

Scotland's National Marine Plan – Consultation - Response.

In principle as planning on land is well established and enables plans to be considered with the public interest in mind it seems not unreasonable that there should be a marine plan.

I apologise for making some factual points which will be obvious to many of those who prepared the plan and who will read /consider responses but points are made partly to remind me and partly as background to arguments. My comments may also seem negative but I do appreciate that much work has gone into this and the staff on tour were both knowledgeable and helpful so please treat this as another take on some aspects of a subject in relation to which there could be many differing views.

Background

The Plan appears to pay heed to :

The 1982 Law of the Sea Convention (UNCLOS) which recognises Exclusive Economic Zones extending 188 nautical miles beyond the Territorial Sea as regards boundaries.

The Convention for the Protection of the Marine Environment of the North East Atlantic adopted in September 1992 (the OSPAR Convention) whereby the Contracting Parties “shall take all possible steps to prevent and eliminate pollution and shall take measures to protect the maritime area against the adverse effects of human activities”. This covers prevention of pollution and applying best environmental practice.

EU Directive 2008/56/EU establishing a framework for community action in the field of marine environmental policy (otherwise known as the Marine Strategy Framework Directive). Referring to the preamble Clause 8 refers to “by applying an ecosystem based approach to the management of human activities while enabling a sustainable use of marine goods and services, priority should be given to achieving or maintaining good environmental status in the Community’s marine environment, to continuing its protection and preservation, and to preventing subsequent deterioration”.

The Directive at clause 10 refers to the diverse marine conditions etc of the various marine regions requiring different and specific solutions, leading in clause 11 to the statement that “each Member State should therefore develop a marine strategy for its marine waters”.

The Directive at clause 27 refers to Member States establishing and implementing programmes designed to achieve good environmental status whilst accommodating existing Community and international requirements. Measures should be based on the precautionary principle and the principles that preventative action should be taken, that environmental damage should be rectified at source and the polluter should pay.

These preamble points are incorporated in the Articles of the Directive.

The foregoing references are limited and tend to the environmental aspects to the exclusion of economic points such as in UNCLOS the Resolution governing preparatory investment in activities relating to polymetallic nodules.

Scotland's Marine Atlas

I found this an interesting backdrop to the Marine Plan, indeed it contains a great deal of general interest. Given the importance attached in the Marine plan to oil and gas and to renewable energy I thought that something might be said about the geology of the relevant areas. I was also initially surprised to see deep sea habitats and plankton apparently occupying the same section but on turning to the relevant pages found that the two were treated differently. On an ecosystem basis the changes in relative abundance of *Calanus finmarchus* and *Calanus helgolandicus* are surely indicative of water temperature changes which may be significant in relation to fish species. However because this underpins the Marine Plan it is important that the information in this is as accurate as possible. I would have liked more time to study it but am not aware of any other single collection of all the information. When planning the underlying geology is important for example in relation to possible future hydrocarbon extraction as most comes from permeable sedimentary strata, often Jurassic, which has a cap which has prevented the hydrocarbons from escaping and in relation to renewables costs may be increased by sediment conditions and underlying rock types to which equipment requires to be anchored, or cables driven through to ensure burial. I mention the point briefly because Scotland is diverse geologically.¹ The British Geological Survey has been doing more offshore work and there is data from oil and gas operators which can be accessed to some extent.

Royal Society of Edinburgh

I have had the benefit of reading the Advice Paper by the above dated June 2011 and tend to agree with the points made. I do favour removing redundant oil and gas infrastructure as decommissioning takes place.

Potential competing or conflicting interests.

There are differences in respect that stakeholders are competing for the use of marine resources and that the public involvement in marine matters is less than on land. The vision of clean, healthy, safe, productive and biologically diverse oceans contains potential conflicts for example between productive and clean and healthy. Productive is likely to mean using for economic benefit which in the past has often meant a dumping ground for sewage (nowadays normally partially treated) etc and occasionally as a resource for gravel or sand and for fishing. The main economic benefit now is oil and gas

extraction. These very conflicts bolster the reasons for having a plan. They also highlight the need for the plan to provide means for resolving conflict in relation to use. Interestingly in their comments in June 2011 at pre-consultation The Royal Society of Edinburgh mentioned conflicting objectives.

