



The South-West Marine Ecosystem Model

Building Social Capital to produce an Annual State of the South-West Marine Ecosystems Report

The aim of the SWME model is to enable and produce an annual report on the state of south-west marine ecosystems and build the social capital among organisations, networks and individuals active within this region who are involved in research, management and recovery of the marine environment.

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Copies of this paper can be downloaded from the SWME website <http://swmecsystems.co.uk/> or obtained from the authors

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Note: This paper describes what SWME *has done*, but it also includes many points that are very *current* to decision making in the near future – it is a working document.



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The South-West Marine Ecosystems Model – Key Points (USPs)

The aim of the SWME model is to enable and produce an annual report on the state of south-west seas and build the social capital among organisations, networks and individuals active within this region who are involved in research, management and recovery of the marine environment.

Annual The programme of communication run on an annual cycle to report change and the state of south-west marine ecosystems in a timely way to influence research, management and recovery.

Communication: Meetings Through conferences and webinars

Communication: Reporting - State of the South-West Marine Ecosystems The reports cover a number of topics on natural systems: oceanography, plankton, seabed and seashore, fish, seal, marine and coastal birds, cetaceans, and management topics: spatial management, MPAs, fisheries, water quality and plastics pollution

Audience To provide feedback to citizen scientists, scientists - researchers, managers & policy advisors, organisations and the wider public.

Regional scale & resonance Covering the Celtic Sea & English Channel and adjacent countries, achieving a level of granularity that isn't achieved at a larger national scale and having a relevance and resonance with the target audiences.

Social capital, organisation, partnership & collaboration Building social capital through meetings that enable greater co-operation and collaboration through an informal partnership. To provide a network for cascading information and raising awareness.

Voluntary – Finance Relying on the voluntary input of the south-west marine community to build continuity and certainty which is not dependent on fund raising.

The South-West Marine Ecosystem Model: Building Social Capital to produce an Annual State of the South-West Marine Ecosystems Report

Introduction

The aim of the SWME model is to enable and produce an annual report on the state of south-west seas and build the social capital among organisations, networks and individuals active within this region who are involved in research, management and recovery of the marine environment.

The South-West Marine Ecosystems (SWME) model has evolved as an informal partnership since 2007 - 16 years. SWME has always relied upon the wide voluntary support of individuals and institutions. The SWME 'financial model' has been based on an enormous level of voluntary support and on low cost conferences that recovered their cost and covered other running expenses (e.g. website). In this sense SWME can be described as a sustainable model which has developed and adapted.

The 2020 SWME conference had to be cancelled because of Covid and the epidemic forced a rethink and adaptation of our approach to many aspects of SWME. In 2021 and 2022 a series of webinars were organised covering the SWME report chapter topics.

All sorts of events and discussions in 2021 highlighted that SWME is a powerful idea coupling social capital and annual reporting at a regional scale. If funded, SWME could develop in many ways, however, in order to take that step we need a document to describe what this idea is – hence this paper. *'Money follows ideas'* and as such SWME could provide a significant opportunity for organisations and individuals in the region. The paper concludes by outlining how SWME might continue to develop. The purpose of this paper is currently as follows:

1. To describe the SWME Model so that the idea can be communicated widely
2. To be the basis of a prospectus to seek funds should this need arise
3. To describe and explore options for future development of SWME in 2022-23

Communications: Conferences & Webinars

The initial idea for South-West Marine Ecosystems (SWME) was Russell Wynne's, who was then based at the National Oceanographic Centre. He was working on a project on Balearic shearwaters with fieldwork based at Gwennap Head, Cornwall which involved a large number of volunteer recorders. In 2007 he set up a meeting at the Marine Biological Association (MBA) and invited a wide range of the active professionals and volunteers (50+) looking at marine species in the south-west; this became a regular event each spring. In 2012 Russell Wynne asked Bob Earll to take over organising the conferences. His first was in 2013 and held at the MBA and was attended by 50+ delegates, however, following an offer from Peter Millar at the Plymouth Marine Laboratory (PML) the 2014, 2015 and 2016 conferences were held at PML with over 150+ delegates attending. From 2017-2019 the conference moved to Plymouth University with 200+ delegates attending. The conference convenor in 2018-2020 was Natasha Bradshaw (with assistance from Ruth Williams and Cornwall Wildlife Trust), and Bob Earll.

