



Benyon Review Into Highly Protected Marine Areas

Final Report

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Box 1. List of Review panel members.



Preface

Our seas are complex environments which are under pressure as never before. There are stunning ecosystems within our marine environment, filled with an abundance of marine life. There are also areas of sea that are degraded by human activity, and of course, our ocean is vulnerable to climate change and other forms of pollution.

We depend on the ocean for so much. We need healthy fish stocks, many of which have been overexploited in the past. Our seas provide an increasing percentage of our energy supplies. We need minerals which are dredged from beneath the seabed. We need healthy seas to sequester carbon and help mitigate human influence on our climate.

Public interest in the health of the ocean has never been higher. People have rightly asked if there is more the government can do to protect our seas, and called for some areas to have high levels of protection.

There is a plethora of protected areas around our coast. Some were designated under European legislation. Some are the product of domestic legislation such as the Marine and Coastal Access Act 2009. Some are designated as Sites of Special Scientific Interest. In all, there might seem to be a confusing array of governance involving different agencies and government bodies, and widely varying management measures.

In this context, government asked me to chair a panel to review if there was evidence of the need for Highly Protected Marine Areas (HPMAs). We concluded that there is such a need. The substantial benefits of HPMAs justify the negative effects and we provided government with proposals for their designation.

I was privileged to lead a panel whose members have expertise and experience in this area. They sought with me and the secretariat to define what HPMAs are, to understand if there is a clear need for them, and to look at how this designation could complement the way we protect and enhance our marine environment. Our remit covered the inshore and offshore English waters and the offshore Northern Irish waters. An explanation for this geographical remit is found in the Report.



Our Report and recommendations are the result of intensive work. We visited many parts of the coast and met with communities whose livelihoods depend on the sea, and those campaigning for greater protection. We had a successful 'Call for Evidence' and held helpful round-table events for key groups.

However, this is not the full Report we intended to write. Covid-19 has affected all our lives and the organisations where we work. It has had an impact on every Government Department, not least Defra. We intended to include clear recommendations for pilot sites in the Report, but evidence gathering for that was not possible during the Covid-19 crisis. Nevertheless, we feel we have provided a set of well-thought-out recommendations for government which should be implemented in a reasonably short space of time.

Personally, this was a rewarding process. Between 2010 and 2013 I was the minister responsible for the implementation of the Marine and Coastal Access Act, particularly the designation of Marine Conservation Zones. I was aware that the addition of more highly protected 'reference areas' as part of the designations of Marine Conservation Zones was not successful. The problem was that the people affected by these measures felt excluded from the process. This was a perception but in these matters, perceptions are the reality in which government and its agencies must work.

While our primary concern is with environmental matters, I hope that all concerned for the health of our marine environment feel we have listened to a wide range of views and that our findings are the result of much thought and deliberation as well as detailed analysis of evidence.

The Panel and I hope that government welcomes our recommendations and works with local communities and stakeholders to develop HPMA's as a new level of protection for our seas.



Richard Benyon.

Acknowledgements

The Benyon Review Panel would like to thank the officials, experts and stakeholders who contributed to the work of this Review. Special thanks go to the stakeholders who responded to our 'Call for Evidence', attended round-tables and hosted or spoke to us on visits where they provided advice and evidence. Your views strongly shaped our discussions.

The Panel is especially grateful to the secretariat based within Defra, led by Jen Ashworth with the core team throughout of Alex Holsgrove, Aisling McGarrigle and Nathan Edmonds. They were joined at times by Stella Bartolini, Angela Moffat, Barbara Cam, George Margereson and Eleanor Williams. Defra's Marine Evidence Team of Robert Cook, Rebecca Shellock, Rosanna Mann and Phil James provided us with invaluable ecological, social science and economic expertise. Thanks to Ruth Stubbles and Simon Brockington of Defra for their oversight.

We would also like to thank Natural England, the Joint Nature Conservation Committee, the Marine Management Organisation, the Centre for Environment, Fisheries and Aquaculture Science, the Environment Agency and the Inshore Fisheries and Conservation Authorities for their advice and evidence.



Executive summary

Forty percent of England's seas are designated as Marine Protected Areas (MPA). However, the government's Marine Strategy assessment¹ shows that the environment is not in a healthy state. This Review asks whether areas with higher levels of protection can enable a greater recovery of the marine ecosystem.

The sea has provided food, materials and recreational opportunities for thousands of years. Beneath the waves, a vast number of species live on or in rocky, sandy and muddy seabeds, and in the water column. Human activities have a significant effect on these habitats and species. **To understand the impact of these activities, and to better understand the sea's condition if recovered to a more natural state, this Review explores the potential for areas with high levels of protection. To be successful, such areas must exclude all extractive and depositional use and prevent damaging levels of other activities.**

This Review answers the following questions:

- What are Highly Protected Marine Areas (HPMAs) and should they be part of marine management?
- What opportunities and challenges do HPMAs create?
- How should government select HPMAs?
- How will HPMAs work?
- How should pilot HPMAs be selected?

¹ Department for Environment, Food & Rural Affairs (2019). *Marine strategy part one: UK updated assessment and Good Environmental Status*. Available at: <https://www.gov.uk/government/publications/marine-strategy-part-one-uk-updated-assessment-and-good-environmental-status>

What are HPMAs and should government introduce them?

The UK's current network of MPAs protects discrete habitats and species while allowing sustainable use to continue. This means that extractive and depositional activities continue in many such sites, albeit under strict conditions. While important for overall marine conservation, these MPAs do not allow ecosystems to fully recover or deliver the full range of ecosystem services.

HPMAs allow marine ecosystems to recover to a mature state. By taking a **'whole site approach'** to designation, thereby protecting all habitats and species in their boundaries, HPMAs give nature the best chance to thrive.

HPMAs will support delivery of government's ambition to:

- i. leave nature in a better state than we found it as set out in the **25 Year Environment Plan**;
- ii. reach 'Good Environmental Status' as set out in the **UK Marine Strategy**;
- iii. sustainably manage, protect and preserve the ocean through a co-ordinated approach as set out **The Commonwealth Blue Charter**;
- iv. conserve at least 10% of coastal and marine areas, consistent with national and international law and based on the best available scientific information as set out the **United Nations Sustainable Development Goals (SDGs)**;
- v. safeguard at least 30% of the world's ocean by 2030, establishing and leading a **Global Ocean Alliance**; and
- vi. be consistent with government's Blue Belt policies for the ocean under its control.

For these reasons, the Panel's headline recommendation is that **HPMAs are an essential component of the Marine Protected Areas network, and government should introduce them into Secretary of State waters²**. The Panel makes the following recommendations in support of HPMA introduction:

² This was the geographical remit of this Review and covers English inshore and offshore waters and Northern Irish offshore waters. Marine conservation is a devolved matter in Scotland, Wales and Northern Irish inshore waters.

Recommendations

1. HPMAs should be defined as areas of the sea that allow the protection and recovery of marine ecosystems. They prohibit extractive, destructive and depositional uses and allow only non-damaging levels of other activities.
2. Government should introduce HPMAs in conjunction with the existing MPA network. In many instances, sections of existing MPAs can be upgraded to HPMAs.
3. Government must set conservation objectives for HPMAs that allow full recovery of the marine environment and its ecological processes.
4. Government must take a 'whole site approach' to HPMAs to conserve all habitats and species within the site boundary. This includes mobile and migratory species that visit or pass through the site.



What are the social and economic opportunities and challenges around introducing HPMA's?

HPMA's have potential social and economic benefits. These include increased tourism and recreational activities, opportunities for scientific research and education, and positive impacts on human health. In addition, HPMA's can enhance the aesthetic, cultural and religious significance of the area and have a range of non-use and intrinsic values. Positive feelings about HPMA's may be expressed in terms of obligation – a sense that they help fulfil a duty to protect the marine environment.

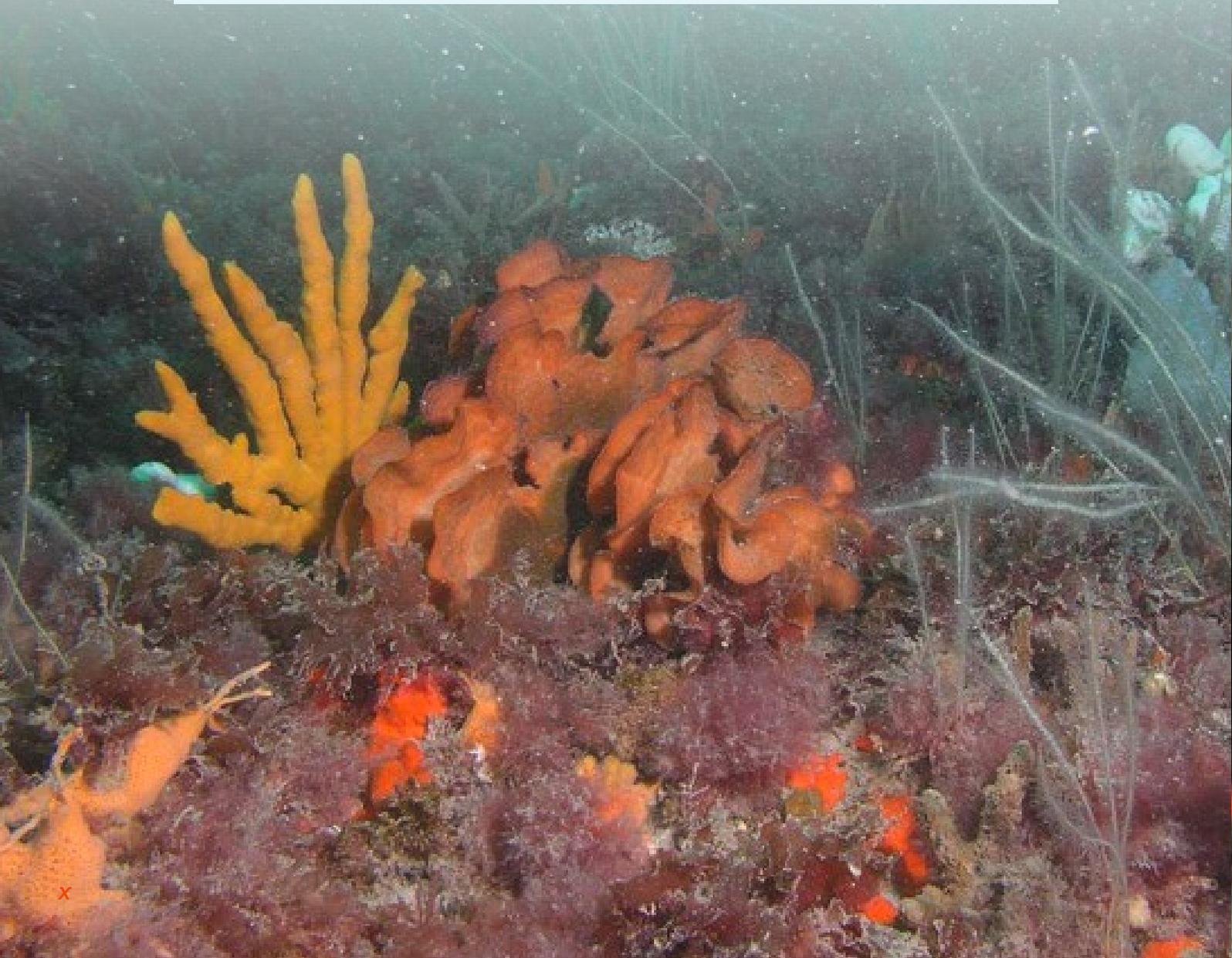
HPMA's may bring social and economic challenges because of exclusion of certain activities and subsequent loss of economic opportunities. These challenges include halting and/or displacement of fishing effort, as well as a range of other commercial activities in the marine environment, leading to increased competition for space.

It is clear from the Call for Evidence, stakeholder engagement and previous designation processes, that the fishing industry may be most negatively impacted by the introduction of HPMA's. The exclusion of fisheries from within HPMA boundaries will lead to loss of catching opportunities in that area. The negative impacts of fishing displacement are often experienced most by small-scale fisheries as they are less able to relocate, and/or the cost of fishing elsewhere is too high. Thus, the Panel are keenly aware that in comparison to other marine industries, small scale local fishers may suffer financial impacts as a result of HPMA introduction.

The potential advantages of HPMA's for the fishing industry were considered by the Panel. Over time, benefits such as spillover and boundary effects can accrue to small scale local fishers. Therefore, given the strength of the biodiversity benefits which HPMA's generate and the fact there are at present no HPMA's designations, the Panel is strongly in favour of their introduction. However, it is also the Panel's view that government must acknowledge and mitigate the impacts of HPMA's on fishing and other marine industries, without compromising HPMA objectives. The Panel's recommendations on nesting HPMA's within existing MPAs, on thorough consultation and on co-management all seek to address this objective.

Recommendations

5. Government and others should use HPMA as an opportunity to increase public awareness of, and engagement with, the marine environment.
6. Government and local authorities should seek to maximise the direct and indirect social, economic and cultural benefits of HPMA designation.
7. Government should acknowledge displacement in its decision making during HPMA designation. It should put strategies in place to support marine uses and avoid creating new problems from moving pressures to other parts of the marine environment.
8. Government should plan the sustainable and equitable use of the marine environment. This includes ensuring that Marine Plans are sufficiently spatially prescriptive to address competing demands on space, alongside the need to allow nature to recover.



The path to successful HPMA identification

To select potential HPMA, government should prioritise areas for recovery potential and benefits to nature (see 'How should government identify HPMA'). Government must also **work with sea users, other stakeholders and local communities** to minimise the consequences of displacement of activities. To do this, the principles of **transparency and early, continuous engagement** with a diverse range of stakeholders in HPMA site identification and implementation must be followed. Government should consider which legislative tools to use and gather supporting evidence, but these should not become barriers to introducing HPMA.

Recommendations

9. Government should adopt the principles of transparency and early, continuous engagement with a range of stakeholders in HPMA site consideration.
10. Government should use 'best available evidence' to designate HPMA and should not use a lack of perfect evidence as a reason to delay HPMA designation.
11. Government must introduce and manage HPMA using quick and pragmatic legislative approaches.



How should government identify HPMAAs?

HPMAAs facilitate ecosystem recovery and protection. Therefore, government should select sites on ecological merit.

Government should identify sites for HPMA designation using the principles of **ecological importance; naturalness, sensitivity and potential to recover; and ecosystem services**. Social and economic principles are a secondary filter: once ecological principles are met sites are selected to minimise any negative effects on certain groups. In applying these principles, HPMA designations must cover a variety of seabed habitats to support recovery of a full range of species and ecosystem functions. To reduce the effects of climate change and improve climate resilience in our seas HPMAAs should aim to protect **blue carbon habitats**.

HPMAAs will benefit any part of the ocean. However, the Panel recommends they are located within existing MPAs, allowing the wider MPA to act as a buffer zone to support and evaluate their recovery.

Recommendations

12. Government should identify sites for HPMA designation using the principles of ecological importance; naturalness, sensitivity and potential to recover, and ecosystem services. Social and economic principles are a secondary filter.
13. HPMAAs should be located within existing MPAs as the existing site will act as a buffer zone to the HPMA. However, in the future alternative locations could be considered, such as co-location with existing and emerging marine industries.
14. In identifying HPMAAs, government should consider blue carbon habitats to improve the climate resilience of the seas.

How can government make HPMA work?

To benefit from high levels of protection, many activities within HPMA should cease after site designation. For example, fishing, construction, dredging, sewage and other discharges, dumping, littering and anchoring are not compatible with achieving recovery³. However, HPMA would not be 'no-go zones' and people could visit and use them for non-damaging levels of recreational activities such as surfing, scuba diving and kayaking.

To be successful, HPMA need a combination of appropriate and well-funded management and simple, easily assessable guidance for marine users. Therefore, HPMA **monitoring and evaluation, enforcement and compliance** will require continuous investment of funds and resources from government. Where practical, government should work with sea users to co-manage sites, and encourage the use of novel technologies for enforcement and management.

³ We recognise that any existing infrastructure may require repair and maintenance.

Recommendations

15. Government should adopt co-management principles where possible, to agree effective management in partnership with sea users.
16. Government must issue guidance on permitted activities within HPMA, underpinned by a simple categorisation approach aligned to International Union for Conservation of Nature categories.
17. Management bodies will need to set out clearly their enforcement responsibilities which will be critical to HPMA success and required by legislation; they should also develop, where possible, voluntary approaches and codes of conduct with stakeholder user groups (particularly for low-impact activities).
18. To increase compliance and reduce enforcement demands, government and marine managers should engage with stakeholders early and regularly, on all aspects of the HPMA process.
19. Technological advancements, including vessel monitoring, should be used to ease the burden of enforcement and monitoring of HPMA.
20. To establish comparative baselines, the monitoring and evaluation of biological, social and economic processes and effects of HPMA must begin before designation and continue long term.
21. Sufficient funding is required for the designation, management, monitoring and enforcement of HPMA. Government must make available resources proportionate to the scale of any designated HPMA.
22. In the longer term, government should reconsider existing marine governance to ensure current structures do not hinder the introduction of HPMA.

How could government select pilot HPMA's?

Due to the restrictions arising from COVID-19 the Panel did not fully analyse pilot site recommendations. However, the Panel noted that one of the conditions set for the Review was to recommend a maximum of five pilot sites. The Panel considered this to be the bare minimum required to evidence the success of HPMA introduction. Instead, to address the variation in environments and activities, pilot sites should have a geographic spread covering **nearshore, inshore and offshore** areas and **different regional seas**.

The Review's 'Call for Evidence' provided a number of areas that respondents recommended as suitable for HPMA's, see [Annex 5](#). Government should use this as a starting point for identifying pilot HPMA's.

Recommendations

23. Supporting evidence for identifying pilot HPMA's should be taken from a wide a range of sources including statutory bodies, academia, environmental NGOs and industry.
24. Government could use the list of sites recommended to the Review as a starting point in any future HPMA process.
25. Five pilot sites are the bare minimum and to cover different environments and activities, the number of pilot sites should have sufficient geographic spread to cover nearshore, inshore and offshore areas and different regional seas.



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Chapter 1: Introduction to the Review and overview of marine protection

“We are at a unique stage in our history. Never before have we had such an awareness of what we are doing to the planet, and never before have we had the power to do something about that. Surely we all have a responsibility to care for our Blue Planet. The future of humanity and indeed, all life on earth, now depends on us.” *David Attenborough*

In looking at the condition of the seas around the UK’s coast there are reasons for both pessimism and optimism.

The UK seas contain some of the richest and most diverse sea life in the world, including over 8,000 species of fish and invertebrates.

The human impact on the natural world has long been a matter of public concern, and in recent years the state of the marine environment has risen rapidly on the public agenda. An increasing number of people have engaged in environmental campaigns about the state of our seas. Often they have been encouraged by media reports and documentaries. In 2017, for example, the BBC’s documentary series, ‘Blue Planet II’, seized the imagination of its audience resulting in demands to tackle pollution and for better management of the seas. At the same time, a new level of environmental activism was making its presence felt by policy makers.

Globally, the ocean is under pressure from fishing, land and sea-based pollution and land- and sea-use change⁴. In the UK in 2019, 11 out of 15 marine condition indicators did not meet their target of ‘Good Environmental Status’ including those relating to birds, fish, seabed habitats, and commercial fish. The 2019 assessment showed that the main pressures affecting marine biodiversity were climate change, fishing and marine litter⁵.

In UK seas marine life was richer and more prolific in the past⁶. Prior to the widespread introduction of mobile fishing gears, seabed ecosystems were populated by a broad range of invertebrates. These included extensive beds

4 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (2019). *The global assessment report on biodiversity and ecosystem services: Summary for policymakers*. Available at: https://ipbes.net/sites/default/files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf

5 Department for Environment, Food & Rural Affairs (2019). *Marine strategy part one: UK updated Assessment and Good Environmental Status*. Available at: <https://www.gov.uk/government/publications/marine-strategy-part-one-uk-updated-assessment-and-good-environmental-status>

6 Roberts, C.M. (2007). *The Unnatural History of the Sea*. Island Press.

of oysters and horse mussels, which in turn sustained diverse communities of other life⁷. Animals like Common, White and Long-nose Skates, Conger eels, Halibut, Angel sharks, Bluefin tuna, Mako, Porbeagle and Thresher sharks were abundant and a regular sight in our seas.

Marine Protected Areas (MPAs), fisheries management measures, and measures to control the amount and type of activity at sea, such as marine planning and licensing, alleviate some human impacts, but the ocean needs more protection to counteract the pressures on biodiversity^{8,9}.

The seas around the UK already contain MPAs, which protect certain habitats and species and support sustainable use. This means that extractive and depositional activities do continue in many protected sites, albeit under stricter conditions. Fishing, including the use of bottom-towed gears, pots, nets and angling, continues in many sites. Several MPAs co-exist with windfarms and aggregate dredging. Management regimes prohibit only the most damaging forms of fishing, dredging and construction when those activities conflict with the designated features of an MPA.

On World Ocean Day 2019, the then Defra Secretary of State, Rt Hon Michael Gove MP, launched this independent Review¹⁰ into whether and how to introduce **Highly Protected Marine Areas** (HPMAs). This Review covers the English inshore, offshore and Northern Irish offshore waters¹¹. Collectively these are referred to as Secretary of State waters and are illustrated in Figure 1.

7 Thurstan, R.H., Hawkins, J.P., Raby, L. and Roberts, C.M. (2013). Oyster (*Ostrea edulis*) extirpation and ecosystem transformation in the Firth of Forth, Scotland. *Journal for Nature Conservation*.

8 Department for Environmental, Food & Rural Affairs (2012). *Marine Strategy Part One: UK Initial Assessment and Good Environmental Status*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69632/pb13860-marine-strategy-part1-20121220.pdf

9 Department for Environment, Food & Rural Affairs and The Rt Hon Michael Gove MP (2018). *A Green Future: Our 25 Year Plan to Improve the Environment*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

10 Department for Environment, Food & Rural Affairs (2019). *Highly Protected Marine Areas (HPMAs) review 2019*. Available at: <https://www.gov.uk/government/publications/highly-protected-marine-areas-hpmas-review-2019>

11 Marine conservation is a devolved matter in Scotland, Wales and Northern Irish inshore waters.

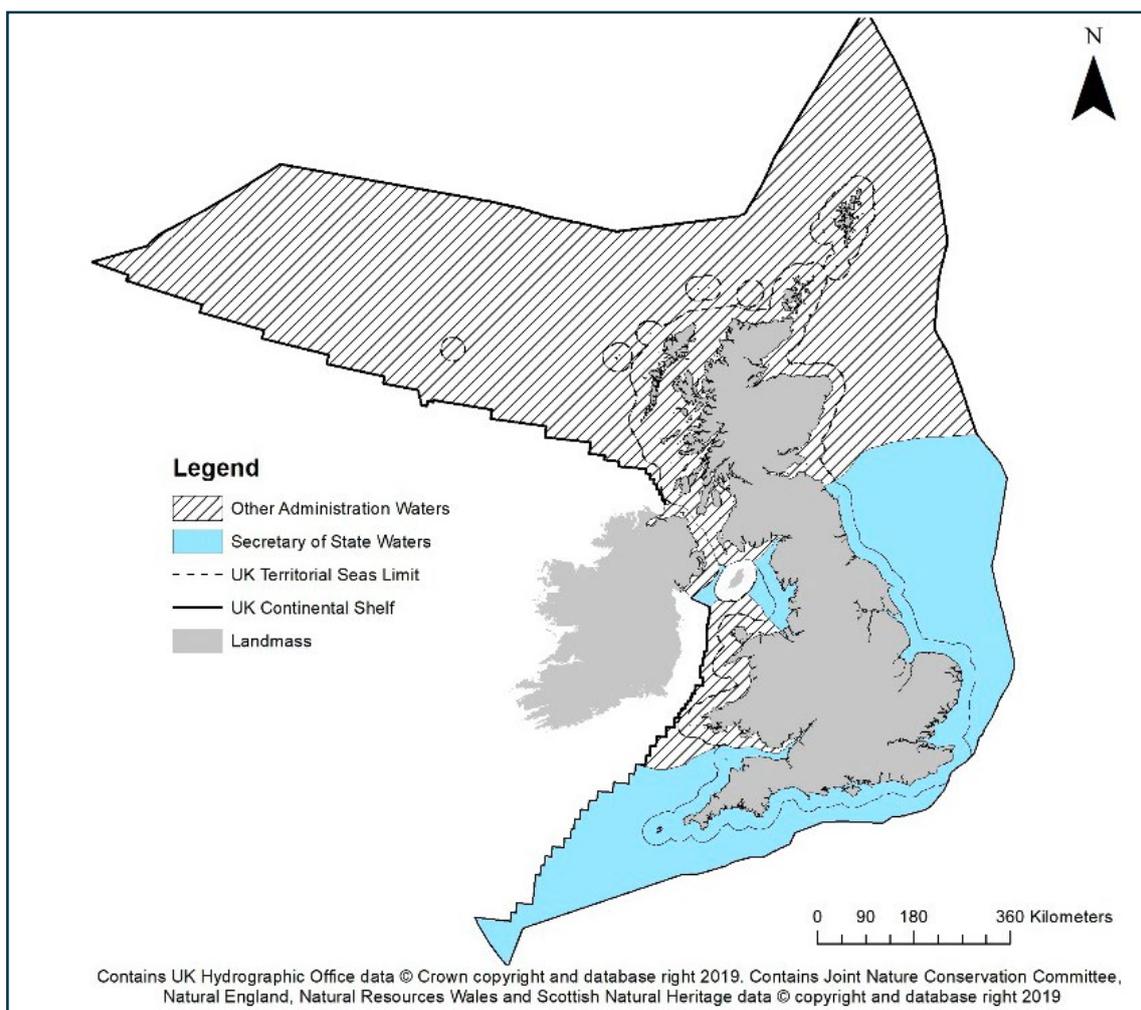


Figure 1. Map showing the Secretary of State waters – the geographic scope of the Review.

HPMAs are the strongest form of marine protection. They protect marine species and ecosystems by safeguarding defined areas from destructive human activity. Globally 2.5% of the world’s oceans are highly protected¹². However, only six of the 19 G20 countries¹³ have included more than 1% of their seas in highly protected reserves¹⁴. Although the UK is one of these six, all UK highly protected areas are in waters around Overseas Territories.

The UK does not have places in its ‘domestic’ seas where all spatially based, damaging activities are removed, and habitats and species can recover to a near pristine or little impacted state. This reality contrasts with people’s expectations: in one survey, for example, around half of the respondents thought that between 1% and 10% of UK seas already had these high levels of protection¹⁵.

12 Marine Conservation Institute (2020). *Atlas of Marine Protection*. Available at: <http://www.mpatlas.org/map/mpas/>

13 The Group of Twenty, or the G20, is the premier forum for international economic cooperation. The G20 brings together the leaders of both developed and developing countries from every continent. Available at: <https://g20.org/en/about/Pages/whatis.aspx>

14 Marine Conservation Institute (2018). *SeaStates G20 2018*. Available at: https://marine-conservation.org/media/filer_public/filer_public/2019/01/28/seastates_g20_2018_full_report.pdf

15 Hawkins, J.P., O’Leary, B.C., Bassett, N., Peters, H., Rakowski, S., Reeve, G. and Roberts, C.M. (2016). Public awareness and attitudes towards marine protection in the United Kingdom. *Marine Pollution Bulletin*.

Governance of the Review

The Secretary of State invited former fisheries minister, Richard Benyon to lead this Review. He was supported by an Advisory Panel (Box 1), with members appointed for their experience and expertise across marine sectors¹⁶. Defra provided a secretariat to the Panel.

The Review's Terms of Reference

The Terms of Reference (see [Annex 1](#)) set the mandate for the Review. The objectives for the Review were to:

- Conduct an impartial and evidence-based assessment of the views of sea users and other relevant stakeholders on the environmental, social, and economic impacts of HPMAs.
- If supported by the evidence, recommend a process for establishing HPMAs and criteria for monitoring their environmental and economic impact. Also make initial recommendations of up to five suitable pilot sites.