Chapter 3 of the paper sets out national principles in an optimistic manner but this seems to leave aside the difficulties of implementation which in turn reflects the legislative background of different layers of government.

Implementation & Enforcement

Who is going to implement the plan? It is prepared by the Scottish Parliament and it looks as if Westminster is happy that it be enforced at Scottish devolved level but what about Europe? In the Maritime Policy Green Paper published by the EU Commission in 2006 (COM(2006) 275 final) there was mention of reconciling the economic, social and environmental dimensions of the exploitation of the seas and of economic and ecosystem requirements to both of which the national Plan has regard. Is this sufficient? The Marine Strategy Framework Directive does not appear to provide an instant answer. Should there not be a clear understanding between the EU and UK and Scottish governments as to the stance of each, the extent to which there is agreement, objectives are shared, the place of each and thereafter the responsibilities and co-operation of each in relation to enforcement? If that has not been achieved then this should be made clear. The plan does appear to comply with the principles of the Marine Policy Framework Directive. Ironically the Framework Directive appears to expect national governments to implement plans but does not recognise that the EU may be a barrier to national governments being able to secure the good environmental status to which the EU aspires in the Framework Directive. In short the EU should check and approve national plans, or recommend changes, and assist member states in enforcing these plans. The question of fishing whether as a common resource or as a historic right should be set aside (as then can relative stability) for the purpose of the EU accepting national marine plans unless there is good reason to the contrary and authorising and backing national governments in enforcing the plans. By way of example in relation to Scotland other EU countries probably pursue a more intensive fishery along the Continental Shelf west of Scotland than the UK nations and whilst the effort may be reduced from the time (1994-1996) when the Shelf Edge study was undertaken that programme highlighted the fishing effort in the area and an irresponsible element which trawled up moored equipment used to measure the slope currents etc (Simpson & Sharples page 308) ². I suspect that the irresponsible fishing referred to was not conducted by UK vessels.

At present the Licensing authority for oil and gas operations is DECC which also has responsibility for environmental safety. The HSE has responsibility for Health and Safety. The EU by directive 2013/30 stipulates that the Licensing authority is not to be the health and safety nor the environmental authority. Although largely a UK responsibility the ongoing role and responsibilities of DECC need to be clarified.

Conflicts

There is a conflict between using resources for short term economic gain and using sustainably. For example there are widely held views (made clear in the oil and gas section of the Plan) that our need for hydrocarbons is such that these although often originating in the Jurassic period ie at least 160ma ago should be extracted and used although that means that such resources are unlikely to be available again for at least that period of time. On the other hand there is a view that fishing effort should be conducted so that it is sustainable more or less year on year. I do not take exception to these decisions but the decisions should be recognised as expecting different standards of different users of the sea and seabed

These conflicts, or at best potential conflicts, are not well covered. I appreciate that Chapter 2 refers to consents being issued by local authorities for aquaculture developments and a framework to be in place which will govern the licensing of specific projects.

There is the potential conflict between the marine plan for Scottish inshore waters and that for Scottish offshore waters but there is a recognition that two legislative regimes operate and there appears to be a successful determination to co-ordinate the two to prevent conflict.

The Approach to Policies section (chapter 3) does set out some of the matters which will be taken into account, but this tends to be based more on balancing development against the effect of development on the environment and protecting ecosystem stability. I do agree with the ecosystem approach.

General Policies

It would be difficult to argue against a presumption in favour of sustainable development. Indeed the general principles which relate to providing economic benefit, social benefit and multiple uses of marine space without damage to the marine environment are unlikely to be controversial.

It is necessary to involve communities where development might impact on communities. I agree with the principle that terrestrial and marine developments should be integrated and shall return to this. Likewise the management of river basins should be integrated with marine plans and management.

Of course all marine interests should be treated with fairness and transparency.

Following on from the foregoing stakeholders and the public should be involved and decisions should be based on facts/evidence. However this is not something in which government has excelled whether at Scottish or European level as regards fisheries.

I agree with the necessity to observe the EU Marine Strategy Framework requirement of Good Environmental Status which properly interpreted is in everyone's interests. The seas are a valuable resource and should be treated as such so that the benefits are long term. Maintaining good environmental status should be regarded as a means of ensuring that the marine environment is looked after and is of value to future generations. Part of the looking after is ensuring that there are appropriate legislative limitations on use and these are observed so general point 12 is acceptable. The interpretation is however more difficult as that affects the implementation. None of us wish wilful destruction and preservation of heritage assets is not in principle going to be opposed but what one person interprets as a heritage asset may be seen by another as old but not an asset. If the number of sites is limited, eg per Map 4, I see no problem but if the number was increased dramatically then views might be different. I sympathise with general point 14.