The SWME conferences have had an audience-developed set of objectives since 2015 and these have been re-written for the 2021 Report (Appendix 1). These have been very 'busy' conferences with up to 25 presentations, short and long. At its simplest the SWME conferences create a collective awareness of the different interests across a wide range of subjects. Unlike the single subject webinars this means that the conference audiences are exposed to a wide cross section of

interests. Evaluation feedback has always shown that ‘networking’ is seen as the most important aspect of these face-to-face conferences.

The 2020 conference was cancelled because of Covid but in 2021 and 2022 topic webinars were arranged. Topic editors set up the webinars usually with two or more presenters and the main institutions (Exeter University, Penryn, Plymouth University and the MBA) provided the hosting platform. The attendance at the webinars in 2021, during a Covid lockdown, ranged from 70-300 (Table 1). The numbers attending the webinars fell in 2022. The SWME YouTube channel set up to host the webinar recordings was getting a higher rate of views in 2022 than 2021 even though most recordings had only been posted for 3-4 months.

Table 1. SWME Webinar Attendance & YouTube Recording Stats

Version

4/8/2022

YouTube stats as of 29/7/2022

[SWME YouTube Channel Link](#)

Topic	2021	2022	2021	2022
	Webinar Attendance	Webinar Attendance	YouTube Views After 12 months	YouTube Views After 3 months
Oceanography & Plankton	At least 80	59	62	72
The Seashore & Seabed	190	No data	241	115
Fishes & Reptiles	>100	No data	55	73
Marine & Coastal Birds	105	No data	56	129
Seals	300	72	316	225
Cetaceans	170	89	269	152
MPAs	225	47	232	54
Fisheries	80	37	73	165
Plastic pollution	70	Not run	60	NA
Water Quality	Not run	No data	Not run	95
Climate change	Not run	39	Not run	74
SWME descriptions	Talks on SWME overall		RE 69, KH 34	RW 18*

* Given at Coastal Futures to 300+ delegates

The SWME website was developed in 2018 as a communication tool as well as repository for annual reports and conference proceedings. Presentations & speaker notes are archived online at <http://swmecosystems.co.uk/archive>.

YouTube Channel. During Covid Ruth Williams set up a [SWME YouTube channel](#).

Presentations to national audiences on the SWME Model were made to the Healthy and Biologically Diverse Seas Evidence Group ([HBDSEG \(Bob Earll\)](#)), [The Porcupine Marine Natural History Society \(Keith Hiscock\)](#) in 2021 and at Coastal Futures - 2022 ([Ruth Williams](#)). These have highlighted the

benefits of annual reporting on a regional scale and demonstrated how the SWME model has helped develop social capital and how many organisations work effectively with citizen science networks.

Meetings: Conferences & Webinars Comparison In Autumn 2022 we will need to decide on the 2023 programme of either webinars and/or a face to face meeting. For 2022-2023 this might not be an either a webinar programme or a one day conference but both. Table 2 compares the benefits of the two types of meeting in the context of SWME. Apart from networking and integration single topic webinars offer a broad range of benefits. There a very clear remit for chapter topics and dedicating a slot to each chapter topic - as at the PML 2022 May workshop - showed these provide a clear focus to what we could cover at any future one day conference – within the time a ‘day’ allows.

Table 2 The strengths and weaknesses of face to face meetings in comparison with Webinars

	Face to Face Meetings	Webinars
1. 'Networking' in its many ways	Very good	Very poor
2. Programme formulation	A convenor with Steering Group support	Chapter topic Editors convene sessions; stronger link to chapter outputs
3. Focus on SWME Chapter topics	Yes, but time limits contributions	Very Good, enables many speaker contributors
4. Programme content: Integration across topics	Could be the main purpose of face to face meetings	Not good
5. Team building with contributors	Much less useful; simple lack of time	Good potential, with a variety of speaker contributions
6. Teams & Resilience	Less useful, because less speakers are actively involved	Stronger because more speakers are involved
7. Audience: Interested in all Chapters	The audience hear all the chapter topics; better for issues of integration across topics	Audiences both general AND those who are only likely to attend that topic
8. Audience reach	Within easy travelling of conference location	Local & much further afield - including the recordings - attendance by others who might not otherwise attend
9. Presentation Recordings	Not used as yet - only PowerPoints	Webinar recordings on YouTube channel give a much better sense of the presentation content
10. Carbon footprint	High	Lower

