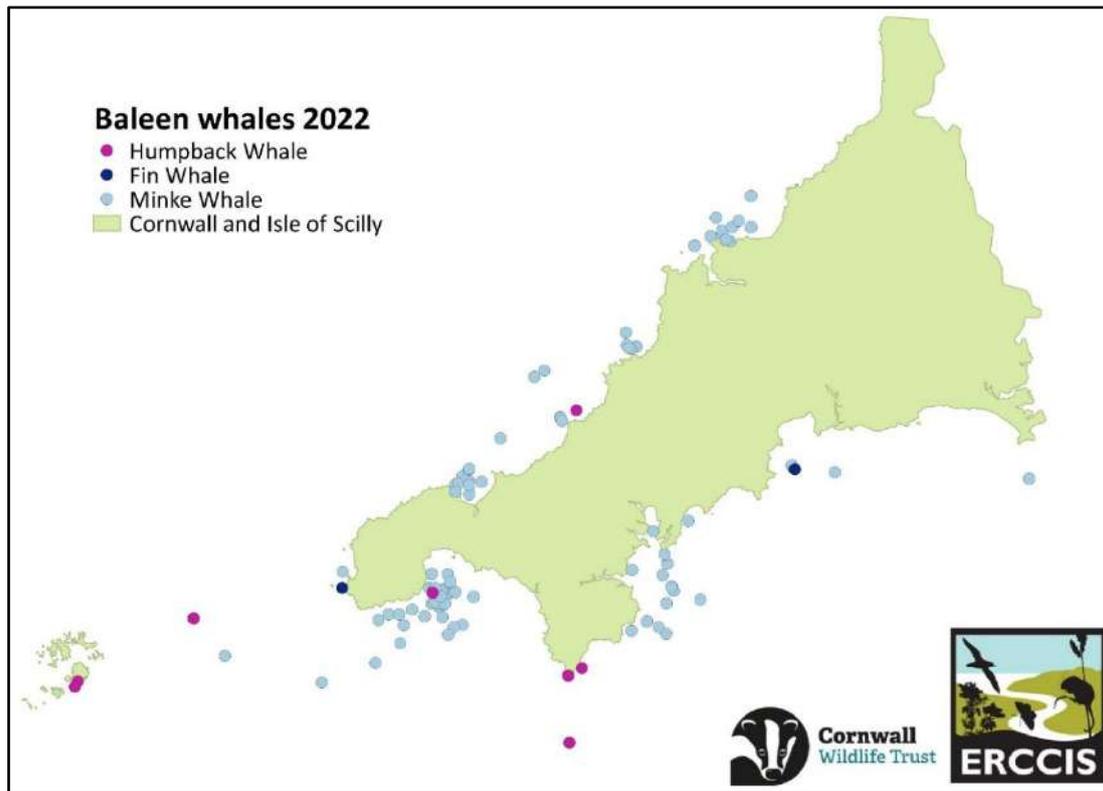
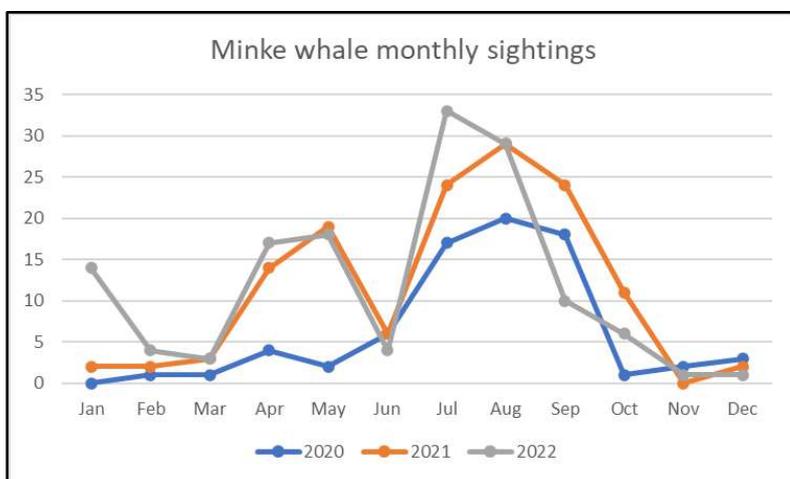


Figure 11.3. Baleen whale sightings distribution in 2022 from CWT/ERCCIS data.

When combined with all other available data, sightings of Fin and Humpback whales are clearly centred around the Isles of Scilly, potentially marking this out as a key habitat in all of south west England especially given most records are ad hoc land-based sightings rather than boat operators or organised surveys. Minke whales are predominantly observed around the Cornish mainland, with occasional sightings in other parts of the region.

Minke whale (*Balaenoptera acutorostrata*).

There were a record 108 sightings of Minke whales reported to CWT/ERCCIS in 2022, which is just short of the record of 112 set in 2021. In combination with other sources of data, the overall sightings figure increases to 140, which is slightly ahead of the record of 136 set in 2021. The apparent trend in sightings seasonality associated with spring and particularly late summer that has been identified in previous SWME reports is once again confirmed in 2022 (Figure 11.4).



Peak months for Minke whale sightings across all data were July (n=33), August (n=29), May (n=18) and April (n=17). It should be noted that these months coincide with the working period for the boat trip operators that contribute data, however this does not explain why June is consistently significantly lower in sightings (n=4) relative to the other months surrounding it. The peaks otherwise appear to indicate that these are productive feeding times for this species around the south-west coastline, while June is a time when feeding opportunities are reduced and the animals temporarily move elsewhere.

Figure 11.4. Minke whale monthly sightings 2020-2022 across all data



Plate 11.1. A Minke whale off the north coast of Cornwall. Image: Nathaniel Barry.

Locations of sightings were fairly widespread around Cornwall from Bude in the north, around Land’s End and along the south coast to Dodman Point, with sporadic further individual sightings in Whitsand Bay, Bigbury in south Devon, and one off Durlston in Dorset. Sightings tended to cluster mainly around Mount’s Bay and Fal Bay, with smaller groupings around St Ives Bay and Padstow Bay. At the Isles of Scilly sightings were mostly along the south and east sides of the island of St Mary’s. For the first time, offshore survey data was available and showed sightings occurring between April to October in the mid-English Channel south of Devon and Cornwall. All sightings in 2022 involved single animals.

Sei whale (*Balaenoptera borealis*).

There were no sightings or strandings of sei whales in south-west England during 2022 (Figure 11.5). For comparison there was one sighting each in July 2020 and 2021, which illustrates they are currently a very rare visitor to the region at least in the coastal waters where the large majority of cetacean observations are made.

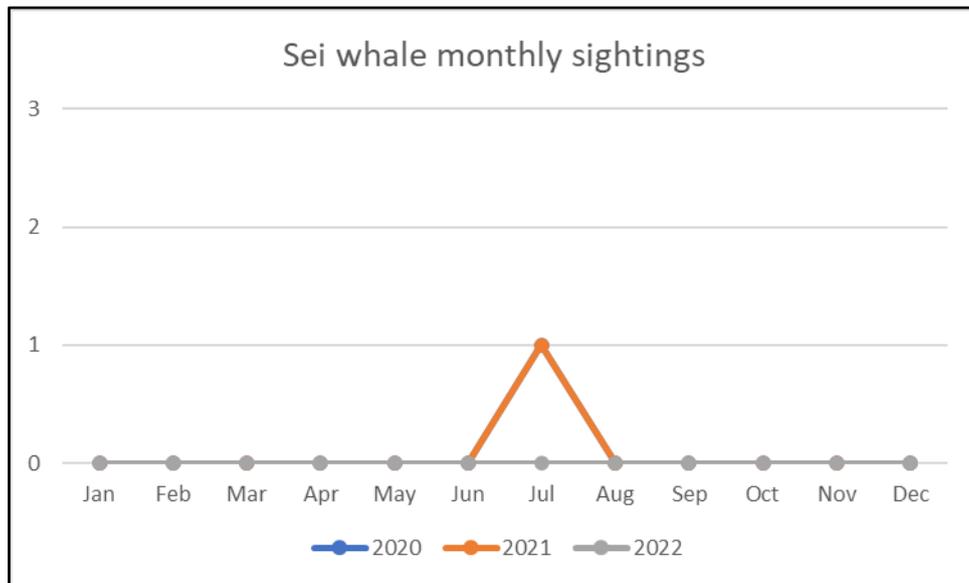


Figure 11. 5. Sei whale monthly sightings 2020-2022 across all data.

Fin whale (*Balaenoptera physalus*).

Two sightings of Fin whales were logged by CWT/ERCCIS in 2022 (10 in 2021), increasing to 33 overall when combined with other data sources, mainly the Isles of Scilly Bird and Natural History Review. Sightings were concentrated in the winter months from February (n=9), January (n=6), December (n=6), with a short summer peak in July (n=6) (Figure 11.5). The summer peak is slightly earlier compared with the previous two years, which occurred in August. As has been noted in past SWME reports, the winter peak coincides strongly with Humpback presence, while the summer peak coincides with peak minke whale presence. This appears to indicate that fin whales use south-west England seasonally, for feeding opportunities with other similar species when prey availability is high.

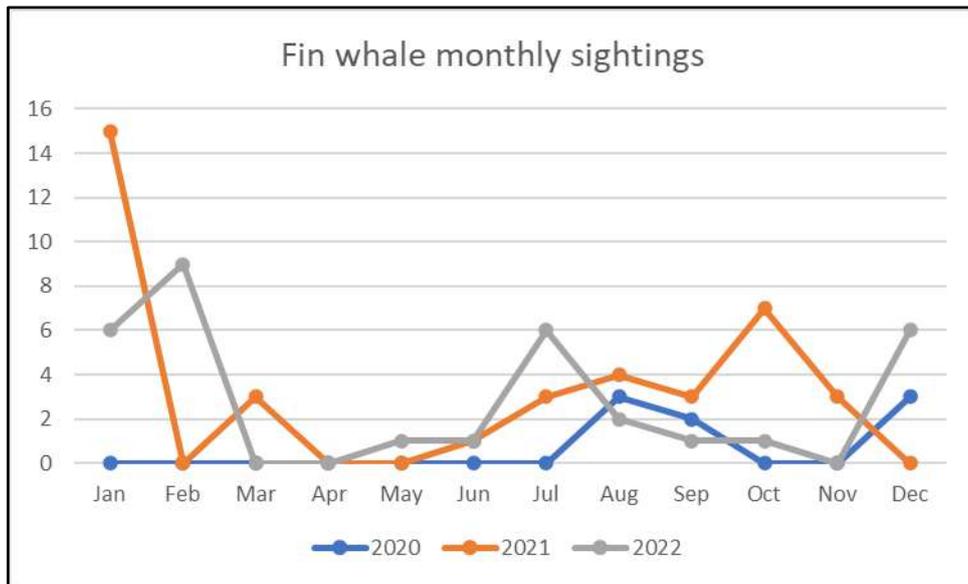


Figure 11.6. Fin whale monthly sightings 2020-2022 across all data.

Geographically, sightings ranged from Land’s End to St Austell Bay in Cornwall, with offshore survey data adding further sightings in the vicinity of the Celtic Deep between south-west England and Ireland including a mother-calf pair in July. Mother-calf pairs have been reported here in summer previously. Another sighting was recorded in the mid-English Channel south of Cornwall. All other sightings came from the Isles of Scilly, mostly along the south and east coasts of the island of St Mary’s.



Plate 11.2. A Fin whale sighted off the south coast of Cornwall. Image: Marine Discovery Penzance.

Humpback whale (*Megaptera novaeangliae*).

There were eight sightings of Humpback whales reported to ERCCIS in 2022 (compared with 18 in 2021), increasing to 37 when other data sources are included – the majority coming again from the Isles of Scilly as with the fin whale records. In 2021 there were a record 64 reports of Humpback whales in total, which is exceptional, however in 2020 there were also 37, so 2022 appears to be a more consistent figure for recent years. It should be noted that many of the records reported here are sightings of the same few animals moving between locations over a period of days or weeks, as some remained around the coast for extended periods of time. Reports peaked in winter, consistent with previous years, led by December (n=21), November (n=5) and January (n=5). Sporadic sightings at other times of the year were also recorded again too (Figure 11.7).

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

The rapid increase in Humpback whale sightings over the last five years in south-west England and sustained levels of observations follows a similar pattern seen in other nearby areas such as the south coast of Ireland and parts of Scotland. The consensus amongst researchers is that this is due to the recovery of the Atlantic population post-whaling moratorium and that they are returned to habitats that they used historically as a stop off point on their annual migration.

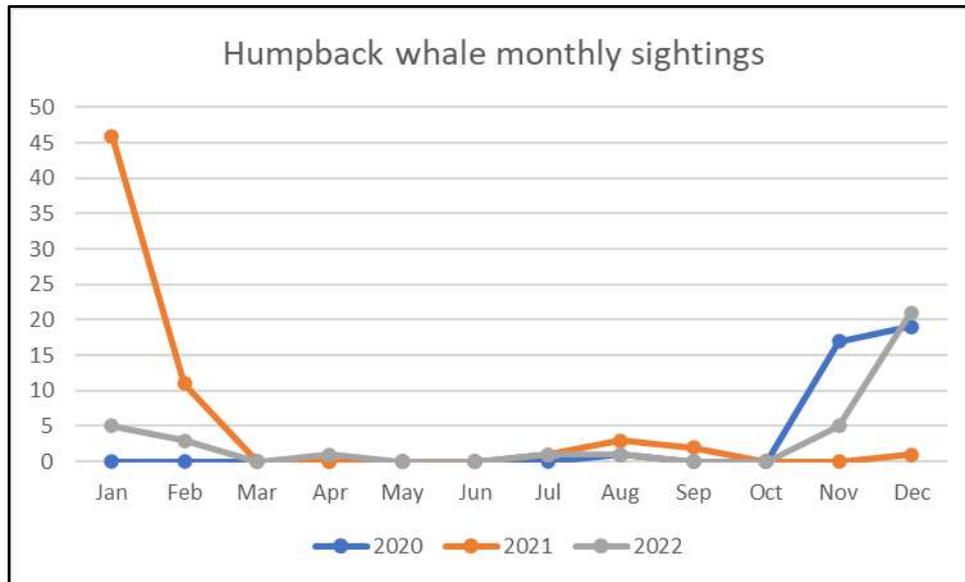


Figure 11.7. Humpback whale monthly sightings 2020-2022 across all data.

The distribution of Humpback whale sighting records were almost entirely from the south coast and Isles of Scilly, with only one record along the north Cornwall coast at St Agnes. The other mainland sightings came from Durlston, Dorset, and Lizard Point, Mount's Bay and off Land's End in Cornwall. The sighting off Land's End was an exceptional group of five seen in December, as otherwise all other records consist of animals alone or in pairs. For the Isles of Scilly, records came once again predominantly from the south and east coasts of St Mary's, demonstrating an emerging trend that this channel between it and St Agnes as well as up towards the Eastern Isles are potentially a very significant habitat for baleen whale foraging.

In the 2021 SWME report the first ever repeat photo-identifications of Humpback whales in south-west England were presented, mainly from animals seen between 2019-2021. An informal identification catalogue has since been set up via CWT/ERCCIS and has grown from six animals in 2021 to 16 in 2022/3 as more historical records with good quality photos have been sourced from social media along with new identifications. New and repeat identifications that took place in 2022 are as follows:

SWUK1 – Pi/Cream tea: after last being seen at the Isles of Scilly in February 2021, Pi turned up in summer 2022 at the Isle of Lewis off the west coast of Scotland, with two sightings a couple of weeks apart. At the time of the first sighting Pi was also in association with a second whale known to the Scottish Humpback ID catalogue as Lindola (who has not been recorded in SW England). Pi then returned to the Isles of Scilly in December and remained there throughout the winter, sometimes observed feeding in the vicinity of fin whales and common dolphins, and later accompanied by a second Humpback whale. This whale has been identified in south-west England every year since 2019 and is showing the strongest indications of having annual site fidelity of all the whales in the catalogue.

SWUK2 – Helen (named for SWME cetacean group convener Helen Chadwick): this whale was depicted in an historical photo taken in 2008 at the Isles of Scilly and sent to the international catalogue Happywhale in 2021, where it was identified as an animal seen in 2012 at the Jan Mayen Islands in the Arctic Circle north of Russia. Helen was sighted for the third time ever in April 2022 at Silver Bank off the coast of the Dominican Republic, which is a known breeding area. This one whale over the course of 14 years and three sightings appears to have linked a whole

migration route from the Caribbean to the Arctic, via south-west England. More sightings of this whale will be especially exciting in the future.

SWUK6 – Morvil ('whale' in Cornish): identified originally by the Irish Whale and Dolphin Group visiting the west and south coasts of Ireland, Morvil was added to the south west UK catalogue following sightings in the Isles of Scilly and Mount's Bay, Cornwall, in summer 2021. Morvil was resighted twice in south-west Ireland in April and October 2022. Interestingly it has been noted that the left fluke now bears scars from an entanglement that must have occurred between summer 2021 and spring 2022. It is not known whether Morvil was able to free him/herself or if human intervention was involved elsewhere in the Atlantic.

SWUK7 – Bob: spectacular photos of a whale breaching and fluking west of Lizard Point, Cornwall, in November 2022 were added to the Happywhale catalogue.

As mentioned above, a number of historical photos have been researched and added to the SW UK catalogue in the last year. These animals are as follows:

SWUK11 – Dhu-Pol Treth ('Blackpool Sands' in Cornish): seen repeatedly off south Devon between February and April 2017. This animal was rescued twice from entanglement at sea by BDMLR, the RNLI, Coastguard and fishermen.

SWUK12: sighted off St Ives in January 2016.

SWUK13: sighted off St Ives in March 2019.