The Panel met ten times between July 2019 and May 2020. It gathered data to consider the environmental, social and economic benefits of introducing HPMAs. It completed a public 'Call for Evidence', undertook four stakeholder round-tables, four site visits and a number of stakeholder meetings (see [Chapter 2](#) and [Annex 2](#) for a description and list of visits and meetings). The evidence obtained shaped the Panel's recommendations and formed the basis of this Report. The Terms of Reference allowed the Panel to recommend up to five pilot HPMAs. Due to the implications of COVID-19 the panel did not fully analyse and agree site recommendations.

Current protection and use of our seas

The UK Marine Protected Area Network

Current MPAs protect rare, threatened and representative habitats and species. The UK government has designated a blue belt of marine protection which spans 220,000 sq. km in the UK¹⁷. This supports commitments under the 2009 Marine and Coastal Access Act to develop a UK MPA network, and international commitments for MPA networks including the 1992 [OSPAR convention](#)¹⁸ and 1992 [Convention on Biological Diversity](#)¹⁹.

16 Department for Environment, Food & Rural Affairs (2019). *Highly Protected Marine Areas review panel confirmed*. Available at: <https://www.gov.uk/government/news/highly-protected-marine-areas-review-panel-confirmed>

17 Department for Environmental, Food & Rural Affairs (2019). *England's Marine Life Protected With Blue Belt Expansion*. Available at: <https://www.gov.uk/government/news/englands-marine-life-protected-with-blue-belt-expansion>

18 The Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention') was signed at the Ministerial Meeting of the Oslo and Paris Commissions in Paris in 1992. Available at: <https://www.ospar.org/convention>

19 Signed by 150 government leaders at the 1992 Rio Earth Summit, the Convention on Biological Diversity is dedicated to promoting sustainable development.

In Secretary of State waters, there are 182 MPAs covering 40%²⁰ of the seas (see Figure 2). These include; Marine Conservation Zones (MCZs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The network is key in contributing to government's ocean conservation work. However, it does not currently include any HPMAs and many activities, although the majority are already regulated, still occur in these MPAs. This leaves a gap in government's approach to recovery, conservation and protection of the seas.

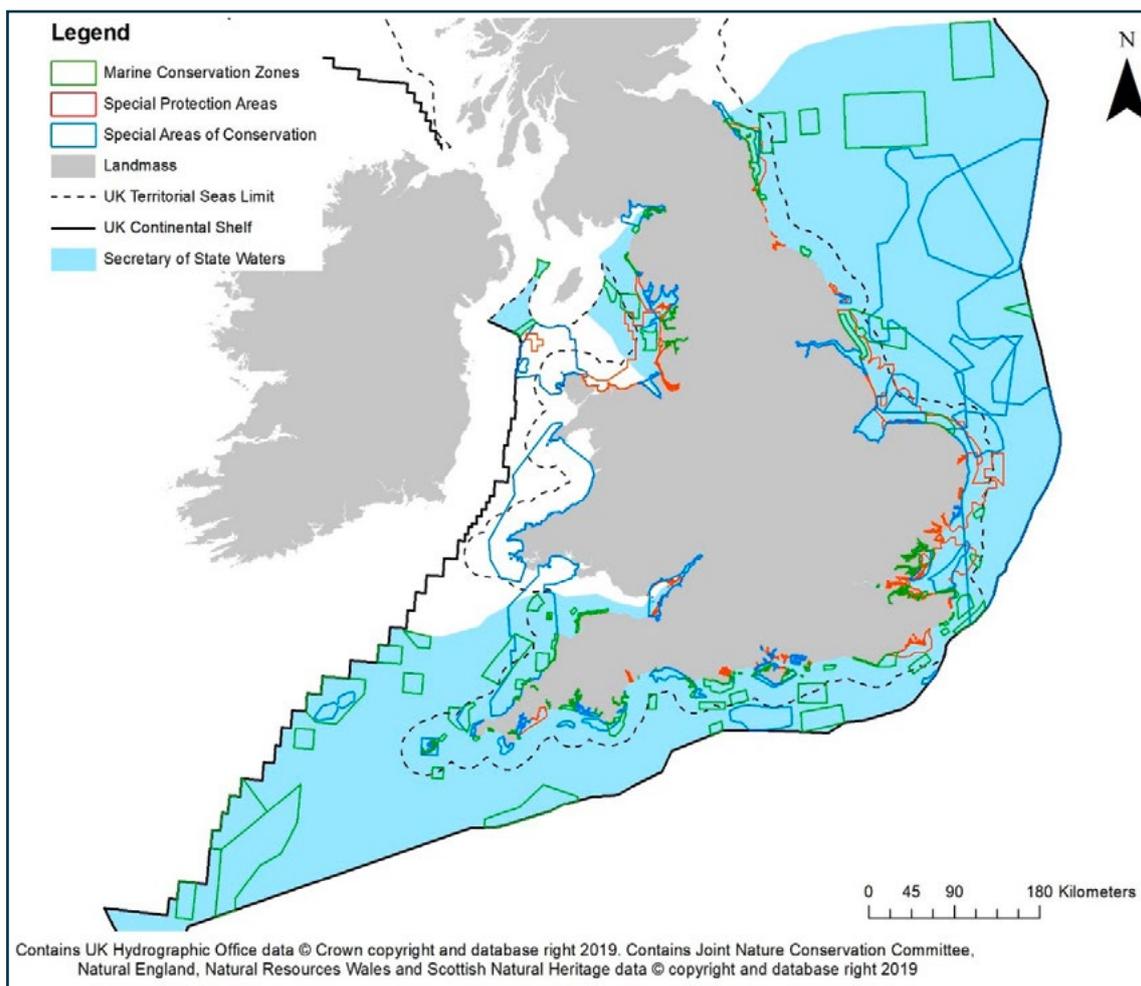


Figure 2. Current MPAs in Secretary of State waters.

The first UK MPAs were Marine Nature Reserves (MNRs) created under the Wildlife and Countryside Act (1981)²¹. The only three sites designated, Lundy Island, Skomer Island and Strangford Lough, are now MCZs. The Wild Birds Directive of 1979 and the Habitats Directive of 1992 introduced European marine sites which include SACs and SPAs. SACs protect habitats and species of European importance including reefs, sandbanks, estuaries, grey seals, common seals and harbour porpoise. SPAs protect seabirds and the habitats upon which they depend. MCZs, designated under the Marine and Coastal

²⁰ Correct at the end of April 2020.

²¹ WWF (2005). *An overview of Marine Protected Areas in the UK*. Available at: http://assets.wwf.org.uk/downloads/ma_overviewukmpa.pdf

Access Act 2009 (MCAA), protect a range of broad habitats and nationally important, rare or threatened habitats and species. There are 91 MCZs in inshore and offshore waters around England and offshore waters around Northern Ireland. These were designated in three tranches (2013, 2016 and 2019) and chosen through a site selection process led by the Joint Nature Conservation Committee and Natural England.

Government designated the first SACs in English waters in the early 2000s but has made slow progress towards achieving its objectives of favourable condition of the habitats and species. Of the 36 SACs in English inshore waters, 17 have had one or more habitats assessed with the results showing that 63% of those habitats are in unfavourable condition²².

At present, 'No Take Zones' (NTZs), which prohibit all methods of fishing have the strongest marine protection in the UK. There are currently three NTZs in Secretary of State waters, at Flamborough Head, Lundy Island and the Medway Estuary. Each NTZ is part of a larger MPA. Lundy and Flamborough Head NTZs are small areas (Lundy NTZ is 3.3km² and Flamborough NTZ is 1km²) with Medway NTZ covering 12.1km² of the intertidal area only. Inshore Fisheries and Conservation Authorities (IFCA) manage these sites using byelaws which control fishing but no other damaging impacts. They are, therefore, not HPMAs.



22 Information from Natural England (2020).

Use of the sea

The UK's seas are a network of activities and designations, many of which overlap. These uses include offshore oil and gas production, maritime transport, telecommunications, tourism, fishing, aquaculture, offshore renewables, and the production of aggregates. Industries that use UK seas contribute substantially to the economy²³ (see Figure 3). The sea also supports sailing, recreational sea angling, scuba diving, wildlife watching and powerboating. Maritime activities contribute £47 billion in value annually to the UK economy and employ over 500,000 people²⁴. Many of these industries are important for coastal communities²⁵ and some, such as offshore wind, help to tackle climate change. The Panel recognised the importance of the blue economy to the UK.

23 ABPmer and ICF (2019). *Study of the Socio-Economic Benefits of Marine Industries*. Available at: <http://www.sudg.org.uk/wp-content/uploads/2019/08/ABPmer-soc-econ-SUDG-1.pdf>

24 Government Office for Science (2018). *Foresight Future of the Sea: A Report from the Government Chief Scientific Adviser*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/706956/foresight-future-of-the-sea-report.pdf

25 Government Office for Science (2017). *Foresight Future of the Sea: Health and Wellbeing of Coastal Communities*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/639432/Health_and_Wellbeing_Final.pdf

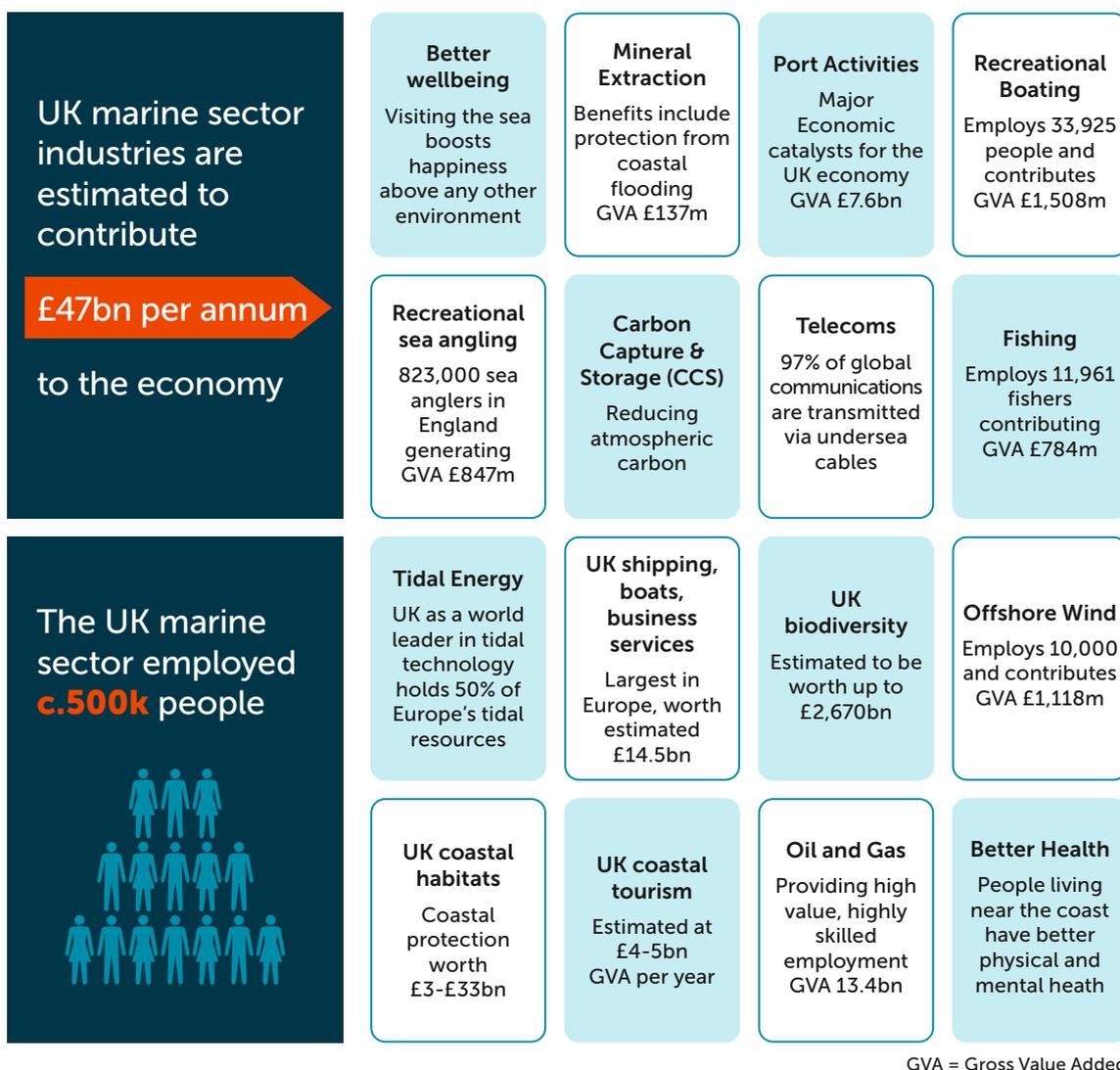


Figure 3. Socio-economic importance of UK seas for society²⁶

Emerging sectors such as offshore renewables, marine aquaculture, and the marine autonomous vehicles sector are predicted to increase their use of UK seas²⁶. The Offshore Wind Sector deal announced in March 2019 has the ambition to power one third of British electricity with offshore wind by 2030²⁷ (see Figure 4). This is currently the most important measure of the UK plan for combatting climate change. The Committee for Climate Change noted that offshore wind would need to provide 75GW of energy by 2050 if the UK moves to extensive electrification²⁸.

26 Data from various sources including: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/706956/foresight-future-of-the-sea-report.pdf, SUDG: <http://www.sudg.org.uk/wp-content/uploads/2019/08/ABPmer-soc-econ-SUDG-1.pdf>

27 Department for Business, Energy & Industrial Strategy (2019). *Industrial Strategy: Offshore Wind Sector Deal*. Available at: <https://www.gov.uk/government/publications/offshore-wind-sector-deal/offshore-wind-sector-deal>

28 Committee on Climate Change (2019). *Net Zero: The UK's contribution to stopping global warming*. Available at: <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf>

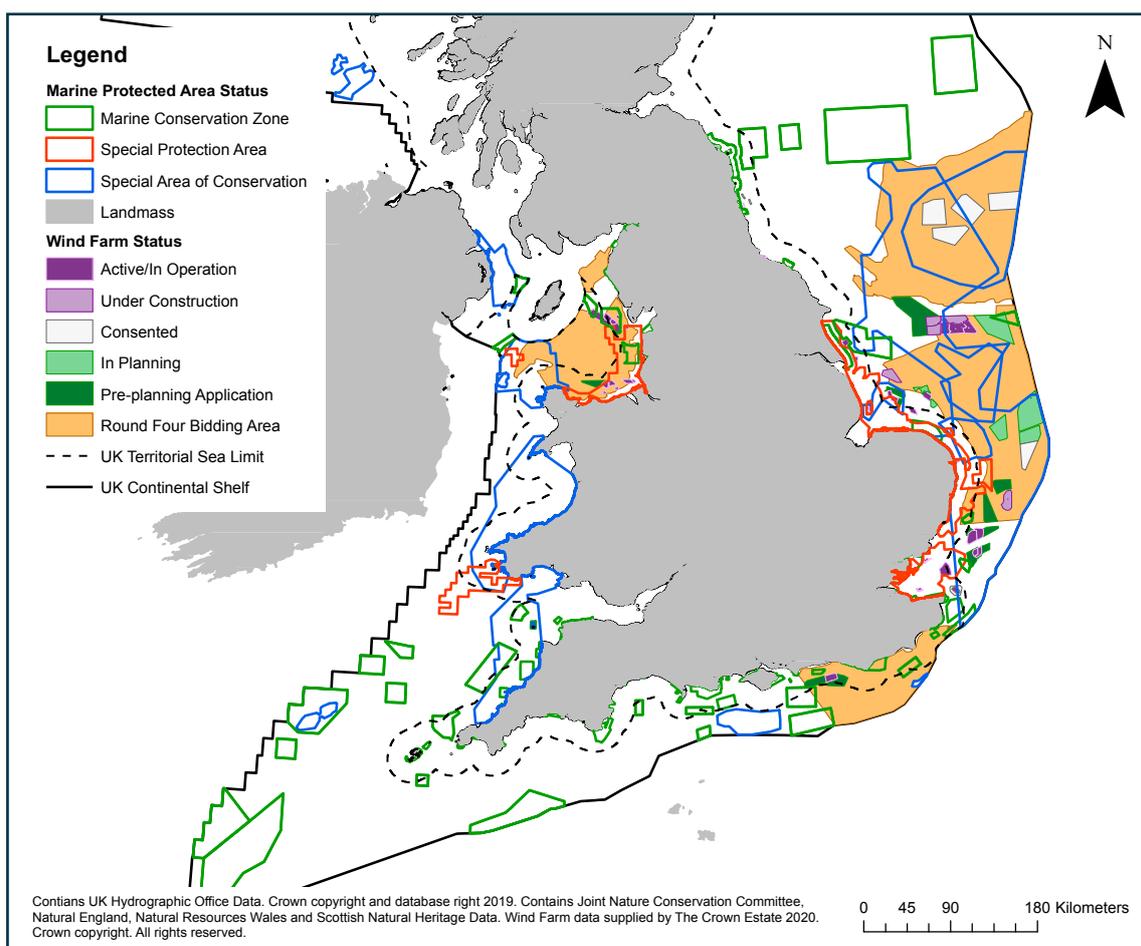


Figure 4. Areas for potential new windfarms and existing MPAs.

The pressures placed on the marine environment by human activities come in various forms and they may compromise the supply of ecosystem goods and services. Examples of pressures are:

- Physical damage from mineral and oil and gas extraction and renewable energy generation;
- Physical disturbance from dredge disposal and from fish and shellfish harvesting;
- Input of nutrients and organic matter from agriculture and transport-shipping;
- Input of other substances from agriculture, urban and industrial use;
- Changes to hydrological conditions from coastal defence and flood protection;
- Input or spread of non-indigenous species from shipping, tourism and leisure activities and aquaculture;
- Marine litter from urban uses, industrial uses and transport (land and shipping);
- Sound from renewable energy generation, extraction of oil and gas and military training and operations.

These factors have individual and cumulative impacts that result in degradation of ecosystems and the limitation or prevention of recovery.

Government has many environmental ambitions for our seas. These include:

- Delivering net zero by 2050.
 - This is supported by the deal for offshore wind energy to provide a third of all UK electricity by 2030²⁹
- Delivering the UK government’s 25 Year Environment Plan⁹. This sets an aim for ours to be the first generation to leave the environment in a better state than we found it. Its marine targets include:
 - reversing the loss of marine biodiversity and, where practicable, restoring it;
 - increasing the proportion of protected and well-managed seas, and better managing existing protected sites;
 - ensuring populations of key species are sustainable with appropriate age structures; and
 - ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems.
- Achieving ‘Good Environmental Status’ as set out in the UK Marine Strategy¹. The Strategy reflects the UK’s vision for “clean, healthy, safe productive and biologically diverse oceans and seas” while being mindful of the human activities that occur in marine areas.
- Implementing the UK government’s Blue Belt policies for MPAs internationally, such as the protection of large areas of ocean surrounding its Overseas Territories.
- Supporting international initiatives for MPAs such as:
 - The Commonwealth Blue Charter³⁰. The Commonwealth countries launched the Commonwealth Blue Charter to sustainably manage, protect and preserve the oceans through a co-ordinated approach.
 - The ‘30x30’ commitment³¹. This is a UK-led initiative to protect at least 30% of the world’s ocean by 2030.
- Building a vibrant and sustainable UK fishing industry by taking responsibility for managing fisheries resources within UK waters, while continuing to protect and improve the marine environment³².

29 Department for Business, Energy & Industrial Strategy (2019). *Offshore wind energy revolution to provide a third of all UK electricity by 2030*. Available at: <https://www.gov.uk/government/news/offshore-wind-energy-revolution-to-provide-a-third-of-all-uk-electricity-by-2030>

30 The Commonwealth Secretariat (2018). *Commonwealth Blue Charter*. Available at: https://bluecharter.thecommonwealth.org/wp-content/uploads/2019/08/Commonwealth_Blue_Charter.pdf

31 Department for Environment, Food & Rural Affairs (2019). *UK creates global alliance to help protect the world’s ocean*. Available at: <https://www.gov.uk/government/news/uk-creates-global-alliance-to-help-protect-the-worlds-ocean>

32 Department for Environment Food & Rural Affairs (2018). *Sustainable fisheries for future generations*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/722074/fisheries-wp-consult-document.pdf

What will HPMA offer beyond existing marine protection?

HPMAs are areas where no extractive, depositional or damaging levels of other activities take place, allowing the biodiversity to recover to a much higher level than in other protected areas (see [Chapter 3](#)). HPMA facilitate this recovery by protecting all habitats and species within the site through what is termed a ‘whole site approach’. Using a whole site approach builds ecological complexity and resilience by protecting the entirety of the ecosystem within site boundaries³³.

HPMAs have many beneficial functions over and above MPAs.

- The undisturbed growth and ecological recovery within an HPMA allows the marine environment to fully recover. Without this benchmark, government has no basis for understanding environmental recovery rates or evaluating effectiveness of work to manage the environment outside these protected areas.
- They re-establish important ecological processes, structures and functioning, leading to recovery of more diverse and complex ecosystems and biogenic habitats^{34,35}.
- Older, larger animals grow and mature. This is important because larger animals have greater potential to contribute to the next generation than smaller animals^{36,37} due to their higher output of offspring. These older, larger animals act as an insurance policy against environmental degradation and biodiversity loss, seeding larvae and juvenile animals within and beyond the boundaries of the site. This is the concept of spillover³⁸.
- Higher levels of reproductive output build connectivity between sites and resilience against disturbance³⁹.
- They act as refuges for species and habitats that are vulnerable to even low levels of extractive and damaging activities⁴⁰.

33 Rees, S.E., Sheehan, E.V., Stewart, B.D., Clark, R., Appleby, T., Attrill, M.J., Jones, P.J.S., Johnson, D., Bradshaw, N., Pittman, S., Oates, J. and Solandt, J.L. (2020). Emerging themes to support ambitious UK marine biodiversity conservation. *Marine Policy*. Available at: <https://doi.org/10.1016/j.marpol.2020.103864>

34 Babcock, R.C., Shears, N.T., Alcalá, A.C., Barrett, N.S., Edgar, G.J., Lafferty, K.D., McClanahan, T.R. and Russ, G.R. (2010). Decadal trends in marine reserves reveal differential rates of change in direct and indirect effects. *Proceedings of the National Academy of Sciences of the United States of America*, **107** 18256–18261.

35 Roberts, C.M., O’Leary, B.C., McCauley, D.J., Cury, P.M., Duarte, C.M., Lubchenco, J., Pauly, D., Saenz-Arroyo, A., Sumaila, U.R., Wilson, R.W., Worm, B. and Castilla, J.C. (2017). Marine reserves can mitigate and promote adaptation to climate change. *Proceedings of the National Academy of Sciences* **114** 6167–6175.

36 Hixon, M.A., Johnson, D.W. and Sogard, S.M. (2013). BOFFFFs: on the importance of conserving old-growth age structure in fishery populations. *ICES Journal of Marine Science* **71** 2171–2185.

37 Kaiser, M. J., Blyth-Skyrme, R. E., Hart, P. J. B., Edwards-Jones, G. and Palmer, D. (2007). Evidence for greater reproductive output per unit area in areas protected from fishing. *Canadian Journal of Fisheries and Aquatic Sciences* **64** 1284–1289.

38 Di Lorenzo, M., Claudet, J. and Guidetti, P. (2016) Spillover from marine protected areas to adjacent fisheries has an ecological and a fishery component. *Journal of Nature Conservation* **32** 62–66.

39 Emslie, M.J., Logan, M., Williamson, D.H., Ayling, A.M., MacNeil, M.A., Ceccarelli, D., Cheal, A.J., Evans, R.D., Johns, K.A., Jonker, M.J. and Miller, I.R. (2015). Expectations and outcomes of reserve network performance following re-zoning of the Great Barrier Reef Marine Park. *Current Biology* **25** 983–992.

40 Roberts, C.M., Hawkins, J.P. and Gell, F.R. (2005). The role of marine reserves in achieving sustainable fisheries. *Philosophical Transactions of the Royal Society of London B* **360** 123–132.

- Increased prey abundance and biomass within HPMAs create feeding opportunities for mobile and migratory wildlife^{41,42}.
- Recovery of seafloor shellfish beds and mats of invertebrate filter feeders can improve water quality⁴³. This effect is further enhanced by the removal of human activities such as trawling and disturbance that resuspend sediments and contaminants from the seafloor.

HPMAs are effective across the world^{44,45} and show more positive effects than other partially protected MPAs⁴⁶.

HPMAs are a method of marine protection that government has yet to adopt in Secretary of State waters. The marine environment is not in a good state and HPMAs are essential to give wildlife breathing space to recover.

41 Norse, E.A., Crowder, L.B., Gjerde, K., Hyrenbach, D., Roberts, C.M., Safina, C. and Soule, M.E. (2005). Place-based ecosystem management in the open ocean pp. 302–327 in Norse, E. and Crowder, L. eds. *Marine Conservation Biology: The Science of Maintaining the Sea's Biodiversity*. Washington DC: Island Press.

42 Boerder, K., Schiller, L. and Worm, B. (2019). Not all who wander are lost: Improving spatial protection for large pelagic fishes. *Marine Policy* **105** 80–90.

43 <https://essexnativeoyster.com/#protect>

44 Stewart, G.B., Kaiser, M.J., Cote, I.M., Halpern, B.S., Lester, S.E., Bayliss, H.R. and Pullin, A.S. (2009). Temperate marine reserves: global ecological effects and guidelines for future networks. *Conservation Letters* **2** 243–253.

45 Lester, S., Halpern, B., Grorud-Colvert, K., Lubchenco, J., Ruttenberg, B.I., Gaines, S.D., Airmé, S. and Warner, R.R. (2009). Biological effects within no-take marine reserves: a global synthesis. *Marine Ecology Progress Series* **384** 33–46.

46 Sciberras, M., Jenkins, S.R., Mant, R., Kaiser, M.J., Hawkins, S.J. and Pullin, A.S. (2013). Evaluating the relative conservation value of fully and partially protected marine areas. *Fish and Fisheries* **16** 58–77.

Chapter 2: Collecting the evidence through listening and learning

The Panel was aware that its work would interest experts, sea users, civil society groups and members of the public. Consequently, the Panel made a listening and learning approach the centre piece of its work programme. [Annex 2](#) lists those with whom the Panel engaged as part of the Review.

During meetings and site visits, individual Panel members met over 50 groups and heard first-hand the importance of effective stakeholder and public engagement. Stakeholders reported that good engagement would aid the delivery of HPMA by helping to secure support for management measures, increased compliance and collaboration on monitoring.

Past experience

The earlier MCZ process outlined in [Chapter 1](#) proposed 65 HPMA which were known as 'reference areas'. However, these 65 sites did not meet the ecological requirements⁴⁷ (set out by the Ecological Network Guidance⁴⁸), and there was little stakeholder support. Therefore, government decided not to take them forward for designation at that time. The Panel was keen to learn from that experience and considered what government and others could do differently when considering HPMA designation in future.

The 'Call for Evidence'

In October 2019 the Panel launched its 'Highly Protected Marine Areas – Call for Evidence' on the government's website (www.gov.uk) to gather as many views as possible. This consultation was open for four weeks and was promoted by a press release, a Defra tweet, and an email bulletin to the Defra marine and fisheries stakeholder list. Review Panel members also promoted it through their networks.

47 Department for Environment, Food & Rural Affairs (2011). Science Advisory Panel Assessment of the Marine Conservation Zone Regional Projects Final Recommendations. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69451/sap-mcz-final-report.pdf

48 Joint Nature Conservation Committee (2010). Marine conservation zone project - ecological network guidance. Natural England. Available at: <http://data.jncc.gov.uk/data/94f961af-0bfc-4787-92d7-0c3bcf0fd083/MCZ-Ecological-Network-Guidance-2010.pdf>

Questions in the Call for Evidence explored the following topics:

- The aims, opportunities and challenges of HPMAs;
- HPMAs site selection;
- Implementation and management of HPMAs; and
- Past experiences of MPAs.

We included multiple choice and open-ended questions to allow for more detailed answers.