Communications: Annual Reports

In 2014 the first annual report for SWME was produced by Bob Earll using mainly speaker notes gathered during the conference; it was 25 pages long. 2015 saw the first of the current style of SWME Annual reports based on chapter topics with editors generating these, but it was in 2016 that the report grew to 67 pages, and subsequent reports have been about 80 pages. The reports only exist in a digital format; it has never been printed. The annual reports can be viewed online at <http://swmecosystems.co.uk/annual-reports>.

The structure of the report is very traditional, with the content based on topic chapters, including oceanography and plankton, seabed and benthos, fishes and turtles, marine and coastal birds, seals, cetaceans and then a number of 'management' categories which have usually included fisheries, marine protected areas, marine plastics and development. In the 2022 webinars climate change and water quality have been included. One major structural weakness of this themed / siloed approach is that it doesn't really capture ecosystem interactions very well.

In 2021 the Annual Report was adopted by the Marine Biological Association and given a DoI number.

It was also in 2021 that the idea of re-framing the report as an Annual 'State of the Seas' Report for the South-West was initiated. There is no doubt that this framing provides a greater focus for the report and the intention is that this will raise its profile and impact, in the process supporting the work of many of its contributors.

The report links was sent by Mailchimp to 1285 contacts on the 15th July 2022 and by August 15th it had been opened 1300 times and received 331 clicks.

Reporting Annual Change: The Objectives of the South-West Marine Ecosystems Annual Reports

For the 2021 State of the South-West Seas Report Editors were asked to prepare conclusions for their Chapters for the first time and to report annual change (RAC) year on year. This is challenging not least in terms of the *language* we use to describe the changes that are reported across the topics. The overall purpose of the report supports the objectives of the conference, collecting observations, supporting recording and science, helping to build networks and provide feedback to everyone involved. It also helps provide the 'horizon scanning' and context (temporal and spatial) for records and to make a difference in protecting and managing our marine environment. Work on indicators was started in the 2021-22 programme. A detailed breakdown of reasons for producing the report includes:

- 1. Describing and reflecting on the normal patterns of events for ecosystems**
- 2. Species:** Highlighting significant ecological and population changes including:
 - Noting new records for the south-west - Highlighting remarkable sightings e.g. Bowhead whale, Cornwall in 2016 or the Dalmatian pelican and Wally the Walrus, etc.
 - Describing the transition of 'new' species populations year on year e.g. Gilthead bream, Couches Bream
 - Good years & bad years – relative status - trends for species like spiny lobsters, bluefin tuna, jellyfish e.g. basking sharks, sunfish
- 3. Larger Species of conservation & management importance** For species such as some fish such as the larger sharks, bluefin tuna, some seabirds, turtles, seals and cetaceans there are

a relatively small number of species of interest. Many of these species clearly have small, finite populations albeit that the south-west is only part of their overall geographic range. Many of these species are recovering from past predation or persecution and this is recognised by their protected status under UK & European conservation laws. Many of these species migrate through the south-west and so SWME can help provide spatial context to the sightings of these species; examples include,

- Seal movements at sites throughout the Celtic Sea
- White beaked dolphins - Lyme Bay, site fidelity of this population
- Bottlenose dolphins: inshore pod movements from Brighton to Cornwall (2020)
- How species distributions are linked to summer oceanic frontal systems e.g. blue sharks and common dolphins
- Manx shearwaters – To and from South Wales Islands to Lyme Bay

In many cases there are strong networks in the south-west recording these species on an annual basis and there are metrics which give a broad indication of the population status which could be used to provide at least a traffic light representation.

4. Recording major events and their effects e.g. the major winter storms of 2014-15 or the polyisobutylene (PIB) incident, the impact of Covid on species disturbance and science.