SWUK14 – Godrevy (named for the location sighted at): sadly a maternally separated calf that spent a week living under the cardinal buoy at the Stones reef behind Godrevy Island, Cornwall, in summer 2010. He was monitored by BDMLR but there was no sign of his mother, without whom it was possible to survive. His decomposing body was sighted in the bay in mid-August, becoming snagged on the cable being laid from Hayle to the offshore wave hub installation. The body was towed out to sea but returned the next day and stranded at Porthkidney beach. He is the only whale in the catalogue with a known gender and known to be deceased.

SWUK15 – Tim (named for BDMLR Area Coordinator Tim Bain (deceased)): an entangled whale sighted near Zennor, Cornwall, in summer 2011. BDMLR attempted to disentangle it but were unsuccessful and the animal was not seen again.

SWUK16: a young whale that breached off Falmouth, Cornwall, in spring 2017.

New whales have already been identified in 2023 and will feature in next year's report. The editor would like to put a call out to anyone with humpback whale photos from south-west England to please send them in to dan@bdmlr.org.uk so that they can be added to the SW UK catalogue and help further our understanding of these animals in our waters.



Plate 11.3. The Humpback whale known as 'Pi' was recorded in south-west England for the fourth consecutive year, as well as being sighted for the first time in Scotland. Image: Steve Truluck (Hebridean Whale Cruises).

12. Cetaceans: Toothed whales and dolphins (Odontocetes).

Edited by Duncan Jones, Marine Discovery Penzance.

Contact: duncoliver@yahoo.co.uk

Conclusions

- The seas around the South-West appear to be an important habitat for Odontocetes and records of Bottlenose Dolphin, Common Dolphin and Harbour Porpoise appear to be increasing significantly.
- Currently, the data used in this report lacks qualification by observer effort, and the influence of environmental conditions during observations is not considered. Additionally, the impact of environmental conditions throughout the year on detection probability is not recorded or taken into account. As a result, the data contains significant unknown biases. Consequently, any conclusions regarding numbers and distribution based on this data are unreliable.
- However, the report does serve as a valuable record of the presence of these species off the coast of the South-West and highlights the need for more comprehensive surveys to establish a more accurate understanding of current numbers and distribution.

Introduction

In 2022, data recording experienced a return to normalcy following the Covid-19 pandemic. However, data coverage still remains skewed towards Cornwall, although the inclusion of data from Organisation Cetacea (ORCA) has improved spatial coverage. Notably, data for offshore areas has increased (see Figure 12.1). While it would be beneficial to have more data from Devon, Dorset, and Somerset, it is important to maintain consistency across years for the purpose of this report. Introducing or removing datasets across different years would make it impossible to determine whether changes in observation numbers are due to fluctuations in animal populations or variations in the amount of data included in the report.

All observations in this report have not been adjusted for survey effort or environmental conditions under which they were made. Increased survey effort enhances the likelihood of detecting animals, thereby potentially inflating the number of observations, irrespective of changes in animal presence. Sea conditions also influence the probability of detecting cetaceans, as weather patterns can vary from year to year. Consequently, certain years may have prolonged periods during which cetacean detection is less likely due to rough sea states. This variability could affect observation totals between years. Other factors that could impact detection include vessel speed, vessel manning, observer experience, and vessel spatial coverage (affected by sea state). All these factors represent unknown biases within the data and presently hinder confident comparisons of observation numbers across years.

Considering these limitations, the 2022 sightings records included a significant number of Bottlenose Dolphin *Tursiops truncatus*, Common Dolphin *Delphinus delphis* and Harbour Porpoise *Phocoena phocoena*.

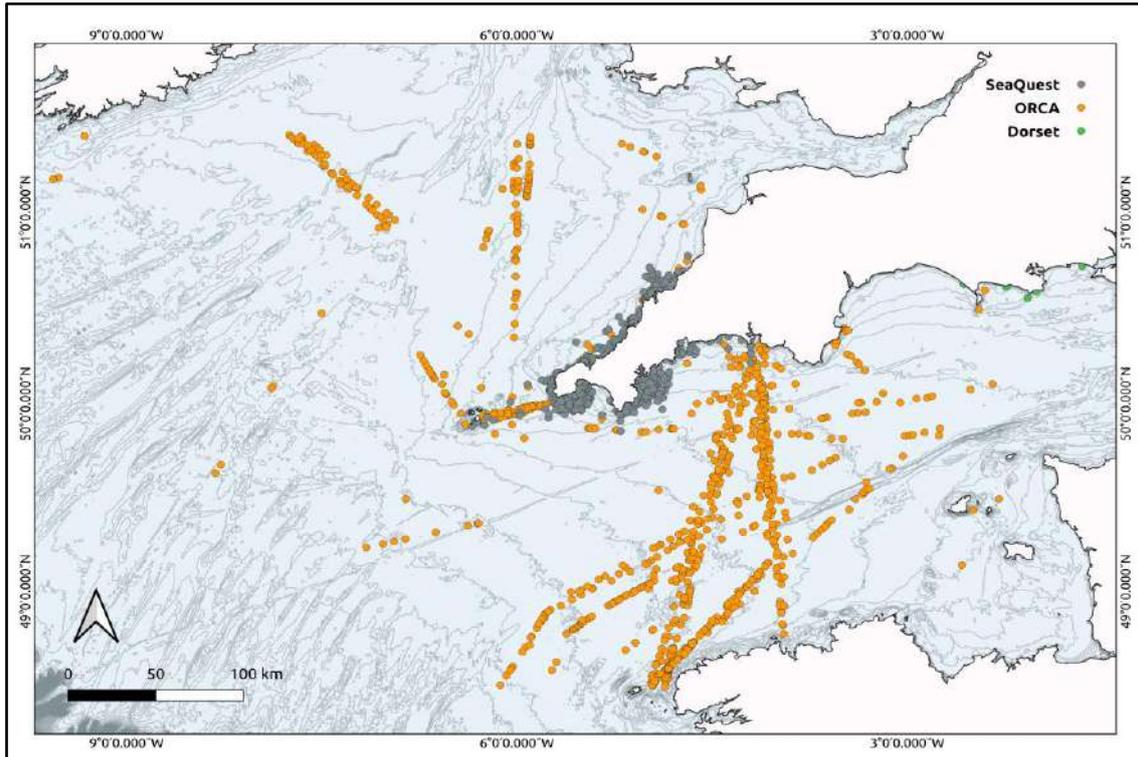


Figure 12.1. Data coverage for toothed whales and dolphins. Sources: Seaquest SW, ORCA , Dorset Wildlife Trust, miscellaneous. This figure does not include all of the data used in the totals it only includes the data that had detailed enough spatial information for mapping purposes.

Harbour Porpoise *Phocoena phocoena*



Plate 12.1. Harbour Porpoises in Mount's Bay taken in 2022. Image: Marine Discovery Penzance.

The number of Harbour Porpoise observations in 2022 (see figure 2) was slightly reduced compared to a total of 3500 in 2021, with 3400 recorded. Both 2021 and 2022 exhibited a significant increase compared to previous years and some of this is due to the inclusion of the ORCA dataset. In 2021, the dataset added

51 animals, while in 2022, it contributed 211 animals. These additions accounted for 5.1% of the increase in 2021 and 19% in 2022, based on the increases observed since 2020.

As the last pre-Covid year, 2019 serves as a reference point, and observations have shown a remarkable rise of 43% in 2021 and 41% in 2022 compared to that baseline. This substantial increase suggests a significant rise in the number of harbour porpoises present in south-west waters. However, it is important to better understand the unknown biases in the data to have confidence in this observed increase.

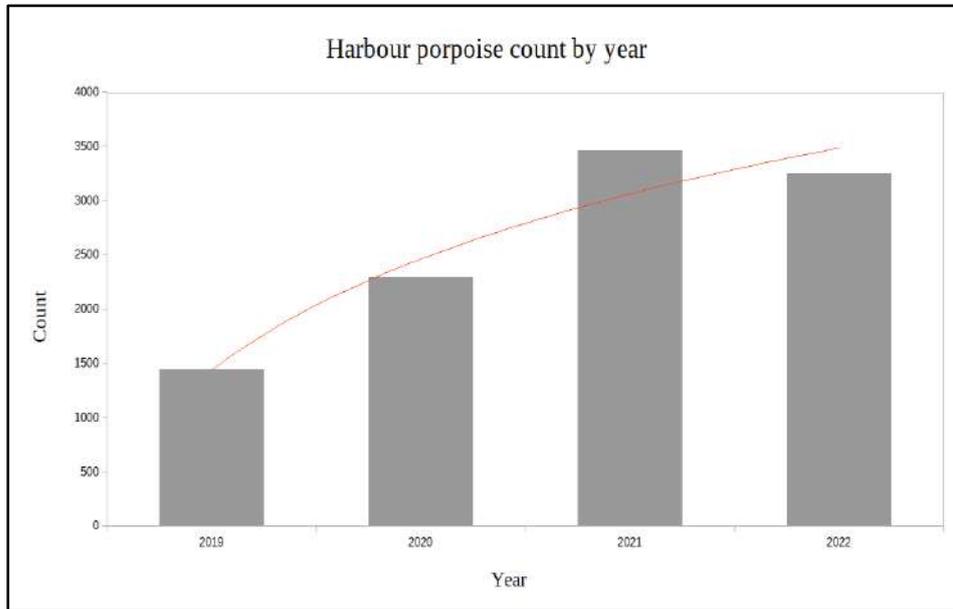


Figure 12.2. Number of harbour porpoises recorded off the south-west of the United Kingdom by year.

Bottlenose Dolphin *Tursiops truncatus*



Plate 12.2. A Bottlenose Dolphin photographed near to the coast in 2022. Image: AK Wildlife Cruises.

There has been a significant increase in Bottlenose Dolphin observations in the waters off the southwest of the UK (see Figure 12.3). In 2022, there were 1400 records, compared to 600 in 2021, 100 in 2020, and 200 in 2019. It is worth noting that 2019 was the last year unaffected by the impact of Covid 19 records in 2021, 56 observations, or 14% of the total, were attributed to the inclusion of the ORCA dataset. In 2022, this number increased to 141 observations, accounting for 10% of the total. Despite the inclusion of the ORCA dataset, which contributes only a small fraction to this increase, the significant rise in Bottlenose Dolphin records suggests an increase in the population of these animals in the south-west waters. However, for this to be confirmed the unknown biases in

the data would need to be properly accounted for.

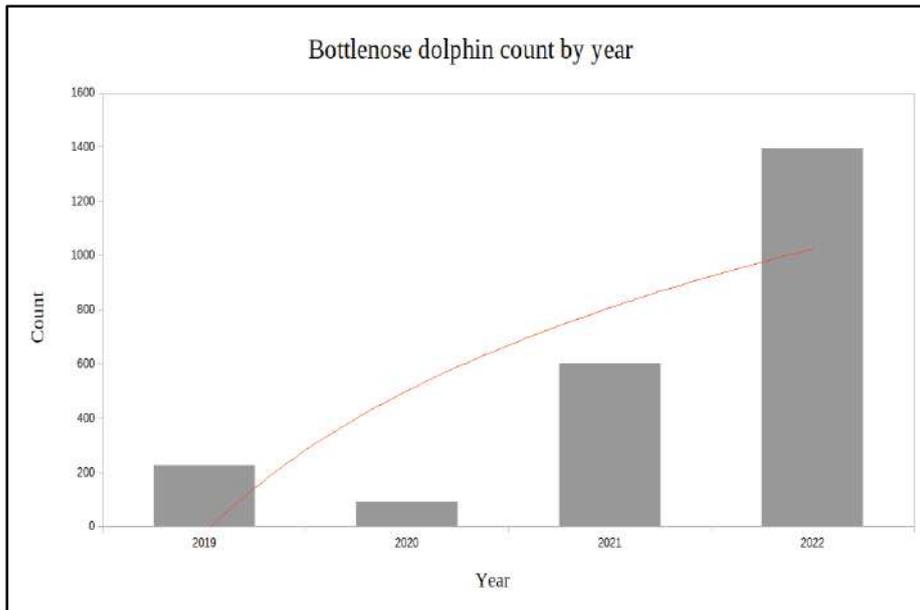


Figure12.3. Number of Bottlenose dolphins recorded off the south-west of the United Kingdom by year.

Common Dolphin *Delphinus delphis*



Plate 12.3. Common dolphins photographed in Mount's Bay in 2022. Image: Marine Discovery Penzance.

There has been a substantial increase in the number of Common dolphins observed in the waters of the southwest UK over the past two years. In 2022, a total of 26,000 dolphins were recorded, which shows a slight decrease compared to 27,000 in 2021 (see Figure 4). In 2020, there were 10,000 records, and in 2019, there were 8,000 records. It is important to note that 2019 was the last pre-Covid year. When comparing the records from 2021 and 2022, there is a 71% increase in 2021 and a 70% increase in 2022. The ORCA data accounts for 1,613 records, or 6% of the total, in 2021, and 6,169 records, or 24% of the total, in 2022. Taking all of this into consideration, there appears to have been a significant rise in the

number of Common dolphins recorded in the south-west waters. However, to better understand this increase, it is crucial to gain a better understanding of the unknown biases present in the data.

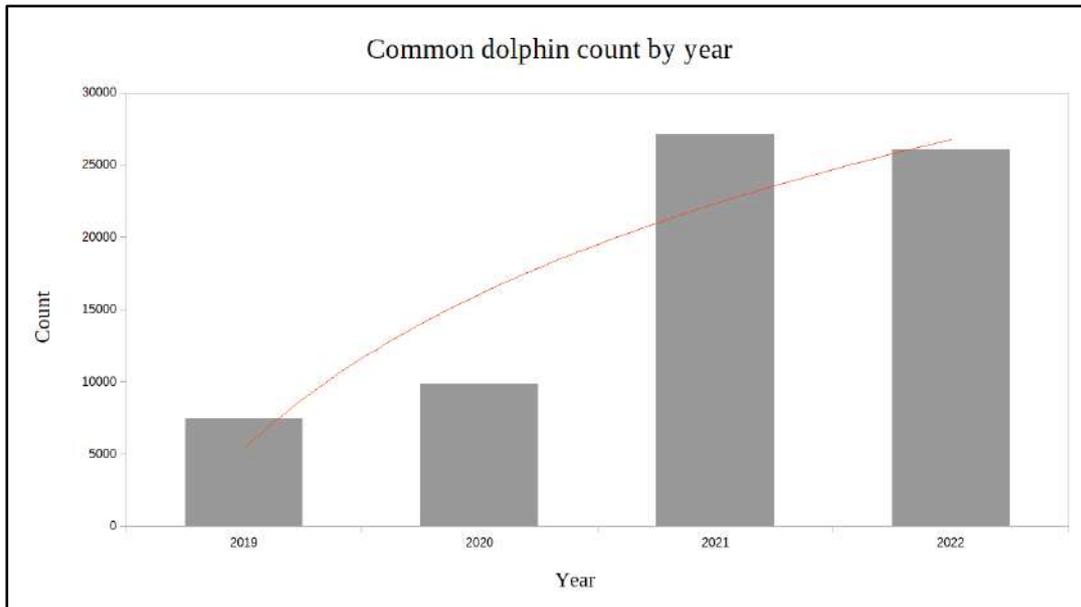


Figure. 12.4. Number of Common dolphins recorded off the south-west of the United Kingdom by year.

Pilot Whales *Globicephala melas*



Plate 12.4. Pilot whales photographed in Mount's Bay in 2020. Image: Marine Discovery Penzance.

Pilot Whale records off the south-west coast of the UK do not exhibit a clear linear trend of increase or decrease. In 2020, which was a year impacted by the Covid-19 pandemic and reduced records, there is a notably high number of records compared to other years (see Figure 5). Pilot whales are known to occur more frequently in deeper waters along the continental shelf edge. The inclusion of the ORCA data has contributed to increased records in those areas. However, this has not resulted in an increase in observations in the years 2021 and 2022, when the ORCA data was included.

It appears that pilot whales appear inconsistently in areas where records are available in this report, and a longer time series of data would be necessary to better understand fluctuations in their numbers.

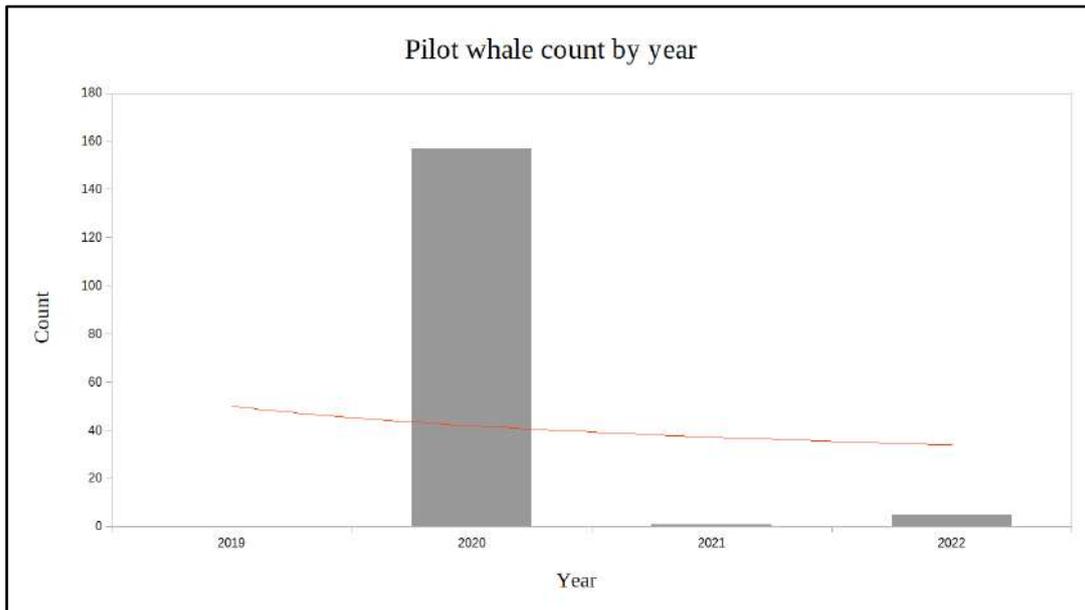


Figure 12.5. Number of Pilot whales recorded off the south-west of the United Kingdom by year.

