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The history of citizen science and marine natural history in the UK: project introduction, overview and first steps – 1960's to 1990

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Introduction

This article introduces and describes a project that we are about to embark upon, and that we hope will engage many Porcupine members. The idea for setting up the Porcupine Marine Natural History Society (PMNHS) arose in 1976 (Woodward 1976) and the inaugural meeting took place in Edinburgh in 1977. The *Porcupine Newsletter/Bulletin* articles have covered the development of marine natural history since the very first issue, with included topics going back at least as far as the voyage of *Porcupine* and the work of Victorian naturalists; we intend to reference these articles.

In the late 1960s and 1970s it seems probable that the UK was leading the world in citizen science and marine natural history in relation to engaging the public and, in particular, recreational SCUBA divers. A host of drivers led to the developing interest in marine recording, including the considerable growth in sports diving, computing, the growing awareness of threats to the environment and the development of marine conservation. These ideas and developments combined to provide the momentum behind the citizen science initiatives that were undertaken during this period.

The aims of this project are to:

- document the history of citizen science and marine natural history in the UK. Many of the people who were involved are still with us, sadly many are not;

- encourage a wide range of articles on the main themes, contributed and led by many authors;

- provide a reference framework for future studies using a chronology that we develop collaboratively; and

- enable current workers to access legacy documents and information on this subject.

The current article covers three main topics namely:

- the guiding ideas for this project;
- examples of some of the main themes of interest for the period 1960s–1992, which will be the subject of further articles; and
- an outline chronology of this period.

The conclusions set out some next steps.

Guiding ideas

The following are the main guiding ideas that we will draw upon in this project.

- A series of thematic articles. We propose a series of articles, with many Porcupine members as first authors;
- Collaboration and acknowledgement. Our hope is that we can develop this project in a collaborative way, fully acknowledging the contributions that many people have made and including their inputs;
- Chronologies. We will develop timelines and chronologies to show how approaches to particular topics have developed (e.g. Table 1);
- Legacy. We will describe what was done and will look into the legacy of these projects, not least to explore how the information collected can be accessed now and potentially used to assess the changes that have occurred over the last 50 years;
- Referencing. *Porcupine Newsletters* and *Bulletins* have been describing many of these topics over the years and as far as possible we intend to reference our articles to these papers, as well as making available many other historic reports and papers.

Citizen science and marine natural history 1960s–1992: Overview of the main themes

We envisage much more detailed future articles that cover a number of the main themes that run through the development of citizen science and marine natural history in the UK. Brief overviews of seven themes are outlined here covering the period of the 1960s–1992. Many other themes are likely to arise during the project.

1. Citizen Science

The legacy of amateur natural historians involved in marine natural history stretches back at least to the 18th century. Indeed many of the people who originally described the British marine flora and fauna were essentially amateurs. Authors such as Gosse and Forbes also wrote popular accounts of marine life, especially in the Victorian era, encouraging the public to visit the seashore and start marine aquariums, thus raising issues of over-collection of specimens. See Hiscock (2018) for more on these early days.

Post-WWII, it was the terrestrial botanists and birdwatchers who led the way, through encouraging biological recording by the public, and there was clearly a developing awareness of the potential of citizen science. In the UK, early marine environmental citizen science projects included:

- the Conchological Society of Great Britain and Ireland in the 1960s, that started the first recording programme for marine molluscs using volunteers – amateur recorders (Heppell 1964);
- Dr David Bellamy, a botanist at Durham University who, in 1968, ran the first citizen science project aimed at sports divers, called Operation Kelp; and
- the Royal Society for the Protection of Birds (RSPB) that, prompted by the high levels of chronic oil pollution around the coast, began its beached bird surveys in 1972.

By 1990, citizen science marine projects could be broken down into a number of categories, including:

- species recording for taxa, either as single groups e.g. molluscs, or mixed taxa e.g. The Species Recording Scheme;
- site and habitat recording both in the intertidal and the shallow sublittoral;
- projects aimed at species being affected by specific human impacts e.g. basking sharks by fishing, dogwhelks by TBT (tributyltin); and
- projects aimed at directly recording human impacts, such as Beachwatch identifying and quantifying marine litter.

The rationale for encouraging citizen science really has not changed over the last 40 years, and is encapsulated by Roger Mitchell (Seaward



Fig. 1: The start: Bernard Eaton (Diver Magazine) initiator of the Underwater Conservation Programme/Underwater Conservation Society (UCP/UCS) was supported and encouraged by Professor David Bellamy (Botanist). Courtesy of DiverNet.com.