The scale and range of responses to the Call for Evidence confirmed that HPMAs are an important and emotive subject. We received almost 400 responses through Citizen Space and by email. Some answered the Call for Evidence questions, others provided alternative responses; all were taken into account. There were 8,000 responses from email campaigns organised by The Wildlife Trusts and the Marine Conservation Society. See [Annex 3](#) for details on the type and volume of responses.

Analysis of responses

The Panel recognised that respondents to the Call for Evidence would have an interest in the marine environment and so views expressed may not be representative of the wider population. It was also aware that the Call for Evidence was less likely to be seen by 'hard to reach' groups or those not already engaged with marine conservation issues. The survey included socio-demographic questions, which gave insight into those who responded and any significant biases.

Data analysis focused on the key themes of the responses. There is a detailed account of analytical methods and the socio-demographics of respondents in [Annex 3](#).

Meeting people

Site visits

The Panel saw existing MPAs and talked to people using and managing those areas about the realities of marine protection and the effects of current designations. Site visits were vital to engage coastal communities and the fishing and marine industries.

Due to time constraints, Panel members limited site visits to areas with marine protection already in place and with active local community groups⁴⁹. Within Secretary of State Waters, Panel members visited Lyme Bay, Poole Harbour and Plymouth Sound, and in Scotland Panel members visited Lamlash Bay on the Isle of Arran (see [Box 2](#)). The areas visited each had forms of marine

⁴⁹ The Panel was due to visit the British Association of Shooting and Conservation at Blakeney to learn more about wildfowling and its management, but due to circumstances surrounding Covid-19 the visit was cancelled.

conservation designation, including MCZs, Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). [Annex 2](#) lists the stakeholders who received Panellists on their visits.

There were consistent messages from stakeholders on all four site visits, including the following:

- Clarity about the aims and management of HPMA is key to ensuring that interested groups, the wider public and affected industries are on board. Beneficial effects need to be publicised at the earliest opportunity.
- HPMA offer a scientific control that government and other interested groups have not had previously. They show 'what good condition looks like' by enabling comparison of recovery inside sites to the wider seas.
- Locating HPMA inside pre-existing MPAs could make management more achievable.
- The Inshore Fisheries and Conservation Authorities (IFCAs) are expert in fisheries management. However, to improve compliance with IFCA management measures, government must address resourcing and funding requirements and recognise how technology can assist future management techniques.
- Co-location of an HPMA with an off-shore windfarm or wreck site may simplify designation, making it more acceptable to local communities. Many groups suggested this will depend on the aims of HPMA.

Whilst these messages were consistent across site visits, not all stakeholders agreed on the necessity of HPMA.

Other significant meetings

The Panel met the Association of IFCAs and its Chief Officers Group, both in specific meetings and on visits. As IFCAs are operational managers for MPAs in inshore waters, the Panel found their opinions and expertise on potential HPMA designations invaluable.

The Panel met the Seabed User and Developer Group, whose members come from marine industries, including ports, aggregates, energy and cabling, to introduce the Review and hear their thoughts on HPMA.

The Panel recognised that site visits in coastal areas would not engage all stakeholders with an interest in the Review. We therefore held four round-table meetings to hear more from key groups as follows:

- Industry;
- Fishing;
- Conservation and recreation; and
- Social scientists (chosen based on marine social science expertise and involvement in previous MPA processes).

The Panel talked to a range of organisations (see [Annex 2](#)) and heard their feedback and messages. Each round-table had around a dozen attendees.

Government Departments and Defra's Arm's Length Bodies

Throughout the Review the Panel liaised with relevant departments (see [Annex 2](#)). The Department for Transport, the Department for Business, Energy & Industrial Strategy, and the Ministry of Defence make use of the seas, while Her Majesty's Treasury holds an interest in economic activities. It was therefore important that they were updated on the Review's progress.

The Review also liaised with Defra's arm's length bodies as these would play a key role in delivering HPMA's if they are designated. These included the Joint Nature Conservation Committee (JNCC), the Marine Management Organisation (MMO), Centre for Environment, Fisheries and Aquaculture Science (Cefas), Environment Agency (EA) and Natural England (NE).

A wider body of evidence

The Call for Evidence, site visits and stakeholder meetings complemented a wider body of evidence, including:

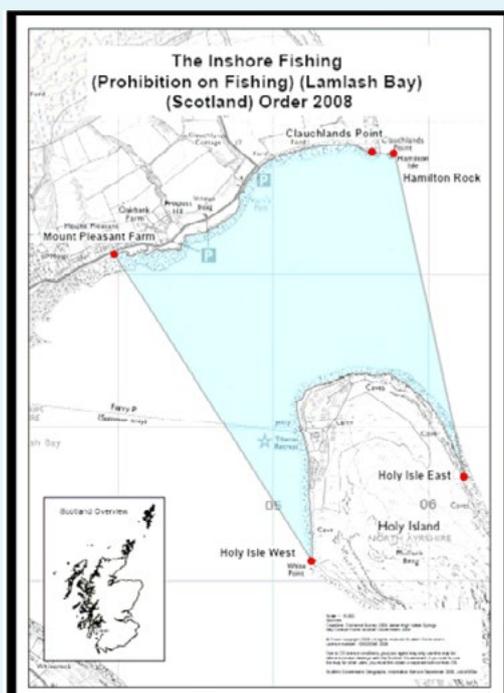
- Peer-reviewed literature;
- 'Grey literature', such as government and agency reports and unpublished documents and
- The expertise of Panel members.



Lamlash Bay No Take Zone, Isle of Arran – a community driven conservation area

Lamlash Bay is a small area (2.67km²) in the Firth of Clyde on the west coast of Scotland. An NTZ was designated in 2008 due to pressure from the Community of Arran Seabed Trust (COAST). COAST is a group of volunteer activists who are committed to protecting the local marine environment.

Successive decades of poor management and overfishing led to a loss of biodiversity and the collapse of finfish fisheries in the area.



The founders of COAST knew that to designate an effective NTZ they needed political support and a 'bottom-up' approach. They worked with Arran-based commercial fishermen and engaged the wider public. By uniting the tight-knit community on Arran they approached government officials with clear support for the NTZ and recommendations of what it should look like.

In the first two years of designation the number of species, individuals and overall biodiversity was greater inside the NTZ and the seabed communities changed over time⁵⁰

50 Howarth, L.M. (2012). Exploring the fishery and ecological effects of Lamlash Bay No-Take Zone - Science report for COAST April 2012. [Online]. Available at: https://www.arrancoast.com/wp-content/uploads/2018/10/2012-Howarth-LM-Exploring_the_fishery_and_ecological_effects_of_Lamlash_Bay_No_Take_Zone_Howarth_Uni_York-1.pdf

A new study from the University of York⁵¹ shows that the numbers of some species have increased by nearly 400% since this NTZ was established. It states that since protection has been in place, biodiversity has increased substantially, along with the size, age and density of species such as the king scallop and the European lobster.

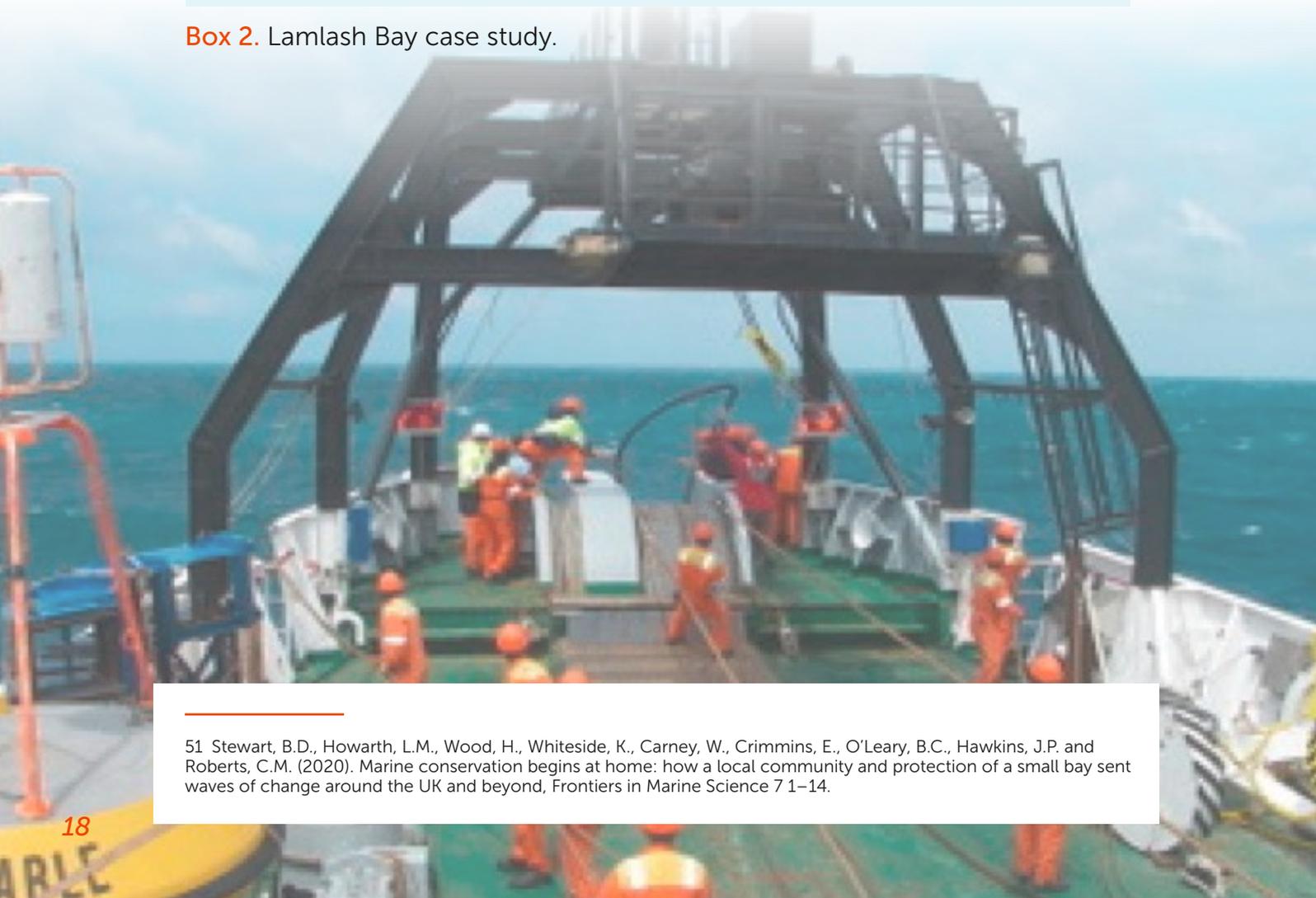
Tourism has also been boosted, as the NTZ has encouraged recreational diving.

The Review team met the Clyde Fisherman's Association as part of our case study. They commented that fishermen could develop their own approaches to conservation without official site designation. For example, they had already introduced a voluntary weekend ban on fishing and a voluntary NTZ.

In Scotland, work by COAST and compliance from the fishing industry led to the designation of a larger MPA (>250 km²) around the south of Arran. This is one of 30 new MPAs in Scottish waters.

The Lamlash Bay case study demonstrated how community support, strong science and political will can be a deciding factor in a successful 'protection designation'. The Stewart report stated that evidence from Lamlash Bay supported the development of strong protection for MPAs and strengthened management potential in the area.

Box 2. Lamlash Bay case study.



51 Stewart, B.D., Howarth, L.M., Wood, H., Whiteside, K., Carney, W., Crimmins, E., O'Leary, B.C., Hawkins, J.P. and Roberts, C.M. (2020). Marine conservation begins at home: how a local community and protection of a small bay sent waves of change around the UK and beyond, *Frontiers in Marine Science* 7 1–14.

Chapter 3: What are Highly Protected Marine Areas and should government introduce them?

What is a Highly Protected Marine Area?

In round-tables stakeholders asked for a definition of HPMAs and for clarification on how they differ from existing Marine Protected Areas (MPAs). The Panel based its definition on the [International Union for Conservation of Nature's \(IUCN\) global categorisation of MPAs](#). Category 1a, in particular, represents the strictest form of marine protection and is a universally recognised indicator of protection.

Recommendation: HPMAs should be defined as areas of the sea that allow the protection and recovery of marine ecosystems. They prohibit extractive, destructive and depositional uses and allow only non-damaging levels of other activities.

This definition includes the need to remove all destructive, depositional and extractive human activities. Prohibiting damaging levels of other activities within these sites allows the marine environment the greatest chance to recover. We discuss activity management in more detail in [Chapter 7](#).

Why the current MPA Network cannot deliver the aims of HPMAs

The UK's MPA network allows broad-scale habitats plus rare and threatened habitats and species to reach a healthy state called 'favourable condition'. This is not the same as full recovery of a designated site.

The total area of MPAs in Secretary of State waters (see [Chapter 1](#)) sounds large but it masks two important points. Firstly, not everything within an MPA's boundaries is protected. Protection applies to designated habitats and species, leaving undesignated features often 'unprotected'. Secondly, not all activities within these MPAs are prevented. Only damaging forms of fishing, dredging

and construction are controlled. Thanks to the byelaws and licensing regime⁵², existing MPAs are not merely ‘paper parks’ as has been suggested⁵³. However, they do not provide the ecosystem with the protection the public expected¹⁵.

The strongest marine protection in the UK is No Take Zones (NTZs). Currently, the total area protected by NTZs in England’s seas is only 16.4km², which is smaller than the City of Westminster and covers less than 0.01% of Secretary of State Waters. Those who argue for higher levels of marine protection are critical of the degree of protection afforded by the current MPA network and of the small coverage of NTZs.

Call for Evidence responses noted that the objective of most MPAs is to ‘maintain’ habitats or species in their current condition not ‘recover’ an area of sea. The lack of full protection is criticised by stakeholders. Responses outlining this came through in our Call for Evidence, with respondents noting that **“MPAs allow ‘sustainable’ activity; HPMA could provide the further protection not given by that”** (*Individual respondent, Other sector*) and **“Management objectives are generally to only maintain site status (often in a degraded condition) rather than restore it”** (*Individual respondent, Science/Research sector*).

During round-table discussions some stakeholders suggested that additions to the MPA network should be ambitious and go further with protection compared with existing designations. We do not know what our seas will look like with little human impact, but introducing HPMA allows us to address that lack of knowledge.

The Call for Evidence revealed strong support for HPMA designation (see Box 3). Respondents stated that HPMA were necessary to repair and renew marine systems, and believed this would not be possible with current levels of marine protection.

52 These include 23 new IFCA byelaws introduced by IFCAs between 2013 and 2018 to directly protect MPA features, 20 additional IFCA byelaws and 30 other management measures that contribute to the protection of MPAs. Available at: <http://www.association-ifca.org.uk/Upload/MPA/IFCA%20Leaflet-2019%20v15-hires.pdf>. The MMO have also put in place six byelaws to protect MPA habitats and species. Available at: <https://www.gov.uk/guidance/marine-conservation-byelaws>.

53 Rankin, J. (2019). Europe’s marine sanctuaries are no more than ‘paper parks’. *The Guardian*. Available at: <https://www.theguardian.com/environment/2019/sep/11/europes-marine-sanctuaries-are-paper-parks>

The Call for Evidence also highlighted the ecological value of the existing network of MPAs. Respondents stated that while the network has potential, more can be done for our seas. HPMAs allow us to build on existing achievements and put in place high levels of protection. Over 80% of respondents to the Call for Evidence agreed with designating HPMAs for ecological reasons, rather than designating them for tourism and cultural purposes. Approximately two thirds of respondents agreed. See [Chapter 4](#) for further discussion.

Lower levels of support for designation for ecological purposes was observed for particular industry groups (e.g. fishing and energy).

Views differed about how HPMAs would relate to the MPA network. Discussions with stakeholders suggested that current MPAs need better management if government is to understand whether the level of protection provided has a meaningful impact. Some groups (e.g. energy and aggregate industries) responded that HPMAs were unnecessary and believed issues with the network were down to a failure in management (see Box 3).



Example of views from the call for evidence

“HPMAs could complement MCZs by offering complete and effective protection from human exploitation which MCZs appear unable to do. It has become apparent that the protection offered by MCZs is selective and not all encompassing”

(Goodwin Sands Conservation Trust, Wildlife/Conservation sector).

“[HPMAs] can complement/support the wider network, particularly for mobile species”

(Sussex IFCA, Defra ALB/delivery body).

“There is currently limited evidence of sufficient quality and quantity to support the designation of specific areas as HPMAs in UK waters. ...To add to the evidence base, a thorough review of existing MPAs with no take zones should be undertaken to look at what lessons can be learnt before considering the designation of any HPMAs”

(Dogger Bank windfarms, Energy sector).

“...The fact that HPMAs are still being considered would suggest that the existing management controls which are already in place and available for designated marine protected areas are not currently delivering the outcomes that are desired. Consequently, it is difficult to reconcile how designating a new form of protected site, without firstly identifying and then resolving the underlying failings or weaknesses in the management success of existing designations, will necessarily secure the desired outcomes”

(British Marine Aggregate Producers Association, Aggregate sector).

“The many reports detailing the loss of fish stocks and the associated damage done to the natural environment by inappropriate fishing techniques illustrates vividly the need for HPMAs to be designated immediately and the protection to be enforced”

(Individual respondent, Wildlife/Conservation sector).

“Evidence of the detrimental effect of human activity on the marine environment is abundant”

(Individual respondent, Recreation sector).

“[HPMAs] could complement and enhance the current designations in English inshore and offshore waters and Northern Irish offshore waters though enabling a mechanism to manage ‘whole sites’ to enable repair and renewal of marine systems, and fully integrating fisheries management with conservation (Ecosystem Based Fisheries Management) as the two are critically interdependent”

(Individual respondent, Science/Research sector).

Box 3. Call for Evidence responses.

What can HPMAs achieve?

Damaging activities will not take place in HPMAs, therefore biodiversity is likely to recover to a higher level than in other protected areas⁵⁴. There is also likely to be a recovery of biodiversity with marine species growing larger and more reproductive. Evidence suggests that a strongly protected marine environment provides conservation benefits beyond their partially protected counterparts^{55,56,57}. We believe HPMAs could deliver similar ecosystem benefits in Secretary of State Waters. Further, HPMAs would provide a scientific benchmark for what recovery of our seas looks like and would set standards within our current MPA network. The benefits of HPMAs are outlined in [Chapter 1](#), and further evidence will be presented throughout this Report.

Biodiversity Gains

A review of the ecological evidence surrounding HPMAs showed that in temperate waters they deliver greater conservation benefits than those seen in other types of MPA⁵⁸. Of the Call for Evidence respondents, 91.7% agreed that HPMAs better protect sensitive and/or ecologically important species and habitats. Previous studies show evidence of higher density and biomass of target organisms and in some cases higher species diversity within HPMAs (see [Figure 5](#) and [Figure 6](#)).

54 Giakoumi, S., Scianna, C., Plass-Johnson, J., Micheli, F., Grorud-Colvert, K., Thiriet, P., Claudet, J., Di Carlo, G., Di Franco, A., Gaines, S.D., Garcia-Charton, J.A., Lubchenco, J., Reimer, J., Sala, E. and Guidetti, P. (2017). Ecological effects of full and partial protection in the crowded Mediterranean Sea: a regional meta-analysis. *Scientific Reports*. Available at: <https://doi.org/10.1038/s41598-017-08850-w>

55 O’Leary, B.C. and Roberts, C.M. (2018). Ecological connectivity across ocean depths: Implications for protected area design. *Global Ecology and Conservation*. Available at: <https://www.sciencedirect.com/science/article/pii/S2351989418301021?via%3Dihub>

56 Lester, S.E. and Halpern, B.S. (2008). Biological responses in marine no-take reserves versus partially protected areas. *Marine Ecology Progress Series* 367 49–56.

57 Guidetti, P., Baiata, P., Ballesteros, E., Di Franco, A., Hereu, B., Macpherson, E., Micheli, F., Pais, A., Panzalis, P., Rosenberg, A.A., Zabala, M. and Sala, E. (2014). Large-scale assessment of Mediterranean marine protected areas effects on fish assemblages. *PLoS ONE*. Available at: <https://doi.org/10.1371/journal.pone.0091841>

58 Schratzberger, M., Paltriguera, L., Neville, S., Weston, K. and Painting, S. (2016). *Review of Highly Protected Marine Areas*. Centre for Environment, Fisheries and Aquaculture Science (Cefas), Lowestoft.

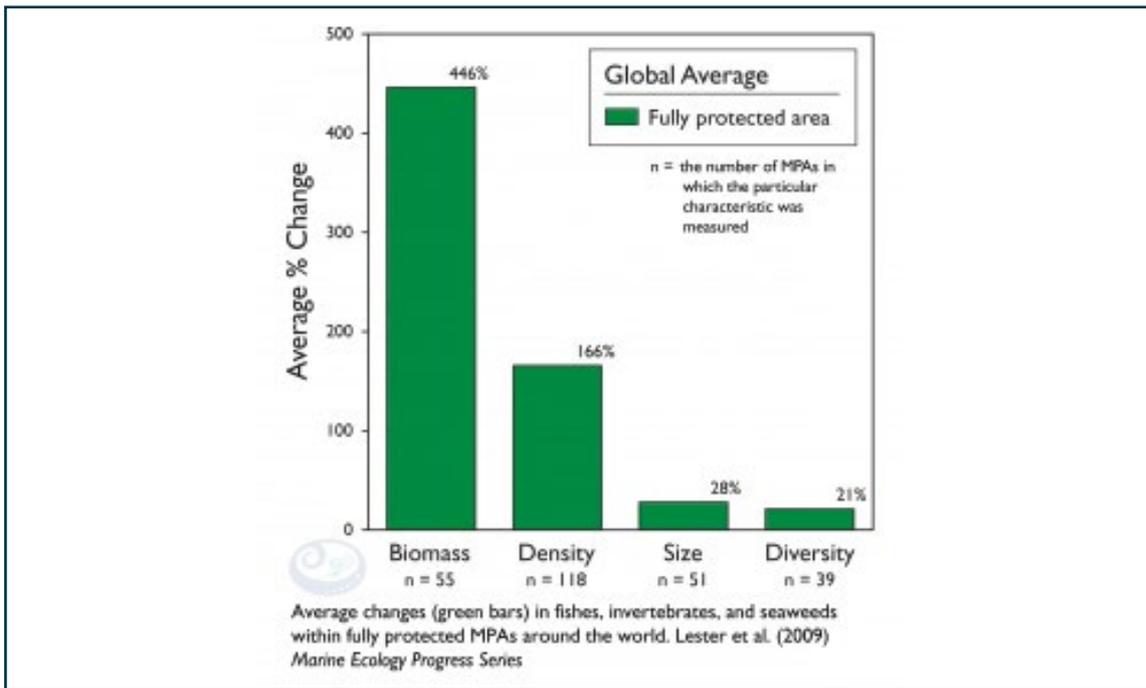


Figure 5. Average global changes in ecosystems after fully protected MPAs were introduced⁵⁹

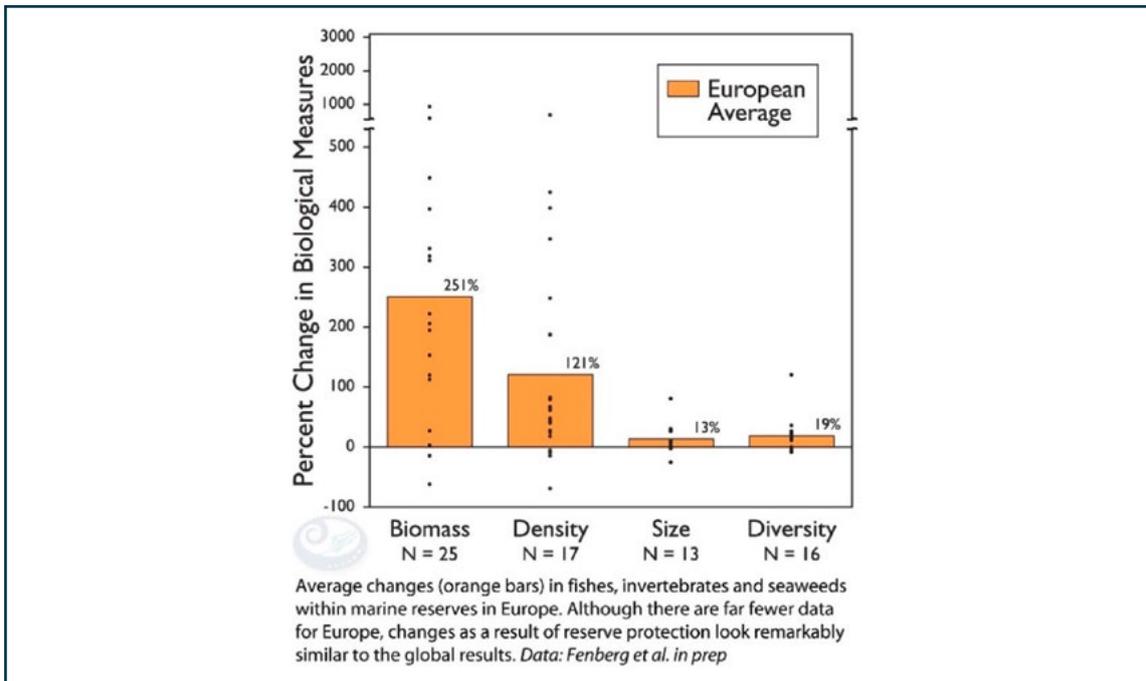


Figure 6. Mean (bars) percent change in biomass, density, organism size, and species richness calculated from response ratios for European reserves.⁶⁰

59 Partnership for Interdisciplinary Studies of Coastal Oceans (2011). *The Science of Marine Reserves*. Available at: www.piscoweb.org

60 Phillip B. Fenberg, Jennifer E. Caselle, Joachim Claudet, Michaela Clemence, Steven D. Gaines, Jose Antonio García-Charton, Emanuel J. Gonçalves, Kirsten Grorud-Colvert, Paolo Guidetti, Stuart R. Jenkins, Peter J.S. Jones, Sarah E. Lester, Rob McAllen, Even Moland, Serge Planes, Thomas K. Sørensen, The science of European marine reserves: Status, efficacy, and future needs, *Marine Policy*, Volume 36, Issue 5, 2012, Pages 1012-1021, ISSN 0308-597X, <https://doi.org/10.1016/j.marpol.2012.02.021>.

The Panel noted a body of scientific evidence supporting the benefits of HPMA over multi-use MPAs for reasons including increased biodiversity, species size, abundant seabed habitats⁵¹, and re-establishment of diminished ecosystems. Due to the current lack of a 'whole site approach' within MPAs in the UK, we must base HPMA expectations on international counterparts.

Introducing HPMA may benefit certain fish stocks including shellfish. Increases in abundance and density of fish stocks^{44,60} arise from better protected, healthier environments. Studies show that uplifts in stock can spill over into adjacent areas that allow fishing, in the form of extra offspring and juvenile and adult animals, benefitting commercial and recreational sectors. These benefits occur in overseas MPAs and tropical waters but also closer to home. Table 1 and Figure 7 show the ecological effects seen in NTZs and Lyme Bay MPA in the UK, and an MPA in Bradda, Isle of Man, respectively.



Table 1. Examples of benefits seen in MPAs with higher levels of protection.

Site/MPA type	Improvements seen
Lundy Island, 3.3km ² NTZ	After 18 months the size and number of the commercially important European lobster, <i>Homarus Gammarus</i> , increased. Legal lobsters were 5 times more abundant and 9% larger in the reserve ⁶¹ .
Lamlash Bay, 2.67km ² NTZ	King scallop densities within the NTZ are now 3.7 times higher than in 2013 ⁶² . Body size of lobsters is also greater within the NTZ and, because egg production increases with body size ^{63,64} , and mature lobsters were so much more abundant in the NTZ, this difference translated to over 5.7 times more eggs.
Lyme Bay Reserve, 206km ² ban on bottom-towed gear fishing.	Studies showed higher levels of biodiversity than areas outside the reserve, 22% increase of pink sea fans in the reserve, 52% increase in number of species, 4.5x more lobsters in the reserve ⁶⁵ . Abundance of great scallop, <i>Pecten maximus</i> , significantly greater in reserve ⁶⁶ .
Columbretes Reserve, Spain, 55km ² MPA prohibiting all commercial and lobster fishing.	At the end of a ten-year study, mature female lobsters were 20x more abundant, and egg production was 30x greater in the MPA than in nearby fished areas ⁶⁷ .