I strongly agree with the points in relation to air quality and noise. Ignoring the high atmosphere reactions (eg ozone and uv light) the practical effects of pollutants leading to acid deposition (whether carbonic or sulphuric) should be avoided.³ As we legislate to ensure air quality and against excessive noise on land it is logical to ensure quality at sea. This links to point 18 with which I also agree; to do otherwise would contravene the good environmental status objective.

With regard to general point 17 actions should not perturb natural trends. I would oppose dredging for sand and gravel where this might, for example with the assistance of rising sea levels, lead to coastal erosion but would equally, in general, oppose expensive coastal defences which would only postpone the effects of rising sea levels. There will be limited occasions when expensive sea defences are justified. This links to point 19. Although references to greenhouse gases are often construed as carbon dioxide (CO₂) it should be kept in mind that methane (CH₄) because of the greater number of atoms is more significant and in anoxic conditions in sea bed sediments is best not disturbed. This may be relevant to any disturbance of the sea bed in relation to attempts to install renewable energy structures and in particular offshore wind turbines.

The general policies are unlikely to generate much controversy but may require to become more specific in application.

Fisheries

The plan identifies different sectors within the fishing industry and each sector has its own priorities. Although there has been a reduction in vessel numbers and in fishermen fishing has the potential to outlast many of the other economic activities because it has the potential to operate sustainably but to do so must recruit fishermen. The greatest challenge is recruitment of fishermen, in particular to the demersal/white fish and demersal/nephrops sectors, as opposed to the Plan's reference to the challenge being to maintain fish stocks, but if the National Marine Plan is able to offer (a) greater certainty to the business case for fishing and (b) a stable future then that will be a useful step

toward encouraging recruitment and achieving the goal of continuing fishing as a Scottish industry and thereby sustaining fishing communities in Scotland.

Map 5 illustrates that fishing is concentrated in certain areas and Simpson & Sharples² page 3 states that ~16% of global marine primary production is attributable to shelf seas which is 5% of the ocean surface. The importance of different factors and of location to primary production by phytoplankton – the main marine autotrophs – is apparent from pages 46/7, 50, 53/4, 58-63 and 67/8 of Carol Lalli & Timothy Parsons⁴ which refers to the requirements for photosynthesis eg chlorophyll a and b, and main accessory pigments such as phycocyanin and phycoerythrin, the effect of nutrients on growth and the limitations on growth of shortages of nitrates and phosphates in the photic zone as well as physical controls on production. Although not all species of fish feed continuously or with the regularity of people the food chain is founded on the phytoplankton which provide the food for zooplankton and other larger organisms and so on up the trophic chain⁵. This emphasises the point that fish are not evenly distributed throughout our seas. The plan favours sustainable use of resources therefore fishing should be permitted so far as possible in the areas where fish are more abundant and fishing can be carried on sustainably.

I would therefore emphasise that as fish are more concentrated in certain areas only parts of the seas around Scotland are so productive as to merit commercial fishing therefore it is important that these areas are kept available for fishing. I do accept that Marine Protected Areas will impinge upon some fishing grounds.

In relation to interaction with other users whilst I accept that installing cables and pipelines causes short-term disruption I am concerned that the effect of offshore wind turbine developments will be negative and will displace fishing from large areas, many of which have been and are actively fished eg the outer Moray Firth. Whilst I accept Marine Protected Areas may act as nursery grounds and conservation areas these will be undisturbed. Areas used for renewable energy will be in part occupied by structures which will affect current flow and therefore sediment deposition. The bases of wind turbines will form a vertical barrier for perhaps 30 years during which incident waves will be reflected to interfere with the next incident wave. The two progressive waves will form a standing wave with double the amplitude. This is more fully explained with equations at pages 76/7 of Simpson & Sharples. The main point is that around structures there will be more turbulent motion in the surface layer. However deflection will occur around the edges of structures and if the speed of currents decreases within parts of a wind farm area then some sediment in suspension will be deposited. Many past depositions have been fans associated with fluvial systems. I presume that there has been some computer modelling of the effects of structures in different depths and with varying current velocities but suspect that this requires further study and my concern is that large areas of sea are given over to renewable energy and lost to fishing with the result that fishing effort is displaced, all without adequate prior investigation.