Table 1: A chronological list of key events impacting the development of marine conservation and citizen science: 1960s–1989

1962	Atlas of the British Flora – Perring & Walters
1964	David Heppell (1964) sets out the marine census areas for the Conchological Society of Great Britain and Ireland marine mollusc recording programme
1967	The oil tanker Torrey Canyon wrecks off Cornwall causing major concerns over oil pollution and threats to the marine environment
1968	David Bellamy organises the first citizen science project for sports divers in the UK, Operation Kelp
1968	Isopod (including marine) recording scheme launched by Holdich & Lincoln (Maguire 2021)
1972	RSPB launch an annual beached bird survey using volunteers to help monitor seabird deaths, in particular from the impacts of chronic oil pollution
1973	The Natural Environment Research Council (NERC) publishes <i>Marine Wildlife Conservation</i> , also known as the Clark report (Clark 1973). It highlights the lack of information and downplays the need for marine conservation
1974	The Biological Records Centre (BRC) produces instructions and guidance for recording schemes – Heath & Scott (1974).
1975	Roger Mitchell at NCC (Nature Conservancy Council) initiates the first pilot littoral and sublittoral surveys towards preparing a Marine Conservation Review, contracting work from the Marine Biological Association and the Scottish Marine Biological Association (NCC Second Annual Report 1975/76). He proposed MNCR site selection criteria in 1977 (Mitchell 1977) and 1979 (Mitchell 1979)
1977	The PMNHS* is launched at an inaugural conference at the Royal Scottish Museum in Edinburgh. The idea arose from a small gathering of like-minded individuals in March 1976, reported in the first <i>Porcupine Newsletter</i> (Woodward 1976).
1977	Underwater Conservation Year (UCY) is launched: citizen science projects for divers; initiated by Bernard Eaton of Diver Magazine; first co-ordinator Charles Sheppard
1978	Underwater Conservation programme (UCP) continued the citizen science projects of UCY; project co-ordinator Bob Earll
1979	Publication of <i>Nature Conservation in the Marine Environment</i> by the NCC, which set the scene for Marine Nature Reserve legislation; co-ordinator Roger Mitchell
1979	Underwater Conservation Society (UCS) inaugurated at the first AGM of the society in Manchester
1981	The Wildlife & Countryside Act sets out legal provision for marine conservation through the designation of Marine Nature Reserves. This in turn prompts more research into sites, but also supports the development of marine NGOs
1982	Publication of the <i>Sea Area Atlas of Marine Mollusca of Britain and Ireland</i>
1984	UCS morphs into the Marine Conservation Society (MCS) which becomes formally constituted and continues citizen science projects.
1985	NCC launches Coastwatch, initially co-funded by WWF-UK and Earthwatch, as a citizen science project to record intertidal and fringing coastal terrestrial ‘phase 1’ habitats and major impacting activities
1987	Basking Shark Watch launched by MCS, prompted by concerns in relation to their over-exploitation in UK waters. This project used recording cards to record surface sightings of the sharks. It continues to this day (2023), now run by the Shark Trust
1987	Resources allocated for a full-scale Marine Nature Conservation Review of Great Britain, launched by NCC; initially managed by Roger Mitchell and later led by Keith Hiscock in the Joint Nature Conservation Committee (JNCC). This was a major initiative to set in context the choice of marine conservation sites around the UK and published in 1998
1988	NCC, Roger Mitchell and Keith Hiscock ask MCS to set up Seasearch, based on funding for expeditions to areas that had not been surveyed, to record habitats and species; Bob Earll was the first project co-ordinator
1989	Tim Berners-Lee, a British scientist, developed the World Wide Web (WWW) in 1989, while working at CERN

* The name “Porcupine” is taken from the naval survey vessel HMS *Porcupine* that was engaged on scientific expeditions in the northeast Atlantic and Mediterranean in 1869 and 1870. She made the first ever deep ocean dredge for living creatures in 1869, resulting in the naming of the Porcupine Bank off the west coast of Ireland.



Fig. 2: Shared interests – expert algologist Ian Tittley (NHM) with Porcupines, St Margaret's Bay, 2011. (Photo: Frances Dipper)



Fig. 3: Citizen science – fun and friends; a mixed herd of Porcupines and Seasearchers en route for the Farne Islands 2017. (Photo by 'unknown' taken with Frances Dipper's camera)

1982) as follows: *"Had the collection of these data [for the mollusc atlas] been the subject of a research contract, the costs would have been prohibitive even if it could have been mounted, which is doubtful. Instead, this project has depended on the good will, hard work and considerable expertise of not only professionals but also very many amateur biologists and naturalists – amateur only in the sense their efforts are voluntary."*

In the 1970s and 1980s there is no doubt that some professional marine biologists were sceptical and vocal about the idea of using volunteers for marine biological recording, not least in their use of the word 'amateur' in a disparaging way. Terms such as 'volunteers' and 'participants' are less value-based and more helpful. The term 'citizen science' solves this linguistic issue and came into common usage in the mid-1990s. It is now widely accepted, with

a growing literature exploring its development and utility (Riesch & Potter 2013). There was always the reality that many volunteers were very highly qualified professionals in other spheres of work and applied these skills to marine natural history.