Risso's Dolphin *Grampus griseus*



Plate 12.5. A Risso's Dolphin photographed in Mount's Bay in 2022. Image: Marine Discovery Penzance.

Records of Risso's dolphins decreased in 2022 compared to 2021, with 280 records in 2022 and 590 records in 2021. In the previous two years, records were consistently around 100 (95 in 2019 and 105 in 2020) (see Figure xx). Photo identification matches between Mount's Bay, Cornwall, and both the Isle of Man and Bardsey Island indicate that Risso's dolphins have a relatively wide range. As cephalopod feeders, their presence in an area is likely to fluctuate with the availability of cephalopod prey. However, the presence of cephalopods shows less consistency across years compared to the prey species of other cetaceans mentioned in this report. This variability in prey availability could explain the fluctuations in Risso's dolphin numbers across years.

To gain a better understanding of Risso's Dolphin population and the fluctuations in their numbers in south west waters, it would be necessary to consider observations over a longer time series and to account for the hidden biases in the data.

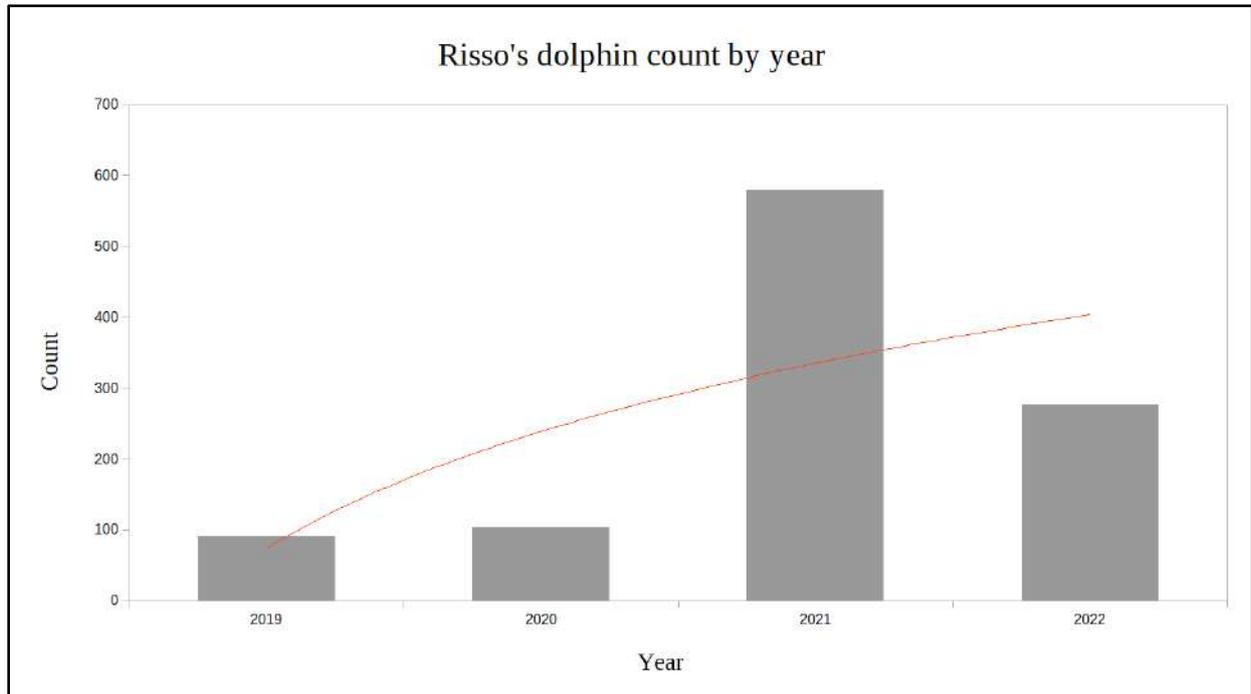
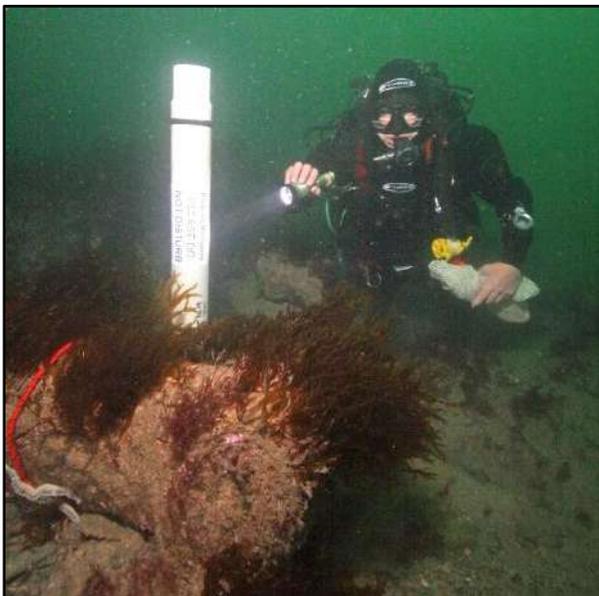


Figure 12.6. Number of Risso's dolphins recorded off the south-west of the United Kingdom by year.

F-Pod datasets



The Cetacean Acoustic Trend Tracking project (CATT) aims to provide F-Pods, which are remote acoustic detection units for recording the presence of odontocetes, to various groups in the south-west of the UK. The objective is to establish a listening array in the south-west waters to monitor long-term trends in cetacean populations. These devices capture the echolocation signals of the animals, and the ultimate goal is to use click trains to identify the species emitting them. Chelonia Ltd supplies the devices free of charge to support this community project. The data collected from these pods will hopefully serve as a valuable supplement to the data in this report.

Plate 12.6. A F-Pod deployed on an existing mooring point between Penlee Point and Rame Head. Image: Keith Hiscock.

The dataset from a pod deployed on the wreck of the Coronation, located between Penlee Point and Rame Head (see Figure 12.6), was included in this year's report. The data was analysed by Freya Diamond from The University of Plymouth (UoP).

KERWEMBURY 2022 09 19 FPOD_6303 file0.FP3	05/10/2022	4	Cetaceans
KERWEMBURY 2022 09 19 FPOD_6303 file0.FP3	06/10/2022	15	Cetaceans
KERWEMBURY 2022 09 19 FPOD_6303 file0.FP3	07/10/2022	4	Cetaceans
KERWEMBURY 2022 09 19 FPOD_6303 file0.FP3	08/10/2022	38	Cetaceans
KERWEMBURY 2022 09 19 FPOD_6303 file0.FP3	09/10/2022	3	Cetaceans
KERWEMBURY 2022 09 19 FPOD_6303 file0.FP3	10/10/2022	8	Cetaceans
KERWEMBURY 2022 09 19 FPOD_6303 file0.FP3	11/10/2022	3	Cetaceans

Figure 12.7. Clip of the data from the F-Pod deployed on the wreck of the Coronation between Penlee Point and Rame Head by Mark Pearce, Peter Bernardes, Steve Fletcher, Simon Scott and Keith Hiscock on behalf of the Wembury Marine Centre (Devon Wildlife Trust).

The future

The data used in this report indicates significant increases in certain species of cetaceans in the waters of the south-west. However, the reliability of these findings is greatly hindered by the unaccounted biases in the data collection process. It would be beneficial to address this issue in future studies. Some datasets within the broader data collection include records of observer effort and environmental conditions. If these datasets were provided with the supplementary effort and environmental data, they could serve as a means to calibrate the wider dataset and provide greater clarity to the results.

13. Fisheries

Edited by Libby West, Senior Specialist in Marine Fisheries, Natural England

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Why include fisheries and commercial fish species in the SWME reporting?

The UK is moving towards an Ecosystem-Based Approach to Fisheries Management, a central tenet of which is to fully acknowledge and integrate humans within environmental management, acknowledging both our impact on and reliance upon ecosystems. One of the primary ecosystem services provided by the marine environment is the provision of food and we are increasingly aware of the great social, economic and cultural importance of fisheries historically and today, particularly in the southwest UK. In the same way that measuring the status of a top predator can be indicative of the health of an ecosystem, the long-term sustainability (or otherwise) of fisheries can be a useful indicator as to the state of the ecosystem. However, marine foodwebs are complex and the abundance of fish populations and the numbers caught or landed by fishermen can be affected by several interacting factors. Any inference regarding the state of an ecosystem or the success of management based upon trends in fisheries catch or landings must therefore be cognisant of the complexity of both the environmental and human dimensions of fisheries.

Ecosystems and fish and fisheries

Marine foodwebs, and the abundance of individual fish populations are often driven by a complex mixture of factors (Figure 13.1) including predation and fisheries pressure (known as top-down processes) and environmental and resource availability factors (known as bottom-up processes). These can include changes in the magnitude, spatial or temporal dynamics of biogeochemical processes, food availability, water temperature or other climatic factors. The interactions between bottom-up and top-down processes and can be complex and hard to disentangle, and will vary between species, locations and through time.

It might be expected that fisheries - usually measured by landings or catches - reflect the abundance of fish in the ecosystem. However, in reality fisheries are also now significantly affected by management (e.g. quotas or other caps on fishing effort, rules around discarding, minimum landings sizes and spatial restrictions), operating costs (especially fuel), market demand and even access to processing facilities for different species.

Catch, landings and fisheries monitoring

Fishing gears are not perfectly selective. They will catch the target species, 'wanted bycatch' which may be made up of valuable commercial species in low numbers, or low-value species in high numbers. 'Unwanted bycatch' may also occur in the form of non-commercial species (including birds, marine-mammals and sensitive fish) and juvenile, over-quota or unmarketable fish. Ideally we would know all the species and the abundance of each species caught, as well as what is discarded. Historically, and in some fleet segments today we only know what is landed, i.e. the target species and wanted bycatch. Therefore landings are a very filtered glimpse of what is actually being caught. Efforts to improve data collection of catches, including time and locations are underway with 'Fully Documented Fisheries' being seen as an important element of sustainable fisheries management.

The long-term picture can also be influenced by our ability to monitor the catches, discards and bycatch, fishing effort and spatial distributions of fisheries effort. This is an area of much change and so it is important to report on progress in this area so that we understand how apparent changes in fisheries are actually the results of our increasing ability to monitor them and report on their catches.

Was 2022 a normal year for commercial fish and fisheries in the southwest?

Trends in landings 2016-2022 from MMO landings data

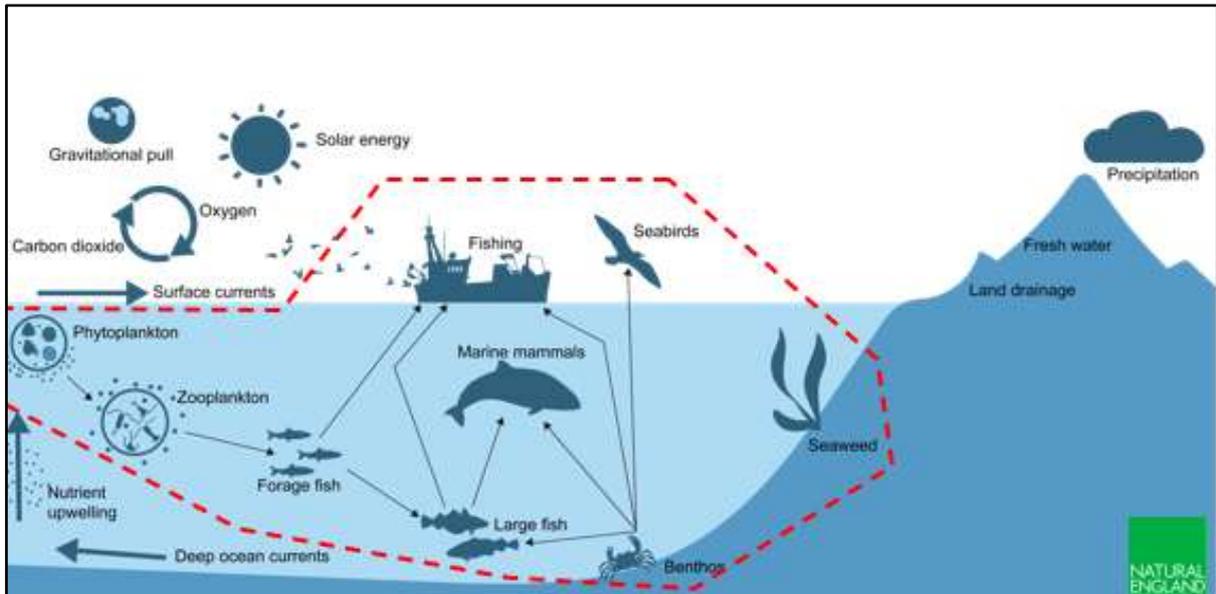


Figure 13.1. The catches and landings by fishermen are affected by a number of different and interacting environmental, ecological, social and economic factors. This image, produced by Jacob Bentley of Natural England shows fisheries as part of a complex marine foodweb.

Landings of some traditionally caught species are declining, for example **Cod and Pollack** (Figure 13.2). Stock assessments undertaken by ICES reflect these trends. For cod they show poor recruitment since 2013 but also increasing fishing mortality since 2012 in the eastern English Channel and southern Celtic Seas. Pollack are not subject to a full stock assessment, but landings and biomass both appear to be declining. However, the reasons for this decline are not yet known, and it is too soon to be able to decisively attribute changes in landings to climate.

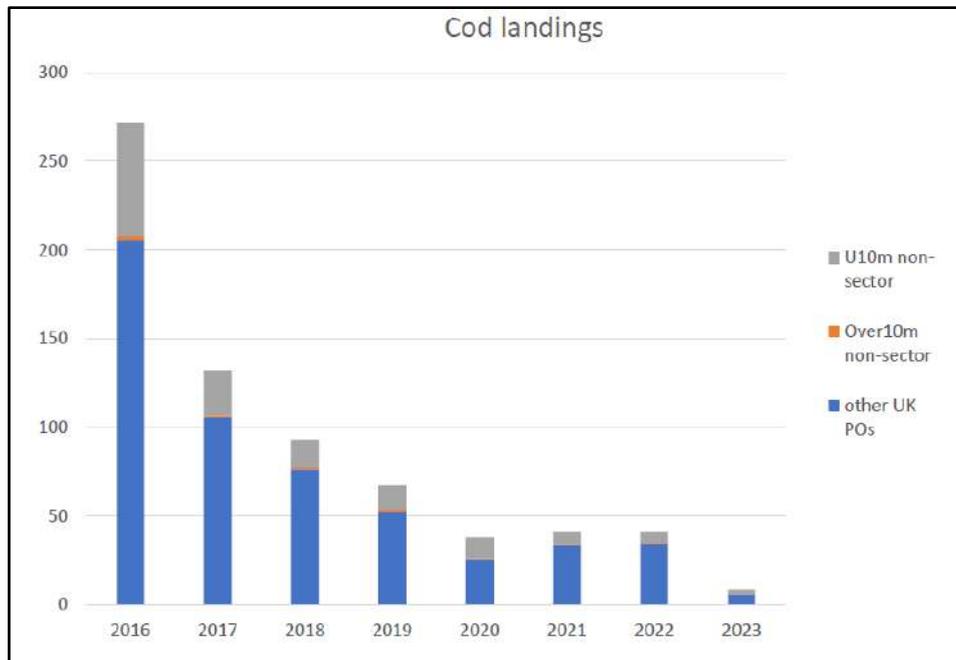


Figure 13.2. MMO data on Cod landings into southwest ports, presented by Jacob Bestwick. Cod are one of the species whose range is expected to shift in response to climate change.

Mackerel landings have also declined since 2016. Stock assessments show a decline in landings. A large peak in fishing pressure and landings in the early 2000s was followed by a reduction in the northeast Atlantic stock, below sustainable limits. Once fishing pressure reduced, populations recovered, following a big peak. However, fishing pressure has since started to increase, and reduced catches could be indicative of this.

Decreased landings of **Brown Crab** are thought to be primarily caused by high fishing effort. The Crab and Lobster FMP will be one of the first to be published and has the potential to contribute significantly to the sustainability of crab fisheries in the UK.

Species which saw notable increases between 2016 and 2022 include **Bass, Sole, Scallop, Undulate Ray and Black Bream**. Bass populations are thought to be rebuilding in response to management which was brought in to reduce fishing effort following a crash in bass numbers in 2010-2012. Sole and Black Bream populations may be benefiting from warmer waters, although fishing pressure for sole in the Celtic Sea has been steadily decreasing for some years according to stock assessment data which is also likely to be contributing to healthy populations (Plate 13.1). The increase in scallop landings is thought to be primarily due to the removal of effort limitations following Brexit, raising concerns over stock sustainability. Increased landings of undulate ray may reflect increases in the stock, which may reflect some level of recovery following reductions in fishing effort since the late 1990s.

The landings of some species (**Cuttlefish, Squid, Sardine and Hake**) remain highly variable between years. Some of these species may have short life cycles, and/ or have populations that are determined by bottom-up processes which can lead to highly variable biomass between years (e.g. cuttlefish and sardine).

Updates to Cornwall Good Seafood Guide ratings in 2022

Ratings by the Cornwall Good Seafood Guide for **Brown Crab** and **Mackerel** were downgraded, in agreement with trends picked up in the landings. **Brill** and **Celtic Sea Plaice** also had their sustainability ratings decreased following poor stock assessments. Conversely, **Western Channel Plaice** saw an improvement in their rating due to a relatively healthy biomass, highlighting the complex interactions between fish, fisheries and the environment.