61 Hoskin, M.G., Coleman, R.A., von Carlshausen, E. and Davis, C.M. (2011). Variable population response by large decapod crustaceans to the establishment of a temperate marine no take zone. *Canadian Journal of Fisheries and Aquatic Sciences* 68 185–200.

62 James, L., (2019). *The recovery of the commercially valuable scallop species, Pecten maximus, Under Different Forms of Protection Around the Isle of Arran*. MSc Thesis. University of York, North Yorkshire 54

63 Cudney-Bueno, R., Lavin, M.F., Marinone, S.G., Raimondi, P.T. and Shaw, W.W. (2009). Rapid effects of marine reserves via larval dispersal. *PLoS ONE* 4.

64 Harrison, H.B., Williamson, D.H., Evans, R.D., Almany, G.R., Thorrold, S.R., Russ, G.R., Feldheim, K.A., van Herwerden, L., Planes, S., Srinivasan, M., Berumen, M.L. and Jones, G.P. (2012). Larval export from marine reserves and the recruitment benefit for fish and fisheries. *Current Biology* 22 1023–1028.

65 Blue Marine Foundation (2019). Available at: <https://www.bluemarinefoundation.com/projects/lyme-bay/>

66 Sheehan, E.V., Stevens, T.F., Gall, S.C., Cousens, S.L. and Attrill, M.J. (2013). Recovery of a Temperate Reef Assemblage in a Marine Protected Area following the Exclusion of Towed Demersal Fishing. *PLoS ONE* 8 1–12.

67 Diaz, D., Mallel, S., Parma, A.M. and Goni, R. (2011). Decadal trend in lobster reproductive output from a temperate marine protected areas. *Marine Ecology Progress Series* 433 149–157.

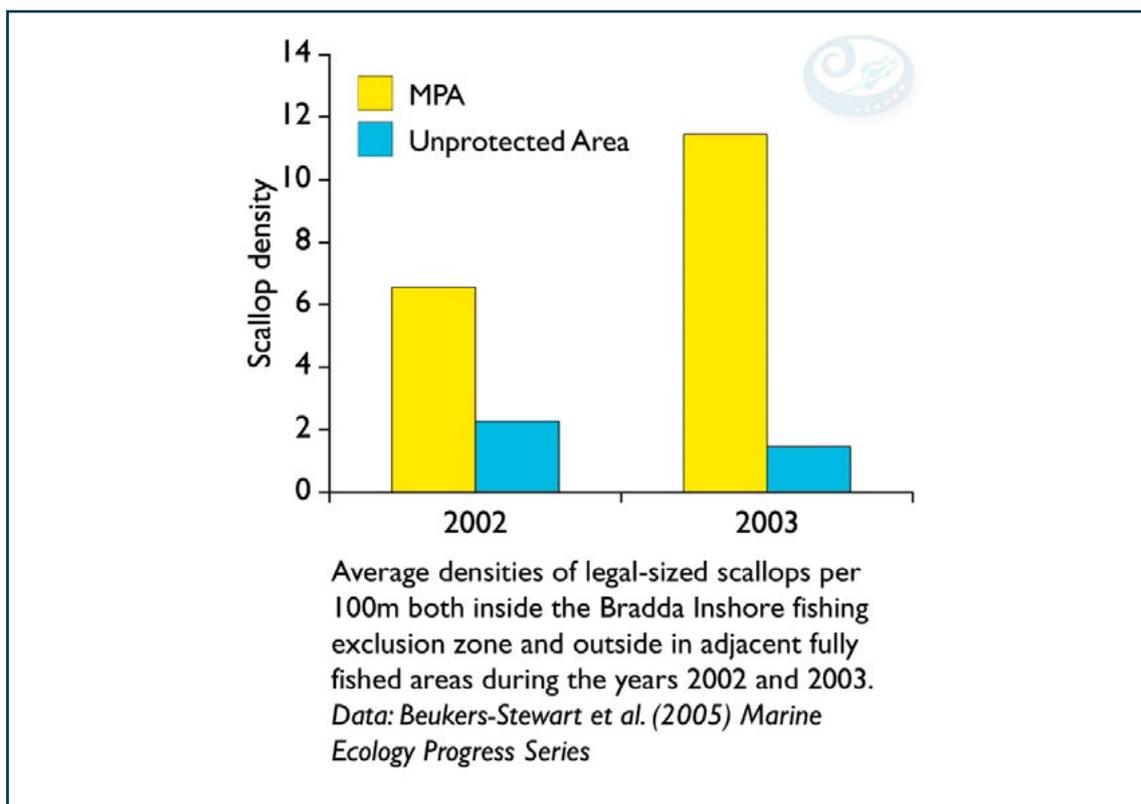


Figure 7. Scallop densities inside and outside MPAs^{59,68}

Of the Call for Evidence respondents, 87.7% agreed that, if introduced, HPMAs could act as NTZs. This would allow commercial fished species to recover and for these benefits to spillover outside of the protected area.

High levels of protection also allow us to understand how recovery occurs in the absence of the human pressures. Removing bottom-towed gear fishing in Lyme Bay increased our understanding of reef habitat, with the colonisation of mixed sediments by species normally associated with hard rock substrates (Box 4).

Our site visit to Plymouth uncovered evidence that in 2014, Lyme Bay recovered from a storm event more quickly than surrounding areas. This was due to higher levels of protection, supporting the Panel's views that enhanced protection leads to greater ecosystem recovery and adds to climate change resilience. The Call for Evidence supported these claims and respondents suggested that **"HPMAs would benefit sites sensitive to change such as extreme weather events, tides and loss of biodiversity"** (*Individual respondent, Science/Research sector*) and **"They could play a huge role in counteracting climate change, giving marine species a safe haven and time to actually recover"** (*Individual respondent, Other sector*).

68 Beukers-Stewart, B.D., Vause, B.J., Mosley, M.W.J., Rossetti, H.L. and Brand, A.R. (2005). Benefits of closed area protection for a population of scallops. *Marine Ecology Progress Series* 298 189–204.

Lyme Bay



Before



After

Overview of site:

Lyme Bay, with an area of 2,460 km², lies in south-west England. The seabed is rocky reef characterised by bedrock, boulders and cobbles overlain and interspersed with areas of mixed sediments. Its national and international conservation significance is due to the range and diversity of the reef and sea cave habitats, such that it is a biodiversity hotspot. The reef supports rich species assemblages. These include the protected species sunset cup coral, and the pink sea fan (which is at the eastern edge of its range). As well as other structural species such as the bryozoan, the soft coral and the erect sponge^{69,70,71}.

In 2008, after years of damage to the bay largely from mobile gear fishing, government implemented a Statutory Instrument⁷². It closed a 206 km² area of Lyme Bay to dredging for shellfish and demersal trawling. This protected and recovered the seabed species within the area and maintained the reef structure. In 2017, 312 km², overlapping the closed area, was designated as a Special Area of Conservation under the Habitats Directive (Directive 92/43/EEC)⁷³ adding further protection.

69 Hinz, H., Tarrant, D., Ridgeway, A., Kaiser, M.J. and Hiddink, J.G. (2010). Effects of scallop dredging on temperate reef fauna. *Marine Ecology Progress Series* 432 91–102.

70 Devon Wildlife Trust (2007). *Lyme Bay Reefs: A 16 Year Search for Sustainability*. Exeter: Devon Wildlife Trust.

71 Natural England (2010). *Inshore Special Area of Conservation (SAC): Lyme Bay and Torbay SAC Selection Assessment Version 2.5*.

72 HM Government (2008). *The Lyme Bay Designated Area (Fishing Restrictions) Order 2008*. Available at: <http://www.legislation.gov.uk/ukSI/2008/1584/article/2>

73 Joint Nature Conservation Committee (2017). *Natura 2000 - Standard Data Form Lyme Bay and Torbay*. Available at: <https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030372.pdf>

Biodiversity recovery following closure:

Changes to the species assemblages within the closed area, compared with outside, were seen two years after the bottom-towed gear closure⁷⁴. After five years, nine of the 16 indicator species monitored showed increased abundances in the closed area, including the commercial king scallop⁷⁵. A less expected outcome from the exclusion of bottom-towed gear impacts was that sessile reef-associated species had colonised the mixed sediment habitats, particularly pebbly sand. This suggested that the functional extent of the reef had expanded beyond the bedrock and boulders into the areas in between these structures⁷⁶.

Social and economic impacts of the Lyme Bay fisheries closure:

Early evidence from the year following the closure showed little economic impact on the fishing and associated processing industries. Fishing in Lyme Bay remained profitable, and static gear fishermen had increased fishing effort and expected longer-term benefits⁷⁷. Further evidence^{74,78,79} showed that the impacts varied according to the activity undertaken by stakeholder groups. For fishers, the impact differed according to the gear type and fishing location. Recreational stakeholders were generally positive about the potential impacts of the Lyme Bay fisheries closure. There was no discernible effect on local communities.

Particular sectors of the fishing industry experienced the majority of negative impacts. Tensions increased between static and towed gear fishers. This occurred where towed gear fishers, displaced from the closed area, targeted grounds traditionally used by static gear fishers. Towed gear fishers often moved to more distant fishing grounds, which lead to increased costs in time and fuel consumption. There were safety concerns that this sometimes led to more dangerous working conditions.

Many local fishers are better off in the long term. This is partly through taking advantage of new routes to market for sustainably caught seafood e.g. through BLUE's Reserve Seafood brand. There is also work underway to build the support of local stakeholders for improvements in the management of the closed area⁸⁰.

Box 4. Lyme Bay (UK) case study.

74 Attrill, M.J., Austen, M.C., Bayley, D.T.I., Carr, H.L., Downey, K., Fowell, S.C., Gall, S.C., Hattam, C., Holland, L., Jackson, E.L., Langmead, O., Mangi, S., Marshall, C., Munro, C., Rees, S., Rodwell, L., Sheehan, E.V., Stevens, J., Stevens, T.F. and Strong, S. (2011). *Lyme Bay - A case study: measuring recovery of benthic species; assessing potential spill-over effects and socio-economic changes; 2 years after the closure*. Plymouth: University of Plymouth Enterprise Ltd.

75 Sheehan, E.V., Cousens, S.L., Gall, S.C., Bridger, D.R., Cocks, S. and Attrill, M.J. (2016). Lyme Bay - A case study: Response of the benthos to the zoned exclusion of towed demersal fishing gear in Lyme Bay; 5 years after the closure. *Natural England*.

76 Sheehan, E.V., Cousens, S.L., Nancollas, S.J., Stauss, C., Royle, J. and Attrill, M.J. (2013). Drawing lines at the sand: Evidence for functional vs. visual reef boundaries in temperate Marine Protected Areas. *Marine Pollution Bulletin* 76 194–202.

77 Mangi, S.C., Rodwell, L.D. and Hattam, C. (2011). Assessing the Impacts of Establishing MPAs on Fishermen and Fish Merchants: The Case of Lyme Bay, UK. Available at: <https://doi.org/10.1007/s13280-011-0154-4>

78 Hattam, C.E., Mangi, S.C., Gall, S.C. and Rodwell, L.D. (2014). Social impacts of a temperate fisheries closure: understanding stakeholders' views. *Marine Policy* 45 269–278.

79 Rees, S.E., Attrill, M.J., Austen, M.C., Mangi, S.C. and Rodwell, L.D. (2013). A thematic cost-benefit analysis of a marine protected area. *Journal of Environmental Management* 114 476–485.

80 Blue Marine Foundation (2018). *Blue Marine Foundation: Review 2018*.

Understanding the ‘real state’ of the natural environment

The potential growth and recovery within HPMAs provide an opportunity to understand the state of the marine environment, free of damaging human activities and influences. For those managing the marine environment, HPMAs offer opportunities to compare and measure the effectiveness of existing marine protections with a fully protected counterpart. Without this benchmark, we cannot understand the effectiveness of our work to manage the wider environment outside of protected areas.

Of the Call for Evidence respondents, 90.1% agreed that HPMAs could allow marine areas the chance to return to as natural a state as possible. Designation of HPMAs was supported by 87.7%. This was on the grounds that they could provide a reliable measure of what recovery could look like if damaging human activities were removed. The Panel heard that HPMAs could provide opportunities for “... investment in baseline and continuous monitoring to demonstrate any potential impacts and benefits to other stakeholders in a local context - in particular the fishing communities...” (Individual respondent, Wildlife/Conservation sector).

HPMA potential for climate change resilience

Global marine sediment carbon stocks can be equal in size or greater than terrestrial carbon stocks such as forests^{81,82,83}. Even in their current state, the UK’s seas take up and store large amounts of carbon dioxide. Globally, the ocean represents the largest active carbon sink, removing 25–30% of carbon dioxide added to the atmosphere by human activities^{82,84}. HPMAs help to identify, protect from degradation⁸⁵, and manage carbon resources, which is important for the UK to meet its climate change commitments⁸⁶. With greater protection, the ecosystems’ ability to provide carbon sequestration and storage will increase⁸⁶.

This was supported by 86.6% of Call for Evidence respondents, who agreed that HPMAs could better prevent or lessen the effects of climate change. Respondents also recognised the need to protect habitats with wider environmental significance (e.g. habitats that can capture carbon or protect species vulnerable to a warming ocean). The Panel heard that it is desirable to choose “Sites that offer the best chance at helping to sequester carbon” and that “Often fishing is put at the forefront in terms of who will benefit long term but we also need to give greater credence to other benefits such as carbon sequestering e.g. seagrass” (Individual respondent, Sector unknown).

81 Williams, C. and Davies, W. (2019) 24. Valuing the ecosystem service benefits of kelp bed recovery off West Sussex. NEF Consulting.

82 IPCC (2020). Glossary. Available at: <https://www.ipcc.ch/srocc/chapter/glossary/>

83 IPCC (2013). Coastal Wetlands in Alongi, D., Karim, A., Kennedy, H., Chen, G., Chmura, G. and Crooks, S. et al. eds. 2013 Supplement to the 2006 IPCC guidelines for National Greenhouse Gas Inventories.

84 Kröger, S., Parker, R., Cripps, G. and Williamson, P. eds (2018). Shelf Seas: The Engine of Productivity, Policy Report on NERC-Defra Shelf Sea Biogeochemistry programme. Cefas, Lowestoft.

85 Burrows, M.T., Hughes, D.J., Austin, W.E.N., Smeaton, C., Hicks, N., Howe, J.A., Allen, C., Taylor, P. and Vare, L.L. (2017). Assessment of blue carbon resources in Scotland’s inshore marine protected area network. Scottish Natural Heritage.

86 IUCN. Marine protected areas and climate change Issues Brief. Available at: <https://www.iucn.org/resources/issues-briefs/marine-protected-areas-and-climate-change>

HPMA designation could protect habitats from damaging activities such as bottom trawling, which release carbon as a by-product. It could also enhance the ecosystem's ability to capture and store carbon. Therefore, HPMA would allow the UK to remain at the forefront in combatting climate change and also help to meet national and international commitments. (See [Chapter 1](#)).

Aims and purpose of HPMAs

The Panel believes HPMA will complement existing MPAs in Secretary of State Waters. We envisage them sitting at the top of the possibilities for marine protection (Figure 8). Studies show that MPAs with a combination of protection levels are a valuable management tool⁴⁶. Existing MPAs provide the bulk of site-based conservation measure, protecting important species and habitats. By siting HPMA within current MPAs, it will be easier to compare recovery across the two levels of protection. In comparison with the rest of the UK MPA network, the Panel imagine the coverage of HPMA to be on a smaller scale (Figure 8).

Recommendation: Government should introduce HPMA in conjunction with the existing MPA network. In many instances, sections of existing MPAs can be upgraded to HPMA.

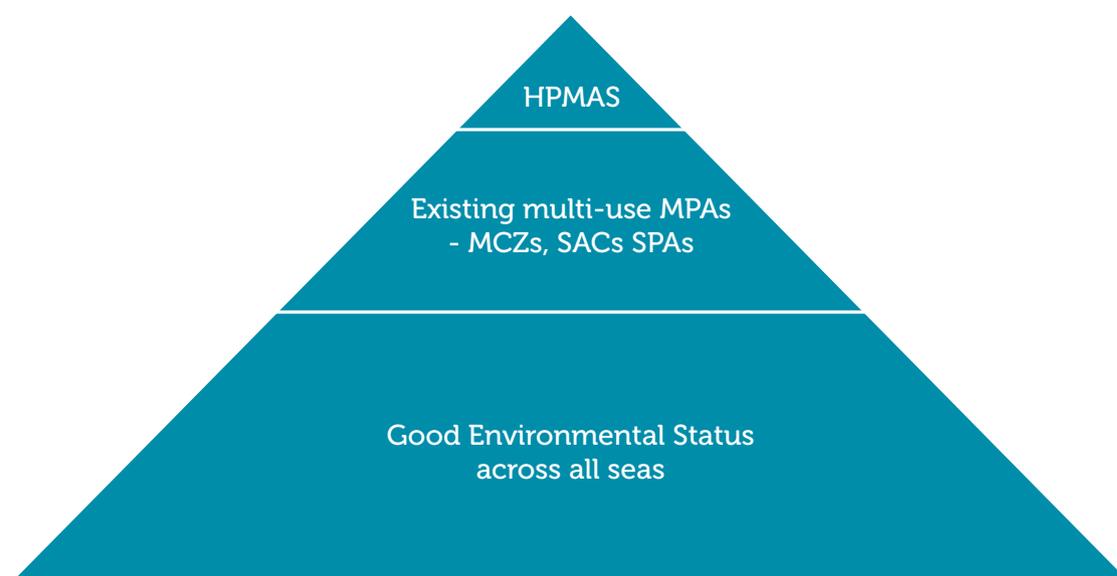


Figure 8. A visual representation of where the Panel see HPMA sitting in the pyramid of marine management.

To complement the current MPA network, HPMA will seek to:

- Protect our seas as part of our duty as stewards of the natural environment;
- Provide a reliable measure of what recovery could look like following removal of all extractive uses, depositional activities and damaging levels of other human activities;

- Better protect sensitive, degraded and/or ecologically important habitats and species.

While not a primary objective, it is also important to acknowledge that HPMAs will provide opportunities to protect blue carbon stores and increase resilience to climate change.

Respondents to the Call for Evidence viewed HPMAs as a way to restrict human activity and reduce human impacts beyond what occurs in existing MPAs. It is clear to us that HPMAs should *not* be 'no-go zones', set aside from public access. Instead, restrictions should limit all but non-damaging activities.

Recommendation: Government must set conservation objectives for HPMAs that allow full recovery of the marine environment and its ecological processes.

One respondent to the Call for Evidence encapsulated a strong vision for our purpose of HPMAs: **"HPMAs would act as the backbone of the MPA network in English and UK waters, offering the strictest protection to areas of greatest biodiversity value and to allow degraded areas to recover naturally for the benefits of climate, nature and people. These sites are a key part of the IUCN guidance on MPAs and form significant parts of MPA networks in other countries, including New Zealand, Australia, USA and indeed in the UK Overseas Territories. These sites would complement the existing multiple use sites in UK waters and increase the resilience of those areas as part of an ecologically coherent and connected network"** (*Individual respondent, Sector unknown*).

We have explored the benefits HPMAs can deliver and noted a recurring ecological theme through Call for Evidence responses. On the basis of this *and* previous evidence, we recommend the purpose and objective of HPMAs should reflect key benefits around the protection and recovery of our seas.

As previously noted, our current MPA designations take a feature-based approach, protecting only certain habitats or species. While they benefit some parts of the marine environment, it means damaging activity can still take place within many sites, therefore limiting ecosystem recovery.

Taking a 'whole site approach' to designation³³ and protecting the entire ecosystem provides a recovery opportunity that we have not seen before in our seas.

Recommendation: Government must take a 'whole site approach' to HPMAs to conserve all habitats and species within the site boundary. This includes mobile and migratory species that visit or pass through the site.

Links with wider marine activity

We recognise that licensed marine activities can provide effective protection to areas of the sea alongside their primary purpose. We discussed this with relevant stakeholders and with BEIS and MoD to determine whether HPMAs could co-exist with energy and defence activities within licenced areas. We determined that human activity associated with these sectors is incompatible with the purpose of HPMAs, but not necessarily other types of MPA.

Nevertheless, government should recognise that marine infrastructure, such as offshore wind farms, can provide high levels of protection for habitats and species. It should investigate the possibility of co-location during the development of future MPA designations.

Using HPMAs alongside other government goals and commitments

As set out in [Chapter 1](#), the UK vision for the marine environment is for 'clean, healthy, safe, productive and biologically diverse oceans and seas'. HPMa designation must sit alongside other government objectives for the use and protection of our seas. It is important to acknowledge HPMAs' potential for carbon storage and the opportunity provided to aid government's national commitment to net zero by 2050.

The Marine Policy Statement (MPS) is required under section 44 of the Marine and Coastal Access Act 2009 (MCAA). It supports the formulation of marine plans and ensures they use marine resources in a sustainable way. We examined the evidence on fully protected marine areas and believe HPMAs can play a role in delivering MPS objectives. These objectives include mitigating the causes of climate change, promoting diverse and resilient marine ecosystems, and contributing to societal benefits. The Environment Bill is in Parliament at the time of writing. It is intended that the proposed new [independent Office for Environmental Protection](#) will hold government to account on its policy commitments.

HPMAs would support government initiatives but they cannot be implemented without some impact on marine industries. We recognise the challenges faced by industries, particularly fisheries, with uncertainty about future fishing opportunities, access, quota, sustainability targets and spatial overlap with other industries. We want to make sure that HPMAs will benefit our seas while minimising disruption and uncertainty for those that derive their living from it. We sought evidence on social and economic effects of marine protection to aid discussion on this, outlined in [Chapter 4](#).

HPMAs may pose challenges to sea users but it is hard to deny their benefits. They would go further than any previous marine protection to safeguard our seas and its species, and help to increase biodiversity, biomass, size and

species density⁸⁷. They could help to mitigate climate change impacts and contribute to the current MPA network and wider government initiatives. This Review has supported HPMA designation due to benefits like aiding ecosystem recovery and providing a benchmark to compare with other marine protection. On this basis the Panel recommends that HPMAs are established in Secretary of State Waters.

87 Edgar, G.J., Stuart-Smith, R.D., Willis, T.J., Kininmonth, S., Baker, S.c., Banks, S., Barrett, N.S., Becerro, M.A., Bernard, A.T.F., Berkhout, J., Buxton, C.D., Campbell, S.J., Cooper, A.T., Davey, M., Edgar, S.C., Försterra, G., Galván, D.E., Irigoyen, A.J., Kushner, D.J., Moura, R., Ed Parnell, P., Shears, N.T., Solar, G., Strain, E.M.A. and Thomson, R.J. (2014). Global conservation outcomes depend on marine protected areas with five key features. *Nature* 506 216–220. Available at: <https://doi.org/10.1038/nature13022>

Chapter 4: Social and economic opportunities and challenges in introducing HPMAs

The Panel is clear that Highly Protected Marine Areas (HPMAs) are an environmental conservation measure. Their designation would present a mix of challenges and opportunities to sea users. These would make it crucial to develop an understanding of the social and economic effects generally and at the level of individual sites. Understanding these effects will help government balance ecological, social and economic considerations, subject to the need for stronger conservation efforts. This is especially relevant where there are site options that can deliver ecological objectives while enhancing social and economic benefits and/or reducing negative effects.

The Call for Evidence, site visits and stakeholder round-tables emphasised the need to consider social and economic factors when designating HPMAs. Stakeholders' views were varied on when, how and to what extent these factors should be considered, and on the influence they should exert on site selection.



Examples of stakeholder views on the need to consider non-ecological factors

“Start with the science when developing site selection and monitoring plans. Socio-economic matters moderate/influence but are not the starting point of selection and management”

(Individual respondent, Science/Research sector).

“When considering experience or examples of the effectiveness or ineffectiveness of HPMAs, we suggest consideration should be given not only to environmental effects but also to effects on local stakeholders, particularly those who had previously undertaken activity within the HPMA but have subsequently been excluded”

(Eastern IFCA, Defra ALB/delivery body).

“The development of these HPMAs should not be seen entirely using the lens of conservation, but also in terms of their economic benefits, and not just to nearby coastal communities, but in growth sectors in the fields of remote sensing and satellite surveillance, demand for which is growing internationally”

(Great British Ocean, Wildlife/Conservation sector).

“There should be no artificial separation between human use and natural science considerations in science-based policy frameworks for MPAs...A key issue that lacked attention related to displacement of existing activities which have both socio-economic, maritime safety and ecological ramifications. Such considerations should form part of a more holistic approach that seeks to incorporate human-ecological planning dimensions in the scientific evidencing process to inform decision-making”

(National Federation of Fishermen’s Organisations, Fishing sector).

“Socio-economic impacts (some more perceived than real) and fisheries displacement, especially of the inshore <10m vessels, are the key challenges to be addressed”

(Individual respondent, Public sector).

“Any introduction of HPMAs should have regard to the impact it has on existing significant activity and the adverse consequences locations could have on such locations, not just in terms of the marine industries themselves but the wider economic and prosperity consequences for coastal communities and the wider UK economy”

(UK Major Ports Group, Ports/Shipping/Cabling sector).

Social and economic effects of HPMAs

The marine environment supports societal well-being through the provision of indirect and direct services. It provides resources, including food and raw materials, biodiversity, carbon sequestration and mitigation, as well as opportunities for recreation and tourism. These uses directly benefit the economy by creating jobs and supporting businesses.

If designated, HPMAs would go further than any other marine management measure currently in use in the UK. According to the definition proposed in [Chapter 3](#), HPMAs would eliminate all extractive, destructive and depositional uses. They would allow only non-damaging levels of human activities, thereby giving the marine environment the greatest chance to recover.

Evidence from many sources shows that achieving these ambitious ecological objectives will pose challenges for current and future sea users. However, it also shows that the recovery of the marine environment can generate enhanced contributions to societal well-being.

What are the social and economic opportunities associated with HPMAs?

The social and economic opportunities associated with HPMAs are less well-evidenced than the ecological benefits, or the negative economic effects of HPMA designation. HPMA designation may enhance the benefits people receive from marine and coastal environments. However, there is uncertainty about the socio-economic opportunities offered by HPMAs, in addition to those provided by other types of Marine Protected Areas (MPAs).

Attitude and acceptance

There is evidence of support for the idea of HPMAs among the wider public in the UK⁸⁸. One study¹⁵, for example, identified strong support for designating more than 40% of UK coastal waters as marine reserves.

Respondents recognised that there was already a level of public acceptability for certain aspects of marine conservation. One organisation stated **“... public support for marine conservation is strong in the UK and elsewhere is also consistently high. Evidence elsewhere also shows that support for these sites [MPAs] among users increases over time as such sites become established if they are clearly enforced and communicated” (WWF-UK, Wildlife/Conservation sector).**

Public and stakeholder acceptance emerged as the strongest theme in responses to the Call for Evidence and the Social Science round-table. We discussed how stakeholder views would affect the introduction and success

⁸⁸ Rose, C., Dade, P. and Scott, J. (2008). Qualitative and quantitative research into public engagement with the undersea landscape in England. *Natural England*.

of HPMA, and heard that effective engagement would be imperative to their success.

Commercial, recreational and cultural benefits

HPMAs offer commercial, recreational and cultural benefits to users. These include coastal protection, fish and fisheries, biotechnology, tourism and recreation, human health and research and evidence. In addition, HPMA may enhance the aesthetic, cultural and religious significance of the area and have a range of non-use and intrinsic values.

Coastal protection

HPMAs could provide protection for marine and coastal habitats that play a significant role in coastal protection. Evidence shows that nature-based solutions can lead to reductions in the costs of coastal defence structures and reduce the effects of storm damage⁸⁹ (see also [Chapter 3](#)). Marine habitats, including kelp forest and seagrass beds, provide coastal protection and resilience through reducing the effects of wave energy on the coastline.