Citizen science is all about people, and the aim of 'outreach' into a wider community has been a key driver behind this idea. Successful citizen science projects often bring together a thriving community of volunteers to work with scientists, to achieve their project objectives. But such collaborations also result in much more - friendships and often a long-lived involvement and interest in the subject way beyond the original project. In successful citizen science networks, those involved can become ambassadors for their subject, sharing their knowledge with the wider public; an excellent current example of this is the Cornish

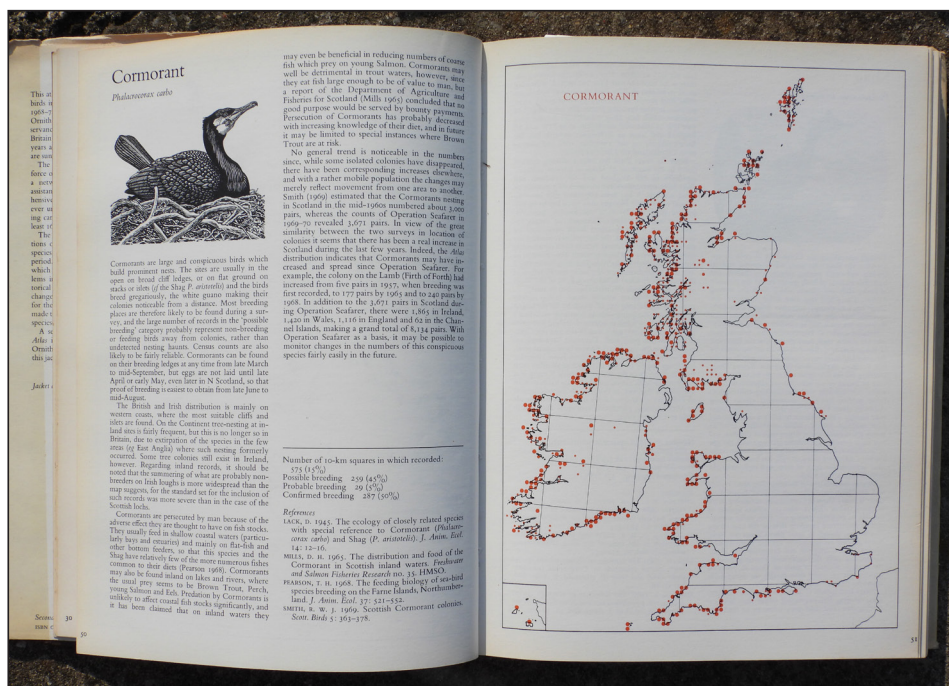


Fig. 4: A page from the 1977 UK Atlas of Breeding Birds (Sharrock, 1977)

Seal Network – see Sayer (in Earll 2018). The legacy of citizen science projects can often lead to new organisations, as happened with the transition of the Underwater Conservation Year/Society initiatives to the formation of the influential Marine Conservation Society.

From the 1960s onwards, computing started to play a key role in the development of biological recording and many early recording cards were modelled on the edge punch cards used by main frame computers at the time. In the 1970s, such computers were widely available for scientific research in institutions and universities. It was not until the early 1980s that personal computers became commonplace, and this transformed the way projects were conceived and managed, but even then communication was by post and telephone – the digital age had not fully come into being. The development of the World Wide Web (WWW) in 1989, enabled websites, emails and social media, which have all become core to citizen science. The mobile phone has also become a driving force of modern citizen science, but was not widely available with its current locational and photographic capabilities, until the 2010s.

Today, citizen science is widely recognised internationally by institutions like UNESCO

(2021) who describe it thus: “Furthermore, citizen science and citizens’ participation have developed as models of scientific research conducted by non-professional scientists, following scientifically valid methodologies and frequently carried out in association with formal, scientific programmes or with professional scientists with web-based platforms and social media, as well as open source hardware and software (especially low-cost sensors and mobile apps) as important agents of interaction. For the effective reuse of the outputs of citizen and participatory science by other actors, including scientists, these products should be subject to the curation, standardization and preservation methods necessary to ensure the maximum benefit to all.” Which is a rather long-winded way of saying that it is jolly useful.