I appreciate the points in relation to displacing fishing effort and agree with the points in the paper.

Fishing does have an impact but it is easy to blame fishing for reductions in fish biomass. We know that stock recruitment is variable year on year, that fish could detect and respond to a temperature front of 0.03-0.07°C and fish will attempt to avoid stressful temperatures (Speight & Henderson page 188)⁶. In short it is easy to blame overfishing but sometimes we may simply be ignorant of the underlying causes and it was refreshing to see the heading “Impact of Environmental Change on Fish Stocks” and a list of factors on page 49. That said the Scottish fleet is much smaller, measures have been taken to reduce mortality and the impact of fishing has reduced. Discards are an indication to fishermen of wasted effort but one positive of discarding at sea is that the nutrients are returned to the sea in approximately the same area from which the resource was taken. If discards are landed then those nutrients are lost to the sea. Is that desirable? I think not.

Fisheries should be considered in an ecosystem context; a mistake was made in relation to cod recovery. Whilst there is a danger that a cause of cod reduction was higher sea temperatures cod recovery may have gone too far and cod may be so abundant as to endanger nephrops. I would like to think that an ecosystem approach would have avoided this result.

Planning policies should ensure survival of demersal and nephrops fisheries. At present there is the prospect of there being no Scottish owned and based fleet within 25 years.

Consultation regarding developments should not just be with locally based fishermen but with those who regularly fish in an area and I would favour a bias in decision making in not displacing fishing effort except when a case has been made for a Marine Protected Area.

If real time closures are implemented then as much notice as possible should be given. In the past these have sometimes been imposed without adequate notice.

It is important that fishing interests are considered preferably by fishermen because fishing is the one activity which is likely to stand the test of time and last long after the energy industry, except perhaps wave and tidal, has gone from our seas.

In short I do favour the fishing industry.

Aquaculture

I do recognise the importance of the industry in particular in rural areas of the West Coast. My only concerns are (1) that most captive fish are carnivorous, (2) that feed relies heavily on products containing wild fish although I understand that the proportion has reduced and (3) that the uneaten feed along with faecal material could cause anoxic conditions underneath cages or, perhaps and/or, cause eutrophication. Whilst I have reservations about the article I would refer to Goldberg and Naylor⁷.

The impact of farms may need to be more thoroughly considered in future and there should be integration between land based and marine planning.

Wild salmon & migratory fish

I appreciate the importance but am in no position to comment.

Oil & Gas

The industry is of great importance and it is likely that further recovery can be achieved from existing wells using techniques not originally available.

We must accept that the industry will decline in importance and that we are using resources which should perhaps in part have been left to future generations.

The existing licensing etc systems/structures appear to have worked reasonably well but as mentioned in Implementation and Enforcement the ongoing position of DECC needs to be clarified.

Carbon Storage

This offers technology for the future but the scope may be more limited than first thought if there is a move away from carbon based fuels.

Renewables

I feel that this has been overhyped but am sympathetic to wave and wind although money needs to be spent to develop both.

However there is a significant cost to developing offshore renewables not least in cabling and infrastructure. The electricity generated would be consumed many miles away therefore much energy would be lost pushing the electricity down the wires to the end user. If energy intensive industries were located near the source of supply the developments would be more appropriate.

I am not convinced that there is an economic case for offshore wind. Wind generated electricity is often expensive to generate on land and will cost more at sea. Renewables have had the effect of increasing electricity bills although the effect has been exacerbated by the lack of investment in new generating capacity. However that does not address the marine plan requirements.

Within marine sediments there are often significant quantities of methane which may be disturbed and escape during construction of renewable infrastructure thereby contributing

to greenhouse gases in the atmosphere. Estimates of carbon in marine sediments vary – 5% to 53% of the total global carbon reservoir, mostly in the form of gas hydrates⁸. Can some of this be tapped? If not there is surely a danger that operations to install offshore structures will result in the escape of the gas to the atmosphere. The quantities may be small but there will probably have to be investigations, not all sites will prove suitable etc. so the total of carbon based gases could be more significant.