Fish and fisheries

Fish are part of the ecosystem and evidence shows that HPMA will benefit fish and shellfish species. A synthesis of the results of empirical studies compared partially protected areas to no-take reserves (defined similarly to HPMA in this Report) and open access areas. It found that no-take reserves outperform partially protected areas in fish density and biomass. They are also good at protecting 'target species', for which the response is largest for biomass. For non-target species the benefits of no-take reserves are less clear⁴⁶.

The Cefas 'Review of Highly Protected Marine Areas'⁵⁸ found evidence of spill-over effects from the increased internal biomass. These effects may benefit fisheries and the marine ecosystem outside the HPMA. There is evidence that the reliability and volume of catches may increase for vessels fishing very close to a no-take boundary^{90,91}. Call for Evidence respondents also suggested that the fishing industry could benefit from positive spill-over effects. The Panel heard that **"...spillover (and larval dispersal) of fish and invertebrates is larger if biomass inside the reserves is larger. We have seen examples of overfish[ing] from lobsters to scallops to tuna, in small and large reserves alike"** (*National Geographic Society, Wildlife/Conservation sector*).

Biotechnology

The marine-focused biotechnology industry is growing. Its continued growth and sustainability depend upon the conservation of ecosystems and

89 Narayan, S., Beck, M.W., Reguero, B.G., Losada, I.J., van Wesenbeeck, B., Pontee, N., Sanchirico, J.N., Ingram, J.C., Lange, G. and Burks-Copes, K.A. (2016). The effectiveness, costs and coastal protection benefits of natural and nature-based defences. *PLoS ONE*. Available at: <https://doi.org/10.1371/journal.pone.0154735>

90 Goñi, R., Hilborn, R., Díaz, D., Mallol, S. and Adlerstein, S. (2010). Net contribution of spillover from a marine reserve to fishery catches. *Marine Ecology Progress Series* 400 233–243.

91 Halpern, B., Lester, S. and Kellner, J. (2009). Spillover from marine reserves and the replenishment of fished stocks. *Environmental Conservation* 36 268–276. Available at: <https://doi.org/10.1017/S0376892910000032>

biodiversity⁹². An HPMA will protect, and possibly expand, the stock of genetic biodiversity in the marine environment. HPMA's could therefore support the long-term sustainability of the market. They can provide a sustained reservoir for genetic resources even if the industry cannot extract directly from a HPMA.

Tourism and recreation

Leisure, recreation and tourism offer non-extractive economic opportunities in HPMA's. This is likely to be the most significant economic driver associated with these protected areas.

This was supported by 62.3% of Call for Evidence respondents, who agreed that HPMA's could preserve and increase opportunities for nature-based tourism. For example, **"HPMA designation has the potential to generate significant socioeconomic benefits through increasing tourism and recreational activities"** (*The Wildlife Trusts, Wildlife/conservation sector*).

There is evidence that implementing marine reserves encourages tourism enterprises to establish and expand. This is true for globally recognised MPAs such as the Great Barrier Reef Marine Park. Further examples are in Palau, New Zealand, the Philippines, Mexico and within the Mediterranean Sea^{93,94}. Not all of these areas have full protection as HPMA's, but there is evidence that HPMA's provide additional recreational benefits compared with other types of MPA. This is due to the higher level of protection of the habitats and species in HPMA's⁵⁸.

Work at Lyme Bay produced similar evidence of benefits. In a recent study, the total value of tourism and recreation in the Lyme Bay area was over £18m per year⁹⁵. Designation of this MPA added around £2m to the total value of tourism and recreation⁹⁶. However, the same research observed that a proportion of this increase came from tourists attracted from elsewhere in the UK, not from additional UK tourists.

Overall, inshore sites are generally more accessible and frequently visited than offshore sites. This means the tourism and recreation benefits to inshore sites on HPMA designation will be greater, though these benefits will take time to occur⁹⁷.

92 Masud, M.M. (2019). Conservation and Sustainable Use of Marine Resources in Malaysia. *Conservation of Marine Resources and Sustainable Coastal Community Development in Malaysia*. Singapore: Palgrave Pivot. Available at: https://doi.org/10.1007/978-981-13-9730-1_3

93 PICRC and Stanford Center for Ocean Solutions (2019). *Palau's National Marine Sanctuary: Managing Ocean Change and Supporting Food Security*.

94 Davies, K.J., Vianna, J.J., Meeuwig, M.G., Meekan, M.G. and Pannell, D.J. (2019). Estimating the economic benefits and costs of highly protected marine protected areas. *Ecosphere*. Available at: <https://doi.org/10.1002/ecs2.2879>

95 Russi, D., Pantzar, M., Kettunen, M., Gitti, G., Mutafoglu, K., Kotulak, M. and ten Brink, P. (2016). *Socio-Economic Benefits of the EU Marine Protected Areas*. Institute for European Environmental Policy.

96 Rees, S.E., Mangi, S.C., Hattam, C., Gall, S.C., Rodwell, L.D., Peckett, F.J. and Attrill, M.J. (2015). The socio-economic effects of a marine protected area on the ecosystem service of leisure and recreation. *Marine Policy* 62 144–152.

97 Scottish Government (2016). *Scottish Marine Protected Areas Socioeconomic Monitoring 2016 Report*.

Human health

HPMA designation may augment the human health benefits currently associated with marine and coastal environments⁹⁸. The global evidence base suggests that HPMA's produce the most positive well-being outcomes in comparison to other types of MPA designation⁹⁹. Positive outcomes, which could apply to the UK, were predominantly related to economic and governance aspects of well-being, such as wealth, livelihoods, empowerment and participation.

Call for Evidence feedback recognised the health opportunities of HPMA's. Of the respondents, 5,165 supported the Marine Conservation Society Campaign response, which stated that **"... in some cases, especially in inshore waters, properly managed HPMA's will directly enhance the health and well-being of those people who regularly visit those sites"**. (*Marine Conservation Society, Wildlife/conservation sector*)

Research and evidence

As well as designating HPMA's, government should use these designations to improve the social and economic evidence base^{95,100}. [Chapter 7](#) describes the need for monitoring and evaluation of HPMA's.

Call for Evidence respondents discussed using HPMA's to gather baseline data for marine research and the opportunity for increased monitoring, evaluation and impact research. This increased understanding of the marine environment will benefit managers, marine users and the wider public through improved management and regulation. The Panel heard that **"... parts of most MCZ's, SACs and existing designations should all have HPMA's designated as 'reference areas' to assess effectiveness of lesser management measures [in non-HPMA sites]"** (*University of Plymouth, Science/Research sector*)

Educational opportunities

HPMA's offer educational opportunities above those associated with existing MPAs. These could raise awareness, enhance engagement and take steps towards developing 'Ocean Literacy'^{101,102} within local communities.

Call for Evidence respondents recognised that HPMA's offered opportunities to discuss HPMA's and broader marine protection with local communities. Respondents provided examples of successful engagement. One example was from Beachy Head West and East, **"Designating MCZ status at Beachy Head West and zests [east] has really helped educators connect the local**

98 Department for Environment, Food & Rural Affairs (2020). *The well-being and human health benefits of exposure to the marine and coastal environment*. Evidence Statement 07.

99 Ban, N.C., Gurney, G.G., Marshall, N.A., Whitney, C.K., Mills, M., Gelcich, S., Bennett, N.J., Meehan, M.C., Butler, C., Ban, S. and Tran, T.C. (2019). Well-being outcomes of marine protected areas. *Nature Sustainability* 2 524.

100 Schratzberger, M., Paltriguera, L., Neville, S., Weston, K. and Painting, S. (2016). *Review of Highly Protected Marine Areas*. Appendix 4 Ecological and socio-economic literature and evidence.

101 Pittman, S.J., Rodwell, L.D., Shellock, R.J., Williams, M., Attrill, M.J., Bedford, J., Curry, K., Fletcher, S., Gall, S.C., Lowther, J. and McQuatters-Gollop, A. (2019). Marine parks for coastal cities: A concept for enhanced community well-being, prosperity and sustainable city living. *Marine Policy* 103 160–171.

102 Brennan, C.J., Molloy, O.D. and Ashley, M. (2019). A system dynamics approach to increasing ocean literacy. *Frontiers in Marine Science* 6 360.

community with these environments for better understanding” (*Atlanta Cook Marine Environment Consultancy, Science/Research sector*).

Another example was from Plymouth Sound National Marine Park, “The designation of Plymouth Sound as a National Marine Park has early evidence of showing great societal impact on understanding the importance of these areas on our doorstep. Many people associate poverty with third world countries, and marine pollution with poor turtles in the Pacific Garbage Patch, and pay less attention to it. By bringing it home, right onto people’s doorstep, they feel more passionate and empowered to do something about it” (*Individual respondent, Other sector*).

Experience from other HPMAs convinced us that HPMAs would offer opportunities to raise awareness of marine issues among the wider public. We believe government and site managers should take advantage of these opportunities.

Recommendation: Government and others should use HPMAs as an opportunity to increase public awareness of, and engagement with, the marine environment.



Aesthetic, cultural and religious significance

Aesthetic, cultural and spiritual values are also associated with marine environments¹⁰⁰. The high level of protection afforded by HPMAs, allowing for the recovery of marine ecosystems, could increase the appreciation and enjoyment of the beauty of such environments, and could strengthen the positive emotional responses connected with sites of cultural and religious significance. More than two-thirds (67.9%) of respondents to the Call for Evidence agreed that HPMAs should be introduced “to support or improve opportunities for cultural, spiritual, educational and/or recreational activities”.

Non-use and intrinsic values

The socio-cultural value of MPAs does not all come from direct use or visitation of the area. It is often argued that people derive well-being from knowing that protection is in place for marine and coastal environments, for current and future generations, and such values have often been referred to as ‘non-use’, ‘existence’ or ‘bequest’ values^{95,103,104}. Alternatively, such positive feelings are expressed in terms of obligation – a sense that protecting the environment is the right thing to do because it fulfils a duty^{105,106}. This sense of obligation was clearly reflected in the Call for Evidence, where a very high proportion (90.4%) of respondents agreed that HPMAs should be introduced “to look after our seas as part of our duty as stewards of the natural environment”.

Important arguments have also been made about innate¹⁰⁷ or intrinsic value. This was defined in the Millennium Ecosystem Assessment as “the value of something in and for itself, irrespective of its utility for someone else”^{104,108,109,110}. While some dispute that intrinsic values can meaningfully be quantified in terms of utility, such values have undoubtedly been important motivators of conservation^{111,112}. However characterised, they contribute to the case for HPMAs, including those that are remote and therefore difficult for people to access or use^{94,113}.

Experience suggests that engagement efforts, including communication, interpretation, exhibitions, film, educational opportunities and citizen science have the potential significantly to enhance human well-being associated with the aesthetic, cultural, spiritual and intrinsic values of protected areas like HPMAs.

103 Pearce, D.W. and Turner, R.K. (1990). *Economics of Natural Resources and the Environment*. Maryland, USA: JHU press.

104 Millennium Ecosystem Assessment (2005). *Ecosystems and human well-being: Synthesis*. Washington, D.C., USA: Island Press.

105 O’Neill, O. (1997). Environmental values, anthropocentrism and speciesism. *Environmental Values* 6 127–142.

106 O’Neill, J. (1993). *Ecology, Policy and Politics: Human Well-Being and the Natural World*. London: Routledge.

107 Department for Environment, Food & Rural Affairs (2007). *A Sea Change: A Marine Bill White Paper*, p. 4.

108 Hargrove, E. (1992). Weak anthropocentric intrinsic value, in Oelschlaeger, M. ed. *After Earth Day: Continuing the Conservation Effort*, pp. 141–169. Texas, USA: University of North Texas Press.

109 Johnson, L. (1991). *A Morally Deep World: Essays on Moral Significance and Environmental Ethics*. Cambridge, UK: Cambridge University Press.

110 Owens, S. and Cowell, R. (2011). *Land and Limits: Interpreting Sustainability in the Planning Process*. London, UK: Routledge.

111 Sagoff, M. (1988). *The Economy of the Earth*. Cambridge, UK: Cambridge University Press.

112 McCauley, D.J. (2006). Selling out on nature. *Nature* 443 27–28.

113 Börger, T., Hattam, C., Burdon, D., Atkins, J.P. and Austen, M.C. (2014). Valuing conservation benefits of an offshore marine protected area. *Ecological Economics* 108 229–241.

Recommendation: Government and local authorities should seek to maximise the direct and indirect social, economic and cultural benefits of HPMAs designation.

What are the social and economic challenges of HPMAs?

Social and economic challenges in implementing HPMAs result from excluding specific activities. These are described below. It is important that government recognises and acknowledges these negative effects as the stakeholders who are impacted are crucial for successful implementation.

Evidence shows that excluding some activities has economic, social and cultural effects on the people and industries involved. This is predominantly from the loss of access and loss of economic opportunities^{114,115,116}. It is important that government considers these effects in site selection and implementation processes, and in the evaluation of the effectiveness of HPMAs. We conclude that government should use the ecological principles described in [Chapter 6](#) to select HPMAs, instead of allowing socio-economic challenges to guide selection.

Displacing activities from one area to another could have negative effects. It is also inevitable that individuals and stakeholder groups will feel the impacts of HPMAs more strongly than others. This has implications for social equity.

There are significant gaps in the evidence on the social, cultural and economic effects of MPAs on individuals and local communities in the UK. However, we can draw insights from:

- The global evidence base examining economic, social and cultural effects of MPAs (including HPMAs)^{99,117,118}; and
- Experiential and local knowledge from the Call for Evidence and wider literature (e.g. consultations and peer-reviewed studies).

Attitudes and acceptance

Effective stakeholder engagement is imperative to gain stakeholder 'buy in' and social acceptance for HPMAs. This is the case where HPMAs introduction could have negative effects on activities and could face opposition. The Panel heard that **"Challenges to the introduction of HPMAs will inevitably come**

114 Marine Management Organisation (2013). *Social impacts of fisheries, aquaculture, recreation, tourism and marine protected areas (MPAs) in marine plan areas in England*, p.192.

115 Marine Management Organisation (2014). *Method and data to monitor the social outcomes of marine plans*, p. 84.

116 Marine Management Organisation (2014). *Social impacts and interactions between marine sectors*, p. 273

117 Mascia, M.B., Claus, C.A. and Naidoo, R. (2010). Impacts of marine protected areas on fishing communities. *Conservation Biology* 24 1424–1429.

118 Navarro, M., Kragt, M.E., Hailu, A. and Langlois, T.J. (2018). Recreational fishers' support for no-take marine reserves is high and increases with reserve age. *Marine Policy* 96 44–52.

from those whose activities might be negatively affected” (Flora and Fauna International, Wildlife/Conservation sector) and “Groups such as commercial fishermen or anglers may be opposed to changes in the law that they feel may affect their livelihoods or recreation” (*Individual respondent, Sector unknown*).

Although there is support for HPMAs, public awareness of HPMAs (e.g. aims and objectives) and expectations present challenges for their introduction and success. [Chapter 5](#) discusses potential solutions to these challenges.

Commercial, recreational and cultural challenges

Challenges for the fishing industry

Commercial and recreational fisheries would be excluded from HPMAs. Evidence on the economic effects of designation on fisheries is mixed. In some circumstances, displacement could increase costs and decrease incomes.

Smaller vessels, and those with less diverse catches, play a role in community cohesion and provision of local livelihoods. These vessels will suffer more than larger ones as they may not have the capability to fish elsewhere. In addition, some Call for Evidence responses questioned whether displaced vessels could safely operate in alternative areas with “...**loss of income, higher fuel costs increased danger by being forced to fish further offshore with vessels less suitable for the task**” (*Individual respondent, Fishing sector*).

Government should balance the need for HPMAs in inshore waters with an action plan supporting social, economic and environmental development of coastal communities. This plan should contain specific actions to support the financial resilience and business success of small-scale coastal fishers and other small businesses.

Call for Evidence respondents discussed the potential to increase fishing effort immediately outside sites. For example, “...**this effect has been well documented in MPA’s globally, where fishers are displaced from areas, thus increasing effort in the surrounding area or potentially ‘fishing the line’ around the closure**” (*The Holderness Fishing Industry Group, Fishing sector*).

In Lyme Bay, bottom-towed fishing gear is excluded and this prohibits dredging for shellfish and demersal trawling over a large area (see [Box 4](#)). Research⁷⁷ shows that the bottom-towed gear exclusion zone had minimal effects on income and financial profits within the seafood value chain. This may be because there was an increase in static gear fishing within the site following the exclusion of bottom-towed gear fishing. The study also showed displacement of bottom-towed gear fishing into static gear fishers’ traditional grounds increased reported conflicts between fishers.

We recognise that not all fishers are capable of moving location, and that displacement of fishing activity may increase spatial conflict between different

gear types. Government must address fishery displacement issues when establishing HPMA.

Challenges for other marine industries

HPMAs may increase spatial conflict with other marine industries, such as the aggregates or offshore wind industries. The primary consideration in HPMA selection should be ecological. However, the exclusion and displacement of other industries, and the impacts of this on government's wider commitments ([Chapter 1](#)), must also be considered when implementing and managing HPMA.

We heard about a number of specific effects. For example, HPMA could displace some aggregates extraction, which provides important products for the construction industry. The aggregates industry could experience increased costs if displacement occurred. It could also face increased license fees, and environmental impact assessment costs if operating near an HPMA.

There may be impacts on offshore wind farm developments. HPMA could extend cabling routes and block access to terrestrial connection points, as well as reduce the effective area available to install offshore windfarms. Appropriate marine planning could avoid these effects which could increase costs to the consumer and impact government's net zero obligation. Through the Call for Evidence, the Panel heard that "... **without adequate baseline data, industry would be concerned that any closure or no take zone could place greater stress on adjacent sites through the displacement or translocation of fisheries or other marine users. In order to avoid this, the process must rely on sufficient data in order to understand the nuances and potential impacts ahead of any decision**" (*Renewable UK, Energy sector*).

Displacement of new cables might result in increased costs for sub-sea cables and terrestrial infrastructure.

Displacement of pressures from HPMA could cause damage to other parts of the marine environment if not managed carefully. We believe that, as for fisheries, government must address displacement effects for other industries as part of HPMA implementation and management.

Recommendation: Government should acknowledge displacement in its decision making during HPMA designation. It should put strategies in place to support marine uses and avoid creating new problems from moving pressures to other parts of the marine environment.

Evidence shows that some activities such as tourism can be co-located with HPMA and enhance their socio-economic benefits. However other activities, such as offshore renewables (see also [Chapter 3](#)) and aggregates extraction, require exclusive use of an area and cannot be co-located at present. Marine planning must play a role in resolving these conflicts, including the impact of

displacement if it cannot be avoided, but Marine Plans are not yet sufficiently spatially prescriptive to achieve this.

HPMAs could increase conflicts between some marine uses but we do not consider this a reason for failing to designate HPMAs. Addressing these issues is beyond the remit of this Review, but we believe this potential rise in conflicts should be managed with an effective system of marine spatial planning.

Recommendation: Government should plan the sustainable and equitable use of the marine environment. This includes ensuring that Marine Plans are sufficiently spatially prescriptive to address competing demands on space, alongside the need to allow nature to recover.

We identified potential benefits associated with introducing HPMAs. Excluding activities from HPMAs will have economic, social and cultural impacts, predominantly from loss of access and the loss of economic opportunities. The evidence does not undermine the case for establishing HPMAs, but highlights the need for action alongside their introduction. This action would deliver the additional benefits that could derive from HPMAs and address negative effects on stakeholders.



Chapter 5: The path to successful site identification and designation

The importance of effective engagement was a consistent theme in our outreach activities and in the Call for Evidence. We heard of excellent examples of engagement but also of cases where it had failed. Such failures were given as a reason why MPAs had not been introduced. Many of these experiences focussed on engagement as part of the site selection process. For example, “...it would be hoped that the experience gained from many years of delivering programmes of marine protected area designation that a thoughtful and well-designed approach would be taken to consult stakeholders and thereby make decisions about the format of any system of highly protected areas and how they might be introduced” (*Historic England, Public sector*).



We heard views that decision makers should designate HPMAs based on the best available ecological, social and economic evidence. Call for Evidence responses suggested that once sites were designated, government and regulators could engage with stakeholders to inform them of management. This approach might seem to be more efficient, but evidence suggests that it risks alienating stakeholders and potentially reducing compliance.

The Marine Conservation Zone (MCZ) site selection process was intensive, and the early stages aimed to be stakeholder-led. MCZ site selection included the MCZ Regional Projects process, three formal consultations with over 100,000 responses, and numerous informal engagement activities. Despite this, some stakeholders still felt excluded from the process and decisions.

We are persuaded that learning from experience can improve engagement when selecting HPMAs. Nevertheless, we recognise resource constraints and the difficulty of pleasing everyone. We conclude that authorities should improve the **quality**, rather than **quantity**, of engagement during the designation process.

Successful engagement builds trust between decision makers and stakeholders. It helps to negotiate (but not necessarily eliminate) conflict and assists in identifying solutions and areas of compromise¹¹⁹. Engagement generates higher acceptance and buy-in, and can also lead to successful implementation and management. Increased compliance, reduced monitoring burdens and better governance are potentially positive effects of successful early engagement¹²⁰. Call for Evidence responses highlighted specific examples of good practice: **“By the end of the Irish Seas Conservation Zone project the group had turned from a combative self-interest driven group into a group of people who understood each other’s viewpoint and respected it so were more easily able to find compromise and agreement”** (*North West Coastal Forum, Public Sector*).

Other responses highlighted the importance of public engagement: **“Engagement with members of the public is essential, because it builds public knowledge and education of the problems and can produce answers”** (*Torfaen Friends of the Earth, Wildlife/Conservation*).

Respondents also recognised the need for participatory methods: **“Participatory and transparent processes of decision-making that go beyond consultation and give stakeholders some level of meaningful influence will be important for the legitimacy and associated effectiveness of the HPMAs”** (*University of Exeter, ExeterMarine Community, Science/Research sector*).

119 Reed, M.S. (2008). Stakeholder participation for environmental management: A literature review. *Biological conservation* 141 2417–2431.

120 Giakoumi, S., McGowan, J., Mills, M., Beger, M., Bustamante, R.H., Charles, A., Christie, P., Fox, M., Garcia-Borboroglu, P., Gelcich, S. and Guidetti, P. (2018). Revisiting “success” and “failure” of marine protected areas: A conservation scientist perspective. *Frontiers in Marine Science* 5 223.

As well as the benefits of engagement, we also heard about the risks of ineffective engagement when identifying areas for MPAs. This message was particularly strong in the Call for Evidence and social science round-table. Without meaningful engagement, identifying and designating sites could produce conflict. We know from experience with MPAs that attempts to introduce sites can fail as a result. An individual respondent pointed to “... examples of failed MPA’s around the Welsh coast where the local stakeholders did not feel a part of the project and without their support the areas have failed in their aims” (*Individual respondent, Other sector*)

Principles for engagement

There are many ways to engage and different approaches suit different contexts. From the Call for Evidence, best practice guidance^{121,122} and peer-reviewed literature^{119,123} we conclude that there are three main principles that guide stakeholder engagement. They are:

- Clarity and transparency;
- Representation and diversity of views; and
- Early and continuous engagement.

Recommendation: Government should adopt the principles of transparency and early, continuous engagement with a range of stakeholders in HPMA site consideration.

Clarity and transparency

Future engagement must clarify the aims, definition and management of HPMA. A lack of clarity creates uncertainty and can lead to misunderstanding, negative perceptions and disengagement^{124,125,126,127}. This is particularly important when communicating the risks and potential effect on stakeholders^{128,129}. The challenge is that it is difficult to assess the effects before detailed proposals for HPMA sites and legal and management plans are developed. Regarding the previous MCZ process, we heard from stakeholders

121 Ehler, C. and Douvère, F. (2009). Marine spatial planning: A step-by-step approach toward ecosystem-based management. *UNESCO*.

122 NOAA (2007). Social science tools for coastal programs. *NOAA Office for Coastal Management*

123 Gopnik, M., Fiesler, C., Cantral, L., McClellan, K., Pendleton, L. and Crowder, L. (2012). Coming to the table: Early stakeholder engagement in marine spatial planning. *Marine Policy* **36** 1139–1149.

124 Young, J.C., Jordan, A., Searle, K.R., Butler, A., Chapman, D.S., Simmons, P. and Watt, A.D. (2013). Does stakeholder involvement really benefit biodiversity conservation? *Biological Conservation* **15** 8359–370.

125 Walton, A., Gomei, M. and Di Carlo, G. (2013). Stakeholder engagement: *Participatory Approaches for the Planning and Development of Marine Protected Areas*.

126 Lieberknecht, L.M., Oiu, W., Jones, P.J.S. (2013). *Celtic Sea Case Study Governance Analysis Finding Sanctuary and England’s Marine Conservation Zones*.

127 UK Parliament POST (2013). *Selection of Marine Conservation Zones*.

128 Pieraccini, M. and Cardwell, E. (2016). Divergent perceptions of new marine protected areas: Comparing legal consciousness in Scilly and Barra, UK. *Ocean & Coastal Management* **119** 21–29.

129 Gall, S.C. and Rodwell, L.D. (2016). Evaluating the social acceptability of marine protected areas. *Marine Policy* **65** 30–38.

that: **“There was no clear guidance in the consultation and it was very open to get stakeholders and public’s questions. This led to much local/public misunderstanding due to the lack of clarity... and the lack of any guidance/ clarity meant that the whole thing was designed to fail. This has led to much negative feelings to possible MCZ’s and highly protective areas in coastal communities...and everything now is an uphill battle”** (*Individual respondent, Sector unknown*).

Defining HPMAs and their management implications reduces uncertainty and misunderstandings¹³⁰ but also provides a tangible proposal to be tested and refined, acknowledging local context. The predicted outcome is that stakeholders are more likely to accept and allow the proposals to succeed^{120,128}. It should be easier to provide a clear definition for HPMAs than it was for the MCZ process. To provide such clarity, we set out our definition in [Chapter 3](#) and management proposals in [Chapter 7](#).

As well as being clear on what HPMAs entail, government must clarify the scope of the engagement process itself. This means setting out how it will use any information gathered, and what is (and is not) open to discussion. From what we have heard, identifying the scope of, and constraints on, engagement and decision-making processes will help to build trust and avoid disappointment.

Representation and diversity

A challenge for any engagement process is achieving widespread, inclusive and diverse representation¹³¹. This was strongly expressed in the Call for Evidence responses. Individual respondents stated that **“All stakeholders, including all members of the local communities near HPMAs not just fishers, need to be included in the discussion at every stage of the implementation process”** (*Individual respondent, Science/Research sector*) and that **“...careful thought needs to be given to who is involved beforehand, so that the process is not disrupted by later additions”** (*Individual respondent, Other sector*).

The engagement approach should be innovative and creative for the best chance of including the hard-to-reach and under-represented voices. It is important for engagement to occur at national and local levels. Taking the time to map out who should be engaged and the most effective approaches to reach them is crucial.

130 McAuliffe, S., Potts, J., Canessa, R. and Baily, B. (2014). Establishing attitudes and perceptions of recreational boat users based in the River Hamble Estuary, UK, towards Marine Conservation Zones. *Marine Policy* 45 98–107.

131 Jones, P.J. (2009). Equity, justice and power issues raised by no-take marine protected area proposals. *Marine Policy* 33 759–765.

Early and continuous engagement

Sufficient time and resources will also be prerequisites for effective engagement^{127,132}. Call for Evidence respondents reflected that a lack of time had caused failures of engagement in previous MCZ site selection. This experience should not be repeated for HPMAAs.

Sufficient time allows for input from across stakeholder sectors and is important for building relationships and trust¹¹⁹. Call for Evidence responses emphasised these requirements. Drawing on an example from the Port Erin Bay Marine Nature Reserve (Isle of Man), one response stated: “... it is important to note that our good relations with the local fishing community did not develop overnight. Instead, there was a period of regular engagement with fishermen for several years prior to the new designation” (*ClientEarth, Wildlife/Conservation sector*). Call for Evidence responses also recognised the importance of allowing time for people to plan and adapt to proposed changes by ensuring “... engagement processes that allowed sufficient time to engage with the relevant interests operating in the areas of interest” (*National Federation of Fishermen’s Organisations, Fishing Sector*).