2. Biological recording – the early years

Many of the formative ideas behind what we recognise as biological recording today, were begun in the late 1950s by Frank Perring (Preston & Oswald 2006). He was the key driving force behind Atlas of the British Flora, published in 1962 (Perring & Walters 1962) and went on to lead a team at the Biological Records Centre (BRC) based at the Monks Wood Experimental Station. The idea was that these recording projects would ultimately lead to



Fig. 5: Early marine surveys: Nature Conservancy Council expedition to South Uist, 1979. (Photo: Frances Dipper)

atlases of the distribution of various species groups, as demonstrated by the British Trust for Ornithology (BTO) with the UK Atlas of Breeding Birds (Sharrock 1977) and which would be the basis for conservation action. According to Norman Holme (Holme 1974) Roland Wigley based at Woods Hole, had started using a computer based system for such mapping projects in the mid-1960s. A host of issues, such as what map base to use, reliability of species identification, the production of field identification guides, recording card design, quality control and data architecture, were issues that were all being keenly discussed (Holme 1974) and debate continues to this day.

By the late 1960s BRC had encouraged the production of recording cards for a number of marine taxa including:

- echinoderms (Eve Southward, of the Marine Biological Association (MBA));
- marine molluscs (the Conchological Society of Great Britain and Ireland), led by Dennis Seaward amongst others. The history of marine mollusc recording back to the 19th century is documented by Taylor (2023) in a YouTube talk;
- seaweeds (British Phycological Society). Wilkinson (2021) writes *"From its foundation in 1951, the British Phycological Society ran*

regular seaweed field meetings to collect full, authenticated species lists for shores all around the British Isles. From 1970 onwards, this was intensified by a refereed mapping scheme with the Biological Records Centre, organized by Trevor Norton and resulting in the publication of a British seaweed atlas (Hardy & Guiry 2003). The BPS recording portal www.bpsalgalrecords.com is a successor to the recording scheme."

- isopods (British Myriapod and Isopod Group) - set up in 1968, led by David Holdich and Roger Lincoln (Maguire 2021).

The first Rio Earth Summit held in 1992, led on to the Convention on Biological Diversity. In the UK this spurred on the 1990s move to create Biodiversity Action Plans (BAPs) and local BAPs (HMSO 1994). This gave further impetus to regional recording centres, such as that set up in Cornwall by Stella Turk, where data could be applied to local projects. On the national stage, this momentum gave rise to the National Biodiversity Network (NBN) and the 'Marine Recorder' framework, a benthic survey data management system.

3. Marine Nature Conservation in the UK

The UK did not lead the world in marine conservation, and the Clark Committee report (Clark 1973) put the brakes on marine

conservation initiatives in the early 1970s. When Roger Mitchell was appointed by the NCC as their marine conservation scientist in 1975, things changed very quickly; this is documented in chapters on Roger Mitchell and Keith Hiscock describing these early years in Earll (2018). The Natural Environment Research Council (NERC) and NCC funded the Biological Records Centre and citizen science projects were seen as providing an important evidence base to underpin conservation action. The publication of *Nature Conservation in the Marine Environment* (NCC/NERC, 1979), got thinking firmly back on track, and then helped enable the landmark legislation in the Wildlife & Countryside Act (1981). This legal recognition became the driver for a wealth of work on potential marine nature reserves, (Mitchell 1987) including a wide range of surveys of intertidal and sublittoral areas around the coast and enabled NCC grant aid to facilitate the establishment of MCS from its UCS origins in 1984. UCS had by this time had eight years' worth of experience of citizen science work with divers. By the mid-1980s a multitude of marine surveys and major programmes were pulling in the same direction, which led to the start of the Marine Nature Conservation Review in 1987, which in turn supported projects like Seasearch.

4. The 'Operation' projects with sports divers

Several 'Operations' and 'Projects' involving the use of numerous sport divers to collect data and material, were organised initially by the botanist David Bellamy, who was a lecturer and then Professor at Durham University. The first of these was Operation Kelp in 1968, which looked at the depth distribution and productivity of forest kelp *Laminaria hyperborea* (Gunnerus) Foslie, 1884. Operation Starfish followed shortly afterwards (1970–1972). These projects were focussed initially on northeast England, extending into southeast Scotland, and were made possible by a modest grant to Bellamy to look at pollution along that coast, which at the time was considerable. The divers collected the kelp plants, and made straightforward counts and many measurements, including depth distributions (Bellamy & Whittick

1967, 1968a, 1968b). They involved several dozen divers. It would be interesting to hear any other views on whether 'Operation Kelp' was indeed the first sublittoral marine citizen science project focussed on involving divers to collect material that would have been prohibitive in terms of manpower and cost if done using professionals only.