Changes to monitoring and management of fisheries in the southwest

Coverage of vessel tracking systems (Vessel Monitoring Systems – VMS) remains patchy with under 12m vessels still not covered by this technology, with some exceptions (e.g. mobile gear in the D&S IFCA District). Improvements in the recording of catches (as opposed to landings) in smaller vessels should improve imminently with the introduction of the requirement for 10m vessels to record all their catch via an app (the CatchApp) now a requirement. New data from trials of Remote Electronic Monitoring (REM) on scallop dredges undertaken by D&S IFCA in partnership with industry have shown that existing cost-effective technology can greatly improve estimate of fishing effort and the ability of regulators to monitor compliance.

The Joint Fisheries Statement was published in 2022 which further committed the UK to developing an Ecosystem-Based Approach to Fisheries Management (EBAFM). The development and publication of the first round of Fisheries Management Plans in 2023 may introduce new management or data collection regimes which are of interest to SWME. Several local initiatives in the southwest are trying to improve the involvement of stakeholders in the management of fisheries, including the MMO-led regional fisheries groups.

The introduction of management into offshore MPAs and the continuing work of IFCAs in inshore MPAs will continue to affect where fisheries activities can occur. Whilst little focus (either during designation or management) has been given to the potential benefits of MPAs to fisheries beyond wider environmental improvements, there are indications of the benefits emerging. Two surveys were undertaken in 2022 at Lundy assessing numbers of crabs and lobsters in the No-Take-Zone (NTZ) compared to fished areas outside. There were approximately four times as many lobsters in the NTZ as in nearby fished areas (Plate 13.2).



Plate 13.1. Common Sole populations also appear to be doing well. This could be due to reducing fishing pressure. Their abundance in nursery areas, such as Bridgwater Bay in the Severn Estuary (where this sample was collected from) is also known to respond positively to water temperatures. Image:



Plate 13.2. The benefits of MPAs to fisheries has received relatively little focus in England. Experimental potting (catch per unit effort) sponsored by the Blue Marine Foundation has shown that abundance of Blue Lobsters was four times higher in the No Take Zone relative to similar fished areas in 2022. During a University of Plymouth study also in 2022, lobsters were tagged. Image: Shion Reynell/University of Plymouth.

14. Marine Protected Areas

Siân Rees, Jean-Luc Solandt and Kate Sugar

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Summary/Conclusions

- In the SWME area, there are currently 53 Marine Protected Areas (MPAs) (10 SACs, 4 SPA, 2 Ramsar sites, 37 MCZ).
- Across the Devon, Cornwall and the Isles of Scilly marine area (coastline to 12nm), 34% of the marine area is now covered by an MPA designation.
- Conservation Advice has been completed for 98% of MPAs (up from 97% past year) and condition assessments completed for 15% (up from 7% the previous year).
- Within the SWME region, inshore areas (0-6nm) have greater coverage by MPAs (25-30%) than offshore areas (20%).
- In terms of fisheries management measures that reduce the pressure on seabed habitats from Bottom Towed Gear (BTG) the Devon and Severn IFCA have the greatest proportion of the area of MPAs (85%) protected from BTG.
- No proposed HPMA within the SWME region were put forward in 2022 for public consultation.
- Studies of seagrass within MPAs has focussed on protection, restoration and estimates of Blue Carbon to significantly inform its protection and recovery.

MPAs overview

In the SWME area, we currently have 53 Marine Protected Areas (MPAs) in total (10 SACs, 4 SPA, 2 Ramsar sites, 37 MCZs). Across the Devon, Cornwall and the Isles of Scilly marine area (coastline to 12nm), 34% of the marine area is covered by an MPA designation. Conservation Advice has been completed for 98% of MPAs (up from 97% past year) and condition assessments completed for 15% (up from 7% the previous year).

The next section is an assessment by Jean-Luc Solandt of information relevant to the protection of seabed habitats from Bottom Towed Gear (BTG) including Table 14.1 which provides metrics for the amount of seabed within MPAs (per regulator district), the amount of seabed protected by a no bottom towed gear fisheries (BTG) byelaw, the proportion of (%) MPA area that are protected via a BTG byelaw and the % area of total areas of MPAs in that regulators district whereby closures to BTG extend to sedimentary seabed habitats (muds, mixed gravels and sands). We can see within the SWME area that the inshore areas (0-6nm) have greater spatial areas within MPAs (25-30%) than the offshore area (20%). In terms of fisheries management measures that reduce the pressure on seabed habitats from BTG the Devon and Severn IFCA have the greatest proportion of the area of MPAs (85%) protected from BTG. Extension of the 'whole site approach' to MPAs where sediment areas between conservation features are also protected from the pressure of BTG through a fisheries byelaw, demonstrates that the Isles of Scilly IFCA include 100% of mixed sediment area within MPAs and the Devon and Severn IFCA include 93% of mud and 79% of the sand habitats within MPAs. For future reference an increase of the mixed sediment areas included within BTG byelaws provides a proxy metric for habitat areas where there are opportunities for nature recovery and restoration beyond features of conservation interest.

Significant progress was made in 2022 to implement fisheries management measures for offshore MPAs. Two sites in the SWME area Canyons MCZ, and South Dorset MCZ have byelaws in place to prohibit bottom towed gear.

In 2021 there was an expectation that a location within the SWME area would be proposed as a Highly Protected Marine Area (HPMA). However, no SWME area proposed HPMA were put forward in 2022 for public consultation. The Secretary of State has requested that Defra explores the potential for additional sites for consideration during 2023.

Research within MPAs has focused on seagrass protection, restoration and estimating contributions to blue carbon. Over the duration of 2023 there were several Blue Carbon focussed events to share expertise and learning across the SW.

MPA reality check – Jean-Luc Solandt (Marine Conservation Society)

The most large-scale influencing factor on UK and European ocean systems is seabed mobile bottom trawling, seining and dredging (Dunkley and Solandt, 2021; IPBES, 2019). These gears are pervasive in the southwest, as this is a productive ground for demersal fishing (Figure 14.1).

There is a large amount of current and historical evidence that such activity changes benthic ecosystems, rebalances food chains, reduces the carbon sequestration and storage abilities of seabed habitats and associated fish biomass, and selects for species with short life histories, and high reproductive and growth rates (Tillin *et al.*, 2006).

As such, understanding how well we are doing in ‘conservation’ terms in many ways starts with how we are managing ‘seabed’ MPAs, but also how ecosystems and fishing activities respond – for the benefit of biodiversity richness and ecosystem services.

We continue to spatially assess Bottom Towed Gear (BTG) closures of areas in the southwest on an annual basis from the various IFCA and MMO waters in the southwest area as a proxy to start considering management, and effective ecosystem-based conservation on a wider seas basis (Figure 14.1).

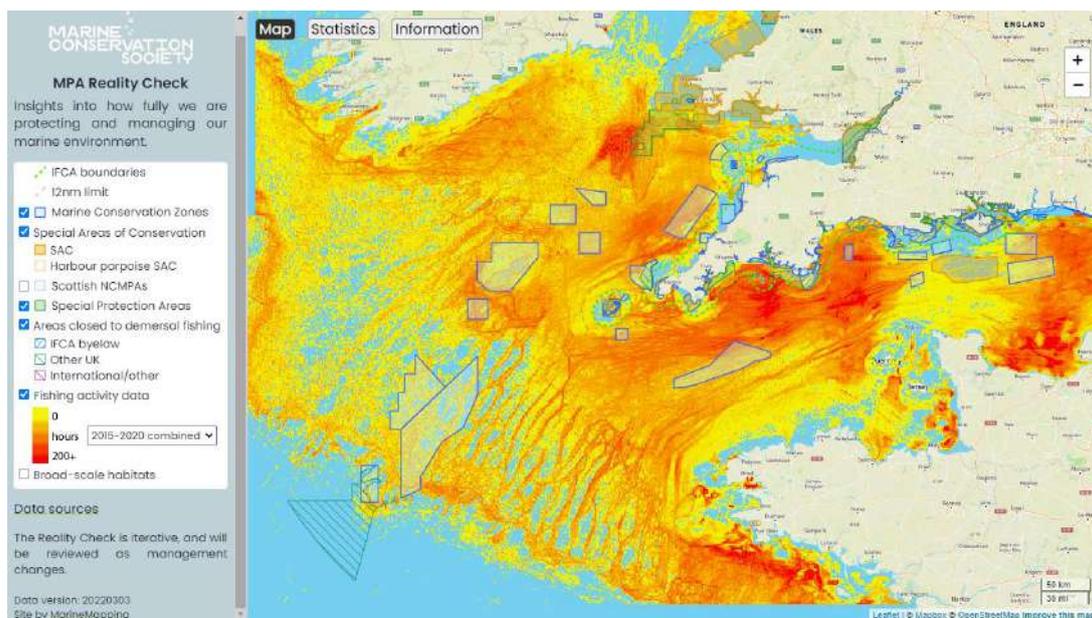


Figure 14.1. Bottom trawling activity of vessels >15m in and around UK MPAs in offshore and nearshore areas (this is an underestimate of trawling activity, as it doesn't take account of smaller vessel activity). Data is intensity of fishing combined for 2015-2020 data for all fleets. Image is taken from the MPA reality check (<https://mpa-reality-check.org/>).

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

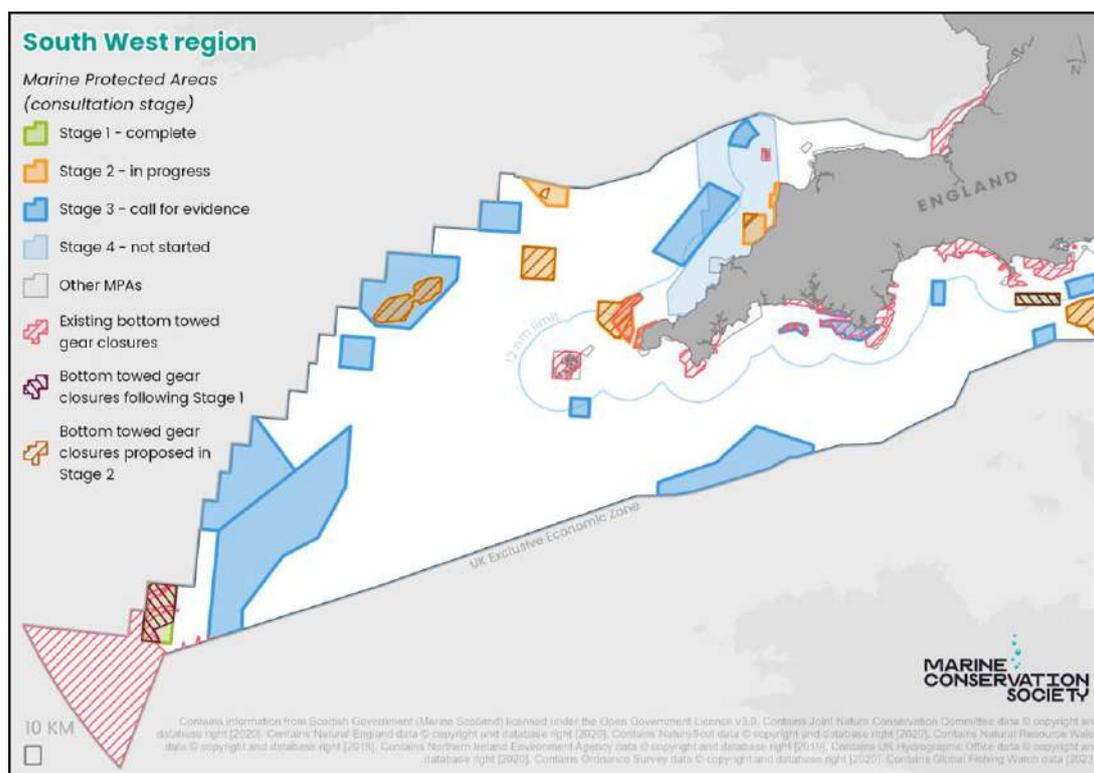


Figure 14.2. Area based closures to all forms of bottom towed fishing gears (including stage 1 offshore MPAs). Note the protection of the 2 sites (Canyons in far southwest, and South Dorset (South of Portland)). Stage 2 offshore MPAs are currently being consulted on by MMO – we’ve included anticipated closures in this map. Stage 3 MPAs will be consulted on in 2024.

Table 14.1. Amount of MPA, bottom towed fishing in MPAs (as of April 1 2023), and closures to bottom towed fishing. We’ve assessed the amount of sediment habitat protected in nearshore IFCA administered waters (source: <https://mpa-reality-check.org/stats/>). Note that the measures to protect offshore sites include one site (South Dorset) and another (the Canyons).

Regulator and 'zone'	District Area / MPA area (km ²)	MPA proportion of district %	Protected seabed in MPAs from BTG (km ²)	MPA area Protected from BTG %	Sediment protected in MPAs %
Devon and Severn IFCA (0-6nm)	4544 / 1326	29.2	1121	85	Mixed: 37.5 Mud: 93.5 Sand: 79
Cornwall IFCA (0-6nm)	4067 / 1036	25.5	408	39.4	Mixed: 58 Mud: 42 Sand: 16.2
Isle of Scilly IFCA (0-6nm)	973 / 294	30.2	230	78	Mixed: 100 Sand: 14.9
Offshore (MMO) (6-200nm)	68086 / 13583	20	766.74	0.8	

Legend. **District Area:** the area administered by the regulator in Column 1 of the table; **MPA Area:** The area of MPA in that regulators district; **MPA proportion of district:** The % area of MPAs (that protect seabed features) in that district; **Protected seabed in MPAs from BTG:** The area in all MPAs combined that is protected from all forms of bottom towed gear in that regulators district; **MPA area protected from BTG:** The % of areas within (or outside) MPAs in that district that regulators protect as a proportion of the whole area of MPAs that are designated to protect the seabed; **Sediment protected in MPAs:** the % area of total areas of MPAs in that regulators district whereby closures to BTG extend to sedimentary seabed habitats (muds, mixed gravels & sands).

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

We have calculated the area and percent of actual protection that exists inside waters of different jurisdiction in terms of byelaws or permit conditions that ban bottom contact fishing gears. We have presented data at EUNIS level 5 data on mixed, sand and mud habitats (Table 14.1) to observe how the proportion of these ubiquitous habitats that are effectively managed in MPAs. Previous research (e.g. Langton et al., 2020) has suggested that many restrictions on bottom towed fishing gears are in areas of MPAs where gears don't operate. This is particularly evident where protection measures have been placed in areas of inaccessible reefs (e.g. waters of South Devon, and Land's End).

The total area of closed seas to bottom towed fishing in southwest England in 2023 stands at 2525km² / 77670 = 3.3% of the sea area.

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MPAs in the South-West – where are we? What's next? Kate Sugar, Natural England

Contact: kate.sugar@naturalengland.org.uk

Marine Protected Areas (MPA) numbers

Table 14.2 Number of Designated Sites in Devon, Cornwall and Isles of Scilly sea area in 2022 (from 0-12nm, following the Natural England local Area Team boundary)

Designation type	Number
Special Area of Conservation (SAC)	10
Special Protection Area (SPA)	4
Ramsar site	2
Marine Conservation Zone (MCZ)	37
Total	53

	Area (SqKm)
Devon, Cornwall and IoS Marine Area (0-12nm)	16,769.11
MPA coverage (0-12nm)	5,711.34
Percentage Coverage MPAs:	34 %

There have not been any new designations in the south-west during 2022, so numbers of designated sites remain the same (see Table 14.2) – a total of 53 sites. To put that in context, that is about 1/3 of the total number of English

MPAs. Note that these figures are calculated for the Devon, Cornwall and Isles of Scilly sea area (from 0-12nm, following the Natural England local Area Team boundary). Numbers of sites differ from those reported in 2021 not due to any changes in the designated sites within the area, but due to a change in which sites are included in the list of 'marine' designations – some purely coastal designations have been removed from the list. Totals given here do not include marine SSSIs, or coastal SSSIs with intertidal features. If and when these types of site are accounted for then the total figures will change again.

Assessing progress towards a 'well-managed' network

Conservation Advice and Condition Assessment are the building blocks for site management – they hold the information that facilitates good site management and will help us work towards the goal of all sites being 'well-managed'. Natural England has a duty to give advice on how to further the conservation objectives for any MPA, identify the activities that are capable of affecting the qualifying features and the processes on which they are dependent. This is done by publishing Conservation Advice packages for each site. For the Devon, Cornwall and Isles of Scilly marine area, there is one site left to write a Conservation Advice package for, so the task of producing Conservation Advice packages is **98%** complete (up from 97% last year). In 2016, Natural England trialled and rolled out a new MPA condition assessment methodology following a standardised approach that assesses if the feature and sub feature conservation targets set for each MPA have been met. So far, the new Condition Assessment methodology has been applied to SACs – a similar process will in the future be applied to SPAs and MCZs as well. Progress has been made during 2022, with the proportion of sites completed (an initial assessment drafted) now at **15%** (up from 7% last year).

Fisheries management in offshore MPAs update for 2022

The Marine Management Organisation (MMO) are addressing fisheries management measures for offshore sites in different Stages. Significant progress was made during 2022.

- Stage 1 sites were considered first and byelaws have now been implemented to prohibit bottom towed gear within the 4 offshore MPAs: the Canyons MCZ, Dogger Bank SAC, Inner Dowsing Race Bank and North Ridge SAC, and South Dorset MCZ. Two of these sites are within the South-West marine area: the Canyons MCZ, and South Dorset MCZ.
- Also in 2022, the MMO held a call for evidence to seek views and additional evidence on a draft assessment on the impact of bottom towed fishing on rock and reef features in an additional 13 MPAs. The MMO used the evidence gathered to complete their fisheries assessments for those sites, to inform necessary management. MMO site level assessments for the 13 MPAs found that fishing using bottom towed gear poses considerable risks to the condition of these features and management measures are required to address these risks. For the south-west, this is relevant to: Cape Bank MCZ/Land's End and Cape Bank SAC and Hartland Point to Tintagel MCZ

During 2023 we expect to see further work on assessment and management of the impacts of fishing on seabed features in 41 MPAs (Stage 3 sites), as well mobile species sites (Stage 4). The pace of work is very fast, with the MMO aiming to have appropriate management in place by the end of 2024.

