



Marine Biological Association written submission supplied for Defra's call for evidence for the Highly Protected Marine Areas inquiry, October 2019.

Written evidence submitted by Dr Matthew Frost, on behalf of the Marine Biological Association.

Questions

Question 1: Would you like your response to be confidential?

- No

Question 2: Are you responding to this call for evidence on behalf of an organisation or as an individual?

- on behalf of an organisation

Question 2a: If responding on behalf of an organisation:

i. Which organisation(s) are you responding on behalf of?

- Marine Biological Association

ii. What is the position you hold at the organisation(s)?

- Deputy Director. Head of Policy and Knowledge Exchange.

Question 2c: If employed or retired, briefly describe the main business activity of your company /organisation? If you are self-employed, or looking for work, please indicate what type of work you do?

- The MBA membership is made up mainly of professional marine biologists and as such regularly invites its members to provide input on a range of issues. The MBA therefore provides a 'clear independent voice to government' on behalf of the marine biological community. The following evidence follows this pattern in providing evidence submitted by MBA members on a number of the issues raised by the inquiry.
- The Marine Biological Association (MBA) is a Learned Society established in 1884 and incorporated by Royal Charter in 2013. The MBA has about 1800 members (including

international members) and runs The Laboratory in Plymouth where approximately 90 scientific staff work. MBA members have been at the forefront of providing scientific information to support marine environment protection, management and education and much of the scientific information that underpins decision-making about environmental protection has come from work undertaken at the Laboratory.

Question 3: How old are you? Please tick one of the boxes below.

- Prefer not to say

Question 4: What is your gender? Please tick one of the boxes below.

- Male

Question 5: Which region of the UK do you live in? Please tick one of the boxes below.

- South West

Question 6: Which of the following best describes where you live? Please tick one of the boxes below.

- Rural – coastal

Part 1: HPMA's aims, opportunities and challenges

Question 7: To what extent do you agree with the following reasons for introducing HPMA's?

- to provide marine areas a chance to return to as natural a state as possible
 - to provide a reliable measure of what recovery could look like if all damaging human activities were removed
 - to act as no take zones, allowing commercially fished species to recover and for these benefits to spill outside of the protected area
 - to better protect sensitive and/ or ecologically important species and habitats
 - to look after our seas as part of our duty as stewards of the natural environment
 - to better prevent or lessen the effects of climate change, for example to protect habitats that can capture carbon or protect species that are vulnerable to a warming ocean
 - to preserve and increase opportunities for nature-based tourism
 - to support or improve opportunities for cultural, spiritual, educational and/or recreational activities
 - other – please specify
-
- The MBA would strongly support all the reasons provided above. It is likely of course that not every HPMA would meet all of these criteria (e.g. some would be more suitable than

others to support recreation and nature-based tourism or for benefitting fisheries) so it is important that unrealistic expectations are not set and expected outcomes are made clear. Another example where expectations would need to be realistic would be for bullet point 6 where an HPMA would not provide *direct* protection from climate change but might enhance resilience to climate change impacts of the species / habitat / communities, mainly by removing other pressures.

- Another potential use of HPMA's could be to provide sources for key species at risk elsewhere. This links to the overflow idea (reasons for HPMA's bullet point 3) but is actually more about species that can be allowed to develop for future transplantation and habitat restoration. There are for example numerous projects restoring Native Oyster populations in the UK. Currently the projects are limited due to lack of source stock but HPMA's could be used to allow these areas to develop on the understanding that stock may be used to repopulate elsewhere. Another species currently subject to transplantation / restoration projects is seagrass, which again would benefit from protection. HPMA's could therefore act incidentally as seedbanks (CF the Svalbard seedbank) for augmented restoration as well as source / overflow areas.
- Another important aspect of HPMA's that should be more explicit is their capacity to provide a research environment to enhance scientific understanding. As well as providing information on recovery and non-impacted states, they can also be used to investigate a number of other questions including:
 - Cumulative pressures. Given the rapidly increasing GHG emissions (both of the last two years saw CO₂ emissions increase by 3%), and that atmospheric CO₂ reached 415 ppm in May 2019, and that the oceans absorb over 70% of the CO₂ and excess heat energy: it seems imperative to think clearly about the future. We know the ocean is becoming more acidic (carbonic acid), even if this decrease in pH is not uniform. By removing specific local pressures, it will be easier to see how these global-scale drivers are impacting species and habitats locally. This will then give us better understanding of how these pressures interact with more localised impacts affecting attributes such as sensitivity and resilience.
 - Source-sink / meta-population dynamics. There is evidence that certain species have been affected by the lack of source populations. This is a key concept by an 'ecologically coherent network' but for which there has been little real understanding in terms of how this works or can be applied.
 - Baselines/ targets/ thresholds. The UK has to set baselines and target conditions under a range of legislation such as the UK Marine Strategy Regulations. There are currently few areas however that allow us to examine what a target condition, for example, could look like. HPMA's would also enable us to study thresholds for recovery / impact.