Charles Sheppard, David Bellamy's PhD student, took over the organisation of a new series of projects 'Project Countdown' and then 'Project Splashdown' (1972–1976). These required the collection of kelp holdfasts and the high diversity of small animals contained within them, to further examine gradients of sewage and industrial pollution around the UK. Quality control was always paramount, and the work extended to lab analyses of tissues for metal contamination. These projects led to several publications, some of which became well cited (Sheppard 1978; Sheppard *et al.* 1978, 1980). It was the 'Operation' projects that set in place the idea of using sports divers to collect marine natural history records and that led directly to Underwater Conservation Year in 1977, an idea first proposed by Bernard Eaton and strongly supported by David Bellamy.

5. The Underwater Conservation Projects

The 'Operation' projects were the start of an explosion of interest from the 1960s to 1990, in using sports divers to collect information from the shallow sublittoral zone. There was a growing awareness throughout this period that there was no basic description of the species and habitats found in our shallow seas. The MCS book *Sea Life of Britain and Ireland* (MCS 1988) and, 30 years later, Keith Hiscock's *Exploring Britain's Hidden World* (Hiscock 2018), provide the kind of description of our shallow seas that terrestrial workers have had, and taken for granted, for over 200 years. Diving science was taken forward by the annual meetings of the Underwater Association from 1967, which included presentations and discussions on sublittoral ecological studies (e.g. Mitchell & Dipper 1983). Many of these encouraged professional ecologists and volunteers to work together. Site descriptions and regional species checklists became common currency

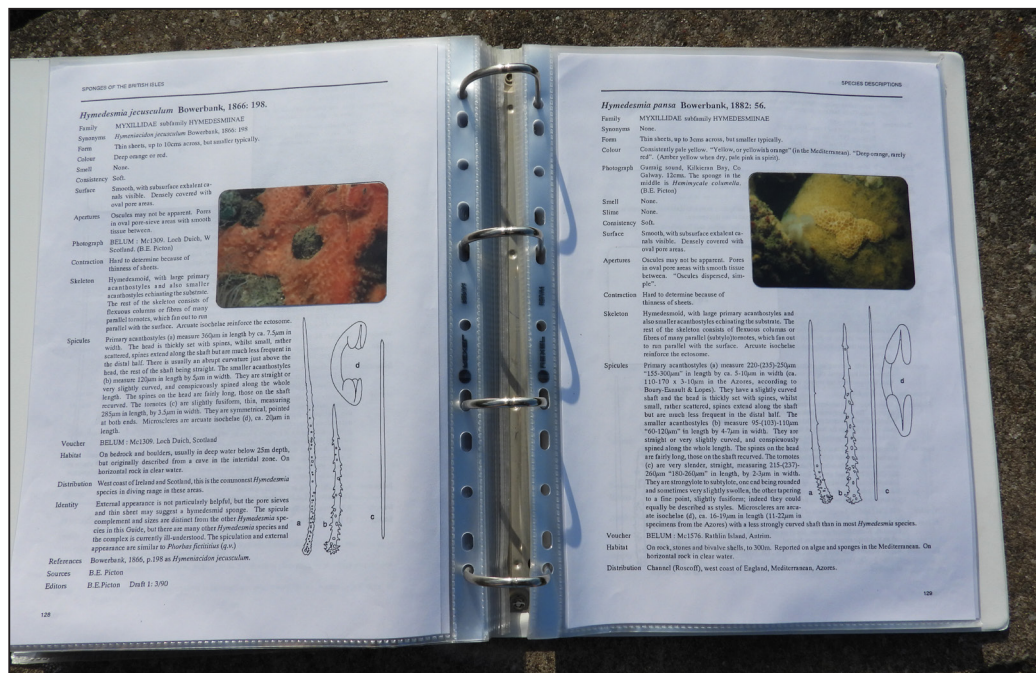


Fig. 6: Example page from the 1992 edition of the MCS sponge guide ("Sponge V"). Two of the authors (Graham Ackers, David Moss) were highly trained professionals in their own fields but 'amateur' marine biologists, whilst the third (Bernard Picton) is a marine biologist.

of these diving projects from the late 1960s onward.