5. Making a difference – managing human activities Reporting change in a timely manner to enable science and management e.g. spiny lobsters

- Recording recovery e.g. seabird populations after rat eradication on islands
- Acting to focus interest Publishing provides a focus for further research, year on year e.g. tuna, spiny lobster, bottlenose dolphins
- Posing questions and exploring interactions – making the links between environmental, species, habitat and management changes
- Telling stories about what we know and providing access – education & outreach

Annual State of the Seas Reporting: The Benefits of Framing & Management Systems

There are many reasons why we should be interested and aware in the marine environment but the main one is a strong commonly shared concern is over what is happening in the natural environment.

The SWME conferences and webinars and the report have developed on an *annual basis* and what this enables is a much more frequent way of getting some sense of the changes that are occurring in the marine environment.

A Devon Coastal Forum meeting in 2020 framed in terms of the state of seas reporting with examples from projects such as the South West Partnership for Environmental and Economic Prosperity [SWEEP \(North Devon\)](#) and the [south-west Ocean Health Index \(Exeter University\)](#) prompted discussions about whether SWME could use 'state of the seas' framing. SWME has advantages in that a) it is not dependent on project funding and b) its annual basis means that there is an immediacy to the process. It has been suggested that we could productively frame the report as 'The State of South-West Marine Ecosystems' since this would then be internally consistent with the SWME brand.

This framing is also set in management systems thinking (Figure 1) which has developed over 60 years in the business setting but applied more routinely in environmental settings since the 1990s. The water industry in the UK, for example, has a number of major management systems run on five

year cycles which focus on the price review, flooding, water quality and water resources. Management system thinking is also the basis of the UK Marine Strategy (UKMS) that operates on a six-year cycle. The management system approach has also given rise to the concept of indicators.

Framing the SWME Report on an annual basis offers a number of advantages including:

1. It provides a clear focus for the chapters and how we view their conclusions, giving the whole process more significance and value
2. It should, over time, improve the impact that the report has
3. It links very strongly to the concept of indicators which should help us to communicate to a wider range of people, including the public, scientists, managers and policy makers
4. The current SWME model is 'sustainable' and so should facilitate year on year reporting and discussions on key issues
5. An annual view enables issues to be addressed more quickly. The increase in bluefin tuna and spiny lobsters have both lead to research and then fishery management actions. Waiting for a six yearly review/reporting process of these changes at a national level is not responsive enough.
6. Press Releases. In 2022 and from time-to-time SWME has produced general press releases. In general lead organisations take the lead in promoting topics that relate directly to their interests.

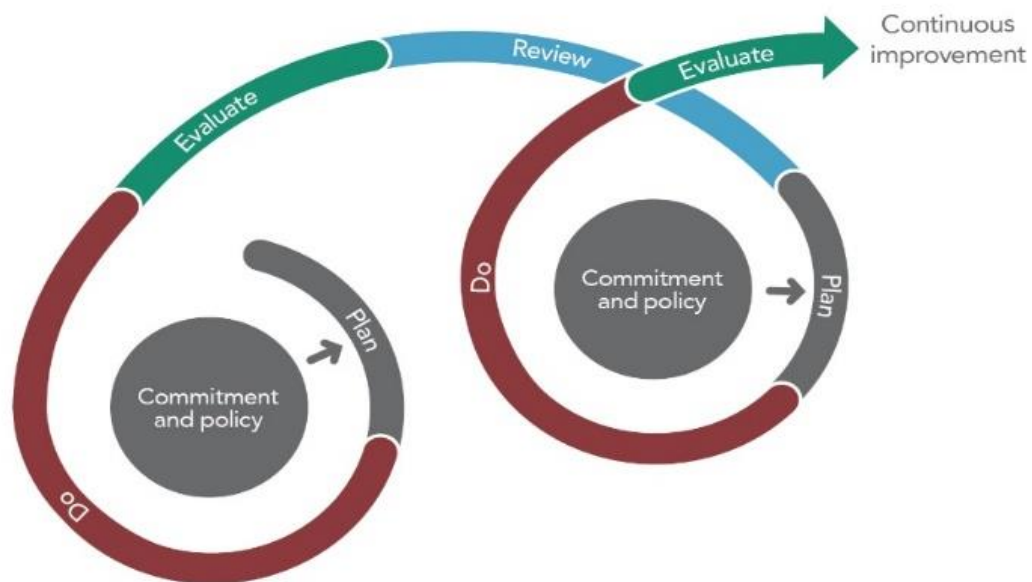


Figure 1. The Management System cycle (from Earll, 2018)

Building social capital, who is involved, organisation, partnership and collaboration

Audience: Who is involved with SWME?