Update on Highly Protected Marine Areas (HPMAs) – progress in 2022

During 2022 there was a public consultation on five candidate HPMAs for English waters. The consultation closed in September 2022. Defra analysed the responses and evidence from the consultation against ecological, social, and economic criteria to provide an up-to-date assessment for each candidate HPMA to inform the designation decision-making process. They have published a summary of the consultation responses alongside the announcement of the sites intended for designation and will shortly publish a summary of the economic evidence.

There are three pilot HPMAs that Defra intend to designate:

- Allonby Bay (in the north west)
- Dolphin Head (in the Channel, south of Portsmouth)
- North East of Farnes Deep (off the north east coast)

HPMAs must be designated before 6 July 2023 as stipulated by the Marine and Coastal Access Act and Defra are currently expecting fisheries management measures for designated HPMAs to be implemented in early 2024, following consultation. While there is no HPMA currently proposed for anywhere in the south-west, the Secretary of State has requested that Defra explores the potential for additional sites for consideration during 2023.

SWME Research Updates

With contributions from Martin Attrill, Sophie Pipe, Vicky Spooner and Mark Parry

Quantifying carbon storage in Plymouth Sound seagrass beds to support development of a Carbon Code. Martin Attrill, Professor of Marine Ecology, University of Plymouth.

In order to provide high resolution data to test the viability of a Carbon Code for seagrass, nine 3m deep cores were taken from within Plymouth Sound: three in the dense seagrass bed at Drakes Island, three in a sparse bed at Cawsand and three in a 'control' site where seagrass used to exist and is now defined as a possible restoration site (Jennycliff Bay). Each core was sliced into 1cm intervals for the top metre, with 1cm slices taken every 5 cm thereafter. Samples are being analysed for inorganic and organic carbon, particle size, stable isotopes of C & N and one core from each site dated using radionuclide markers (Pb210 and Cs137). Preliminary dating of the Drake Circus core suggests the full 3m core may be as old as 1200 years, potentially giving a very long record of carbon patterns beneath the seagrass bed and the opportunity to assess rate of carbon storage across the sites. Initial results suggest that there is a significant amount of variability in carbon levels between cores within the same site and with depth below the seabed. Given the fine resolution of the core analysis, this study will provide highly detailed patterns of carbon storage over time within and outside seagrass beds that will inform models assessing the potential of carbon credit schemes for seagrass in the UK.

Seeding Change Together *Zostera noltei* restoration project, Fal SAC. Sophie Pipe, Cornwall Wildlife Trust.

In July 2022, Cornwall Wildlife Trust launched a new seagrass restoration project. The three-year trial aims to identify low-cost, effective restoration methods for *Zostera noltei* in Cornwall. We hope to work alongside the UK Noltei Network to produce a comprehensive guide to intertidal restoration using a low-cost, simple approach that can be easily applied by community groups. In year one, the first small-scale trials of seed harvesting methods, in-situ seed storage, and planting methods, including both transplantation using the horizontal rhizome method and seed planting with hessian bags, have been conducted. Alongside restoration trials, extensive monitoring of bed extent over time, overall seagrass health, abundance, and reproduction, and water quality will be conducted through the three-year project. At the end of each year, results will be assessed alongside an evaluation of methods and techniques, and where required, methods will be refined, incorporating any additional relevant methods. Though carbon capture is an important nature-based solution that has the potential to support climate mitigation, extensive biodiversity monitoring will be conducted alongside trials to highlight the importance of the site and support the value of the SAC and SSSI, monitoring the potential changes in biodiversity as restoration develops on site.

Seagrass, No Anchor Zones and Advanced Mooring Systems

Vicky Spooner, Environment Manager, Falmouth Harbour.

The majority of Falmouth Harbour waters sit within or next to an MPA. We operate within the Fal and Helford Special Area of Conservation and the Falmouth Bay to St Austell Bay Special Protection Area for birds and are bordered by SSSIs and Marine Conservation Zones in the Helford and Manacles. Previously these environmental designations have been seen as a potential hindrance but recently the harbour are trying to look at how we can reduce our impacts and those of harbour users. As part of this drive we have worked with a masters student at Plymouth University to generate natural capital accounts for our waters and also taken steps to understand the

impacts of our activities on the local marine environment. As a result in, May 2021, we removed eleven swinging moorings that were having a localised impact on the Flushing Seagrass bed. Regeneration was monitored by volunteer divers from the University of Exeter and Seasearch measuring scour patches under six of the removed moorings in August 2021 and then in May 2022. There are a few anomalies in the data but, on the whole, it appears that the scour patches are reducing in size. A voluntary no anchor zone (VNAZ) was established in the area where the moorings were removed, this VNAZ is marked using two simple Advanced Mooring Systems (AMS) at either end. These AMS were installed in May 2021 and use the stirling design of mooring consisting of a granite block, chain and net floats placed along the length of the chain to lift the chain off the seabed at all states of the tide removing the physical impact of the mooring on the seabed. In July 2022 Falmouth Harbour installed a third stirling AMS, this time designed to secure a vessel as a trial and thanks to funding through the TEVI project. The design of the mooring was modelled by MOREK and the trial was successful as the mooring held the vessel in place for over three months. Concerns were raised around the proximity of chain and floats of the mooring being close to the surface of the water at low tide so further trials are required to minimise this hazard in the future.

Restorative techniques within EU LIFE Recreational ReMEDIES, propagation from seed and seedlings.

Mark Parry, Head of Ocean Habitat Restoration @ Ocean Conservation Trust.

LIFE Recreational ReMEDIES update for 22/23 planting season within Plymouth Sound. The ReMEDIES project spent the first two years focusing on seed deployment within Plymouth Sound and the Solent. Mark provides an update on how the focus has shifted to growing plug plants in closed conditions within the National Marine Aquarium for transplantation into the restoration sites, Mark reports on some unexpected results over the winter of 22/23.

Plymouth Sound (from Mark Parry, Ocean Conservation Trust). There were two carbon coring campaigns, the first sampled 50 cores to a sediment depth of 75cm for analysis of spatial variations of carbon stocks within Drakes Island and Cawsands seagrass meadows. The second focused of acquiring deeper sediment cores with use of a vibrocore to collect 9 x 300cm sediment depths to analysis total C stock and sediment accumulation rates, the sites sampled were Drakes Island, Jennycliff and Cawsand Bays. Both sets of samples are currently being analysed with CHN analysis and we are awaiting the results.

EU Life Recreational ReMEDIES restoration work continued in Jennycliff Bay with the only activity in 2022 being the planting of juvenile plants in coir mats in September. Preliminary results indicate the assistance of nature recruitment of plants around the planting units over winter. Work continues to understand how the intervention has had a positive affect and extent.

Monitoring of Advanced Mooring Systems trials installed in summer 2019 in Cawsands continues with positive results of recruitment of juvenile plants inside the previous halo scar of the mooring.

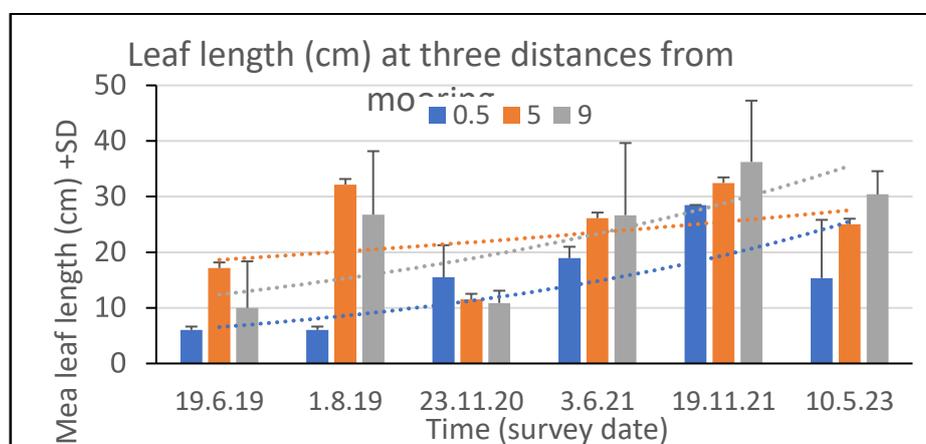


Figure 14.3. Growth of *Zostera marina* inside the ‘halo scar’ where a ‘sweep’ mooring has been replaced by an Advanced Mooring System. Work performed by Dr Jean Luc Solant (MCS) and Mark Parry (OCT).

15. Water quality

Edited by: Zuzanna Dusza

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Summary/Conclusions

- When considering marine water quality, it is important to adopt a **'wholescape'** approach which also considers water quality in the area's river catchments.
- **Riverine water quality** in the South-West requires considerable improvement. Following the **Water Framework Directive**, only **20%** of river bodies are classified as achieving good or better ecological status, and **0%** achieved good chemical status.
- **Estuarine water quality** presents in even worse condition. According to the WFD, only **13%** is classified as having reached good or better ecological status, and again, **0%** has achieved good chemical status.
- The main threats to good water quality are the **agriculture industry** (overuse of fertiliser and pesticide), **untreated sewage** and **wastewater** released by water companies, and the effects of **urban development** (run-off from roads, railways, and towns).
- The picture looks a bit better when looking at **coastal water quality**. Using WFD once again, **0%** of coastal waters achieved good chemical status, yet **70%** managed to achieve good or better ecological status.
- Apart from WFD, for coastal water quality, we can also use **Bathing Water Quality** as a measure. In 2022, out of the 148 designated bathing waters, **82%** were classified as 'Excellent', **18%** were classified as 'Good' and **1%** were classified as 'Sufficient'.
- While this may seem a success, bathing water assessments can be a poor proxy for determining coastal water quality as samples are limited to designated sites and only encompass the UK bathing season.
- Another way to assess coastal water quality is to look at sewage overflows (especially **CSOs**). Based on data from the **Environment Agency**, it was found that water companies released untreated sewage 5,504 times into designated bathing waters in 2022 for a total of more than 15,000 hours. According to that same report, South West Water (SWW) discharged sewage for 2,007 hours.
- The progress towards improved water quality in our catchments and around the coast has stalled. Fewer water bodies achieved good or better ecological status in 2022 than they did in 2015 when the first **South West River Basin Management Plan** was drafted.
- There has **not been much change** in the **WFD classifications** of riverine, estuarine, and coastal water bodies since 2021.
- There have been slight improvements in **Bathing Water Classifications**.
- Over **91%** of Storm Overflows are now fitted with monitoring devices required by the government, up from **89%** coverage in 2021.
- There has been a noticeable increase in **citizen science** and **public engagement**.

For much of the data and information which has helped to shape this chapter, we thank Dr Laurence Couldrick of West County Rivers Trust.

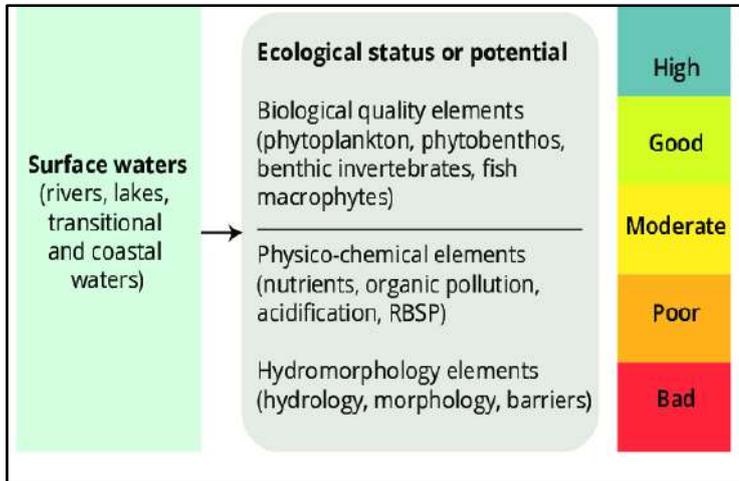
The 'Wholescape' Approach

As mentioned, while we are mostly interested in estuarine and coastal water quality, it is crucial to adopt a more 'wholescape' approach and look beyond the mean high-water mark. This allows to investigate the processes happening upstream in the rivers and catchments. The predominant water quality pressures on our seas have their source on land and travel down to our coasts via rivers.

Read more about the 'wholescape' approach here: [Wholescape Approach to Marine Management \(WAMM\) - CaBA \(catchmentbasedapproach.org\)](https://www.catchmentbasedapproach.org/)

How Water Quality is measured

Under the [Water Framework Directive](#) (WFD), surface waters, including riverine, estuarine and coastal waters, are assessed in terms of their **ecological** and **chemical** status.



Ecological Status is a composite measure and is based on an assessment of the status and quality of various biological, physio-chemical, and hydro morphological elements. The result of this assessment may fall into one of the five status classes ranging from **bad to high** (see Figure 15.1)

Figure 15.1. Ecological Status Classes - Bad to High.

Chemical Status is an assessment which considers the amount of priority substances in the aquatic environment. These substances are viewed as the most harmful and polluting. The outcome of this assessment may be either **good** or **failing**. Good status is only achieved when none of these substances exceed agreed standard.

The State of the South West's Riverine Water Quality

Based on data collected by the Environment Agency (EA) and published in the [South West River Basin Management Plan](#), the situation is not very positive, and improvements are required.

In terms of ecological status, of the **591** river water bodies in the region, only **20%** are classified as good or better.

In terms of chemical status, of the **591** river water bodies in the region, **0%** have achieved good status.

A deeper dive into this data is available on the [Environment Agency's Catchment Data Explorer](#).

The State of the South West's Estuarine Water Quality

Moving further downstream, we can have a look at the state of **estuarine water quality**, which, like riverine bodies, can be assessed using the WFD.

Based again on the South West River Basin Management Plan data, the assessment outcomes look even **worse** than for our rivers.

For ecological status, of the **23** estuarine bodies in the region, only **13%** are classified as good or better. In terms of chemical status, **0%** have achieved good chemical status.

Possible causes of river and estuarine water quality issues

Water quality in our surface waters (rivers, estuaries, coastal waters), is **under threat** from multiple sources. In a [recent report](#) on Water Quality in Rivers, the Environmental Audit Committee, with input from Defra, identified **three main threats** that cause water bodies to fall short of achieving good ecological status. These are:

- Impact of **diffuse pollution from rural areas** which is responsible for **40%** of water pollution in England;
- **Impact of wastewater** from sewage treatment works which is responsible for **36%**;
- **Urban diffuse pollution** which is responsible for **18%**.

These numbers represent estimates for all inland waters in England and the proportions of these drivers will depend on the catchment/stretch of river.

The State of the South Wests' Coastal Water Quality

Arriving at the coast, we can again make use of the WFD (which extends to 1 nautical mile with respect to ecological status and 12 nautical miles for chemical status).

In terms of chemical status, it's a similar story with **0** of **23** of the South West's coastal bodies achieving good chemical status.

However, for ecological status, **70%** of the region's 23 coastal water bodies have been assessed as being in good or better ecological status.

Bathing Waters

While the WFD is the most comprehensive assessment, others exist for coastal waters.

Bathing Water Classification are one of the most well-known mechanisms to identify sources of pollution to bather's health. Up to **20** samples are taken by the EA from each site during the bathing season and each sample is tested for bacteria, specifically **E. coli** and **intestinal enterococci**.

There are **148** designated bathing waters in the South-West and the 2022 classifications revealed **82%** of them to be in excellent condition, **18%** in good, **1%** in sufficient, and none in poor.

Despite this looking like positive news, especially considering that in the 1990s, only **25%** of bathing waters met high standards, progress has stalled over the last few years. The UK now sits at the **bottom** of the **European Water Table**.

Criticisms of this classification method include it only considering the bathing season which runs from May 15th-September 20th in England and Wales, omitting the winter season when a lot of swimmers and surfers are still in the water.

Combined Sewage Overflows

To better understand the state of our rivers, estuaries, and coastal waters, we can also consider the frequency and duration of **sewage overflows**. Sewer overflows are a feature of the wider sewage infrastructure and are designed to prevent water backing up into homes in the event of **exceptionally heavy rainfall**. Despite this, we are increasingly seeing discharge notifications issued at times of what many would consider **normal rainfall events**.

The topic of **CSOs** has recently gained a lot of traction and thanks to the **campaigning** of national charities, local groups, and individual ocean and river activists, water companies are now required to submit data on the number of times and for how long each of their sewer overflows discharge on an annual basis. This data must be published by regulators each year.

The Event Duration Monitoring (EDM) Data for the entirety of the UK shows that the total number of spills has gone down from over **372,000** in 2021 to just over **301,000** in 2022. The duration in hours also decreased from **2.6 million** in 2021 to **1.7 million** in 2022.

EDM data for **SWW** shows that average spills were down **27%** from 2021 and the duration of spills was down by **17%**. However, most sources conclude these figures are due to 2022's dryer than average weather and subsequent **droughts**. There were still more than **37,000** monitored sewage spills in the SWW region.

When considering the Bathing Season Data, the [Surfer's Against Sewage 2022 Water Quality Report](#) states that during the season, sewage was dumped into bathing waters **5,504** times for a total of **15,012** hours.

For the past two years, SAS have teamed up with [Top of the Poops](#), a website analysing and mapping annual sewage data released by regulators in March. For 2022, the winner was **Plymouth Hoe (East)** with **5,158** h of sewage discharge.