Underwater Conservation Year and its follow-up years of work (1977–mid 1980s) prompted a host of general recording projects on common marine species, nudibranchs, sea urchins, sea fans and sublittoral habitats, as well as many specific local and national diving expeditions and projects around the UK coastline. The phrases 'diving with a purpose' and 'underwater birdwatching', coined by Roger Mitchell, were used to highlight what was being organised. These projects and expeditions also prompted the development of training courses and photographic identification guides to many marine groups as well as the Species Directory (Howson 1987), which was the basis for the World Register of Marine Species (WoRMS) initiative. The annual meetings of the Underwater Conservation Society, followed by the Marine Conservation Society, were the main meetings that brought the diving, marine biology and conservation communities, volunteers and professionals together (1979–1991).

The MCS continued to use its background expertise in citizen science throughout the 1980s for a variety of projects, including

Basking Shark Watch (1987–current) and a project on dogwhelks in relation to TBT pollution. In 1993, MCS started its Beachwatch project (based on an American version) to record marine litter; it continues to this day and involves thousands of participants.

6. Citizen science projects on the seashore

By comparison with diving projects, initiatives focussed on the seashore during the period under discussion (1960s to 1990) were limited. David Nichols and others in the southwest, got as far as producing an intertidal recording card in 1976 (Nichols 1976).

MCS tried to develop a project aimed at the intertidal environment for 1983–84; this was called SeaWatch but gained little traction and the funding ran out. As mentioned above, MCS did actively promote national recording of dogwhelks in relation to TBT pollution causing imposex, in the late 1980s.

Coastwatch, set up and run by Roger Mitchell and Teresa Bennett (NCC) in 1985, with funding from WWF and EarthWatch, was a phase 1 survey of intertidal habitats and communities at particular locations around the coast of the UK and included recording human impacts on the shore. It was based on the classic Ordnance

Survey (OS) Tetrad map system, with habitats being 'coloured in' during the recording process.

In the late 1980s the similarly named Coastwatch Europe project was led by Karin Dubsky, based in Ireland; she was a key member of Seas At Risk (SAR), a European NGO coalition. Coastwatch Europe sought to record human impacts on the shore and also involved nutrient and bacterial testing. Within the UK, the Coastwatch Europe project was led by Gareth Rees, with the project co-ordinator Kathy Pond based at Farnborough College of Technology and was funded by the insurance company Aviva. MCS, as a member of SAR, supported this UK Coastwatch Europe project, as well as the NCC/WWF Coastwatch phase 1 survey project.

7. A new generation of marine life guides to help identification

Accurate identification of species is vital for recording and conservation projects, marine or otherwise. In the 1970s, there were very few marine field guides available at a level useable by non-professionals. The 1958 Barrett & Yonge 'Collins Pocket Guide to the Seashore' was a ground breaker in terms of providing a comprehensive guide to many marine species with simple keys, as well as colour and black and white illustrations. It was the starting point for many marine recording projects. The 1976 'Hamlyn Guide to the Seashore and Shallow Seas of Britain and Europe' by Campbell and Nicholls, extended coverage into the sublittoral, thus providing for the small, but increasing number of recreational divers interested in marine recording. It was illustrated in colour, but had no keys and the wide geographic coverage restricted the number of British and Irish species included. Non-comprehensive guides covering many diverse groups have a tendency to lead to mis-identifications.

At this time there were a number of excellent specialist scientific publications available for identifying particular marine groups. For example, between 1975 and the early 1980s, Paul Cornelius authored a timely systematic revision series on hydroid identification, published in the *Bulletin of the British Museum (Natural History)*. In addition, the NCC funded

a number of AIDGAP field keys (Aids to Identification in Difficult Groups of Animals and Plants), published by the Field Studies Council, including Brown Seaweeds in 1979 and Red Seaweeds in 1986, both by Sue Hiscock.

The 1970s was also the era in which the Linnean Society of London started its *Synopses of the British Fauna (New Series)* the first of which (1970) was British Ascidiarians written by R H Millar. A review by D R Houghton in the *Journal of the Royal Naval Scientific Service* described it thus: "This book is an absolute must for ecologists, students and others concerned with the identification of species. It will also appeal to the growing army of aqualung swimmers who wish to do more than casually observe the beauties of the marine environment". Other marine volumes followed, notably (from the marine point of view) British Opisthobranch Molluscs (T E Thompson, and G H Brown, No.8, 1976), and British Anthozoa (R L Manual, No 18, 1981). The latest (2015) marine guide in this series is Intertidal Marine Isopods by Naylor and Brandt. This is a second edition of the original No.3 by Naylor in 1972.