Figure 2 shows the main groups involved with SWME. Initially SWME meetings were convened and administered by just one person with the support of speakers, but this has now evolved and developed so that 20+ people now play an active part in the SWME Model each year. The following organisations and individuals have been involved with SWME from its conception, including:

The conference convenors: originally this was Russell Wynne, and has recently been Bob Earll and Natasha Bradshaw, in effect a person that takes the lead in instigating the programme for the year.

Building Social Capital- It's People that make SWME

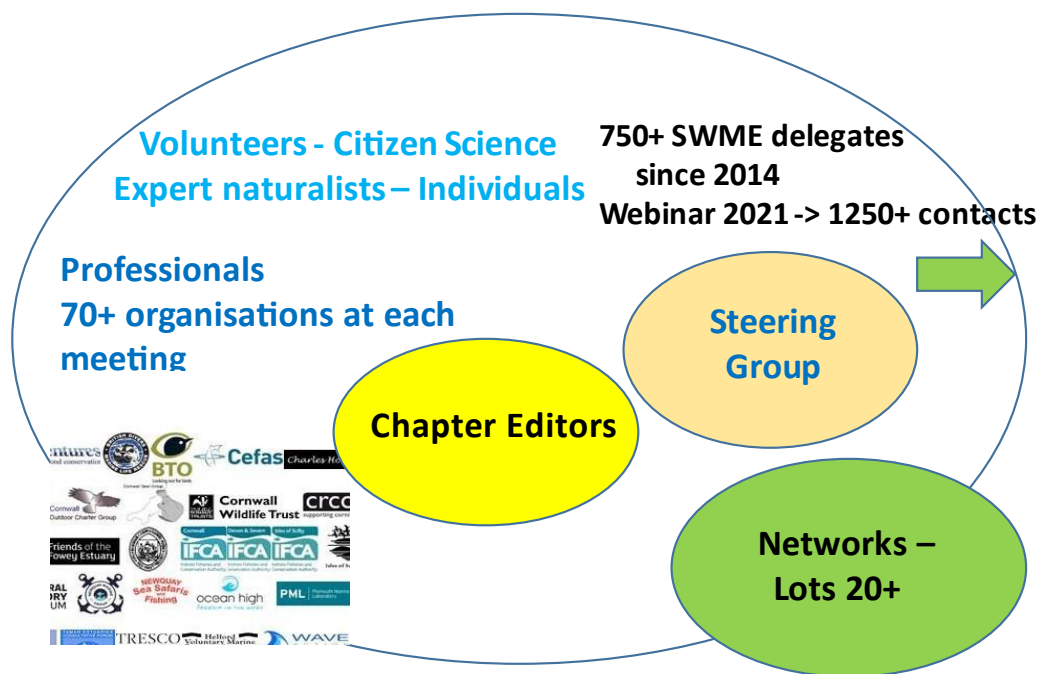


Figure 2. Social Capital: it's People that make SWME – who is involved?

Institutional support. The initial meetings were held at the Marine Biological Association, then the Plymouth Marine Laboratory (Peter Millar, Tim Smyth & Angus Atkinson) and then Plymouth University (Martin Attrill). In Covid with the webinars these organisations and Exeter University (Penryn) – Brendan Godley, have again provided support to SWME in providing platforms for the webinars. Ruth Williams (Cornwall Wildlife Trust) has enabled CWT to provide administrative and financial support for SWME.

Editors. There is now an editorial team, led by Keith Hiscock, comprised of Bob Earll and Paul Naylor. This is supported by chapter editors (Table 3) whose role has changed and expanded since Covid to also included convening the individual topic webinar programmes as well as editing the report chapters.