I think that noise underwater should be added to the “Noise” section under “Living Within Environmental Limits”. Noise especially during construction could be considerable and noise can travel considerable distances underwater and at a more noticeable volume with possible disruption to marine life.

To “Collision risk” I would add marine craft. I appreciate that oil and gas installations have operated without collisions by ships, excepting rare supply vessel incidents and a guard ship incident some years ago but turbines at sea are not subject to the same supervision.

I have already mentioned sedimentary processes as a weakness of renewables when discussing the fishing industry and displacement.

I think that there are a number of weaknesses in relation to the case for offshore wind and am particularly concerned by the loss of fishing grounds. Any applications should be subject to a rigorous planning and economic study.

Recreation & Tourism

Not qualified to comment but certainly enjoy the coasts of Scotland on a personal basis.

Transport.

I agree with the objectives, in particular with the first four. Overall transport to the islands is much better than it was 50 years ago.

Telecoms & Defence

I have no comments on the remaining chapters.

Other matters

Water Quality

I appreciate that much has been achieved in reducing waste being pumped into the sea but if water quality is to be improved waste must be dealt with on land. For example

Scottish Borders Council granted application 12/00929/FUL for installation of a pump house and associated works for effluent discharge at Drysdale Old Cambus, Cockburnspath TD13 5XX despite objections, many of which related to this being sited close to Siccar Point which is of geological interest. The planners were made aware of the additional biological oxygen demand, possible eutrophication and the requirement for clean seas and consent of Marine Scotland. What is the point of having a Plan if those in authority ignore it? Different authorities must work together.

Climate Change

If the seas warm then the species of fish will change but is there not also a question of deoxygenation of the sea. This is looking well ahead beyond our planning term but warm water holds less oxygen than colder water and may therefore be less productive. The point is mentioned in an article by T. Lyons & C. Reinhard Deoxygenation in warming seas- looking back to the future, *Geology* (geology.gsapubs.org/content/40/7/671.full). This looks back to the Paleocene-Eocene Thermal Maximum 55m.a.ago when oceans warmed and the oxygen content reduced.

There is also the likelihood of increasing acidification of the seas with increased toxicity of heavy metals and a less habitable environment for fish.

Measuring Good Environmental Status

I noticed in the Marine Pollution Bulletin earlier this year an article by S. Bourlat & others “Genomics in marine monitoring: New opportunities for assessing marine health status”. The article specifically refers to the MSFD in Europe and to good environmental status before going on to refer to the significant gaps in the understanding of marine ecosystems and in the knowledge required to achieve an ecosystem based management policy that integrates all the indicators.

I mention the point because much will depend upon monitoring and how monitoring is carried out. I doubt if this has received the attention in the Plan which it merits.

Marine Protected Areas

I have not commented on the specific proposals but would make a plea for full consideration to be given to the views of the fishermen who work the areas in question. I do support the principle of such areas and wish some created taking account of the need to safeguard habitats and ecosystems balanced against the interests of users and accept that not all users will be happy. The existence of islands of undisturbed ecosystems will no doubt create “reserves” and probably some nursery areas although most species of commercial fish do move and are not static.

References

- 1 Con Gillen : *Geology and Landscapes of Scotland* Dunedin Academic Press 2013.
Quoting from the Preface to the first edition “Scotland has been a Mecca for

geologists ... “ The book goes on to refer to the landscape variety underpinned by underlying geology.

- 2 John H. Simpson & Jonathan Sharples : Introduction to the Physical and Biological Oceanography of Shelf Seas, Cambridge University Press 2012.
- 3 Roberts, D. A. et all : Article, Ocean acidification increases the toxicity of contaminated sediments. Global Change Biology 2012.
- 4 C. M. Lalli & T. R. Parsons : Biological Oceanography, an introduction, Elsevier 2nd edition 1997.
- 5 see M. Speight & P. Henderson : Marine Ecology concepts and applications, Wiley Blackwell 2010 at pages 89 – 94 for some prey and predation points.
- 6 M. Speight & P. Henderson : Marine Ecology concepts and applications, Wiley Blackwell 2010
- 7 R. Goldberg & R Naylor : Future Seascapes, fishing and fish farming, The Ecological Society of America, www.frontiersin ecology.org
- 8 Mogollon & others : Methane gas-phase dynamics in Marine Sediments: a case Study, American Journal of Science March 2009