However, in reality this excellent and invaluable series, as well as the AIDGAP series, whilst bridging the gap between popular guides and specialist publications, was still aimed at professionals, students and experienced non-professionals. In the 1970s and 1980s there was therefore a wide-ranging feeling and acknowledgement among the marine biology community, of an increasing need for comprehensive guides to marine groups that would be both accessible and usable by non-professionals (particularly recreational divers), as well as professionals.

In the 1970s and 1980s, divers were taking advantage of much better underwater photography equipment, albeit in the pre-digital age, to produce fantastic colour images of many species. The UCS conservation initiatives in the late 1970s started to use 'mini-print' sets, colour photographic prints of marine species stuck (do-it-yourself) into ring-bound publications, to start what became a series of seven guides to different marine groups, including sponges. These were collaborations between professional marine biologists and

sports divers, the latter providing many of the images. The mini-print series was followed by the MCS colour photographic *Guide to Inshore Marine Life* (D Erwin and B Picton 1987) and others, with the publisher Immel. The mini-prints were early precursors to the Seasearch colour photographic guides, started in the 2010s and the latest of which covers *Inshore Fishes of Britain and Ireland* (L Baldock and F Dipper 2023).

Today new photographic field guides to terrestrial, freshwater and marine groups appear regularly, some restricted to the UK, with many also covering northwest Europe - the time for sticking photographs onto pages is long gone.

Conclusions – Next Steps

This paper has set out the broad ideas behind our 'History of Citizen Science and Marine Natural History in the UK' project, which we hope will prompt a series of articles developing the framework chronology and themes illustrated here. Other themes will undoubtedly arise as the project progresses and many will warrant separate articles led by a variety of different authors.

It seems particularly appropriate to look forward to the 50th anniversary of PMNHS in 2027 as a focal point for this project, not least because of the support Porcupine and its members has provided to many of the initiatives described here. The early chronology given in Table 1 outlines the main ideas that have been evolving and developing over this time. It is interesting how the gestation of ideas has often taken a number of years before arriving at these key points in timelines.

The legacy element of our project will be important in a variety of ways that include:

- celebrating the contributions made by a wide variety of people who led the way at the start of this story, and the legacy they have left in terms of projects and organisations originating from their work;
- preserving paper copies. The digital dark age is real. Many important reports and papers were produced using computers and storage

media that now no longer exist, so paper copies are valuable. Some focussed thought needs to be directed at securing material from the early days of diving surveys in particular;

- highlighting important historic papers that need to be archived carefully e.g. Holme (1974) and Nichols (1976) and that need to be made more widely available, possibly through a Porcupine website archive; and
- highlighting biological records from the early stages of citizen science that are likely to provide interesting points of contrast in both species and community ecology compared to current information.

Reviewing how citizen science and marine natural history has developed should also prompt us to think about the purpose of our future activities. There are clearly many climate and environmental challenges facing us and we need to think whether our marine recording efforts are being as effective as they might be in meeting these challenges.

This article is clearly just the start of the story that forms the basis of much that has happened subsequently. We hope this article will spark your interest and we would like to encourage others to originate and contribute to further articles. Interested Porcupine members should approach the Porcupine editor Iain Dixon, Bob Earll or Frances Dipper.

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References

- Bellamy, D. & Whittick, A. 1967. Operation Kelp. *Triton magazine*, April 1967.
- Bellamy, D. & Whittick, A. 1968a. Operation Kelp. *Triton magazine*, February 1968.
- Bellamy, D. & Whittick, A. 1968b. Kelp forest ecosystems as a 'phytometer' in marine pollution. *Underwater Association Report* 3: 79–82.