Overall, the **worst offenders** nationwide are **United Utilities** followed by **SWW**.

When considering data for **CSOs** during the **bathing season** in the **SWW region**, the figures also show that the number of incidents in **2022** was **lower** than that reported in **2021**.

There was **50%** less spills and **75%** lower spill duration in 2022 than in 2021. There is also a new [WaterFit Live Map](#) launched by SWW to help tackle the issue by mapping **live sewage spills** at beaches and outlining **beach investment plans**.

West Country River's Trust: Citizen Science Investigators

While the **EA's Catchment Data Explorer** is an extremely useful dataset, due to government underfunding and the subsequent decrease in the total number of water quality surveys and sites, it doesn't provide a complete picture. In the absence of this data, there are other sources we can turn to, to help us better understand water quality.

For riverine water quality, one such dataset is the **West Country River Trusts' (WRT) Citizen Science Investigators (CSI)**. Over the past few years, the CSI network of volunteers has undertaken over **400** samples and has helped fill data gaps to target and identify degrading water bodies. Where 12 or more surveys have been collected within a river body, **Scorecards** are produced. These provide information about various water quality measures including **dissolved solids, turbidity, ecology, pollution, and phosphate levels**. These are tested for by volunteers using specialised testing kits. The stretch of river is then awarded an overall percentage mark and grade. More Scorecards can be viewed on the [WRT CSI webpage](#), two examples are also provided below.

The main aims of the CSI scheme are to:

- Educate and engage
- Spot pollution events and be able to act quickly
- Produce valuable data
- Create a network of catchment communities

There is now also a plan to expand the CSI scheme into the **estuarine and coastal realms**.

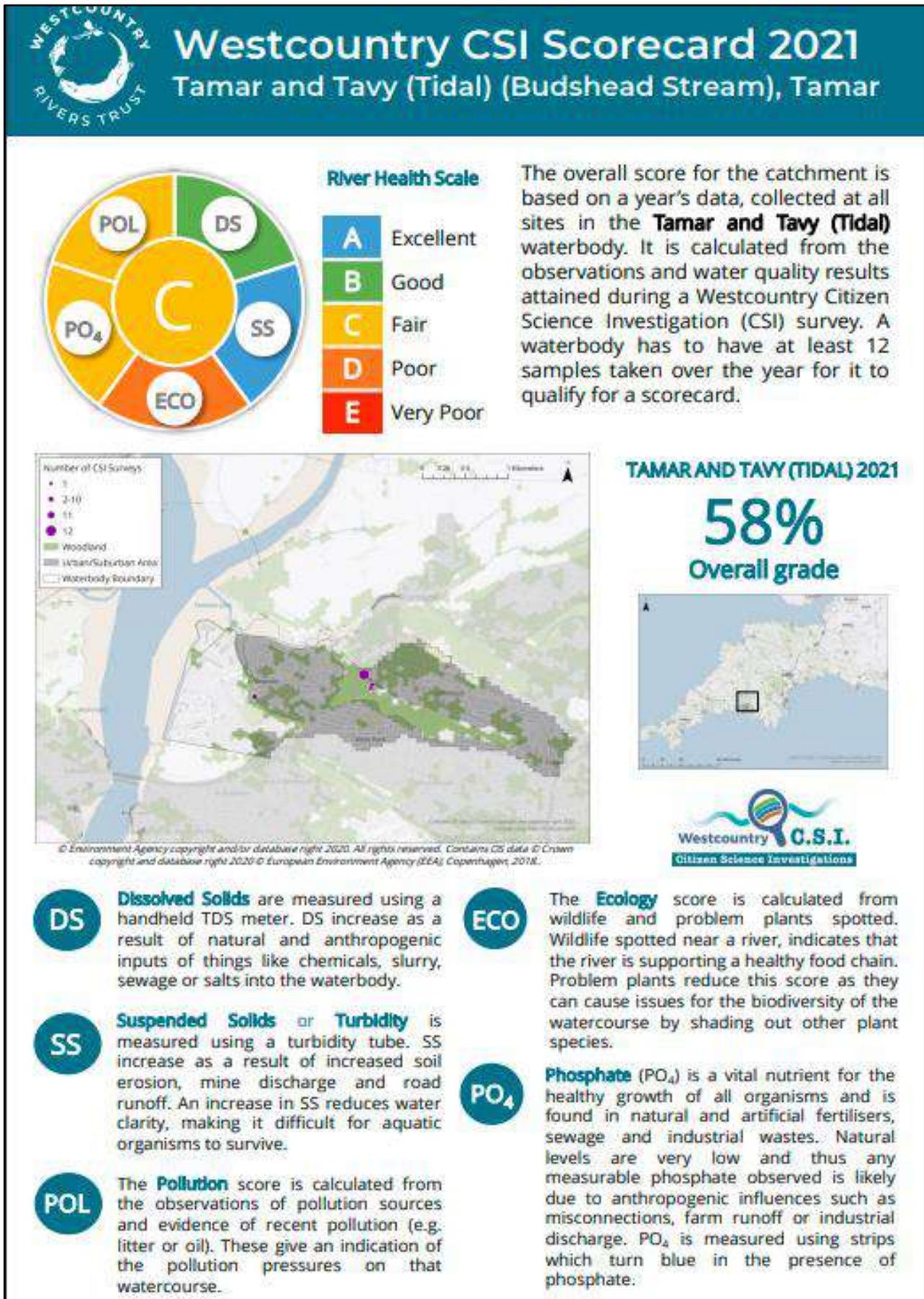


Figure 15.2. WRT's Scorecard produced for the Tamar and Tavy rivers (2021).

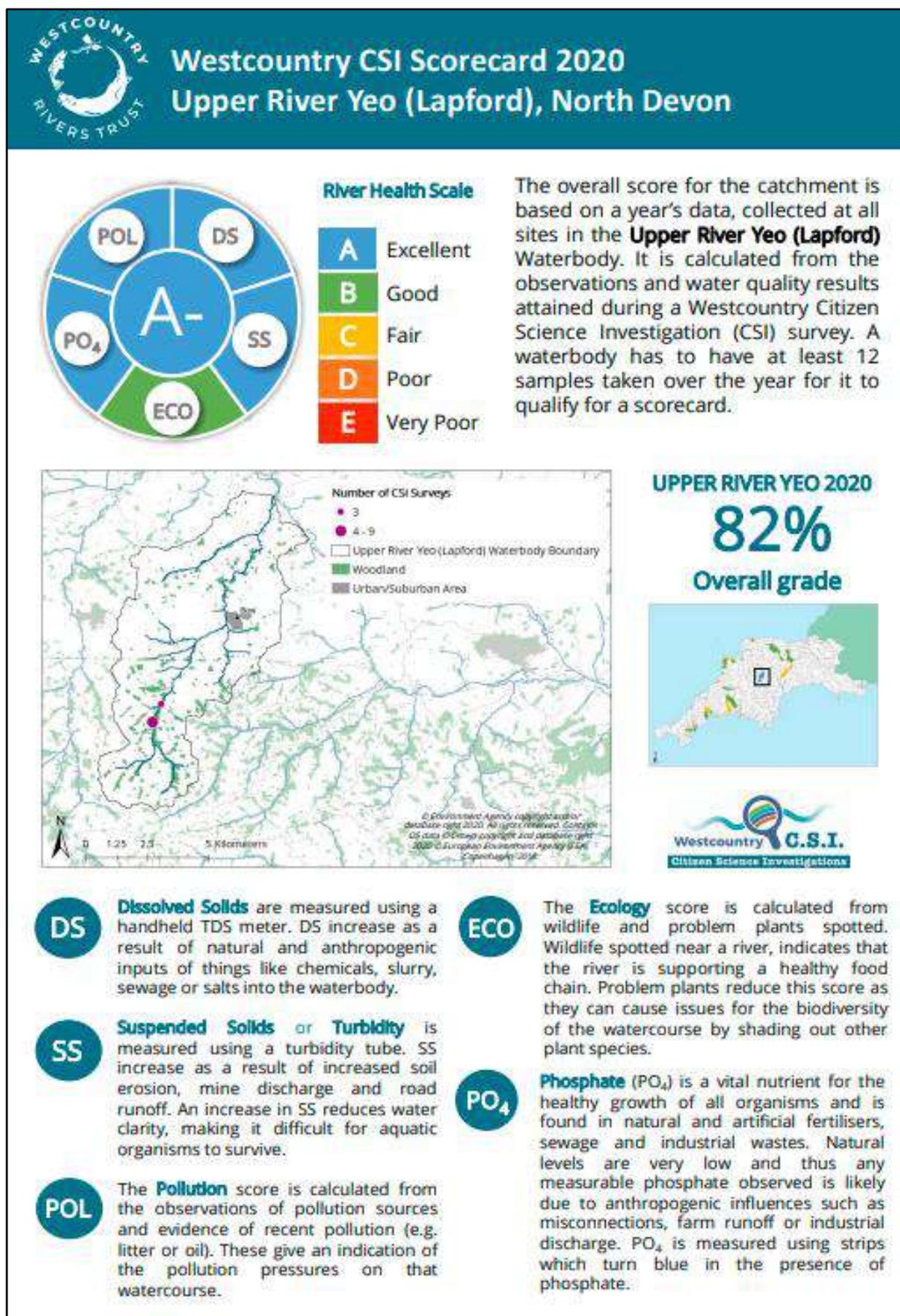


Figure 15.3. WRT's Scorecard produced for the Upper River Yeo (2020).

Direction of Travel

In terms of the direction of travel, it seems that the progress towards improving water quality in our catchments and around our coasts has stalled, and even, gone into reverse.

For example, looking at ecological status for our surface waters, the number of these achieving good or better status has **decreased since 2015** when the first River Basin Management Plan draft was written.

Table 15.1. WFD ecological status data 2015 to 2022.

Year	Bad	Poor	Moderate	Good	High
2015	135	820	2,943	774	7
2022	137	794	2,962	754	4

In 2022, the government published [The Storm Overflows Discharge Plan](#) which set out targets to protect people and the environment from the detrimental effects of CSOs. The government’s promise to address and reduce storm overflows was also embedded into law through the [Environment Act 2021](#). On the 9th May 2023, it was made known by Defra that a [consultation](#) aimed at expanding targets to tackle sewage across the entirety of the nation’s coasts, estuaries and marine designated sites, is to take place.

Despite these declarations, only time will tell if these official measures will amount to positive change. In the meantime, campaigning bodies such as SAS continue to protest and keep the public informed about live spills through their **Safer Seas and Rivers Service (SSRS)** maps and app.

Most recently, thousands of protesters around the UK gathered to join SAS at their annual **paddle out** which aims to draw attention to water companies and their continued failure to keep our waters safe for the environment, and for us.

In 2022, the government published [The Storm Overflows Discharge Plan](#) which set out targets to protect people and the environment from the detrimental effects of CSOs. The government’s promise to address and reduce storm overflows was also embedded into law through the [Environment Act 2021](#). On the 9th May 2023, it was made known by Defra that a [consultation](#) aimed at expanding targets to tackle sewage across the entirety of the nation’s coasts, estuaries and marine designated sites, is to take place.



Figure 15.4. SAS protest paddle out at Gyllyngvase Beach, Falmouth. Image: Jory Mundy. Source: [Surfers Against Sewage Falmouth beach paddle out protest | Falmouth Packet](#)

Wider implications and interactions

The **wider implications** of poor water quality and its interactions with other topics in South-West Marine Ecosystems include:

- **Contamination of fisheries** and higher **fish mortality** as well as **reductions in species diversity** in polluted areas due to **decreased dissolved oxygen**^{1,2}.
- Treated wastewater can cause male brown roaches to develop **ovarian cavities** as well as induce changes in the **kidneys** and **immune system**³.
- Physical and biological **damage** to **seagrasses** and **salt marshes** where it can **smother habitats**, lead to high levels of local **acidification**, and increase the risk of **disease**⁴.
- Loss of coastal **ecosystem services** like **erosion control**, **buffers from storms**, and **nurseries for juvenile fish**^{5,6,7,8,9,10}.
- **Animal and human disease** resulting from **pathogens**, **heavy metals** and **toxic chemicals** that can cause acute **disease** as well as **long-term disruptions** to ecological processes^{11,12}.
- **Eutrophication** due to nutrient overload that depletes oxygen, kills marine flora and fauna, and disrupts ecological processes¹³.

- Harmful **algal blooms** that can produce **toxins** or physical material (sargassum) that kill marine life, close beaches, and can cause human disease through direct exposure and indirectly through consumption of contaminated seafood^{14,15}.

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16. Marine Planning in the South-West

Edited by: Alicia Shephard, Carlotta Cocciardi, Mel Nicholls (with a summary description of offshore windfarm developments by Alex Banks)

Contact: alicia.shephard@marinemanagement.org.uk

Conclusions

This report emphasises the work that was ongoing in the Marine Management Organisation in 2022.

- Marine planning is essential to manage the increasing demands on marine space and resources. To do so, marine planning integrates economic, social and environmental considerations.
- In June 2021 the South West Marine Plan was adopted as part of a suite of regional marine plans which meant that all English waters were covered by a marine plan.
- The South West Marine Plan is a statutory decision-making document in the south west marine plan areas. We are currently in the implementation and monitoring stages of the marine planning cycle.
- A detailed monitoring approach has been developed to measure the effectiveness of the policies of the South West Marine Plan. Every three years, a report is compiled to provide an update on the effectiveness of the plan.
- The first 3 Year Report on the South West Marine Plan is due to be laid before Parliament in June 2024.
- Marine planning continues to evolve, the MMO is working closely with the Defra Marine Spatial Prioritisation programme and will implement some of the consequent changes in the amendments of the East Marine Plan.

Marine Planning Context

As the marine environment becomes progressively busy and the demand for resources increases, strategic management needs to be in place. Marine planning ensures that:

the right activities happen at the right time and in the right way, placing sustainable development at the centre of all decisions.

Marine plans provide policy and spatial guidance for each marine plan area, promoting co-existence of suitable activities to account for the multidimensional boundaries of the marine environment.

The Marine Plans are statutory and are prepared in accordance with the requirements set out under the Marine and Coastal Access Act (MCAA) 2009 and the [UK Marine Policy Statement](#). The MCAA states that “a public authority must take any authorisation or enforcement decision in accordance with the appropriate marine policy documents, unless relevant considerations indicate otherwise”.

The South West Marine Plan (SWMP)

The [South West Marine Plan](#) was one of four marine plans developed concurrently between 2016 and 2021.

The South West Marine Plan covers the English inshore and offshore waters between the Severn Estuary border with Wales and the River Dart in Devon. The south west inshore marine plan area spans approximately 2,000 km of coastline and covers a total sea area of 16,000 km², whilst the south west offshore marine plan area covers a vast expanse of 68,000 km² and extends from 12 nautical miles to the outer limit of the UK Exclusive Economic Zone (Fig.1). This makes the south west region the largest among the marine plan areas.

Each marine plan aims to reflect regional priorities which are articulated in the plan vision (see below); the South West Marine Plan was developed whilst engaging with local stakeholders to mirror and protect the area’s strong

maritime heritage, the many activities of economic and cultural importance, and the diverse range of internationally significant habitats and species.

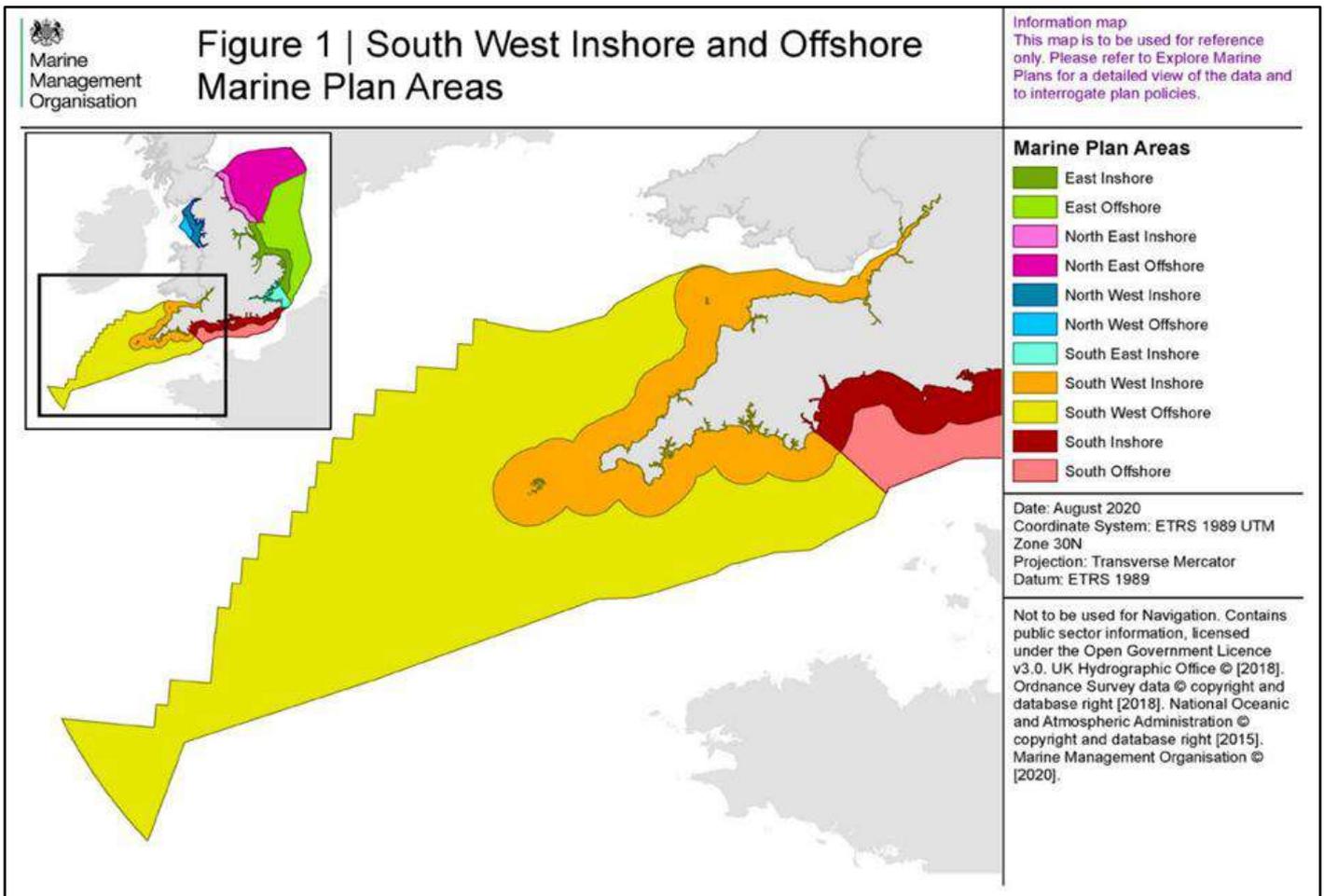


Figure 16.1. The south west inshore and offshore marine plan areas

The vision for the south west marine plan areas in 2041

As England's Ocean Peninsula, the south west marine plan areas are sustainably developed and thriving, based on their unique nature and close links to the maritime area in terms of economy, society, environment and governance. Across the region, fishing, tourism, port development and harbour regeneration, with the associated safeguarded or new infrastructure, support a strong and diversified maritime economy that encourages sustainable economic growth and employment. Emerging and innovative renewable energy opportunities, which contribute significantly to the UK's commitment to reduce greenhouse gas emissions to net zero by 2050, have been realised in suitable locations throughout the south west marine plan areas. Community well-being and cohesion, and the recognition, enhancement, protection and appreciation of natural assets, cultural heritage, and seascape and landscape, are being delivered through plan-led management. Sustainable access to the marine area and management along the coast and in estuaries have enhanced resilience to climate change, such as in the protection and use of saltmarsh in the Severn Estuary. The region's close economic and social ties to defence on the south Devon coast continue to be supported. Authorities and relevant organisations are working together to successfully apply plan-led management. Decisions made in the south west marine plan areas apply an ecosystem approach and natural capital framework. The environment is in a better state than before, and Good Environmental Status is achieved. Biodiversity is conserved, enhanced and restored through applying well-established principles of biodiversity gain and delivery of a well-managed ecologically coherent network of marine protected areas. Transboundary effects are effectively considered through close liaison across regional, national and international borders.