We encourage decision makers to reflect upon the balance between time constraints and the effectiveness of stakeholder engagement when designing the HPMA designation process.

As well as allowing sufficient time for engagement, considering when to engage is important. The Call for Evidence and round-tables produced differing opinions on the relative merits of engaging before or after identifying potential sites.

We believe engagement should take place at the earliest point once the aims of HPMAAs are clear and that the site selection process should be robust and transparent. Site selection should be science-led and based on the ecological principles set out in [Chapter 6](#). However, early engagement will increase trust and buy-in to the process and enable access to stakeholders’ expertise and knowledge.

To increase trust and ownership, engagement should continue beyond site selection through to designation and implementation. A criticism of the MCZ process was that after a successful participatory approach to engagement at the site selection stage, designation became a top-down process¹³³. Stakeholders reported a loss of ownership and a decline in transparency and social capital. For example, “... the lesson here, which particularly applies to any HPMA process that may follow, is the need to be absolutely clear how stakeholders will be involved, not only during designation processes,

132 Pound, D. (2009). Adopting effective stakeholder engagement processes to deliver regional marine protected area (MPA) network. *Natural England*.

133 Lieberknecht, L.M. and Jones, P.J.S. (2016). From stormy seas to the doldrums: The challenges of navigating towards an ecologically coherent marine protected area network through England’s marine conservation zone process. *Marine Policy* 71 275–284. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X16302172>

but also beyond them once sites are in place..." (*British Marine Aggregate Producers Association, Aggregate sector*).

We have been convinced that a more robust process involving stakeholders has the potential to deliver better, and better supported, HPMA. Such an approach would provide the designation process with some flexibility to respond to local and site-specific contexts, whilst still delivering the desired environmental benefits. Whilst we advocate a stakeholder process that is wide-ranging, ensuring that views are heard and deliberated, and lessons learnt, the process should also be compatible with timely progress towards introducing HPMA as an essential instrument of marine conservation. Within this broader policy, we do not believe that lack of complete consensus should prevent or unreasonably delay site designation.

We heard support for the co-management of HPMA where state institutions, other organisations and stakeholders share governance and decision-making power post designation. We discuss the benefits and limitations of this approach in [Chapter 7](#).

Science and Evidence

Evidence requirements for marine protection will differ during site identification, designation and management. Government required the 'best available evidence' for site identification and designation at the start of the MCZ process¹³⁴. This acknowledged that action should not be limited by lack of certainty on the evidence, though in sites where stakeholder activities were restricted, the quantity and quality of evidence needed to be higher. A best available evidence approach gave flexibility in the evidence gathered and enabled local and expert evidence to inform regional group discussions.

In response to feedback from Defra, tranche 1 designation and subsequent MCZ tranches shifted to a need for 'sufficient evidence' for site identification, designation and implementation¹³⁵. This change in approach moved the burden of proof onto government. This slowed the MCZ designation process, with over £9 million^{136,137} spent on survey work in potential MCZs between 2011 and 2016.

We believe the HPMA process should take a pragmatic approach to evidence, recognising the value of differing evidence sources and expert knowledge.

134 Joint Nature Conservation Committee (2011). Levels of evidence required for the identification, designation and management of marine conservation zones. *Natural England*. Available at: http://jncc.defra.gov.uk/pdf/110506_LevelsOfEvidenceForMCZs.pdf

135 Joint Nature Conservation Committee (2016). MCZ levels of evidence: advice on when data supports a feature/site for designation from a scientific, evidence-based perspective. *Natural England*. Available at: <http://data.jncc.gov.uk/data/c812bf90-1e37-4623-ab6a-e97f471a2492/MCZ-levels-of-evidence-Addendum-2016.pdf>

136 Department for Environment, Food & Rural Affairs (2011). Defra R&D Data Collection Programme for recommended Marine Conservation Zones (rMCZ). Available at: <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=18221&FromSearch=Y&Publisher=1&SearchText=m-cz&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

137 Department for Environment, Food & Rural Affairs (2011). Defra R&D Data Collection Programme for recommended Marine Conservation Zones (rMCZ). Available at: <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=18983&FromSearch=Y&Publisher=1&SearchText=m-cz&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

We acknowledge that the evidence base will always be incomplete but are convinced that, once the best available evidence is collated, the need for 'perfect' evidence should not be used as a delaying tactic.

Recommendation: Government should use 'best available evidence' to designate HPMA and should not use a lack of perfect evidence as a reason to delay HPMA designation.

Legal frameworks

Many stakeholders and members of the public have had previous experience of MPA designation and management. We heard a range of opinions relating to the legal frameworks used in marine protection.

It is clear to us that stakeholders and the wider public will have greater trust in HPMA if they sit within a robust legal framework. For example, it was noted that *"...ultimately whatever course is decided on HPMA will require the legislation behind them to ensure they are fully protected"* (North Western IFCA, Defra ALB/delivery body).

For HPMA to take a 'whole site approach', resource and evidence availability make it unrealistic for government to list every designated feature within a given area in the designation order. This might, for example, be required if HPMA were designated as MCZs under the Marine and Coastal Access Act 2009 (MCAA). Moreover, the feature-led approach to MPA designation and management is not appropriate to respond to the potential ecological benefits across a whole site which HPMA might deliver.

To deliver a whole site approach we propose that HPMA adopt broad conservation objectives to give a high level of protection to the marine environment. In our view, this would be the most pragmatic means of introducing HPMA which fulfil the objectives outlined in [Chapter 3](#).

There are a number of options for creating legal powers for HPMA, including:

- a. Introducing new primary legislation to create a bespoke HPMA designation regime;
- b. Using the existing MCZ provisions under MCAA;
- c. Amending the Marine and Coastal Access Act (MCAA) through a Statutory Instrument;
- d. Using Inshore Fisheries and Conservation Authority or Marine Management Organisation byelaws; or
- e. Using the provisions for Sites of Special Scientific Interest under the 1981 Wildlife and Countryside Act.

The above options are appropriate either individually or in combination. Government will decide the best route for designating HPMA's. It will take account of the time taken to introduce a framework and the need for a robust legal mechanism. Whatever approach prevails, we recommend the timely and pragmatic implementation of HPMA's.

Recommendation: Government must introduce and manage HPMA's using quick and pragmatic legislative approaches.



Chapter 6: How should government identify HPMA – principles for site selection

A major objective of this Review was to develop criteria for government to select Highly Protected Marine Areas (HPMAs). It was also to create a process to identify and introduce pilot HPMA in Secretary of State Waters.

How we developed site selection principles

The Panel developed a set of site selection principles. We used evidence from previous Marine Protected Area (MPA) designation processes, information from the Call for Evidence, site visits, round-tables and relevant literature. We also consulted the Statutory Nature Conservation Bodies (SNCBs) ([Box 5](#)). Our proposed site selection principles reflect the connections between the environmental, social and economic factors that will collectively determine the success of HPMA.

How listening to experience helped develop selection principles

Call for Evidence responses clarified the importance of selecting HPMA for ecological benefit. The Panel recommends applying ecological principles when first identifying HPMA pilot sites. Respondents acknowledged the need to take account of social and economic factors during site selection, recognising that HPMA would be more likely to achieve their ecological aims as a result. We recommend that once sites have been filtered using ecological principles, government should consider social and economic factors to identify potential HPMA.

Recommendation: Government should identify sites for HPMA designation using the principles of ecological importance; naturalness, sensitivity and potential to recover, and ecosystem services. Social and economic principles are a secondary filter.

We heard throughout the Review that HPMA should be large enough to deliver sufficient environmental benefits. Call for Evidence respondents noted that **“Size [is] relative to the ecological impact. The larger the better”** (*Marine Conservation Society, Wildlife/Conservation sector*).

They also suggested that this is supported by the current evidence base⁸⁷. For example, “MPAs can only be effective if they have 4 out of 5 qualities: no take, large size, old (over 10yrs), well enforced and isolated” (*Individual respondent, Science/Research*).

Evidence suggests a minimum effective size for the existing MPA network¹³⁸ and this knowledge should be applied to inform HPMA sizing. If this minimum size is realised, HPMA sizing should be determined after applying the environmental principles and subsequently the social and economic principles. This allows for consideration of site-specific factors.

Due to the benefits that existing MPAs can offer, such as the provision of buffer zones, we recommend siting HPMA within existing MPAs. However, we recognise that in future there may be benefits in locating HPMA elsewhere, for example to allow for partnerships to be built between marine managers and emerging industries. This flexibility may prove successful in supporting the protection and restoration of the marine environment.

Recommendation: HPMA should be located within existing MPAs as the existing site will act as a buffer zone to the HPMA. However, in the future alternative locations could be considered, such as co-location with existing and emerging marine industries.

Ecological Principles

Throughout the Review, the Panel reviewed evidence and heard strong support for the potential environmental and ecological benefits that HPMA can deliver (see [Box 5](#) for examples of views from the SNCBs). This support came from many different marine users. Call for Evidence respondents generally backed ecological reasons for HPMA introduction, including specific references to HPMA protecting “...biodiversity hotspots” (*Individual respondent, Science/Research*) and “...habitat[s] that could help with mitigating climate change impacts e.g. seagrass meadows and kelp beds...” (*Individual respondent, Science/Research*).

We recommend that ecological principles are the primary filters when considering identification. This is to ensure HPMA provide reliable and accurate baseline data, thereby increasing society’s understanding of the marine environment. The ecological principles we developed to identify HPMA will create areas of the sea that provide baselines to help us understand the success of existing MPA designations.

138 Roberts, C.M., Hawkins, J.P., Fletcher, J., Hands, S., Raab K. and S. Ward. (2010). Guidance on the size and spacing of marine protected areas in England. *Natural England*.

Views from Statutory Nature Conservation Bodies (SNCBs) – NE and JNCC

These bodies advised government during the development of the UK's current MPA network. The Panel sought input from the SNCBs during the Review, including their advice on HPMAs introduction.

The Joint Nature Conservation Committee (JNCC) and Natural England both believed that HPMAs could deliver most value by providing a definition for “...what ‘good’ or ‘favourable’ condition looks like for the range of features afforded protection under the existing MPA network” (JNCC).

The SNCBs held complementary views to other stakeholders on the potential for HPMAs to provide natural solutions to climate change. Natural England was clear that “...the network design principles set out in the Ecological Network Guidance remain valid but would benefit from additional principles around natural capital/climate change”.

Box 5. Views from the SNCBs from the Call for Evidence.



The Panel looked to previous designations as a starting point to identify these ecological principles. This included the Ecological Network Guidance⁴⁸ developed by Natural England and the Joint Nature Conservation Committee (JNCC) for use in MCZ identification as well as Marine Scotland's naturalness principle¹³⁹. The Ecological Network Guidance supports the creation of an ecologically coherent MPA network, and we felt it was relevant for HPMA.

As discussed previously, the ocean plays an important role in global carbon cycling. By maintaining a healthy marine environment, we are likely to increase climate change resilience. Many stakeholders and SNCBs recognise this potential to combat climate change. This Review therefore recommends that blue carbon habitats are identified for protection during the HPMA site selection process.

Recommendation: In identifying HPMA, government should consider blue carbon habitats to improve the climate resilience of the seas.

The Panel recommends three ecological site selection principles to underpin identification of HPMA (Box 6).

139 *Marine Protected Areas in Scotland's Seas. Guidelines on the selection of MPAs and development of the MPA network.* Available at: <https://www2.gov.scot/Resource/0051/00515466.pdf>

Ecological Principle 1: Ecological importance

The evidence supporting the introduction of HPMA, described in [Chapter 3](#), emphasises the ecological benefits provided by HPMA. We consider the structure and functioning of an ecosystem within an HPMA to be of key ecological importance. As such, this principle ensures that decision makers recognise these essential structures and functions during an HPMA identification process. We appreciate that ecological importance can be measured in a variety of ways.

Ecological Principle 2: Naturalness, sensitivity and potential to recover

Degradation in marine ecosystems occurs when the habitats and species they contain are more sensitive to the human pressures they are subject to. Where parts appear to be less impacted, HPMA help us understand how ecosystems exist in the absence of damaging human activities. Where the ecosystem is more degraded, HPMA help us understand the process and timescales for recovery. This principle enables us to identify areas to demonstrate how recovery and/or change occurs in the absence of damaging human activities.

Ecological Principle 3: Ecosystem services

The marine environment supplies valuable ecosystem services, such as the ability to provide resilience to climate change, shoreline protection, and food. The ocean is a huge carbon sink and plays a major role in global cycling of carbon. Specific marine habitats and species have a capacity to capture and store carbon from the surrounding environment and are referred to as blue carbon habitats (see [Chapter 5](#)). Stakeholders proposed that HPMA selection protects blue carbon habitats from future damage. We recommend that capacity to protect blue carbon habitats and other important ecosystem services is an underlying principle for site selection.

Box 6. Ecological principles for HPMA site selection.

The Panel identified and developed criteria to fulfil each ecological principle which could be used in an HPMA identification process. These criteria are presented in [Annex 4](#).

Social and economic principles

Ecological principles are an essential first step in identifying sites to deliver the best environmental outcomes. An important second step is understanding the wider social and economic factors surrounding HPMA introduction. By considering these factors, decision makers can identify the HPMA most likely to be effectively designated, implemented, managed, enforced and monitored. This is crucial, as without effective delivery, the environmental benefits of HPMA will not be realised even if a perfect ecological HPMA candidate is identified.

By recommending the inclusion of social and economic principles (see [Box 7](#)), the Panel recognised the interconnectedness of environmental, social and economic systems that deliver our environmental aims. Ultimately, these systems must interact to enable and deliver environmental change.

While acknowledging their importance, we also know that incorporating these principles in a site selection process will be difficult. In the Call for Evidence, we received differing views about the inclusion of social and economic factors, particularly how to apply evidence and weigh it against environmental factors. On one hand, it was noted that **“Existing management arrangements and uses of the marine area should be key considerations in selecting any areas so that socio-economic factors and knock-on displacement effects are appropriately considered”** (*South Western Fish Producer Organisation Ltd, Fishing Sector*).

Whereas we heard the opposing opinion from other stakeholder groups. For example, **“Business interests who would profit financially should be excluded”** [from the site selection process] (*East Kent Wildlife group, Wildlife/Conservation*).

We recognise this difference in opinion but do not believe it is reason enough to ignore this challenge.

This Review identified three possible social and economic principles we think that, if fulfilled, will help HPMA to achieve their environmental aims ([Box 7](#)). These would entail paying careful attention to:

1. Attitudes and acceptability;
2. Governance, management and capacity; and
3. Social and economic activities and effects.

The Panel recognised the limitations in monetising the impacts of HPMA in any future analysis to support HPMA identification and designation. We feel that an extensively monetised assessment would not be appropriate in this process. Therefore, under Social and Economic Principle 3 we envisage that activities would only be taken into consideration if they are currently occurring in the area of the potential HPMA. This allows for an understanding of how widespread the activity is, and the potential impact of HPMA introduction. In line with the principles above, we feel that government should not use economic valuation alone to choose between sites.

Social and Economic Principle 1: Attitudes and acceptability

Protected sites are much more likely to be successful where there is high social acceptance and local buy-in. The importance of effective stakeholder and public engagement was a strong cross-cutting theme from the Call for Evidence. We heard the same arguments at site visits and round-tables. This principle addresses knowledge, attitudes and social acceptance from stakeholders and local communities.

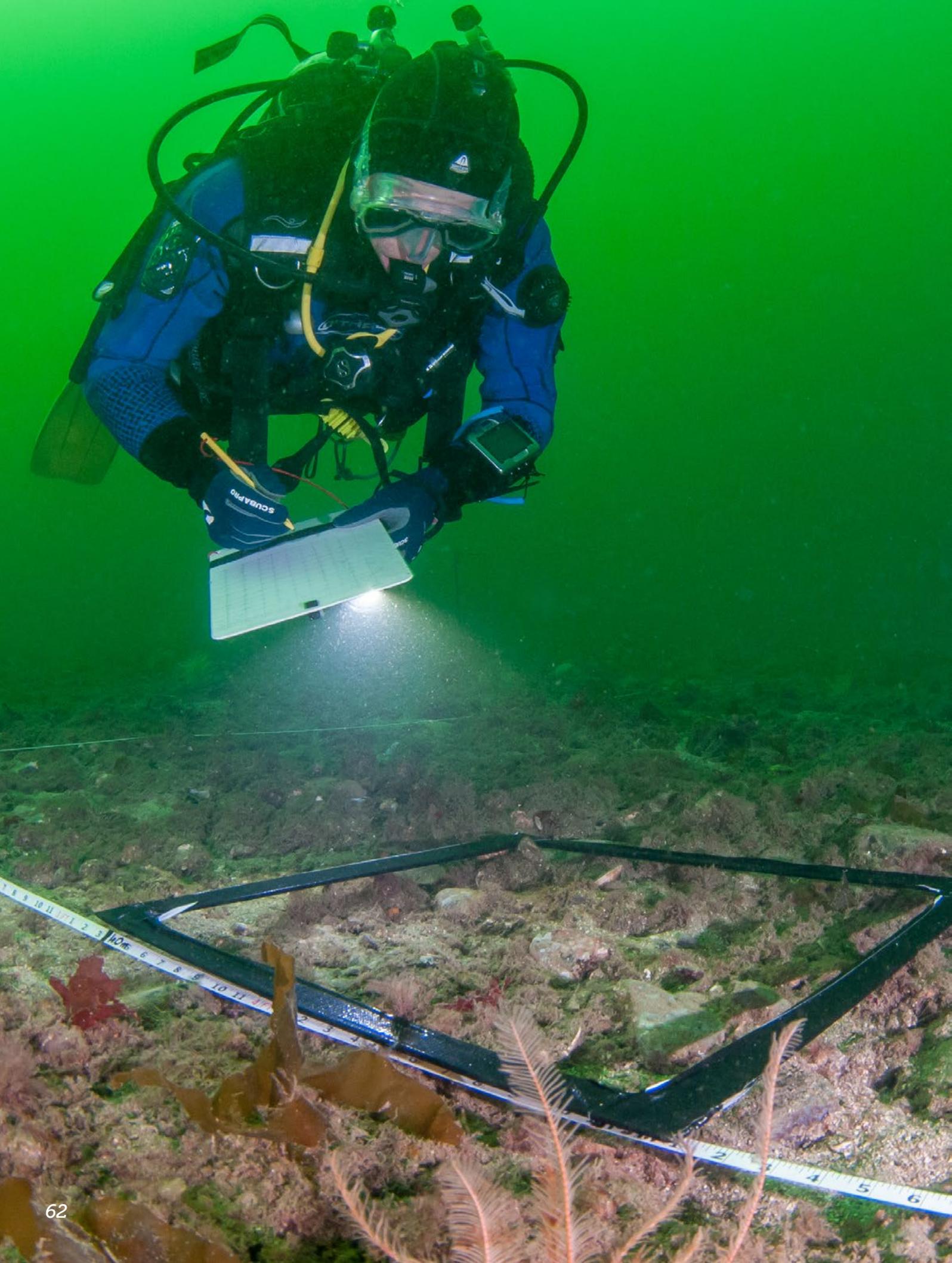
Social and Economic Principle 2: Governance and management

This principle assesses the extent of current and future governance arrangements that could support HPMA introduction. The Call for Evidence highlighted the importance of considering governance and management in site selection. This principle includes stakeholders and the public's current experience with conservation designation and the availability of resources and infrastructure.

Social and Economic Principle 3: Social and economic activities and effects

Maritime industries including the fishing, energy and shipping sectors highlighted the need to consider current use and activities as part of the site selection process. This principle considers activities that are occurring within the site. It also considers potential social and economic effects (e.g. on employment, health and well-being, recreation and tourism, culture, aesthetics, research and education, social equity and social conflict).

Box 7. Social and economic principles for HPMA site selection.



Chapter 7: How can government make HPMAs work?

Like all successful Marine Protected Areas (MPAs), Highly Protected Marine Areas (HPMAs) need a combination of appropriate and well-funded management and simple, easily assessable guidance for marine users. Clearly communicating the purpose of the sites as well as the rules and subsequent consequences of non-compliance within HPMAs would increase marine user compliance, reduce enforcement and help achieve ecological objectives.

Working in partnership to manage HPMAs

Call for Evidence respondents believed NGOs or established stakeholder groups could take a governance role, using their networks to support the management of future designations. The Panel agrees that marine managers should pursue stakeholder partnerships to support the governance of HPMAs. While potential stakeholder partners may be easier to identify in the inshore zone, managers should also seek offshore partners.

One such partnership approach is through co-management. There are many definitions of co-management. In the context of HPMAs and environmental governance, we envisage a sharing of responsibilities between the state and marine users¹⁴⁰. This does not necessarily require changes to legislative responsibilities.

We heard through the Call for Evidence and round-table events that co-management can build relationships which are beneficial in helping HPMAs achieve ecological success. It can be effective at both utilising rich local knowledge and increasing buy-in from stakeholders. For example, we heard that **"... relationships with local partners and stakeholders has been key to the successful establishment and ongoing management of the area..."** and that **"... management will require multi agency/partnership approach and stakeholder buy in"** (*North Eastern IFCA, Defra ALB/delivery body*).

We believe governance arrangements for HPMAs should be as inclusive as possible. Management should be within clear parameters, providing a

140 Pieraccini, M. and Cardwell, E. (2016). Towards deliberative and pragmatic co-management: a comparison between inshore fisheries authorities in England and Scotland. *Environment Politics* 25 729–748. Available at: <https://doi.org/10.1080/09644016.2015.1090372>

flexible way of delivering HPMA's whilst ensuring that ecological aims are not compromised.

For co-management of HPMA's to work effectively there must be a clear allocation of responsibility. Both government (including Arm's Length Bodies) and sea users must work together to define and communicate their roles to marine users. We heard that this "... opportunity to communicate these issues to the wider community, [enables] a discussion about prioritisation and needs" (*Southern IFCA, Defra ALB/delivery body*).

Developing co-management partnerships for HPMA's will require the allocation of time and funding aligned to the agreed level of responsibility.

Recommendation: Government should adopt co-management principles where possible, to agree effective management in partnership with sea users.

Managing activities

HPMA's provide the strictest protection from human impacts. HPMA management must be clear and restrictions on permitted activities must go beyond existing protection in the UK to deliver the aims of HPMA's. The Panel acknowledged concerns that the 'devil is in the detail' regarding allowable activities. We therefore recommend that government provides clear guidance to explain acceptable activities within HPMA's. We believe a simple categorisation approach closely aligned to the International Union for Conservation of Nature (IUCN) guidance¹⁴¹ would be effective and clear for sea users (see [Table 2](#)).

Recommendation: Government must issue guidance on permitted activities within HPMA's, underpinned by a simple categorisation approach aligned to International Union for Conservation of Nature categories.

Providing that the ecological objective of an HPMA are not compromised, this baseline guidance may be updated to reflect government/stakeholder partnerships' outputs regarding permitted levels of non-damaging activities within HPMA's. This allows for recognition of local idiosyncrasies. Marine managers should adopt the 'Precautionary Principle' regarding the type and levels of non-damaging activity allowed within an HPMA. This means that activities with the potential to harm will be prohibited within HPMA's unless proven by the user to be harmless.

141 Internationally recognised International Union for Conservation of Nature (IUCN) standards list different categories of activities allowed in protected areas. See Day, J., Dudley, N., Hockings, M., Holmes, G., Laffoley, D., Stolton, S., Wells, S. and Wenzel, L. eds. (2019). Guidelines for applying the IUCN protected area management categories to marine protected areas. *IUCN*. Available at: <https://portals.iucn.org/library/node/48887>

Table 2. Suggested categorisations for activities within HPMAs.

Activity	Permitted
Anchoring/mooring	No – unless in emergency situations
Collection of flora, fauna, natural materials	No – unless for research that cannot be undertaken elsewhere
Deposition of any material on the seabed or in the water column (including dredge material, installation of structures and cables, littering, discharges and any other works)	No
Dredging (including mineral extraction and maintenance or capital dredging)	No
Fishing (including commercial, recreational and catch and release)	No
Maintenance and operation of existing structures	Potentially – would require permit/license
Motorised boating	Yes – may require restrictions on speed and noise
Navigation / transit of vessels	Yes – may require restrictions on speed and noise
Non-motorised boating	Yes – may require restrictions on areas or timing of access.
Personal watercraft	Yes – may require site specific restrictions.
Scientific research and education	Potentially – would require permit/license
Scuba diving, snorkelling and swimming	Yes
Walking, hiking	Yes
Wildlife observation	Personal – yes Commercial – potentially – could require permit and code of conduct

The table above outlines key types of human activities that may occur in a marine area but is not exhaustive. The traffic light system does not define the allowable levels of each 'green' activity. Rather this would be for government or government/stakeholder partnerships to refine. Visitor site-use can fluctuate, and allowable activities should be reviewed regularly to ensure ecological aims are met. We propose that activities undertaken in HPMAs are assessed using the Precautionary Principle.

During the site visit to Poole and at round-table events, the Panel heard that most sea anglers operate a catch-and-release policy. By operating this policy

and others, such as gear modifications and fish handling techniques¹⁴², the sea angling community is taking steps to minimise its environmental impact. However, capturing fish, even if not fatal in the first instance, will reduce the life span of an animal if captured repeatedly. The effort expended by the fish in the process may leave it exhausted and vulnerable to predation. Moreover, depending on the time of year and location, angling may negatively impact breeding behaviour despite a range of reported post-release mortalities¹⁴³. As a result, catch-and-release angling is likely to have an impact on the health and mortality of fish and therefore conflict with the goals of HPMAs¹⁴⁴.

We do not believe that angling (catch-and-release or otherwise) is compatible with HPMAs. This is not to say that sea anglers will not benefit from HPMAs. Evidence suggests that angling in areas adjacent to HPMAs can deliver spillover benefits to recreational fisheries¹⁴⁵. The co-management of these adjacent zones could develop partnerships between recreational sea users and management bodies to undertake monitoring and collect scientific data.

Legally supported voluntary measures can maintain ecological benefits

The Panel recognised the success of voluntary management schemes in the UK. However, in the context of HPMAs, we are conscious that without legal underpinning voluntary codes may be undermined. When we visited the Lamlash Bay MPA, we saw how voluntary monitoring by the community has deterred non-compliant fishing within the NTZ. It also helps to recover habitats and shellfish populations. This voluntary arrangement was subsequently re-enforced using provisions in the Marine (Scotland) Act 2010.

Through the Call for Evidence, the Panel gained feedback from conservation bodies. For example, there was a recommendation that **“...reliance on voluntary measures to deliver a high level of protection to vulnerable habitats and species is not appropriate”**. (*The Wildlife Trusts, Wildlife/conservation sector*).

Instead, it was suggested **“...that a stronger statutory route would be the most suitable mechanism in the face of strong economic pressure”** (*Wildlife and Countryside Link and Northern Ireland Marine Task Force, Wildlife/conservation sector*).

Marine industries also supported this view.

142 Danylchuk, A.J., Clark Danylchuk, S., Kosiarskib, A., Cooke, S.J. and Huskey, B. (2018). Keepemwet Fishing—An emerging social brand for disseminating best practices for catch-and-release in recreational fisheries. *Fisheries Research* 205 52–56.

143 Bartholomew, A. and Bohnsack, J.A. (2005). A review of catch and release angling mortality with implications for no-take reserves. *Reviews in Fish Biology and Fisheries* 15 129–54.

144 Arlinghaus, R., Cooke, S.J., Lyman, J., Policansky, D., Schwab, A., Suski, C., Sutton, S.G., Thorstad, E.B. (2007). Understanding the complexity of catch-and-release in recreational fishing: an integrative synthesis of global knowledge from historical, ethical, social, and biological perspectives. *Biological Reviews in Fisheries Science* 15 75–167.

