Response by the Scottish Association for Marine Science to the UK Parliament call for views on marine planning and environmental protection

Introduction

1. "The Environmental Audit Committee of the UK Parliament is seeking views on the Government's delivery of its environmental obligations under international marine treaties and the Government's strategy for marine planning and protection." Questions posed include:

- "Does the Government have an adequate strategy to address the actions required to ensure alignment with its environmental obligations under multiple international marine treaties?"
- "What are the existing pressures on the marine environment?"
- "How well does the UK's current approach to marine planning operate across (1) different regions and sectors and (2) areas for which devolved administrations have responsibility?"

2. The Scottish Association for Marine Science (SAMS) is an independent research organisation, established in 1884 and housed near Oban since 1969, that provides impartial advice based on scientific evidence. We provide a response to these questions in relation to what are called the 'pelagic habitats''.

Pelagic habitats and the plankton

3. The pelagic habitats comprise the water columns and the plankton therein, which contribute to important ecosystem services. Excepting some jellyfish, members of the plankton are mostly small – they include microscopic algae, protozoa and animals the size of water-fleas – and are thus not well known to the public. Nevertheless, they fuel the marine food webs that feed fish, marine mammals and sea-birds; contribute to carbon sequestration; and make oxygen by photosynthesis. Some of them are stimulated to excess growth by anthropogenic inputs of nitrogen and phosphorus compounds. A few species impact on human health by way of shellfish-vectored toxins and on aquaculture by harming farmed fish.

4. During the Defra programme of research into Natural Capital and Ecosystem Assessment, we estimated that the ecosystem services provided by the UK's pelagic habitats were worth the equivalent of about 5% of national GDP, implying that the natural capital in these habitats added about £3 trillion to the UK's inclusive national wealth of about £35 trillion in 2019.

International obligations

5. As recognised in the recent Plankton Manifesto of the UN Global Compact, plankton and pelagic habitats contribute to UN Sustainable Development Goal 14, 'to conserve and sustainably use the world's ocean, seas and marine resources'. We don't know how the UK reports on this.

6. More concrete UK obligations are those as a signatory to the *Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic* (1992, in force 1998). The UK has played a leading role in advancing OSPAR's strategies to combat *eutrophication* and for *biodiversity*, including in the development of indicators of the health of pelagic habitats.

7. However, populating these indicators requires monitoring of the plankton in all the water bodies that make up the UK EEZ. The UK Pelagic Habitats Expert Group (PHEG: planktonandpeople.org/), to which SAMS contributes, is concerned about maintaining this monitoring and about remedying gaps in both areal coverage and types of plankton sampled. A particular concern for SAMS is whether the Scottish Government invests sufficiently in monitoring the pelagic habitats in the very large area of sea for which it has responsibility. This is especially true of the complex waters on the west coast of Scotland.

Existing pressures

8. As analysed by PHEG, the main pressures on the pelagic habitats are those of:

- Climate change, which has resulted in warmer seas and greater amounts of freshwater runoff; in the case of UK waters, increasing sea temperatures correlate with decreases in the abundances of types of plankton that provide food for fish;
- Pelagic fisheries, which by overharvesting of plankton-eating fish, may be changing the balance of organisms in the plankton;
- Demersal fisheries, which by damaging the sea-bed and animal communities there, have likely contributed to decreased water transparency and thus inhibited the growth of photosynthetic plankton;
- Nutrient enrichment from urban waste-water, agriculture and fish-farming, the emissions from salmonid aquaculture being of particular concern in the case of the western and northern coastal waters of Scotland.

9. The clearest evidence is that for climate change in almost all parts of the sea around the UK, and for the effects of nutrient enrichment in certain UK waters.

10. Hypotheses about impacts of fishing come from knowledge of marine food webs. Evidence of correlation between fish catches and plankton changes has proven

hard to find, possibly because of complex interactions within food webs and because usable time-series of data are too short.

11. Theory suggests that strong regulation of fisheries is not only good for marine ecosystems but also increases the profits of the industry.

12. Nutrient enrichment of the sea is a mixed blessing. It can increase plankton production and thus food for fish and cultivated bivalve molluscs. Above a certain level it causes an undesirable disturbance, to the balance of organisms and the quality of the water environment, that is defined as *eutrophication*, and which should be avoided.

13. The indicators used by PHEG interpret *biodiversity* in terms of the contribution of each functional type - or lifeform - of planktonic organism to the working of marine food webs and the health of the pelagic habitats, and thus to the sustainability of the ecosystem services provided by these habitats.

Marine Planning in Scotland

14. SAMS recently responded to a Scottish Government consultation on a proposal to extend marine planning zones for aquaculture. Currently, Scottish local authorities are responsible for consenting the development of marine fish and shellfish farms in Scottish waters. The current marine planning zones extend out to 3 nautical miles from the coastal baseline; the proposal is to extend these to 12 nautical miles, i.e. to the limit of Scottish territorial waters. Because the coastal baseline links headlands and islands, these planning zones are already extensive on the west coast of Scotland.

15. The Food and Agriculture Organisation of the UN has argued that planning for aquaculture should include the strategic identification of areas suitable for the cultivation of each type of farmed organism, prior to the permitting of developments at sites within these areas. We argued that, for western Scottish waters, the proposed extension to existing local authority powers was not conducive to such strategic planning of aquacultural developments in offshore waters, because local authorities such as Argyll and Bute or Eilean Siar lacked expertise and funds for this work.

16. We identified the need for an adequately funded, and democratically controlled, Regional Marine Planning pPartnership (RMPP) to identify offshore zones for aquaculture, in what is in essence a single water body extending from the Mull of Kintyre to Cape Wrath. Such partnerships were envisaged in the Marine (Scotland) Act 2010 but are yet to be fully implemented. We argued that the operational area for this RMPP should be drawn on the basis of information about oceanographic conditions, rather than by offshore extension of terrestrial boundaries as laid down in the Scottish Marine Regions Order 2015.

17. We argued that realising the potential for aquaculture's co-location and port sharing with other industries, such as offshore renewable energy generation, requires an integrated strategic planning system, rather than one that splits planning between local authorities (for aquaculture), the Scottish Government (for other sectors) and the UK government (for the part of the EEZ beyond territorial waters).

18. Finally, we argued that better monitoring and scientific knowledge of the western Scottish waters was needed for their environmental protection and for sustainable development of offshore industries.