Table 3 SWME Editors in 2021-22

Oceanography	Tim Smyth
Plankton	Angus Atkinson
Benthos	Keith Hiscock
Fish & Turtles	Doug Herdson
Marine & Coastal Birds	Alex Banks
Seals	Sue Sayer
Cetaceans	Dan Jarvis, Duncan Jones, Abby Crosby
Fisheries	Libby West & Bob Earll
Marine Protected Areas	Sian Rees
Water Quality	Steven Guilbert
Plastic pollution	Delia Webb, Zara Botterell & Sarah Nelms
Climate change	Claire Wallerstein

We have also recognised the importance of marine spatial planning, not least in connection to the large scale development of floating offshore wind energy in the South-West and will be covered from 2022-2023 onward.

Steering Group. Up until 2020 there was an informal group comprising Bob Earll, Keith Hiscock, Natasha Bradshaw and Ruth Williams which made decisions on the event. Since 2020 this has developed more formally, and in 2020/21 this was set up as a steering group which also included representatives of the institutional partners. For the 2021-2022 season the SG met monthly up to January and then more frequently as more co-ordination of the webinar programme has developed, with discussions about the May 6th face to face PML meeting and discussions around indicators. We have made it clear that SG members needn't attend every meeting, however, with individuals in the email group it means that they are kept 'in the loop'.



Figure 3. Participants at the May 6th, 2022, meeting of SWME Steering & Editorial Group members at the Plymouth Marine Laboratory Organisations. At the last face-to-face meeting held in Plymouth in 2019 over 70 different organisations were represented. At that point there were 750

contacts on the mailing list. It seems likely that there will now be in excess of 100 organisations attending the webinar programme.

Networks. There are over 20 'networks' in the south-west which are associated with organisations, particular citizen science projects and forums. There is a 'network' email list that is used for promotional mailings. This ranges from sports anglers to groups like the Cornwall Seal Group Research Trust with over 300+ contacts.

Individual contacts: The contact database for SWME has been developed cumulatively, year on year, using a Mailchimp mailing system with people opting in to receive mailings and attend the events. In the spring of 2020 this stood at 750+ contacts. The webinar process and mailings expanded this to 1250+ by the spring of 2021. The contact list has remained at this level during the 2022 webinar programme.

Building Social Capital: Organisation, Partnership & Funding

The SWME conferences – like all conferences – are valued by delegates for the opportunity to 'network'. As soon as you start to look at 'networking' in detail you realise its complexity but in essence what it is helping to do is build social capital. The idea of capitals was developed by [Jonathan Porritt in his book published in 2005](#), and is now widely understood and has also been updated in the Natural Capital Committee's diagram (Figure 4).

Year on year SWME and the way it has developed has led to the formation of an informal partnership which currently (2022) has 25+ people contributing significantly. SWME has no organisational status, no constitution or bank account. In many ways it is similar to an organisation Wildlife & Countryside Link which operates a 'reverse umbrella' model. The participant organisations retain their individual policies and working and have to '*opt in*' to any collective effort (Earll, 2018). In SWME this is best seen with the work on the report press release where individual organisations are encouraged to take the lead once a press release has been formulated.

Building Social Capital is important because developing inter-personal relationships is key in collaborative working. To tackle any of the environmental issues that we face we need to be fully aware of other stakeholders with an interest in issues and it is interesting how many of the webinars have benefited from collaborative working.

The webinars have given us the ability to develop a more focussed view of the work on particular topic groups and to reach more people. However, virtual meetings really fall down on networking. The need for face-to-face meetings will be key to continuing to build social capital across the south-west and beyond.