145 Roberts, C.M., Bohnsack, J.A., Gell, F.R., Hawkins, J.P. and Goodridge, R. (2001). Effects of marine reserves on adjacent fisheries. *Science* 294 1920–1923.

We strongly recommend that marine managers enter partnerships with stakeholders where possible. However, these should be supported by a robust statutory framework to ensure HPMA achieve their ecological objectives.

Recommendation: Management bodies will need to set out clearly their enforcement responsibilities which will be critical to HPMA success and required by legislation; they should also develop, where possible, voluntary approaches and codes of conduct with stakeholder user groups (particularly for low-impact activities).

Stakeholder engagement can help deliver compliance

HPMA management should aim to maximise compliance rather than rely on enforcement. This is because non-compliance will often have damaged an area before enforcement can be effective. As HPMA start to deliver ecological benefits, the biodiversity within them will be more valuable, and compliance will be essential. One infringement could undo years of recovery.

The Panel heard concerns that poor stakeholder engagement can affect compliance. We learned that ineffective communication of a designation's ecological objectives can lead to reduced stakeholder buy in. A lack of buy in may result in a **"...greater level of, and reliance on, enforcement. It is anticipated however that an over reliance on enforcement will likely fail..."** (*Southern IFCA, Defra ALB/delivery body*).

We agree with the Southern IFCA that **"The process by which HPMA are identified and designated will thus define the level of compliance with the objectives of the site's designation"**. (*Southern IFCA, Defra ALB/delivery body*).

We therefore acknowledge that effective stakeholder communication strategies can help drive community support for, and compliance with, HPMA rules. As mentioned in [Chapter 4](#), engagement should start at the earliest point to allow relationships between managers and marine users to build over time. However, we are similarly aware that repetitive consultation can create stakeholder disengagement or 'consultation fatigue'. To avoid this, engagement should be carefully planned to remain effective.

Recommendation: To increase compliance and reduce enforcement demands, government and marine managers should engage with stakeholders early and regularly, on all aspects of the HPMA process.

Sometimes, despite all efforts to avoid it, infractions happen within protected areas. It is for times like these that a mechanism for enforcement must exist within HPMA.

The importance of effective enforcement

It is essential to build trust among sea users to ensure continued compliance with management rules. Illegal activities can undermine those who comply with the rules and break the trust which has developed. Enforcement must therefore be consistent, proportionate, and delivered equally to all marine users to create a level playing field.

Our visits highlighted the value of 'policing by consent', the idea that anything imposed is hard to enforce, whereas measures developed together are easier. Again, trust is key. Over time those involved are likely to feel greater ownership of the HPMAs and may support intelligence gathering or even informal enforcement roles.

The Panel recognise that enforcement is an essential part of a marine manager's compliance toolbox. For these tools to be effective however "... **funding also needs to be made available for appropriate management and enforcement of [these] sites, alongside the existing network. This extends to the need to ensure that the MMO and IFCA are adequately funded and resourced to support successful management of the entire network of MPAs**" (*Dogger Bank Wind Farms, Energy sector*).

We appreciate that HPMAs may require greater management than existing MPAs. Because of this, government must provide adequate resourcing, which prioritises compliance but makes enforcement available when required.

We recognise that in the current system, data from non-eye-witness evidence is hard, if not impossible, to use in court. Practical enforcement must occur until there are legal means to prosecute rule-breakers, using evidence gathered by remote technology. However, as noted in the Call for Evidence, "[t]here would be no need for eyewitnesses if GPS data etc. was actionable on its' own" (*Individual respondent, Recreation sector*).

Technology as a force for good

Modern technology provides a useful and cost-effective means to protect and manage HPMAs. Existing technology used in MPAs, such as remote sensing and Vessel Monitoring Systems (VMS), are important in identifying non-compliance. They play a vital role in enforcement because there is not enough 'on water' capacity to deliver this in our seas. Data provided by VMS on the location, course and speed of vessels enables marine managers to take enforcement action where necessary.

Through the Call for Evidence the Panel heard that "**Vessel Monitoring Systems (VMS) [should be introduced] on all vessels along with Remote Electronic Monitoring (REM) and sufficient funded to enable monitoring of this data**" (*Oceana, Wildlife/Conservation sector*).

We appreciate that these technologies can support enforcement by easing the 'on water' requirements of marine managers.

We also heard from marine managers that “... [t]echnological tools’ are secondary assets of compliance strategies...”

and that “...the importance of trained officers with access to traditional forms of assets (boats etc.) should be seen as central, and not secondary to the [management] task” (*Southern IFCA, Defra ALB/delivery body*).

Technological solutions are not the only means of increasing compliance. We believe that appropriate funding should be available for traditional enforcement, in combination with funding for emerging technologies.

An example of remote monitoring of fishing vessels relating to closed areas is found in the United States. In relation to the New England fishery closures in offshore waters, the U.S. Coastguard monitors the fishing vessels with a VMS system called “boattrac”. If a vessel breaks the closed area boundary rule, it is notified at sea to return to port immediately. The catch is then confiscated, and the owners fined. This process is recorded as a violation and the fishermen cannot sit on any Fisheries Council management body or take part in any research work. Fines can result in significant financial losses in the region of US\$100k¹⁴⁶.

Recommendation: Technological advancements, including vessel monitoring, should be used to ease the burden of enforcement and monitoring of HPMAs.

As HPMAs are adopting a ‘whole site approach’, the level of activities allowed within the zones will be lower than in most MPAs. This should reduce uncertainty regarding the type of activities allowed which could over time, translate into reduced management costs. This is supported by the Call for Evidence, for example, “... whole site management is cheaper and more effective than trying to manage feature by feature” (*Oceana, Wildlife/Conservation sector*).

Monitoring and Evaluation

Only by monitoring and evaluating HPMAs over time will government know if they are successful in achieving recovery and biodiversity benefits. Data from monitoring and evaluation will guide future management, public messaging, future site selection and management.

Government must define monitoring requirements (and associated standards) for HPMAs, recognising that monitoring priorities and activities will change over time. This should be guided by knowledge acquired from current MPA monitoring. Monitoring and research on biophysical, governance, social and economic aspects of HPMAs will teach us about best practice in Secretary of State waters. We recognise the opportunity for commercial and recreational sectors to engage in citizen science projects in, or close to, HPMAs depending

146 O’Keef, C.E and Stokesbury, K.D.E. (2014). *Best practice in fisheries management: US sea scallop fishery*.

on local restrictions. Encouraging this may engage marine users while providing useful information to inform managers¹⁴⁷.

In addition to monitoring activities, robust site evaluation should occur. This includes establishing baseline data in both HPMAs and comparison sites to determine the impact of HPMAs on ecological and social and economic aspects. This will allow marine managers to evaluate the ecological progress of HPMAs, the effectiveness of management structures and the benefits to local community and businesses.

Recommendation: To establish comparative baselines, the monitoring and evaluation of biological, social and economic processes and effects of HPMAs must begin before designation and continue long term.

To create a robust monitoring and data collection framework within HPMAs, government will need to make available significant resources proportional to the HPMAs size. Funding requirements are likely to be higher than those directed to existing MPAs.

Recommendation: Sufficient funding is required for the designation, management, monitoring and enforcement of HPMAs. Government must make available resources proportionate to the scale of any designated HPMAs.

HPMA Governance

MPA management sits within a wider framework of marine management and governance with a variety of government departments, Arm's Length Bodies and international agreements involved. As a result, governance arrangements can be complex and may benefit from simplification.

The Inshore Fisheries and Conservation Authorities (IFCAs), Environment Agency (EA) and Marine Management Organisation (MMO) manage the marine space depending upon location and activity. Natural England (NE) and the Joint Nature Conservation Committee (JNCC) provide advice on protecting biodiversity. Several Government Departments have roles in regulating marine activities. In addition to Defra, these include the Ministry of Defence, the Department of Business, Energy and Industrial Strategy and the Department for Transport.

There are opportunities to simplify governance models in future (e.g. governing inshore and offshore areas together). The Panel appreciates that

¹⁴⁷ Ambrose Jr, W.G., Clough, L.M., Johnson, J.C., Greenacre, M., Griffith, D.C., Carroll, M.L. and Whiting, A. (2014). Interpreting environmental change in coastal Alaska using traditional and scientific ecological knowledge. *Frontiers in Marine Science* 1 40.

changing legal responsibility requires primary legislation, appropriate time and resourcing. Nonetheless, revised governance may ease the delivery of government's vision of clean, healthy, safe, productive and biologically diverse oceans and seas, including through HPMAs.

The Panel did not hear support for any one preferred method of HPMa governance through visits, round-tables or the Call for Evidence. Several stakeholders shared concerns about existing marine governance, with one respondent summarising as follows: "... **there are too many organisations trying to do their bit. It needs to be simplified down to one managing body with resources to implement the areas**" (*Individual respondent, Recreation sector*).

While we also heard suggestions for collaborative approaches between marine managers and users. An emphatic opinion we heard was that governance must "...**engender[s] trust among stakeholders and is perceived as just (in terms of appropriate recognition, procedural justice in the consultation and decision-making, and distributive justice in terms of the outcomes for different stakeholders...)**" (*University of Exeter – Exeter Marine Community, Science/Research sector*).

Recommendation: In the longer term, government should reconsider existing marine governance to ensure current structures do not hinder the introduction of HPMAs.





Chapter 8: How could government select pilot HPMAAs?

A core objective of this Review was to identify whether HPMAAs were required in Secretary of State waters. If HPMAAs were required, the Review would recommend a process for identifying HPMA pilot sites. The Panel believes that through the principles presented in [Chapter 6](#) and the draft site selection criteria in [Annex 4](#) government could successfully identify pilot sites.

All sites should fulfil the three ecological principles before being considered as possible HPMAAs. These ecological principles – ecological importance; naturalness, sensitivity and potential to recover; and ecosystem services – are described in full in [Chapter 6](#). If a potential site fulfils these ecological principles, we recommend applying of a series of social and economic principles which could filter these ecologically important sites. These principles would entail paying careful attention to attitudes and acceptability; governance and management; and social and economic activities and effects – these are also described in [Chapter 6](#).

If justified by evidence, the Terms of Reference asked the Panel to recommend up to five suitable pilot sites for potential designation. Any pilot site recommendations need to consider the economic impact of potential HPMA designation. However, the Panel does not feel that economic assessment should form a deciding factor in HPMA site selection. This is because HPMAAs are, first and foremost, a means to deliver ecological not economic benefit.

Evidence from statutory bodies, academia, environmental NGOs and industry convinced us that government should introduce HPMAAs. The Panel intended to identify and recommend pilot HPMAAs. However, the already challenging timescale for delivering the Report and then the unprecedented circumstances of COVID-19 affected the process. The Panel could not assess the evidence required to identify and shortlist pilot HPMAAs. We therefore urge government to use wide sources of data to support the future HPMA identification process according to the principles that we have identified.

Recommendation: Supporting evidence for identifying pilot HPMA sites should be taken from a wide range of sources including statutory bodies, academia, environmental NGOs and industry.

Pilot sites recommended to the Review

The Panel reluctantly decided not to take HPMA site selection any further in this Review. However, we wanted to share the list of sites which were suggested to us for investigation. Respondents to the Call for Evidence, Panel members and Defra's Statutory Nature Conservation Body (SNCB), between them, recommended this list. Although the list is not endorsed by the Panel, we consider it a good starting point for identifying pilot HPMA sites ([Annex 5](#)).

This list shows a range in terms of scale and a geographic spread around our seas. The majority of the areas recommended to the Panel overlap with existing MPAs, which reinforces our recommendation that pilot sites should be within established MPAs. This list could form a starting point for selecting pilot HPMA sites.

Recommendation: Government could use the list of sites recommended to the Review as a starting point in any future HPMA process.

The Panel was unable to recommend specific pilot HPMA sites to government due to the COVID-19 crisis. However, we made some clear recommendations about the process for selection:

- Pilot sites should cover a range of different marine environments and be situated in the nearshore, inshore and offshore.
- They should not be in intertidal areas due to the additional complications associated with governing and regulating the marine/terrestrial interface and its users.
- They should be geographically spaced around Secretary of State waters. This geographical spacing could be done through using the bio-geographical regional seas¹⁴⁸ or using Marine Plan areas¹⁴⁹.
- Achieving this spread requires more than the minimum five pilot HPMA sites prescribed in the Terms of Reference.

148 Department for Business, Energy & Industrial Strategy (2018). *UK Offshore Energy Strategic Environmental Assessment, OESEA3 Review*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/536241/HAL_OESEA3_G83_VER02.pdf.

149 Marine Management Organisation (2004). *Marine Plan Areas UK*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/325688/marine_plan_areas.pdf.

Recommendation: Five pilot sites are the bare minimum and to cover different environments and activities, the number of pilot sites should have sufficient geographic spread to cover nearshore, inshore and offshore areas and different regional seas.

The focus of HPMA pilot sites is to show how our seas can recover when damaging human impacts are removed. However, government should also consider how else pilot sites can contribute to overall ocean health. To that end, we suggest that one or more of the pilot HPMA should maximise the protection of blue carbon.



Chapter 9: Conclusions

We heard much evidence and held many discussions during the course of this Review. This convinced us that government should introduce Highly Protected Marine Areas (HPMAs) for the protection and recovery of marine habitats, species and ecosystems. Secretary of State waters have an extensive Marine Protected Area (MPA) network. However, this is not designed to achieve full recovery of marine ecosystems and many harmful activities still occur in these sites.

Safeguarding areas of the sea from extractive, destructive and depositional uses, while allowing non-damaging levels of other activities, would help government to implement and evidence environmental recovery. This in turn would enhance understanding of what management measures are needed within the existing MPA network and the rest of the sea.

Government must identify HPMAs on the basis of their ecological value and according to the principles recommended in this Report. We acknowledge the potential negative effects for some sea users from introducing HPMAs, and therefore recommend applying social and economic principles as a secondary filter when identifying sites. Once ecological principles are met sites can be selected to minimise negative impacts on certain groups. For all aspects of the HPMAs process, including selecting and managing sites, government and marine managers should regularly engage with a diverse range of stakeholders.

Restrictions arising from the COVID-19 pandemic meant we could not recommend pilot HPMAs, much to our disappointment. Government should not use the lack of recommended pilot sites as reason to delay the introduction of HPMAs. Rather, the evidence provided in this Review should be used to begin a process of site selection as soon as practically possible. Since we have recommended that pilot HPMAs should be located within existing MPAs, we do not believe that additional and costly evidence collection is needed. We urge government to bring the outputs of its site selection process to consultation at the earliest opportunity.

The HPMAs Review Panel look forward to government's response to our Report and recommendations, and to witnessing HPMAs designation in Secretary of State waters.



Annex 1: Review of Highly Protected Marine Areas – Terms of Reference

It is vital that we manage our seas in a more sustainable way for future generations. There has been significant progress with establishing an ecologically coherent network of Marine Protected Areas (MPAs).

The current approach to MPAs focuses on maintaining species and habitats at, or recovering them to, a favourable condition. This is a healthy state but not pristine, and so allows some sustainable activities to occur in MPAs. In Highly Protected Marine Areas (HPMAs), all human activities with the potential to damage are prohibited.

Purpose of the Review

To recommend whether and how HPMAs could be introduced in areas of sea within the UK government's competence.

Context

The Review aims to deliver on the government's ambition to leave nature in a better state than we found it. It also sits alongside, and must recognise, the government's other objectives which involve the use of the sea.

These include:

- The government's ambitions for sustainable fisheries after the UK has left the EU, as outlined in the Fisheries White Paper;
- The potential for sustainable aquaculture to meet growing UK and global demand for seafood;
- The role that offshore renewables, interconnection, and new technologies such as carbon capture, usage and storage play in tackling climate change and helping us meet longer term decarbonisation goals;
- The government's agenda to maximising economic recovery of UK petroleum (MER UK). This is of strategic importance to the UK Energy mix and to the economy;
- The contribution of the port and shipping sector to the UK economy.

Outputs

Review Chair and Panel to develop evidence-based process and criteria for selecting HPMA, including any recommendations on potential locations for a small number of potential pilot sites.

Objectives

1. Conduct an impartial and evidence-based assessment of the views of sea users and other relevant stakeholders on the environmental, social, and economic impacts of HPMA.

HPMA bring substantial benefits for conservation and biodiversity. Support for HPMA recommendations from sea-users will be important particularly from the fishing industry and from other sectors such as ports, shipping, aggregate offshore wind, interconnection, new technologies (such as carbon capture, usage and storage), and oil and gas developers. Sea-users will need to be consulted throughout the review, as well as government Departments with an interest, and their views on any potential economic or other impacts reflected in its conclusions.

2. If supported by the evidence gathered, recommend a process for establishing HPMA, criteria for the ongoing monitoring of their environmental and economic impact, and initial recommendations of up to five potentially suitable pilot sites.

The review will need to justify any recommendations for pilot sites on the basis of scientific evidence and robust economic impact assessments, including a sectoral breakdown for key marine industries affected. The review may wish to apply a natural capital approach to assess the potential economic and environmental costs and benefits of a HPMA, as compared to a typical MPA, at any given pilot site.

Geographic scope

- Executive competence for marine conservation is devolved in Scotland and Wales, and in Northern Ireland in relation to the inshore zone. The review will consider the waters for which the Secretary of State has responsibility: the English inshore and offshore and Northern Ireland offshore zones.

Roles and responsibilities

- The review chair will be responsible for overseeing the strategic direction and progress of the review. The review chair will report to the Secretary of State for Environment, Food and Rural Affairs.
- The review chair and panel will be responsible for the development of the process and criteria for selecting recommended pilot sites for HPMA.

- Any subsequent consultation on the location and designation of HPMAs will be undertaken by Defra.

Timing

- The review will start in June 2019, and will be due for completion by the end of 2019¹⁵⁰.

Governance

- The review chair will be responsible for governance arrangements within the review, in consultation with the Director of Marine and Fisheries.

150 In January 2020 Ministers extended the Review until spring 2020.

Annex 2: List of visits and stakeholders engaged

Key:

V – visit RT – round-table
M – 1-1 meeting P – phone call

Government Departments and Defra agencies

Department for Environment, Food & Rural Affairs (internal policy teams)*
HM Treasury (M)*
Ministry of Defence (M)
Department of Transport (M)*
Department for Business, Energy & Industrial Strategy (M)*
Dept. of Agriculture, Environment & Rural Affairs (Northern Ireland)* (P)
Welsh Government* (P)
The Crown Estate (RT)
Natural England (M)
JNCC (M)
MMO (M)
Cefas (M)

** denotes where stakeholders met the Secretariat only*

Local Authorities

Plymouth City Council (V)
Bournemouth, Christchurch and Poole Council (V)

Industry

Energy UK (RT)
British Marine (V)
UK Chamber of Shipping (RT)
UK Major Ports Group (V/RT)
European Subsea Cables Association (RT)
Renewable UK (RT)
Oil and Gas UK (RT)
Innogy (RT)
Ørsted (RT)
British Marine Aggregates Producers Association (V/RT)
British Ports Association (V/RT)
Charter Boat Sector (V)
Poole Harbour Commissioners (V)
Cattewater Harbour Commissioners (V)
Sutton Harbour Holdings PLL (V)

Environmental / Conservation

The Wildlife Trust (V/RT)
Marine Conservation Society (RT/M)
Blue Marine Foundation (V/RT)
World Wildlife Fund for Nature (RT)
Greenpeace (RT)
New Economics Foundation (RT)
Oceana (M)
Community of Arran Seabed Trust (V)

Fishing

Association of IFCA's (V/RT/M)
National Federation of Fishermen's Organisations (RT)
South West Fish Producers Organisation Ltd (V)
Seafish (RT)
New Under Ten Fishermen's Association (V)
Cornish Fish Producers Organisation (V)
Clyde Fisherman's Association (V)
West Bay Fisherman's Association (V)
Lyme Regis Fisherman's Association (V)
Weymouth Fisherman's Association (V)
Othneil Oysters (V)
Tamar Estuaries Consultative Forum (V)
Professional Boatman's Association (V)

Recreation

British Sub-Aqua Club (RT)
Royal Yachting Association (RT)
British Association of Shooting and Conservation (V/RT/M)
The Angling Trust (V/RT/M)

Academia

University of Plymouth (V/RT)
Marine Biological Association (V)
Cardiff University (RT)
University of Salford (RT)
Plymouth Marine Laboratory (RT)
University of Bristol (RT)
Portsmouth University (RT)
University of Stirling (RT)

The following groups were invited to round-tables but were unable to attend:

Royal Society for Protection of Birds

Charter Boats UK

Client Earth

JNCC

Anglo North Irish Fish Producers Organisation

Individual academics

Individual fishers

New Under Ten Fishermen's Association

Annex 3: Call for Evidence detailed methods

Call for Evidence objectives

The 'Call for Evidence' gathered views on whether and how HPMAAs could be introduced. It supported the Review by hearing a diverse range of opinions, experience and expertise. It specifically asked for views on:

- Aims, opportunities and challenges of HPMAAs
- HPMA site selection
- Implementation and management of HPMAAs
- Past experiences of MPAs

List of Call for Evidence questions

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

- Yes
 No

Question 1a: *If you answered yes to this question please give your reason.*

About you

Question 2: *Are you responding to this Call for Evidence on behalf of an organisation or as an individual?*

- On behalf of an organisation
 As an individual
 Don't know
 Prefer not to say

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

- i. Which organisation(s) are you responding on behalf of?
- ii. What is the position you hold at the organisation(s)?

Question 2b: *If responding as an individual, which of the following best describes your current employment status? Tick all that apply.*

- Full-time paid work or self-employment (30+ hours per week)
- Part-time paid work or self-employment (under 30 hours per week)
- Retired
- In education
- Unemployed (Seeking work)
- Not in paid employment (not seeking work)

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?*

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

- Under 18
- 18–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 75+
- Prefer not to say

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

- Male
- Female
- Other
- Prefer not to say

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

- East Midlands
- East of England
- London
- North East
- North West
- South East
- South West
- West Midlands
- Yorkshire & the Humber
- Scotland
- Wales

- Northern Ireland
- Don't know/prefer not to say

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

- Urban – coastal
- Urban – non coastal
- Rural – coastal
- Rural – non-coastal
- Don't know/prefer not to say

Part 1: HPMAs aims, opportunities and challenges

Question 7: *To what extent do you agree with the following reasons for introducing HPMAs?*

- 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

Response scale:

- Strongly disagree
- Disagree
- Slightly disagree
- Neither agree nor disagree
- Slightly agree
- Agree
- Strongly agree

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.*

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

Question 10: *What is your opinion of the evidence for HPMA's? Where is more evidence required?*

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?*

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?*

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.*

Part 3: Future implementation and management of HPMA's

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

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

In this section, we are keen to hear from people who have had any involvement in the identification, designation or management of MPAs. Whilst this Review is considering HPMA's in relation to areas of English inshore and offshore waters and Northern Ireland offshore waters, we are interested in learning from experience of MPAs from across the UK. This information will help to inform the process for considering implementation of any potential future HPMA's.

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

- Yes
- No
- Don't know
- Prefer not to answer

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
- What worked well?
- What could be improved?

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 HPMAs?*

Part 5. Any other comments

Question 17: *Are there any other comments you would like to make in regard to HPMAs?*

Analysis Methods

The Call for Evidence (Highly Protected Marine Areas – Call for Evidence) was published on GOV.UK on 3 October 2019 and remained open for four weeks. It closed on 31 October 2019. The Call for Evidence provided an insight into perceptions and attitudes towards HPMAs of those individuals and stakeholders that responded to it. Qualitative thematic analysis was used to examine the data. As respondents opted to respond to the Call for Evidence, the sample isn't representative of the UK population. Therefore, the Report does not quantify the evidence or seek to generalise findings. However, where appropriate and apparent, the Report provides an indication of the strength of view or extent of support from the Call for Evidence.

Overview of responses to the Call for Evidence

The Call for Evidence was well received by stakeholders and the public. Overall, 399 responses were received through the online portal (GOV.UK) and by email. This section provides an overview of the socio-demographic characteristics of those that responded to the Call for Evidence.

Type of response

The majority of responses were received from individuals. A total of 286 individuals responded to the Call for Evidence (71.68% of the sample; see Figure 9 of the responses, 107 were made on behalf of an organisation (26.82% of the sample). Two campaign responses were also received, representing 0.5% of the total responses. The first was from The Wildlife Trusts, which was signed by 2,818 people. The second was from the Marine Conservation Society, signed by 5,165 people. The four remaining respondents stated 'Prefer not to say' (0.75%) or did not provide a response (0.50%).

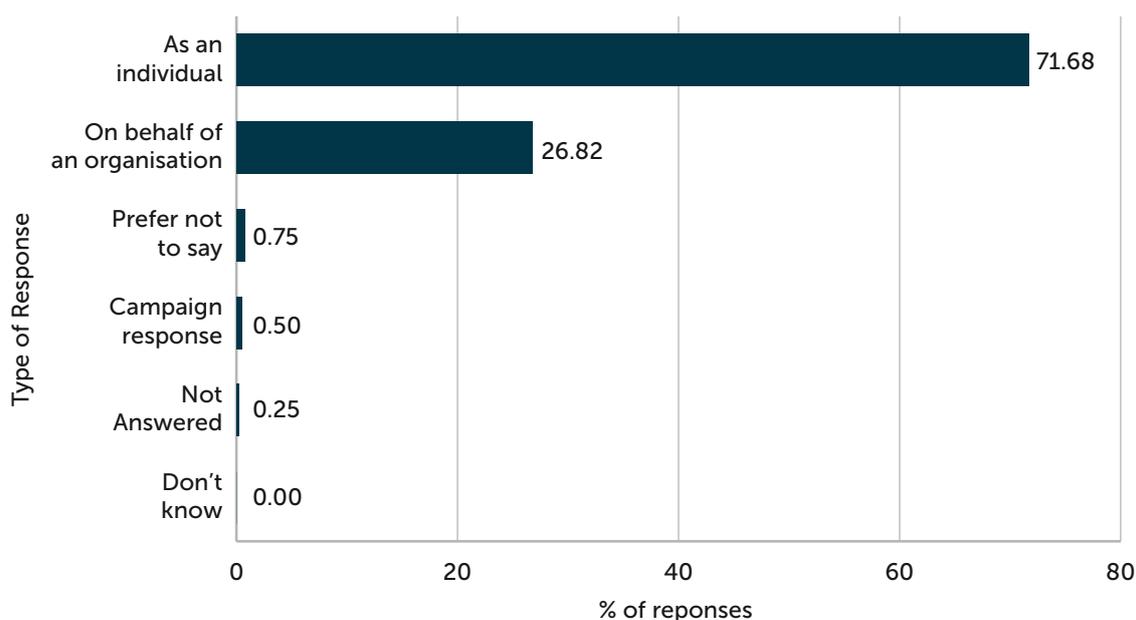


Figure 9. Graph displaying the Call for Evidence responses (% of responses) by respondent type (n=399).

Individual responses: socio-demographic information

Individuals were asked to provide socio-demographic information as part of their submission for the Call for Evidence. Data on gender, age, employment status, region of the UK and the type of area they lived in (e.g. coastal or non-coastal) was collected. Socio-demographic characteristics were analysed for individual responses only (total of 286 responses) and are summarised below.

Gender

There was a relative split between the number of males (49.65%) and females (47.20%) individuals responding to the Call for Evidence (see [Figure 10](#)).