- The above are only examples but the potential scientific benefit of HPMA's should be made more explicit. One idea would be to have certain HPMA's set aside for scientific observation only (i.e. above and beyond the standard monitoring that will be required across all MPAs).

Question 8: Do you have any experience or examples relevant to the UK where you believe HPMA's or similar have been effective or ineffective? Please provide any relevant evidence.

- The effectiveness of Marine Protected Areas in Jersey, Channel Islands, is currently being investigated as part of a PhD project undertaken by one of our MBA members (contact details available on request). The data collected so far shows the importance of biogenic habitats such as seagrass and maerl (the importance of which has already been researched and documented around the world), and provides rationale for their protection from destructive fishing gears. The MPAs in Jersey only prohibit mobile gear such as dredging and trawling. In order to really protect a habitat and to enable researchers to understand changes in habitat and species composition, highly protected marine areas are needed to remove all fishing and extractive activities. The work from Jersey is providing some useful data on the effectiveness of more robust protection.
- The No Take Zone (NTZ) in Lundy is a well-known example of overspill effects as is the NTZ in Lamlash Bay at Arran in Scotland. All have led to clear benefits beyond the protected area.
- There is also strong anecdotal (=observed) community experience on Fair Isle of the loss of abundance and size of fish in inshore waters after the Scottish Herring Fisheries Act of 1883 was repealed in 1984 (see Riddiford, N.J. & Riddiford, E.A. 2011. Proposal for a Marine Protected Area for the Waters around Fair Isle. FICA, FIBOT & NTS. FIMETI Fair Isle. 128pp.). This was a measure for only one group but is strong evidence, in the eyes of the Fair Isle community, that refuge areas do work – even for fish which fishermen's organisations may (and did) argue are migratory and thus not benefiting from fixed no-take zones.
- The Fair Isle community members have seen at first hand the New Zealand no-take model, which has been an enormous success and the Cabrera terrestrial-marine National Park (Mallorca, Spain). Both had initial opposition from fishing interests but now are very much valued by stakeholders including fishermen active & successful outside the no-take boundaries (again, contact details for the MBA member involved in this work can be requested).
- There is also evidence from debates (in the literature and elsewhere) on the effectiveness of HPMA's vs standard MPAs. The USA and Australia for example have long histories of debate on this issue with evidence growing of the importance of HPMA's (e.g. <https://www.americanprogress.org/issues/green/reports/2019/06/03/470585/marine-protected-areas-help-fisheries-ocean-ecosystems/> and references therein).
- There are many examples where standard protection has not been sufficient to protect the marine ecosystem and where HPMA status would have been more appropriate. For example, The UK decided to designate Scanner pockmark, Braemar pockmarks and Crocker carbonate slabs as Annex I Feature "Submarine Structures Made By Leaking Gases' under the Habitats

Directive as an. Scanner was proposed but there was no enforcement to protect the site from damage e.g. from trawling, and no proposal to stop drilling for gas outside the SAC (that would remove the methane generating the features of interest). The last survey of the Scanner pockmark suggests that the qualifying features (carbonate structures associated with escaping methane) may have been buried, either by sediment slumping or by a gas blow-out. This example shows the importance of having an adequate area where damaging activities should be excluded around sites even if designated HPMAs.

Question 9: Do you see any challenges to the introduction of HPMAs? If so, how could these challenges be addressed? Please provide any relevant evidence.

- **Challenge 1. Economics:** one of the challenges in economic trade-off is that it is relatively easy to attribute a cost to an activity (e.g. how much a 'fishery' might make in an area) but often more difficult to attribute cost to benefits of protection (e.g. through ecosystem service provision or tourist potential). The science around ecosystem service provision has improved but the benefits of environmental protection need to be assessed over long periods and larger scales than the cost of a localised activity linked to habitat use or exploitation.
- **Challenge 2. Enforcement:** If a HPMA is established, then adequate resource will be required for enforcement as well as thoughts on how to manage displacement. All vessels, regardless of size, should be fitted with AIS or VMS to help with this.
- **Challenge 3. monitoring:** any banning of activity such as fishing will be obvious immediately in terms of its economic or societal impact but it may take time to realise the benefits associated with a recovered ecosystem. Adequate resource for scientific study and monitoring over appropriate time-scales is vital in order to help understand the latter.
- **Challenge 4. General investment:** there is a risk that the current status of potential HPMA sites means potential economic benefits are not recognised or realised post-designation (so designation can then be challenged). In order to realise benefits of HPMAs however then some up-front investment may be required. It has been shown for example in New Zealand NTZs that eco-tourism is a major benefit but investment was needed upfront to encourage and support this as an activity (see <https://www.ltandc.org/new-zealand-marine-protected-areas-mpas-as-ltc-examples-poor-knights-islands-marine-reserve/>).