South West Marine Plan development stage

Like all English marine plans, the South West Marine Plan was developed using the marine planning cycle (Fig 2), which is similar to the process used for developing terrestrial plans.

Evidence and stakeholder engagement is crucial to each step in the plan making process. Steps 2-5 for the marine planning cycle (Figure 15.2) took place over three iterations.

The [first iteration](#) involved gathering stakeholder input on various aspects, including how they envisage using the plans, shared concerns, potential policy responses, and exploring potential digital formats for displaying marine plans. During the [second iteration](#), stakeholders actively contributed to establishing the vision and objectives for the designated plan area. Finally, the [third iteration](#) focused on collecting stakeholder feedback and opinions regarding the draft policies outlined in the plan. Throughout all three iterations, stakeholders from the south west region exhibited the highest level of engagement compared to other plan areas.

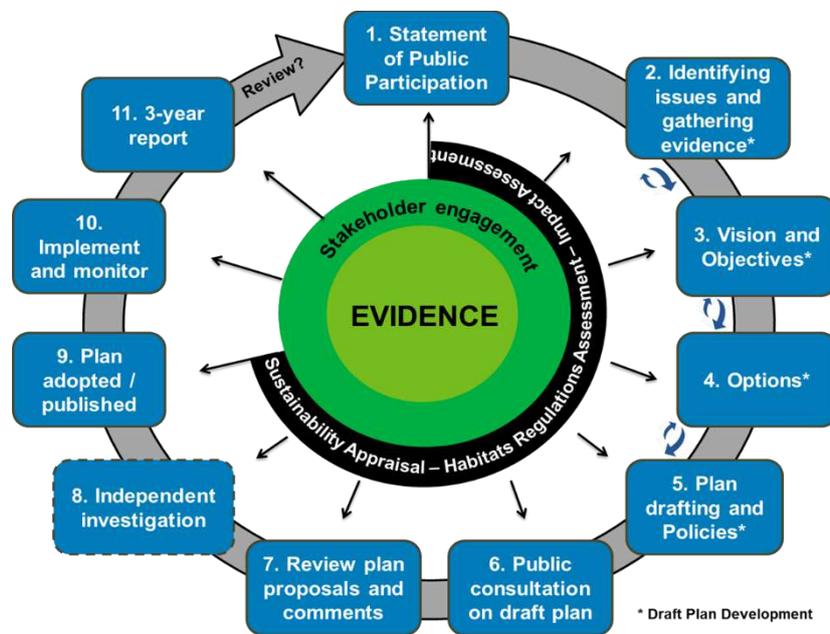


Figure 16.2. Marine plan development cycle.

The South West Marine Plan is currently at stage 10 entering into stage 11. Implementation sessions have been run nationally which are designed to support stakeholders to use the marine plans. The effective use of plan policies is now also being monitored using a series of indicators. The results of monitoring the use of marine plans will inform stage 11 of the plan development cycle where a report is due to be produced every three years to review the efficacy of the marine plan. The next 3-year report is due to be published in 2024.

Marine Plan Implementation

Marine plan implementation sessions are designed to encourage stakeholders to use the marine plans when carrying out developments that may impact the marine environment.

Training sessions commenced in 2019 as part of stakeholder engagement on the development of policies for the north east, north west, south east and south west Marine Plans. When published for statutory consultation in 2020,

the Draft South West Marine Plan became a material consideration so training was delivered primarily to decision-making authorities. Further training was delivered in 2021 to authorities and other stakeholders after the adoption of the South West Marine Plan. The most recent annual round of implementation training was carried out in 2022 which again prioritised decision-making authorities. Training has also been provided to developers, consultants and agents on a more ad hoc basis throughout the plan development process. Of the 24 sessions delivered nationally, the south west saw 19 attendees from six local planning authorities, three attendees from port and harbour authorities and one attendee from an IFCA.

Marine Implementation in Practice

The marine license process requires that applicants complete a marine plan policy assessment to show they have considered the marine plans in their licensing application. Figure 16.3 shows what licenses were granted in the south west in 2022.

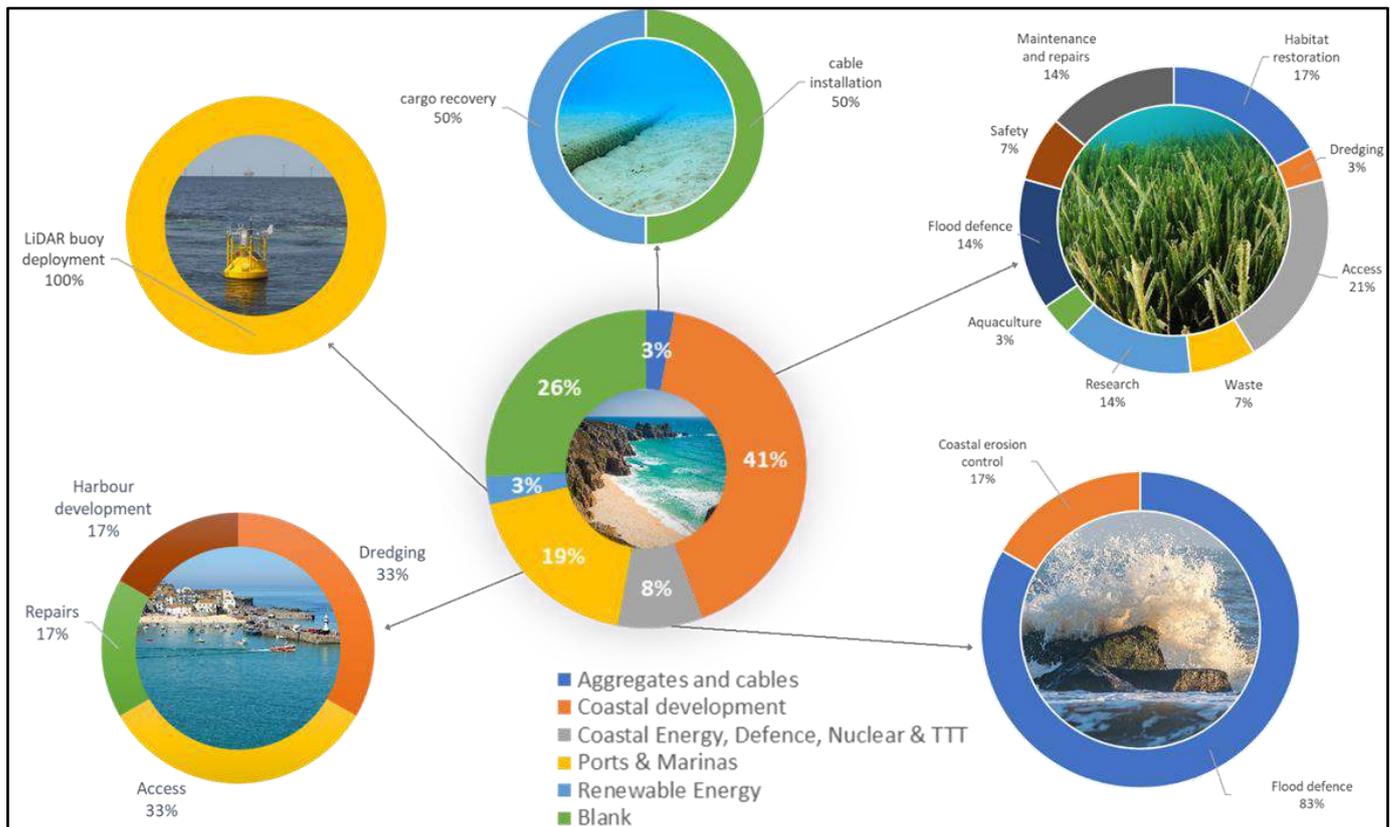


Figure 15.3. License requests in the South West Marine Plan in 2022. There was a total of 70 license applications, of which 1 was rejected, 14 were withdrawn, 45 were approved and 10 are still awaiting a response. The licenses are grouped into 5 main sectors: Aggregates and Cables, Coastal Development, Coastal Energy, Defence, Nuclear & TTT, Ports and Marinas, Renewable Energy. 18 licenses were not grouped into any sector.

Two new wildlife licences were also granted in the south west in 2022, both for science and education purposes in relation to the short snouted seahorse and spiny seahorse.

Marine Plan monitoring

Marine plan monitoring is necessary to understand the effectiveness of different policies within all marine plans including the south west. The monitoring of the marine plans includes:

- Monitoring indicators
- Annual surveys

Monitoring indicators

Indicators provide metrics which can be measured to evaluate progress towards achievement of plan and policy objectives. Indicators have been developed for every policy in the marine plan, drawing information from environmental, economic, and social data.

For example, we have an indicator to measure the abundance and population changes of priority and highly mobile species (including seals, cetaceans and seabirds) over time. It also measures the change in disturbance incidents recorded at the coastline. This indicator uses data from local and national sources including the charity ORCA, the Sea Mammal Research Unit and Cornwall Seal Group.

This indicator tests the effectiveness of several policies:

- *SW-BIO-1*: this policy supports proposals that enhance the distribution of priority habitats and priority species. It also requires proposals to work through several steps to reduce detrimental impacts on the distribution of priority habitats and species.
- *SW-BIO-2*: this policy supports proposals that enhance or facilitate native species or habitat adaptation or connectivity, or native species migration. It also requires proposals to work through several steps to reduce detrimental impacts on native species or habitat adaptation or connectivity, or native species migration
- *SW-DIST-1*: This policy requires proposals to work through several steps to reduce detrimental impacts on highly mobile species through disturbance or displacement

Successful use of the policy may lead to an increase in the distribution of mobile species such as seals, especially where population level impacts of disturbance have decreased. In the south west, the effectiveness of such policies is vital due to the diverse range of species and habitats.

Other local monitoring datasets are used in the indicator that measures levels of marine litter across marine plan areas, testing the effectiveness of the marine litter policies:

- *SW-ML-1*: This policy requires public authorities to make adequate provision for the prevention, re-use, recycling and disposal of waste to reduce and prevent marine litter.
- *SW-ML-2*: this policy supports proposals that facilitate waste re-use or recycling to reduce or remove marine litter. It also requires proposals to work through several steps to minimise the amount of waste entering the marine environment.

The information for this indicator is collected from the Marine Conservation Society Beach Clean data and OSPAR Commission Seafloor Litter Survey Data. Successful use of the policy may lead to a decrease in the amount of marine litter found within marine plan areas.

The complete Annex of Indicators is available on request.

Monitoring surveys

Every year we collect stakeholder views in the form of monitoring surveys to complete about the use of the marine plans, so that we are able to make the links between marine plan use and policy application. The surveys also ask questions about stakeholders' perception of policy effects.

In this way we can make sure that the marine plans remain fit for purpose in sustainably managing the marine ecosystems. In 2022, stakeholder surveys were not directly carried out as they were being reviewed to improve user experience, uptake and the data being collected. However, some data was collected as part of the 2022 marine plan implementation training sessions. The 2023 surveys have now been launched and will run from the 9th of May to the 30th of June, the results of which will be published as part of the 2024 report of the South West Marine Plan.

Moving forward with marine planning

Marine planning is an ever-evolving area with many exciting developments on the way. Currently we're looking at the following:

Co-existence and Marine Spatial Prioritisation

Spatial squeeze is a key issue for the future of our seas. Our seas are only going to get busier over the coming decades and, we need to factor in new activities such as the growth of new types of energy. To deliver our future targets and ambitions on Net Zero, energy security, the Fisheries Act, the environment and levelling up, we need to assess how we could prioritise now. This will avoid putting both the marine environment but also the £211 billion value of our blue economy at risk.

Defra are leading cross governmental marine spatial prioritisation for England. The MMO are working closely with Defra on every stage of the programme to build our understanding of future demands, optimise use of our seas, maximise coexistence and co-location between all sea users and prioritise use of our marine space.

The programme will engage with marine industries over the next few months to improve our understanding of future demands and identify opportunities for greater colocation and co-existence.

The East Marine Plan

The MMO is now readying itself for replacing the East marine plan. This process will formally begin with the publication of a statement of public participation later this year.

Strategic Renewables Unit Offshore Wind Development

The near future of offshore wind development in the Celtic Sea takes two forms. The first is the deployment of five floating offshore wind demonstration projects totalling 426MW. The first two projects will be at the old Wave Hub site near St. Ives (TwinHub), and Erebus in Wales, these have both been consented. Three further sites are in the pre-consenting stage, Llŷrs 1, Llŷr 2 and White Cross . Following these demonstration projects, The Crown Estate are in the pre-leasing stages for an additional 4GW of floating wind across up to four sites in Welsh and English waters. Read more here: Celtic Sea Floating Offshore Wind Programme (arcgis.com). The acceleration of offshore wind is key to meeting our net zero commitments and in 2022 the government set out an ambition to deliver 50GW of offshore wind by 2030. This increase in deployment must maintain our existing levels of marine environmental protection and minimise impacts to other marine users and industries. Several working groups, programmes and projects have been established to realise this - notably the Offshore Wind Environmental Improvement Package, Offshore Wind Enabling Actions Programme and the Offshore Wind Industry Council. Here government, regulators, developers and other marine stakeholders work together to fulfil these ambitions.

Marine Planning information and requests

Your local Marine Planners are available for any question you might have about the South West Marine Plan or marine planning in general.

Please contact:

- Carlotta Cocciardi (northern extent – Bude, Cornwall – Severn Estuary border with Wales):
Carlotta.Cocciardi@marinemanagement.org.uk, 2087204967
- Mae Van Loef (southern extent – River Dart, Devon – Bude, Cornwall):
Mae.vanLoef@marinemanagement.org.uk, 07780216820

Offshore windfarms



Summary description compiled by Alex Banks (Natural England) including information from Graham Moates (The Crown Estate) and Neil Farrington and Harrison Smith (Celtic Sea Power)

In 2021, The Crown Estate announced [plans](#) for a leasing round to deliver 4GW of clean, renewable energy through floating wind in the Celtic Sea. This new technology sees turbines placed on large floating platforms, enabling them to be located in deeper water than their fixed-base cousins.

Three initiatives have come together in a programme of strategic data collection, to describe the baseline environment of the Celtic Sea. In doing so, powerful evidence will be available to inform environmentally sensitive planning and decision-making.

The three initiatives are the Crown Estate Pre-Consent Survey Programme, the Celtic Sea Power Cornwall FLOW Accelerator and POSEIDON (Planning Offshore Wind Strategic Environmental Impact Decisions).

Among steps being taken to accelerate and de-risk the process for developers, [The Crown Estate](#) has committed to a comprehensive programme of pre-consent surveys, with datasets being made freely available to successful bidders.

[Celtic Sea Power](#) (CSP) is a strategic enabling organisation, owned by Cornwall Council, helping to support the successful emergence of a Floating Offshore Wind (FLOW) sector in the Celtic Sea. CSP is leading on a regional 'FLOW Accelerator' approach to zonal planning for FLOW development and as part of this activity a number of areas for new environmental data collection have been identified. The activities target critical areas in the licensing and consenting process that could be accelerated and de-risked with the availability of a sound single evidence base, approved by regulators and made available to the FLOW sector. This work can help to contextualize the potential future impacts of floating wind in the region minimizing risk and maximizing sustainable benefit. The campaign portfolio includes (or shortly will include) floating LiDAR wind resource / meteocean data, eDNA sampling, digital aerial surveys, aerial LiDAR bird flight height surveys, and subsea acoustic data collection.