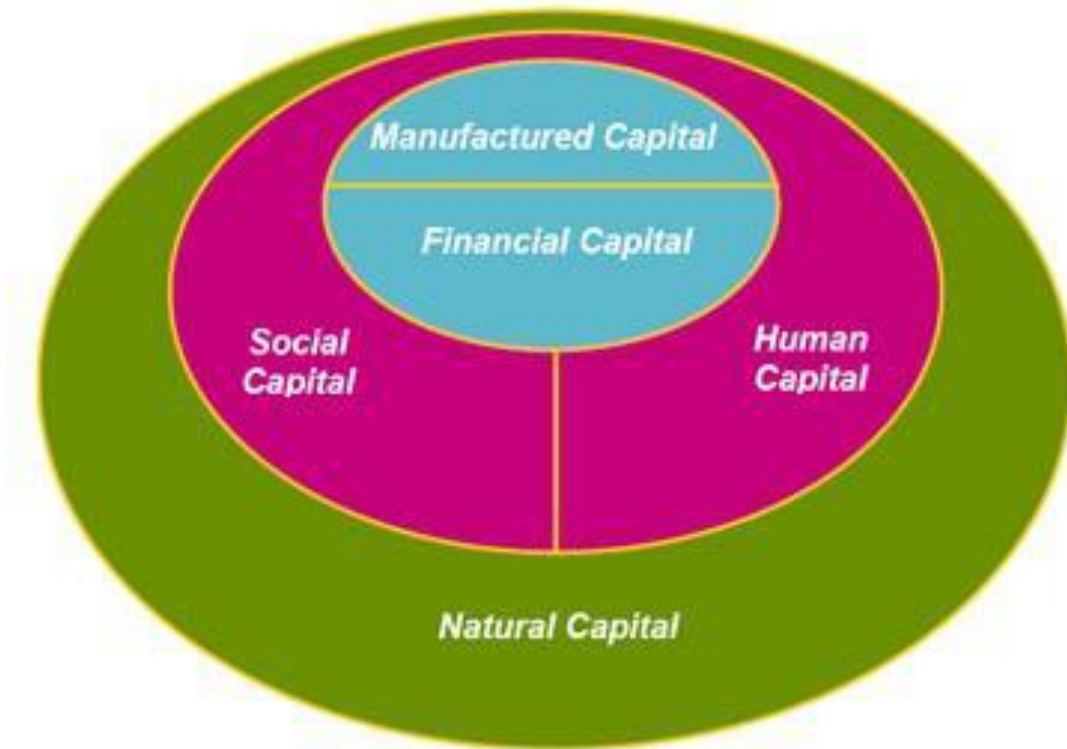


Figure 4. **The relationship between the capitals – Social, Human and Natural – Natural Capital Committee (Natural Capital Committee (2019))**

SWME can also provide a vehicle to explore common interests should the need arise. This has happened with projects on bottlenose dolphins and in 2021 the opportunity of a Masters Student arose to look at the issue of indicators in SWME’s work and will be reported in the autumn of 2022. In the process of discussing the 'indicators' project, it became apparent that there is a coincidence of interest in indicators among a number of SWME members, and we have held several meetings in 2021-22 to explore this.

A Regional Model: Where is the ‘South-West’?

There are a number of ways of thinking about the ‘South-West’ including:

Human geographic boundaries. The English region of the south-west includes Cornwall, Devon, Dorset, Somerset and Avon. It soon becomes apparent however, from various studies that their routine movements between Irish, Welsh and French waters for many of the vertebrate species (see below).

Governance boundaries. In terms of marine governance the south-west is a region for the purposes of marine spatial planning in England. The inshore and offshore zones are important for both planning, marine protected areas and fisheries regulation (IFCAs out to 6 nm, MMO 6-12 nm).

Oceanography. The south-west includes the coastal and marine environments of the English Channel, Bristol Channel and [Celtic Sea](#). From an oceanographic sciences perspective the south-west is a complex area with a variety of influences varying from the oceanic in the far west to the major estuarine – coastal influences of the Severn Estuary. The seasonal stratification of the western waters in the summer resulting in fronts is of major importance to the feeding and distribution of many pelagic species in the Celtic Sea and English Channel.