Question 10: What is your opinion of the evidence for HPMAs? Where is more evidence required?

- There have been many studies on No Take Zones (NTZs) both in the UK and further afield. The general consensus is that these zones are many times more productive than surrounding unprotected waters and in the cases where the NTZ has not shown an increase in biodiversity and/or an increase in commercial species, it is normally a result of the NTZ being too small. The evidence of the benefit of highly protected marine areas has already been collected and summarised in several review papers (available on request).

- Where the evidence is lacking is on how highly protected areas can protect highly mobile species. Fish will not stay within an invisible boundary line and those with far ranging migrations will not benefit from small protected areas.
- There are also evidence needs that are related to HPMA's but also to MPAs in general. For example, socio-economic benefits need to be better understood and also the how adaptive management practices can be used at a time when climate change is predicted to continue to cause changes in species and habitat distribution (See <http://www.mccip.org.uk/impacts-report-cards/special-topic-report-cards/marine-biodiversity-legislation-2015/management-implications-for-marine-protected-areas-in-a-changing-climate/> and supporting studies at <http://www.mccip.org.uk/climate-smart-adaptation/climate-change-and-marine-conservation/>.)

Question 11: The UK already has a network of MPAs that includes Marine Conservation Zones (MCZs). How could HPMA's complement and enhance the current designations in English inshore and offshore waters and Northern Irish offshore waters?

- Creating HPMA's in areas that are important for spawning of local species can provide source populations to facilitate recovery elsewhere.
- HPMA's can provide refuges for particularly sensitive or rare species.
- A fundamental value of HPMA's is in helping us understand basic conservation issues such as restoration, recovery thresholds, resilience, cumulative pressures and target / baseline setting. HPMA's therefore function as a major source of evidence to enable better management of MPAs in general.

Part 2: HPMA site selection

Question 12: What evidence and factors should be considered when selecting sites for HPMA's and who should be engaged in the process?

- It is important more than one approach is considered. A) HPMA's could be used to protect biodiverse areas with sensitive and rare species or good examples of a particular habitat or ecological type, in order to prevent future damage. B) it is worth taking areas that have been damaged by activities in the past but that have a potential to function as in A) and that will be able to help provide evidence on recovery.
- It is important that the evidence for potential benefits of HPMA's (including examples of economic and other benefits – see elsewhere in this response) is gathered and presented clearly upfront so that a wide range of stakeholders can be encouraged to 'buy-in' to the concept at as early a stage as possible.

Question 13: Are there any locations where it would be particularly beneficial: (i) for a location to become an HPMA or (ii) an existing or part of an existing MPA to become an

HPMA? Please could you state these in the box below and provide any relevant evidence.

- Anywhere that is an important spawning ground for commercially important species will increase the likelihood of designation.
- Designating part (e.g. 50%) of an existing large MPA as an HPMA would create excellent study areas to determine the effects of different levels of protection on biodiversity. This would also be potentially less disruptive than designating completely new areas.

Part 3: Future implementation and management of HPMAs

Question 14: What would be the most appropriate way of managing and monitoring HPMAs? How do you think this could fit alongside existing marine management?

- All boats should have VMS or some sort of tracking system so that catch can be attributed more accurately to marine areas and features.
- Another consideration is making it easy for fishermen to know where they can and cannot fish. Protected areas could be included on digital charts that can be uploaded into chart plotters.
- The voluntary sector could also be mobilised where appropriate. Citizen science has seen a large growth (e.g. divers being involved in surveys) so providing easy ways for citizens to be involved should be considered. There is some evidence that this has been successful in Arran and may be an effective approach if linked firmly with guidance and cooperation with the designated management team. Other ways of making good use of resource may be agreements with the research and / or education sector to help with monitoring. Funding would be required but HEIs for example could then make use of students and other resource (there are examples of where long-term monitoring has been undertaken by students). None of this should be a substitute for an adequately funded monitoring programme and may not be appropriate for some sites (e.g. deep offshore) but better use could and should be made of volunteers to increase engagement and promote ocean literacy.