[POSEIDON](#) is a project led by Natural England, in delivery partnership with Cefas, Bangor University and a range of supporting organisations, funded by the Crown Estate's [Offshore Wind Evidence & Change Programme](#). It aims to collate and collect observational data on seabirds, marine mammals and benthic habitats across UK waters, to update and improve models of distribution and abundance for key species and habitats. It will map sensitivity to offshore wind in an integrated way, allowing the greatest ecosystem (and consenting) risks to be easily identified. POSEIDON includes a two-year programme of data collection (2022 – 2024) before publicly available mapping tools become available in 2025.

Collectively, these initiatives are working together with the shared aim of creating a powerful evidence base for Celtic Sea FLOW planning and decision-making. This involves complementary and synergistic planning of data collection, sharing of data, and ensuring availability and accessibility of outputs produced, wherever possible.

(Image from the SWME Conference presentation available on <https://www.youtube.com/watch?v=SLVJg2e7BVs>)

17. Marine Plastics

Edited by: Zara Botterell & Sarah Nelms

Contact: z.botterell@exeter.ac.uk; s.nelms@exeter.ac.uk

Summary/conclusions

- A big thank you to all volunteers! In 2022, from the CPPC data, **33,962.6 hrs** were contributed to environmental work in Cornwall undertaken by **61,358** volunteers. This equates to an economic value of **£353,890**. Total rubbish removed and recycled or disposed of was **138,667.6 kg** or **138.7 tonnes!**
- Whilst volunteer hours had decreased along with weight of litter removed since 2021, the weight of the removed litter was still above that of the pre-COVID years.
- **Requests:** Please get in touch if you have any data on animal interactions with plastic, beach clean data, Southwest relevant publications. (z.botterell@exeter.ac.uk, s.nelms@exeter.ac.uk)

CPPC background



The Cornish Plastic Pollution Coalition comprises over 50 environmental organisations, local marine conservation groups, beach cleaning groups and marine science experts, collectively representing tens of thousands of people in Cornwall and beyond. The main areas of work of the CPPC are:

- to raise awareness of the issue of marine litter and plastic pollution around our coastline by working with community groups, interested schools, and other organisations who wish to engage with the CPPC.
- to informally improve information exchange and coordination between organisations and volunteers involved in marine litter and plastic pollution in Cornwall.
- to specifically highlight the issue of balloon debris in Cornwall.
- to raise the issue of marine litter and plastic pollution with identified businesses and organisations and try to persuade them to change their practices to more environmentally friendly methods / products

Delia Webb and Claire Wallerstein are currently the Co-ordinators and key contacts for the CPPC. Website: www.cppccornwall.org.uk

Delia: info@cppccornwall.org.uk 01736 787191 / 07736400960

Claire: info@cppccornwall.org.uk 01752 823308 / 07815 567234

At the end of 2022, the CPPC asked members for data relating to their beach-cleaning and litter-picking activities to establish the true picture and economic value of this type of voluntary work in the Duchy. This report details the statistical data received from those groups and individuals who keep such records of their activities but is by no means a comprehensive list as many groups do not keep formal recordings of their work.

Summary of Results

In the 12 months of 2022 a massive **33,962.6 hrs** were contributed to environmental work in Cornwall undertaken by **61,358** volunteers. This equates to an economic value of **£353,890**.

Economic value of total volunteer hours in 2022 based on the UK Minimum Wage (£10.42) $33962.6 \times £10.42 =$ **£353,890**

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

Total rubbish removed and recycled or disposed of is **138,667.6 kg** or **138.7 tonnes!**

Table 15.1. Breakdown of CPPC member beach clean data

Name	Group Total Volunteer Hours	Group Total Weight (kg)	Group Total Economic Value
2 Minute foundation	13761.00	100035.00	£143,389
Beach Guardian	1525.00	915.00	£15,890
Clean Cornwall	5176.00	16445.00	£53,933
Clean Ocean Sailing	1206.00	2395.9	£12566
Fathoms Free	320.00	1012.00	£3334
Final Straw Cornwall	273.00	1490.00	£2845
Fishing For Litter	260.00	1860.00	£2790
Friends of Portheras Cove	488.00	590.00	£5084.96
Friends of Fowey Estuary	24.5	20.00	£255.29
Friends of St Andrew's Wetlands Reserve	21.00	115.00	£219
Ghostnetbusters	560.00	6000.0	£5835
Helford Voluntary Marine Conservation Group	10.00	20.00	£104.2
IOS Wildlife Trust	2133.00	1310.0	£22,225
Looe Marine Conservation Group	47.00	120.00	£489
Mounts Bay Marine Group	68.00	25.9	£708
Newquay Marine Group	179.00	143.00	£1865
One Bag Beach Clean	627.00	421.9	£6533
Perranporth Marine Conservation Group	356.60	370.00	£3715
PL24 Community Association	179.00	760.00	£1771
Polzeath Marine Conservation Group	554.00	630.00	£5772
Rame Peninsula Beach Care	1209.50	890.00	£12,602
RSPB Cornwall	184.00	1060.00	£1917.28
Sealife Trust	100.00	97.5	£1042
Smartie Lids on the Beach	36.00	120.00	£375
St Agnes Marine Conservation Group	185.00	54	£1927
Surfers Against Sewage	4192.00	937.4	£43,680
Three Bats Wildlife Group	180.00	100.0	£1875
Transition Falmouth	110.00	375.0	£1146
Transition Truro	7.00	40.0	£72.94

Trends

The beginning of 2022 was likely to still have been impacted by the effect of COVID-19. Whilst volunteer hours have decreased along with weight of litter removed since 2021, the weight of the removed litter is still above that of the pre-COVID years (Figure 1). Please note the below graphs were produced using raw data and have therefore not been corrected for number of people/distance/changes in minimum wage etc.

South-West Marine Ecosystems in 2022 (The State of South-West Seas)

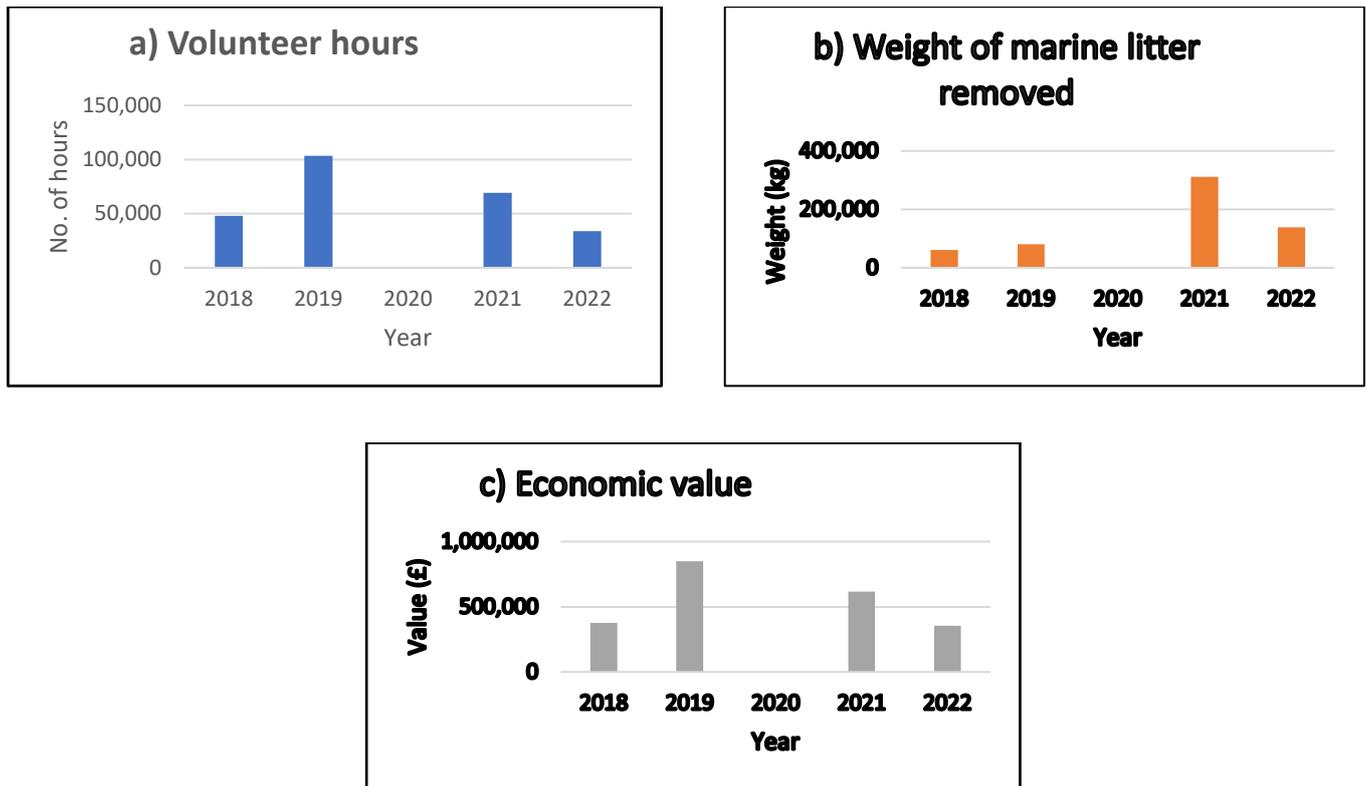


Figure 15.1. Yearly trends of a) number of volunteer hours; b) weight of marine litter removed; and c) equivalent economic value.

Beach/Litter cleans from outside of Cornwall

- Torbay Cleaner Coasts Initiative removed 27 large sacks of plastic debris in 2022 with over 100 volunteers taking part.
- Me and the Plastic Sea removed 648 dog poo bags from coastal locations in South Devon and additionally did around 146 hours of volunteering litter picking in 2022.
- Till the Coast is Clear recovered approximately 7,000kgs of coastal pollution last year. Volunteer hours numbered ~300. Approximately 70% of the plastic pollution recovered can be directly attributed to commercial fishing, 10% to general recreation, recreational fishing, water sports, and all forms of boating. The final 20% is single use plastic of all descriptions, bottles, convenience food rappers and containers. Aluminium cans and glass bottles make negligible percentage.
- Plastic Free North Devon collected 1115 kg of plastic waste, with 673 volunteers taking part in beach clean activities, totally 1247 volunteer hours.

We wish to expand this section further and capture many more of the beach clean/litter picking activities in the Southwest. Please do get in contact if you have some data you would be happy to share (z.botterell@exeter.ac.uk, s.nelms@exeter.ac.uk).

Animal interactions with plastic

We wish to expand this section further and capture as many of the interactions in the south-west. Please do get in contact if you have some data you would be happy to share (z.botterell@exeter.ac.uk, s.nelms@exeter.ac.uk).

Seal entanglement

Cornwall-Seals having experienced or still experiencing entanglement were recorded 860 times during 419 surveys. In total 124 unique entangled seals were identified from the catalogues. These numbers also include bycaught seals that have been hooked in line.

Devon- One seal entangled in the rubber banding which holds the weights to the gillnet on the seabed.

Plastic incorporated into nests

Lesser Black-backed gull nests, Steep Holm, Bristol Channel. From over 300 nests, 3 were found to have incorporated plastic. All of which was white or blue sheet/film like plastic debris.



Plate 15.1. Plastic incorporated into a nest. Image: Matt Twigg, Natural England.



Plate 15.2. Plastic incorporated into a nest. Image: Alasdair Robertson, Natural England.

In the news:

- [Devon councils team up to tackle plastic pollution](#) (May 2022).
- [Plastic Pollution: birds found eating glitter on Skomer Island](#) (November, 2022).
- [Plastic pollution: New project launched to recycle UK's fishing nets](#) (October, 2022).
- [Plastic Pollution with Prof Richard Thompson](#) (University of Plymouth) (January, 2022).
- [Free wooden bellyboards to fight plastic pollution](#) (April, 2022).

Research outputs 2022

The south-west is a hub for plastic pollution research, below find some of the 2021 publication's from our SW based research institutes and universities.

Alava, J.J., McMullen, K., Jones, J., Barragán-Paladines, M.J., Hobbs, C., Tirapé, A., Calle, P., Alarcón, D., Muñoz-Pérez, J.P., Muñoz-Abril, L. and Townsend, K.A., 2022. Multiple anthropogenic stressors in the Galápagos Islands' complex social–ecological system: Interactions of marine pollution, fishing pressure, and climate change with management recommendations. *Integrated Environmental Assessment and Management*.

https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/ieam.4661?casa_token=ZfEU3GRiM9YAAAAA:WKY8kSalgKs7ShY2i1RU80AZHyPsoWLFUOmK58T6riUYobNhgT4j14ShDb2ou8U0MyVLI8xvht5AH9Q

Botterell, Z.L.R, Bergmann, M., Hildebrandt, N., Krumpfen, T., Steinke, M., Thompson, R.C. and Lindeque, P.K., 2022. Microplastic ingestion in zooplankton from the Fram Strait in the Arctic. *Science of the Total Environment*, 831, p.154886.

<https://www.sciencedirect.com/science/article/pii/S0048969722019799>

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18. Seabed 'litter' (discarded or lost material)

Edited by: Keith Hiscock (from information supplied by Ghost Fishing UK, The Thousand Tyres Project and Fathoms Free)

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The 'Seabed litter' category is new for the report of 2022 and is introduced as, although a significant proportion of that 'litter' is 'plastics' and (including fishing nets and gear) is recovered from the shore, much remains on the seabed – it is that seabed material that is included here. Seabed litter encompasses material other than fishing gear such as tyres, metal and glass that is discarded/lost. Wrecks are not included.

The greatest amount of material reported was fishing-related and included nets and pots. Adjacent to the shore and especially in the vicinity of harbours, piers and wharves, the discarded/dumped items included traffic cones, bicycles, tyres (lost fenders or discarded) and supermarket trolleys.



Plate 18.1.
Lost/abandoned wrasse pots on 30th July 2020.
Image: Keith Hiscock



Plate 18.2. The recovered pots on 7th May 2022.
Image: Keith Hiscock

On 7th May 2022, a large number of lost/abandoned wrasse pots were recovered from a few metres of water in Batten Bay, Plymouth Sound. The pots had been located on 30 July 2020 and were marked with an IFCA tag but, since the identified owners were no longer fishing for wrasse, they had no interest in recovering the pots. Volunteers from 'Fathoms Free' (<https://www.fathomsfree.org/>) recovered the pots. Images: Keith Hiscock.

As an illustration of the variety and quantity of items that might be recovered inshore, the following are extracts from the Plymouth Herald newspaper:



"The Plymouth City Council-led clear up came about after the 'Preventing Plastic Pollution' project at the end of April saw divers commissioned to head deep into waters at Mount Batten and Mutton Cove, near the Royal William Yard, with the aim of recovering any plastics that they possibly could." "The volunteers eventually hauled-up:

2 Dumpy bags full of angling line (at least)	3 Pushchairs	8 Trollies
55 Bikes	1 Go-cart	60 Car/truck tyres
22 Scooters	1 Motorcycle	80 Bike tyres

The Council said the haul included "much, much more besides".

Plate 18.3. Recovering a bicycle from the Tamar at Mutton Cove.

"All of the rubbish was hauled ashore and sorted by a hardy bunch of volunteers provided by the **The 1000 Tyres Project** who will assist in recycling the waste."

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See: https://www.plymouthherald.co.uk/news/plymouth-news/hundreds-tyres-among-staggering-pile-7073985?fbclid=IwAR37d_yzNLJRsjhvb7oPpPwq88dcY553oqCyY9HZ-unzHdXNI1F1yE9WvM.

Ghost Fishing UK (<https://www.ghostfishing.co.uk/>) recovered lost/abandoned fishing nets from several locations in the Devon, Cornwall and Dorset in 2022 as well as surveying other locations where lost gear had been reported. Locations where nets and other fishing gear were recovered included:

Galicea (wreck) Lyme Bay	Oregon (wreck) Bigbury Bay	Horseshoe Reef, Mewstone, Wembury	Kingston Alalite (wreck) Nr Plymouth Breakwater	'The Crack' Outer Bizzies, Falmouth
Outer Bizzies, Falmouth	East Narrows, Falmouth	NE of Caroni River, Falmouth	Rockpool Beach, Mousehole	'Marks from Rejoice DH88'

Fathoms Free (www.fathomsfree.org) recovered lost/abandoned fishing gear from the following locations in 2022.

Location	Reported Item	Boat or Shore
Watergate Bay	Ghost net cleared from beach	Shore
St Agnes	Pot & Rope	Shore
Mount Batton	Wrasse Pots & Lobster pots	Boat
Mount Batton	Wrasse Pots	Boat
Porthtowan	Ghost net recovery from rocks	Shore
Hellopes, Penzance	Monofilament	Boat
Caroni Rivers, Falmouth	Trawl	Boat
Bizzies, Falmouth	Trawl, monofilament	Boat
Alice Marie, Penzance	Monofilament	Boat
Zone, St Ives Bay	Monofilament	Boat
Busby, North Coast Cornwall	Monofilament	Boat
Gwithian	Beach cleaned of ghost gear	Shore
Butchers Cove, South Devon	Ghost gear cleared from cliff path	Shore
Looe	Beach cleaned of ghost gear	Shore

Thanks to Elle Speirs for providing the above summary.



Plate 18.4. A truck load of nets on their way to recycling. Image: Fathoms Free.

Many organisations will arrange for recovered fishing gear to be recycled. The Fathoms Free website notes: “The nets collected will be taken to our friends at Ghostnetbusters ALDFG Recovery who have a holding area available to them at Circular&Co, and from there the nets will be collected along with the many others in bulk by the team from Odyssey Innovation Ltd to be fully recycled in their Net Regeneration and Marine Regeneration schemes.”