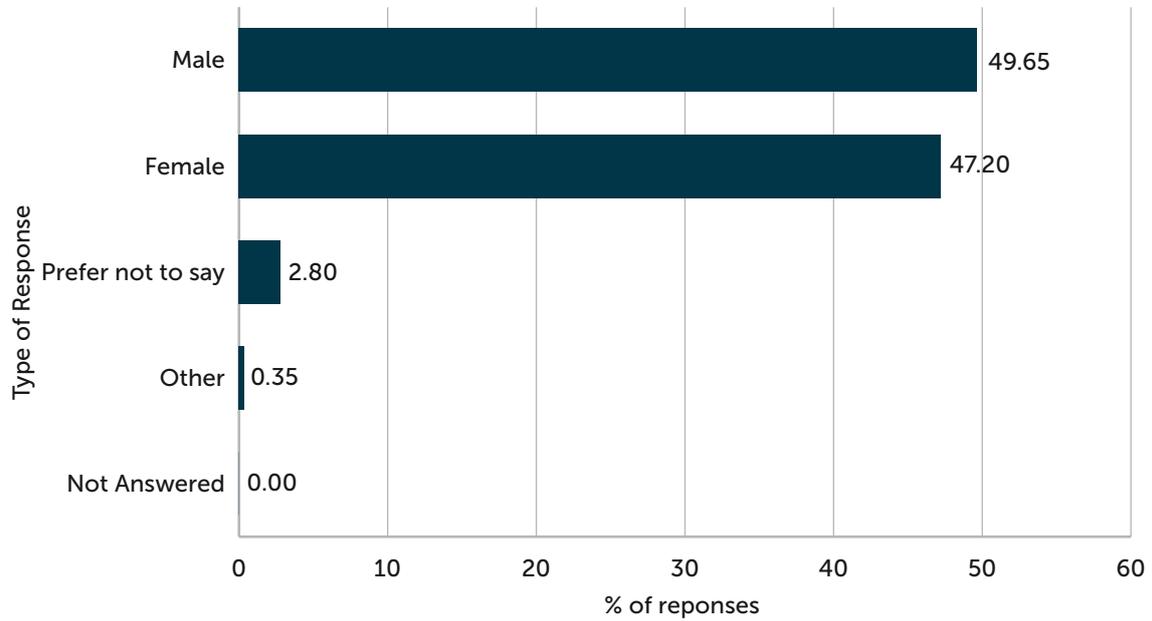


Figure 10. Graph displaying the Call for Evidence responses (% of responses) by gender (n=286).

Note: only includes individual responses.

Age

The majority of respondents were in the middle to upper age categories, particularly 55–64 years and 65–74 years. There was less representation from younger age groups, principally under 18 and 18–24 years (see Figure 11).

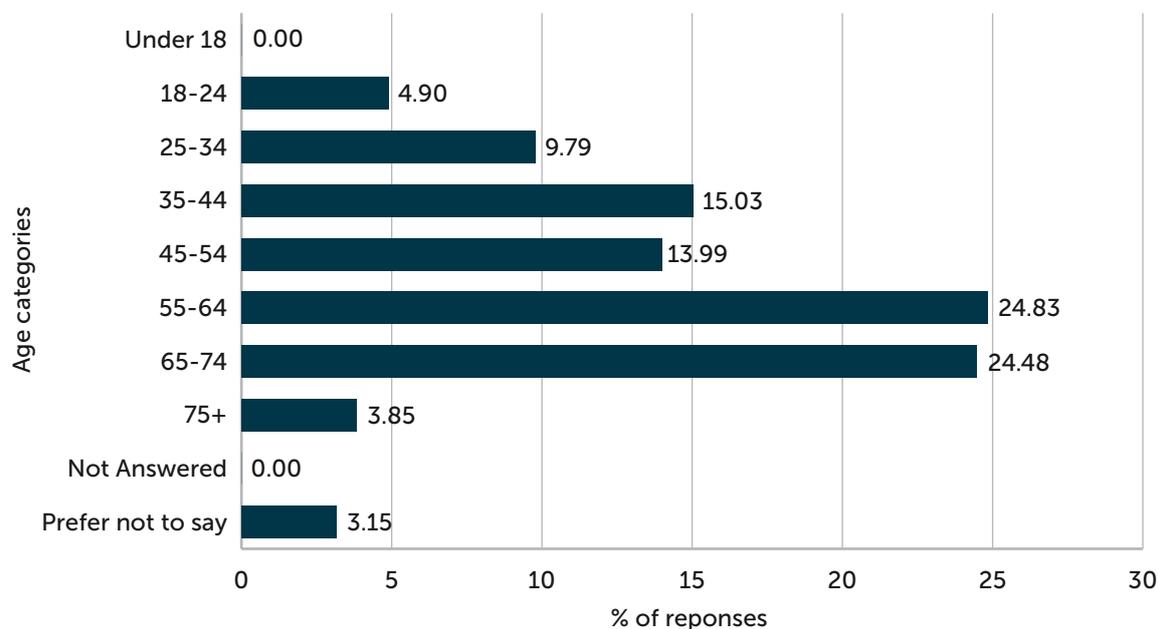


Figure 11. Graph displaying the Call for Evidence responses (% of responses) by age (n=286).

Note: only includes individual responses.

Employment status

Respondents were asked to select the options which best describe their current employment status. They could select multiple options (e.g. 'Part-time paid work' and 'In education'). Most respondents in the sample were in 'Full-time paid work or self-employment' (30+ hours per week) or were 'Retired' (see Figure 12). The fewest responses were received from individuals that were 'Unemployed (seeking work)'.

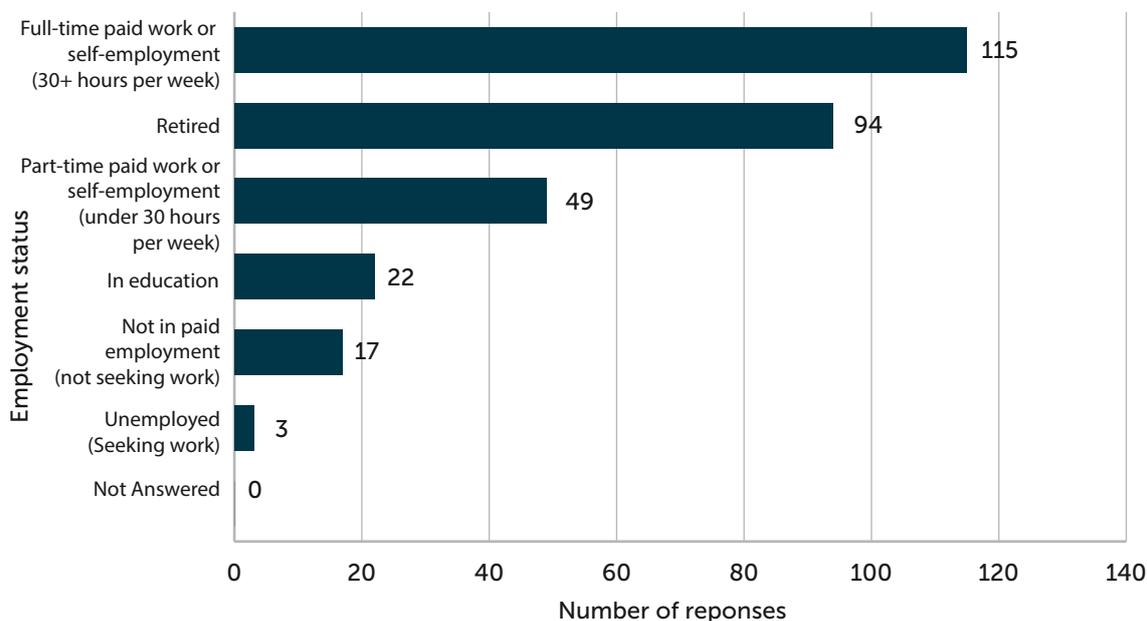


Figure 12. Graph displaying the Call for Evidence responses (number of responses), categorised by employment status.

Note: sample only includes individual responses (total of 286 responses). Respondents were able to select multiple options for employment.

Region

The majority of responses to the Call for Evidence were received from those living in the South East (38.81%) and South West (30.07%). There was less representation from other UK regions, particularly Northern Ireland (see Figure 13).

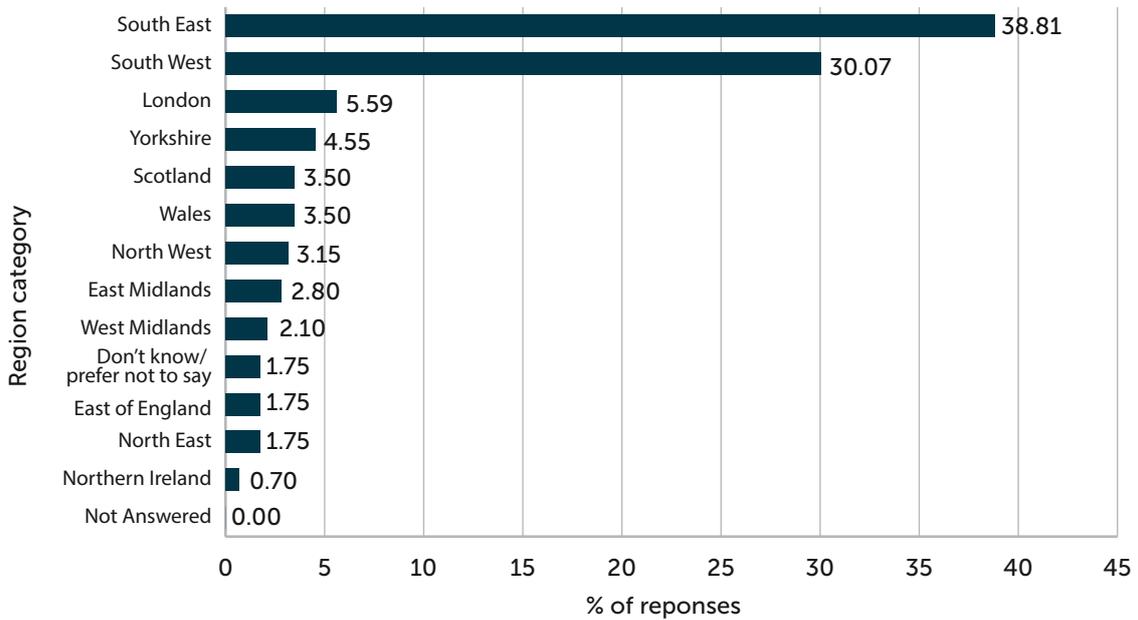


Figure 13. Graph displaying the Call for Evidence responses (% of responses) by region (n=286).

Note: only includes individual responses.

Type of area

Most respondents to the survey were based in coastal areas (60.14%), both urban (32.87%) and rural (27.27%). Fewer respondents were from non-coastal areas (39.16%), including urban (22.73%) and rural (16.43%) localities (see Figure 14).

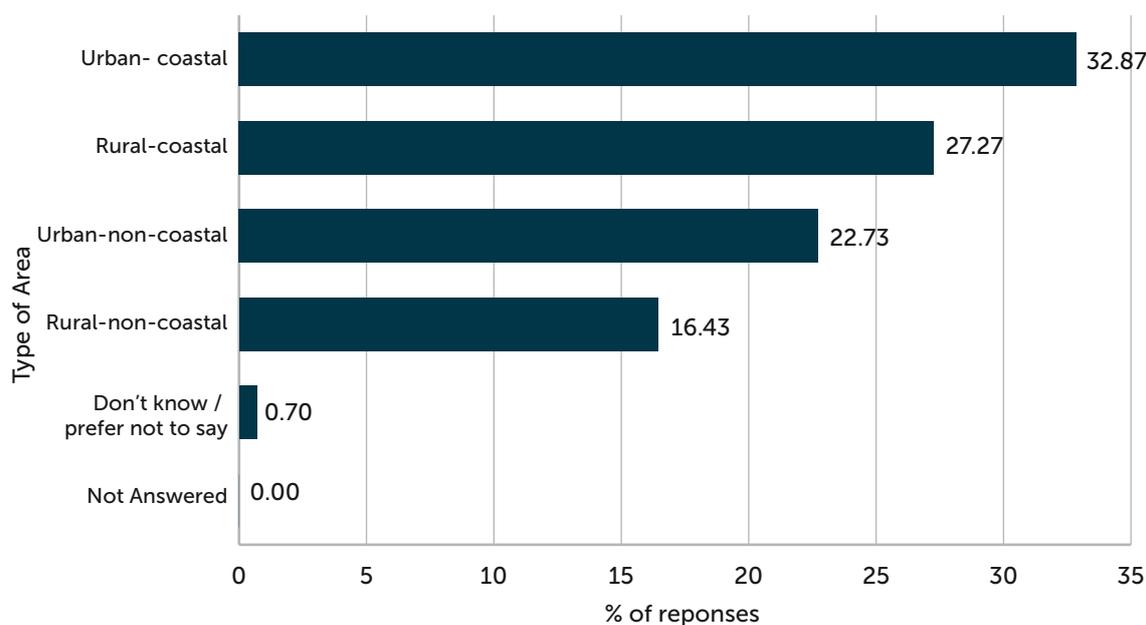


Figure 14. Graph displaying the Call for Evidence responses (% of responses) by area type (n=286).

Note: only includes individual responses.

Organisation response (by sector)

Of the respondents, 107 submissions to the C4E were made by organisations, however, some organisations submitted multiple responses. Overall, responses to the Call for Evidence were received from 93 different organisations. Figure 15 and Table 3 provide a breakdown of the organisations by sector. Most responses were received from organisations within the wildlife and conservation sector (e.g. NGOs) they represented 31.18% of organisation responses to the Call for Evidence. There was a relatively even spread of responses across the other sectors. The lowest number of responses was received for the aggregate sector, representing 1.08% of the Call for Evidence sample. The full list of organisations that responded to the Call for Evidence are shown in Table 4.

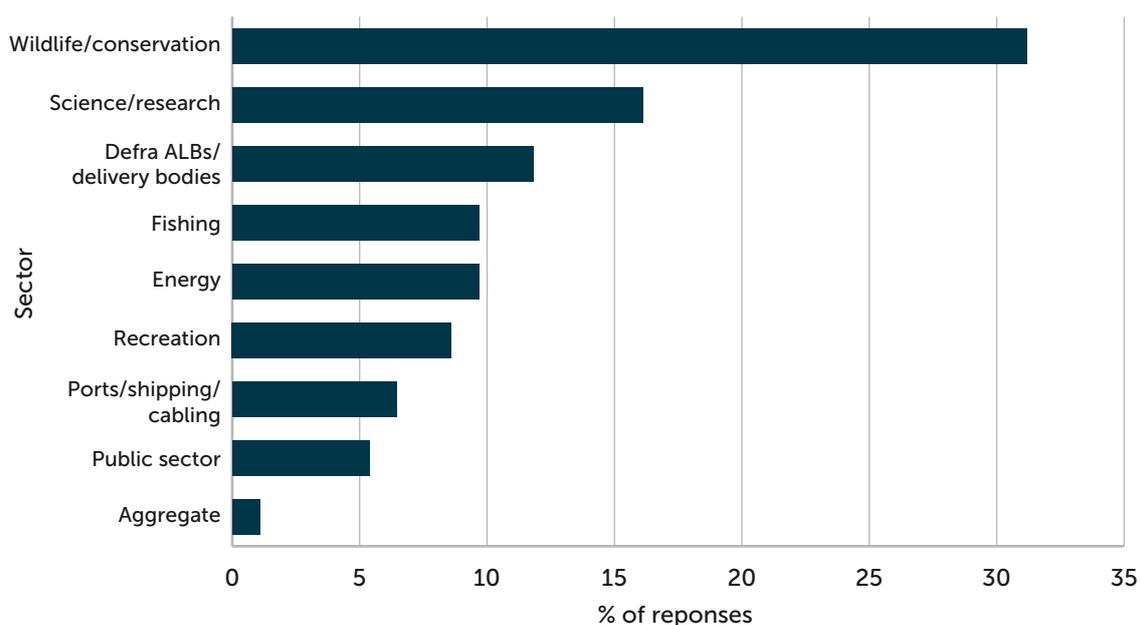


Figure 15. Breakdown of responses to the Call for Evidence by organisation.

Table 3. Breakdown of stakeholder responses by sector (total of 93 individual organisations).

Sector	Number of organisations	% of responses
Aggregate	1	1.08
Ports/shipping/cabling	6	6.45
Energy	9	9.68
Fishing	9	9.68
Recreation	8	8.60
Defra ALBs/delivery bodies	11	11.83
Public sector	5	5.38
Wildlife/conservation	29	31.18
Science/research	15	16.12
Total	93	

Note: some organisations submitted multiple responses

Table 4. List of organisations that submitted responses to the Call for Evidence (total of 93 organisations).

Sector type	Organisations
Aggregate	British Marine Aggregate Producers Association (BMAPA)
Ports/shipping/cabling	European Subsea Cables Association (ESCA) UK Chamber of Shipping UK Major Ports Group British Ports Association Falmouth Harbour Commissioners Associated British Ports
Energy	Wartsila UK Ltd. Vattenfall SSE Renewables Ørsted Wind Power A/S Innogy Renewables UK Ltd Dogger Bank Wind Farms Energy UK Renewable UK OGUK
Fishing	National Federation of Fishermen's Organisations Swanage Fisherman's association Waterdance Ltd South Western Fish Producer Organisation Ltd The Holderness Fishing Industry Group: South Devon and Channel Shellfishermen Limited Northern Ireland Fish Producers' Organisation Weymouth and Portland Fishermen and Licensed Boatman's Association Shellfish Association of Great Britain
Recreation	Tamar Valley Association for Shooting & Conservation Padstow Sealife Safaris The Angling Trust The Angling Trades Association Ltd The British Association for Shooting and Conservation (BASC) The British Sub Aqua Club (BSAC) Royal Yachting Association British Canoeing

Sector type	Organisations
Defra ALBs and delivery bodies	Joint Nature Conservation Committee (JNCC) Marine Management Organisation (MMO) Natural England Association of Inshore Fisheries and Conservation Authorities North Western Inshore Fisheries and Conservation Authority Sussex Inshore Fisheries Conservation Authority Eastern Inshore Fisheries & Conservation Authority Northumberland Inshore Fisheries and Conservation Authority Devon and Severn Inshore Fisheries and Conservation Authority North Eastern Inshore Fisheries and Conservation Authority Southern IFCA
Public sector	Historic Buildings and Monuments Commission for England (Historic England) Selsey Town Council The Crown Estate North West Coastal Forum Historic England
Science/research	The Marine Biological Association Seascope Analytics Limited and Seascope Research Community Interest Company Institute of Marine Engineering, Science and Technology Cambridge Coastal Research Unit (CCRU) University of Plymouth – Sheehan Research Group The National Oceanography Centre Society for Underwater Technology University of Essex University of Exeter, Exeter Marine Community Plymouth Marine Laboratory Joint Nautical Archaeology Policy Committee Chartered Institute for Archaeologists University of Plymouth MapSourced Limited Thyme Consultants Ltd

Sector type	Organisations
Wildlife/conservation	<p>The Wildlife Trusts Cornwall Wildlife Trust Norfolk Wildlife Trust Greenpeace UK WWF-UK National Geographic Society Zoological Society of London Oceana Blue Marine Foundation Great British Oceans RSPB Whale and Dolphin Conservation Fauna and Flora International ClientEarth Marinet Limited Honor Frost Foundation East Kent Wildlife Group Westcliff Conservation & Community Association Ramsgate. Atlanta Cook Marine Environment Consultancy (ACMEC) and Surfers Against Sewage (Brighton, Hove & Shoreham Local Rep) Cornwall Wildlife Strandings Network Plastic free Falmouth, Seas for the future cic Save Goodwin Sands/Goodwin Sands SOS Goodwin Sands Conservation Trust Torfaen Friends of the Earth Wembury Marine Conservation Area Advisory Group Wildlife and Countryside Link and Northern Ireland Marine Task Force Newquay Marine Group River Len Local Nature Reserve Management Committee Marine Conservation Society</p>

Annex 4: Draft site selection criteria to fulfil selection principles

Site Selection Principle	Site Selection Criteria
Ecological Principles	
Ecological Importance	Does the area contain high biodiversity?
	Is the area important for key life cycle stages for species of conservation importance?
Sensitivity and potential to recover	Are the habitats and species within the area judged to be sensitive?
	Does the site have to the potential to recover?
Ecosystem Services	Does the site contain important areas of blue carbon?
Social and economic principles	
Attitudes and Acceptability	What level of support is there for an HPMA from local communities?
	What level of support is there for an HPMA from stakeholders?
	To what extent is there ownership and pride over the resource in the potential HPMA site?
	What level of support was received from stakeholders for the existing MPA (e.g. pre-designation)?
	What is the current level of support from stakeholders for the existing MPA (e.g. post-designation)?
	What level of support was received from the local community for the existing MPA (e.g. pre-designation)?
	What is the current level of support from the local community for the existing MPA (e.g. post-designation)?
Governance and management	To what extent are stakeholders engaged with the management of the potential HPMA site?
	Are governance and management processes established (e.g. is there an MPA manager)?
	Is there research capacity within the vicinity of the potential HPMA site to support ecological monitoring and evaluation?
	Is there research capacity within the vicinity of the potential HPMA site to support socio-economic monitoring and evaluation?
	Is the potential HPMA site accessible for monitoring of activities and enforcement?
	Is the potential HPMA site accessible for ecological monitoring?

Site Selection Principle	Site Selection Criteria
Social and economic activities and effects	Is there aggregate extraction occurring within the potential HPMA site?
	Is there aggregate extraction occurring within proximity of the potential HPMA site?
	Does dredging occur within the potential HPMA site (e.g. dredging channels, areas, lines or points)?
	Does dredging disposal occur within the potential HPMA site?
	Does dredging disposal occur within proximity of the potential HPMA site?
Social and economic activities and effects	Are there coastal discharge points within the potential HPMA site (e.g. an urban wastewater treatment plant)?
	Are there active extractive license other than aggregates and dredging?*
	Are there active sampling licenses granted for the area?*
	Is there a wind farm development within the potential HPMA site?
	Is the HPMA site a potential site for wind development?
	Are there tidal leases or potential tidal streams within the area?*
	Are there oil or gas wells or operations within or near the HPMA area?*
	Are there oil and/or gas pipelines that traverse the area?*
	Are there renewable energy cables that traverse the area?*
	Are there telecoms cables that traverse the area?*
	Is the potential HPMA site within a high-density navigation route?
	Do passenger ferry services traverse the potential HPMA site?
	Is there potential for traffic to traverse the potential HPMA site?
	What is the economic value of shipping traffic in the area?*
	Are there major passengers, goods or vessel ports in or near the HPMA site?*
	Does angling take place within the potential HPMA site?
	Does sailing take place within the potential HPMA site?
	Are motorboats used within the potential HPMA site?
	Does anchoring occur within the potential HPMA site?
	Are there dive sites which are visited for their natural features within the potential HPMA site (e.g. reefs)?
	Are there dive sites which are visited for their cultural heritage within the potential HPMA site (e.g. wrecks)?
	Is the site used for wildlife watching or bird watching?
	Are there wrecks of important cultural heritage within the potential HPMA site?
	Are there areas/features of important cultural heritage within the potential HPMA site (excluding wrecks)?
	Is there an education or visitor centre within or adjacent to the HPMA site?

Site Selection Principle	Site Selection Criteria
Social and economic activities and effects	To what extent would an HPMA affect aggregate, dredging and other extraction stakeholders?
	To what extent would an HPMA affect energy production stakeholders (e.g. oil and gas)?
	To what extent would an HPMA affect renewable energy stakeholders?
	To what extent would an HPMA affect fishing stakeholders?
	To what extent would an HPMA affect shipping stakeholders?
	To what extent would an HPMA affect recreation stakeholders?
	To what extent would an HPMA affect local communities?
	What effect would an HPMA have on stakeholder relationships (between sectors)?
	What effect would an HPMA have on stakeholder relationships (within sectors)?
	Would an HPMA allow for benefits to be equally distributed among stakeholders?
	Would an HPMA allow for costs to be equally distributed among stakeholders?
	What effect would an HPMA have on the health and well-being benefits provided by the current MPA?
	What effect would an HPMA have on exceptional scenic beauty in the current MPA (e.g. natural areas with features of natural beauty)?
	What effect would an HPMA have on the delivery of educational opportunities in the current MPA (e.g. field trips/on-site learning)?
	What effect would an HPMA have on cultural features in the current MPA (e.g. religious, historic, artistic or cultural values)?

Annex 5: List of sites recommended to the Benyon Review Panel for further investigation

Respondents to the Call for Evidence, Panel members and Defra's SNCBs recommended these sites and the list is not endorsed by the Panel.

We excluded from this list sites that were recommended in sea areas outside the remit of this Review, as well as very large-scale sea areas that were recommended including Cornwall and the Irish Sea.

Suggested site	Marine Plan Area
Farne islands and Northumbria coast	North East Inshore
Farnes East MCZ	North East Offshore
North East of Farnes Deep MCZ	North East Offshore
Swallow Sand MCZ	North East Offshore
Bempton Cliffs / Flamborough Head	North East Inshore
Dogger bank	East Offshore
Markham's Triangle MCZ	East Offshore
The Wash and North Norfolk Coast	East Inshore
Cromer	East Inshore
Orford Inshore MCZ	East Inshore
Blackwater, Crouch, Roach and Colne Estuary	South East Inshore
Isle of Thanet, including Pegwell bay and Ramsgate	South East Inshore
Goodwin sands MCZ	South East Inshore
Shakespeare bay, Dover	South East Inshore
Folkestone Pomerania MCZ	South Inshore
Fairlight & Dungeness	South Inshore
Beachy Head	South Inshore
Chichester and Langstone harbours	South Inshore

Suggested site	Marine Plan Area
Portsmouth harbour	South Inshore
Wight-Barfleur Reef SAC	South Offshore
Poole harbour	South Inshore
Studland bay	South Inshore
Kimmeridge	South Inshore
South Dorset MCZ	South West Inshore
Lyme bay	South West Inshore
East of Start Point MCZ	South West Inshore
Torbay	South West Inshore
Start Point	South West Inshore
Kingsbridge Estuary	South West Inshore
Plymouth including Rame Head and Wembury bay	South West Inshore
Whitsand and Looe Bay	South West Inshore
Hand Deeps reef	South West Inshore
Falmouth	South West Inshore
Fal and Helford	South West Inshore
The Manacles	South West Inshore
Gwennap Head	South West Inshore
Greater Haig Fras Area	South West Offshore
East of Haig Fras MCZ	South West Offshore
North East of Haig Fras MCZ	South West Offshore
SW approach to Bristol Channel MCZ	South West Inshore
The Gannel, Newquay	South West Inshore
Lundy island	South West Inshore
Severn Estuary and Weston-Super-Mare	South West Inshore
Croker Carbonate Slabs SAC	North West Inshore
River Ribble	North West Inshore
Morecambe bay	North West Inshore
South Rigg MCZ	NA, Irish Sea

Glossary

ALB	Arm's Length Body
BEIS	Department of Business, Energy and Industrial Strategy
Blue carbon	The carbon stored in coastal and marine ecosystems. Coastal ecosystems such as mangroves, tidal marshes and seagrass meadows sequester and store more carbon per unit area than terrestrial forests and are now being recognised for their role in mitigating climate change.
Cefas	Centre for Environment, Fisheries and Aquaculture Science
Defra	Department for Environment, Food & Rural Affairs
DfT	Department for Transport
EA	Environment Agency
Ecosystem services	The direct and indirect contributions of ecosystems to human well-being. They support directly or indirectly our survival and quality of life.
GES	Good Environmental Status as described under the UK Marine Strategy.
HPMA	Highly Protected Marine Area
IFCA	Inshore Fisheries and Conservation Authority
Inshore	Near coastal waters extending from the coastline out to 12 nautical miles.
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
MCAA	Marine and Coastal Access Act 2009
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MPA	Marine Protected Area
MoD	Ministry of Defence
NE	Natural England
Nearshore	The nearshore is defined as an indefinite zone extending seaward from the shoreline well beyond the breaker zone. It defines the area where the current system is caused primarily by wave action.

Net Zero	An overall balance between emissions produced and emissions taken out of the atmosphere.
NTZ	No Take Zone (NTZ) is a Marine Protected Area (MPA) where all methods of fishing are prohibited.
Offshore	Coastal waters extending from 12 to 200 nautical miles, or the median line.
SAC	Special Areas of Conservation
SPA	Special Protection Areas
Secretary of State (SoS) Waters	English inshore and offshore waters and Northern Irish Offshore waters under the competence of the Secretary of State for Environment Food & Rural Affairs.
SNCB	Statutory Nature Conservation Body – in the SoS waters these are Natural England for English inshore waters and JNCC for English and Northern Irish offshore waters.