Part 4: Your past experience of the Marine Protected Areas (MPA) identification, designation, and management process

Question 15: Have you been involved in the identification, designation or management of MPAs in the UK previously?

- Yes

Question 15a: If yes, we would like to learn from your experience of being involved in MPA identification, designation and management. Please could you provide information on:

- **the name of the MPA(s) and your role and involvement**
- I was asked to undertake independent reviews of evidence for a number of MPAs where evidence for their designation was being challenged by stakeholders. I reviewed evidence for JNCC Offshore sites (Wight-Barfleur Reef; Pisces Reef Complex; and Croker Carbonate Slabs); NE Inshore Special Area of Conservation (Studland to Portland); and SNH SAC (Sound of Barra) – copies of all reports are available on request.
- **what worked well?**
- The evidence for designation (photographs, ROV video, raw and interpreted data from surveys) was easily accessible and correctly interpreted in all cases. There were clear audit trails for how evidence to support designation was collected and stored. This meant that myself and another scientist colleague were able to visit the agencies involved and access and interrogate the evidence for ourselves. As a result, the designations were seen to be correct. There are often accusations that evidence is used ‘selectively’ or even misrepresented so having this clear audit trail was vital.
- **what could be improved?**
- The fact that there were challenges to the evidence showed that not enough was done beforehand to explain to stakeholders how scientific and other evidence had been used for designation.

Note: other MBA members who contributed to this response have been involved as follows:

- **the name of the MPA(s) and your role and involvement:** MBA member Nick Riddiford was project coordinator (mainly voluntary, latterly at times grant-funded) during the process leading to the Fair Isle Demonstration & Research Marine Protected Area (1989-2016), MPA declared November 2016.
- **what worked well?:** The main characteristics of the push for a MPA and the form it now takes are 1) driven from the start by the Fair Isle community from a perceived need to safeguard the resource, 2) has engaged and incorporates all stakeholder groups, including Shetland & Scottish Fisheries organisations, 3) is formulated to create a partnership approach involving community, stakeholders & scientific research working together, 4) Fair Isle community retains major input through a steering committee of key stakeholders.
- **what could be improved?:** progress is being made with some Demonstration & Research elements already under way or planned. However, funding remains an issue. The steering committee is still short of full funding to employ a steering officer (whose role would be further fund-raising as well as to pull the various groups and interests into a cohesive whole and encourage more research organisations to become involved). Marine Scotland

has been forthcoming with some funding but central government bodies may need to engage at a high level if the HPMA concept is to work (including policing, for instance).

- **the name of the MPA(s) and your role and involvement:** MBA member Michael White was involved in the Lleyn Peninsula designation
- **what worked well?:** The range of participants was impressive and included caravan site operators, jet-skiers, coastal fisheries, local people who collected shellfish, crabs or lobsters; coastal walkers, nature lovers, and parish councils. Many people just wanted a clear explanation of what an MPA would mean for them personally ~ something that publicity literature generally fails to provide. Most important was the ability of presenters, including myself, to understand the local culture and ways-of-life: vitally important in rural Wales where Cymraeg is the main language.

Question 16: How has stakeholder and local knowledge been included in previous processes to introduce MPAs (inshore or offshore)? Please can you comment on whether and how this knowledge can better be integrated in future processes associated with HPMA's?

- Certainly have a steering or management committee that includes local stakeholders. Have an easy route for people to raise questions and concerns. A website is now simple to maintain. Make sure that people are responded to. Answers should be factual and consistent. Try and keep politics out of the story. Include scientists and site managers who are extremely knowledgeable about each site. Engage local schools and organise field-trips where possible. Investigate options for Higher Education to gain new marine recruits.
- Stakeholder and local knowledge provided the baseline information towards achieving an MPA. This is best laid out in Riddiford & Riddiford (2011), which can be provide separately on request).

Part 5. Any other comments

Question 17: Are there any other comments you would like to make in regard to HPMA's?

- There is strong support for the designation of HPMA's but all the different acronyms and levels of protection are becoming hard to follow and are creating layers of complexity for management and legislation. There should be a move towards a total readjustment of thinking of how areas of our sea are designated, with the whole sea area being protected from the start and then designating areas for different fishing gears. i.e. a dredging zone, and a potting zone. Not, a no dredging zone or a no potting zone. Control of each fishing area could then be given to the those who fish there, which should reduce competition as they will have to work together to ensure they do not overfish their grounds. Creating a

sense of ownership and stewardship is key for the long-term effectiveness of all marine protected areas, HPMA or otherwise.