- Clark, R.B. 1973. Marine Wildlife Conservation: Report of the NERC Working Party. *Natural Environment Research Publications Series 'B'* No. 5.
- Earll, R.C. 2018. *Marine Conservation: People, Ideas and Action*. Pelagic Publishing, Exeter.
- Hardy, G. & Guiry, M.D. 2003. *A Check-list and Atlas of the Seaweeds of Britain and Ireland*. London: British Phycological Society.
- Heppell, D. 1964. The British Marine Census Areas. *Journal of Conchology* **25**: 299-303.
- Heath, J. & Scott, D. 1974. *Instructions for recorders*. Biological Records Centre, UK. 28pp.
- Hiscock, K. 2018. *Exploring Britain's Hidden World: A Natural History of Seabed Habitats*. Wild Nature Press, Plymouth. 272pp.
- HMSO. 1994. *Biodiversity: The UK Action Plan*. London: HMSO.
- Holme, N.A. 1974. Recording schemes for benthic macrofauna. ICES C.M.1974/K:17 [available digitised online but difficult to reference/find; RE and FD have copies]
- Howson, C.M. (Ed) 1987. *Directory of the British Marine Fauna and Flora. A coded checklist of the marine fauna and flora of the British Isles and its surrounding seas*. Marine Conservation Society, 471 pages.
- Maguire, W. 2021. A new BMIG Intertidal Marine Isopod Recording Scheme. *Bulletin of the British Myriapod & Isopod Group* **33**: 7-8. https://www.bmig.org.uk/sites/www.bmig.org.uk/files/bulletin/BullBMIG33-2021p07-8_Maguire_Intertidal-Isopods.pdf
- Marine Conservation Society 1988. *Sea Life of Britain and Ireland*. Immel Publishing Ltd.
- Mitchell, R. 1977. Marine Wildlife Conservation. *Progress in Underwater Science*, **2**: 65-81.
- Mitchell, R. 1979. Marine Wildlife Conservation in the Coastal Zone. In: Nicholls, D. (ed.) *Monitoring the Marine Environment*. 181-193. London: Institute of Biology.
- Mitchell, R., Earll, R.C. & Dipper, F.A. 1983. Shallow sublittoral ecosystems in the Inner Hebrides. *Proceedings of the Royal Society of Edinburgh*, **83B**: 161-184.
- Mitchell, R. 1987. Conservation of marine benthic biocenoses in the North Sea and the Baltic. A framework for the establishment of a European network of marine protected areas in the North Sea and the Baltic. Strasbourg, Council of Europe for European Committee for the Conservation of Nature and Natural Resources. *Nature and Environment Series*, No. 37.
- NCC/NERC 1979. *Nature Conservation in the Marine Environment*. Report of the NCC/NERC Joint Working Party On Marine Wildlife Conservation. NERC (ISBN 0-86139-083-0).
- Nichols, D. 1976 Ref 1/76 *South West Marine Biology Study Group: Instructions for using Rocky Shore Field Card*. [Instructions on categories, Field recording card, SMBA/MBA Coastal recording Sheet, & data map] [Bob Earll has a copy]
- Perring, F.H. & Walters, S.M., (eds.) 1962. *Atlas of the British Flora*. Thomas Nelson & Sons, London.
- Preston, C.D & Oswald, P.H. 2006. Obituary Frank Perring. *Watsonia* **26**: 197-207. The Botanical Society for Britain & Ireland <https://archive.bsbi.org.uk/Wats26p197.pdf>
- Riesch, H., & Potter, C. 2013. Citizen science as seen by scientists: methodological, epistemological and ethical dimensions. *Public Understanding of Science* **23**:107. <https://doi.org/10.1177/0963662513497324>
- Seaward, D.R. 1982. *Sea area atlas of the marine molluscs of Britain and Ireland*. Published for the Conchological Society by the Nature Conservancy Council. ISBN 0-86139-198-5.
- Sharrock, J.T.R. 1977. *The Atlas of Breeding Birds in Britain and Ireland*. British Trust for Ornithology & Irish Wildbird Conservancy. Academic Press (T. & A.D. Poyser). ISBN 0 85661 018 6
- Sheppard, C.R.C. 1978. The responses and success of non-specialist divers in Underwater Conservation Year, with particular reference to the habitat recording scheme. *Progress in Underwater Science* **4**: 99-104.
- Sheppard, C.R.C., Bellamy, D.J. & Sheppard, A.L.S. 1980. Study of the fauna inhabiting the holdfasts of *Laminaria hyperborea* (Gunnerus) Foslíe, 1884 along some environmental and geographical gradients. *Marine Environmental Research* **4**: 25-51.
- Sheppard, C.R.C., Jupp, B.P., Sheppard, A.L.S. & Bellamy, D.J. 1978. Studies on the growth of *Laminaria hyperborea* (Gunnerus) Foslíe, 1884 and *Laminaria ochroleuca* Pylaie, 1824 on the French channel coast. *Botanica Marina* **XXI**:109-116.
- Taylor, S. 2023. Marine Mollusc Recording Scheme: Discoveries from the Conchological Society 50 min talk <https://www.youtube.com/watch?v=hq4N6WxNJKY>
- Wilkinson, M. 2021. The Seaweed Field Meetings of the BPS. *The Phycologist*, **101**: 14-22.
- Woodward, F. (ed.) 1976. *The First Porcupine Newsletter* <https://pmnhs.co.uk/wp-content/uploads/2011/11/001-PNV1N1NOV76.pdf>
- UNESCO (2021) Recommendation on Open Science. <https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en>



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