Species. There are physiographic and biogeographic 'break points' around the south-west seas creating provincial characteristics. Those breakpoints are incorporated into the coastal sectors used by the Marine Nature Conservation Review of Great Britain but there are others. Debris from America often washes up on the more south-westerly beaches often with invertebrate and algal species in this debris

For the vertebrates we learn more and more that these species move throughout the region often in routine and regular movements, for example:

- Manx Shearwaters from the South Wales Islands routinely fly to feed in Lyme Bay during the summer
- The south-west resident Bottlenose Dolphin pod is well known from Padstow to Brighton and can travel that distance in 4 days
- Bass tagged on the Dart can migrate as far as Milford Haven in less than a year
- Bluefin tuna – spend the late summer in the south-west but travel to mid-Atlantic waters as well as the coast of Tunisia
- Grey seals routinely move between and use haul-outs throughout the south-west coasts of England, Wales, Ireland and France

Funding Scenarios - A sustainable model?

SWME is sustainable in the sense the current model has developed, adapted and run for 16 years. The main strength of the SWME model is that it is run by volunteers, often contributing considerable time and expertise. That collaborative ethos is what helped us adapt successfully to an online model during Covid. The face to face conferences have always been low cost (£25 fee) using a not-for-profit rationale, which covers the main expenditure (venue & catering costs). This is a sustainable funding model for the conferences. Most importantly this also means that no time is spent either looking for funds or worrying whether the conference can take place or not because of funding.

Scenarios At the May 2022 PML meeting two scenarios were discussed:

1. Encourage and enable an organisation/s or individuals to seek funding to cover and develop key elements of what SWME does.
2. Carry on as currently, developing and refining the voluntary, low cost model including making the conference and (if selected) the on-line attendee fee to cover the costs of organising (including hosting) the conferences at least.

Scenario 1 Encourage and enable organisations to seek 'project' funding to cover and develop key elements of what SWME does.

The current 'funding climate' under this Government has seen Agency budgets cut back significantly but there has also seen an upsurge in all sorts of 'funds' to undertake projects that the Government deems to be of value. This also applies to many funds not within the Government's control. It is not an unrealistic scenario to envisage one or more of our major organisational partners putting in a funding bid to develop the SWME model as a partnership, not least to cover its major activities of convening the conference and producing and editing the annual state of the seas report. Many of the SWME partners are extremely adept at developing project proposals. This SWME Model paper can act as repository of information on which such proposals for all or part of SWME could be prepared.

It goes without saying that seeking project funding would have to be done with considerable care so as to maintain the collaborative approach and collective input which is so valued within SWME. This scenario also places onus on partner/s in terms of time to look for and apply for suitable funds. One of the points made at the HBDSEG meeting in 2021 was that this model could be rolled-out to other regions, such as the MMO planning areas. *The 'seek project funding' scenario was discussed and largely rejected by the May 2022 PML meeting because of the potential destabilisation this would cause to voluntary efforts.*

Scenario 2 Carry on as currently, developing and refining the voluntary, low cost model

These points cover a number of areas where we could continue to run SWME as at present, but make efficiencies where possible, develop succession planning and spread the load between the wider partners and steering group.

Discussion and Conclusions

This paper describes the major developments of the South-West Marine Ecosystems model since its inception in 2007 and the rapid developments during the period of the Covid epidemic. It seems very likely that it will continue to develop to meet the needs and develop benefits for its partners and audience, including:

- Reporting annual change: this represents as interesting challenge but is at the heart of what SWME is doing.
- Developing communications, and in particular with improved social media outreach.
- Seeing how this model compares with similar approaches and whether the model can be developed in other regions.

References

Earll, R.C. (2018) Marine Conservation: People, Ideas and Action Pelagic Publishing 303pp ISBN 978-1-78427-176-3

Natural Capital Committee (2019) [Natural Capital Terminology](#) pp15

SWME Website <http://swmecosystems.co.uk/>

SWME YouTube webinar channel <https://www.youtube.com/channel/UCoJA2OkFX0fM-oq7bVTofhQ>

Appendix 1 South-West Marine Ecosystems - Aim and Objectives

The aim of the SWME model is to enable and produce an annual report on the state of south-west marine ecosystems and build the social capital among organisations, networks and individuals active within this region who are involved in research, management and recovery of the marine environment.

The objectives of SWME were updated for the SWME 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 & Collaboration** 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 annual with a report covering a number of topics on **natural systems**: oceanography, plankton, seabed and seashore, fish, seal, 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. [Annual reports are held on the SWME website](#).

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.