



**Association of
Salmon Fishery Boards**



Comments on 'Scotland's National Marine Plan: Pre-Consultation Draft' June 2011

Introduction

The Association of Salmon Fishery Boards is the representative body for Scotland's 41 District Salmon Fishery Boards (DSFBs) including the River Tweed Commission (RTC), which have a statutory responsibility to protect and improve salmon and sea trout fisheries. The Association and Boards work to create the environment in which sustainable fisheries for salmon and sea trout can be enjoyed. Conservation of fish stocks, and the habitats on which they depend, is essential and many DSFBs operate riparian habitat enhancement schemes and have voluntarily adopted 'catch and release' practices, which in some cases are made mandatory by the introduction of Salmon Conservation Regulations. ASFB creates policies that seek where possible to protect wider biodiversity and our environment as well as enhancing the economic benefits for our rural economy that result from angling. An analysis completed in 2004 demonstrated that freshwater angling in Scotland results in the Scottish economy producing over £100 million worth of annual output, which supports around 2,800 jobs and generates nearly £50million in wages and self-employment into Scottish households, most of which are in rural areas.

Formed in 2005, Rivers and Fisheries Trusts of Scotland (RAFTS) is an independent freshwater conservation charity representing Scotland's national network of 25 rivers and fisheries Trusts and Foundations. Our members work across over 90% of Scotland's freshwaters to protect and develop our native fish stocks and populations by undertaking a range of activities including freshwater, river habitat restoration, fish and fisheries monitoring, research and education programmes. RAFTS is the membership organisation of the fisheries and rivers trusts operating in Scotland and is, itself, a charity and company limited by guarantee.

We welcome the opportunity to comment on the pre-consultation on Scotland's National Marine Plan. However, we still have significant concerns with the plan as set out, which are covered in detail below. Our major concern is the total lack of recognition of the conservation importance of both Atlantic salmon and sea trout. This is reflected by their inclusion in the 'Food' section of the document despite the ban on the sale of rod caught salmon and the failure to mention the status of Atlantic salmon as European protected species.

Overarching Comments

- Whilst we support the statement that 'a healthier ecosystem will deal with the impact of climate change more easily than a less healthy ecosystem', the plan fails to recognise the key strategy for climate change mitigation of removing/minimising additional pressures such as those which are man induced from species or habitats at risk from climate change.
- We do not support a 'presumption in favour of development' within the National Marine Plan.
- The sector plans are simply a statement of what is currently happening, coupled with the aspirations for expansion of each industry. There is no assessment as to whether such developments are sustainable, no attempt to address potential conflicts and no direction or guidance for regional marine planning partnerships as to how to deal with such conflicts.
- We believe that the inclusion of Wild Salmon and Freshwater Fisheries in Section 1 is inappropriate. Further, there is no recognition of the conservation importance of salmon and sea trout.
- The environmental impacts section for Wild Salmon and Freshwater Fisheries is muddled and does not recognise the need to limit the impact of coastal mixed stock fisheries and reduce annual catches to help preserve stocks.

- The aquaculture section includes an aspiration to expand the industry by 50% without addressing the sustainability of such an expansion. In addition, this section does not adequately address the environmental impacts of aquaculture, particularly with regard to negative interactions between wild and farmed fish.
- The potential environmental effects of electromagnetic fields from marine renewables and cabling must be addressed.

Specific comments

Chapter 7

No reference is made to the scoping study on marine ecosystem objectives (SNH Commissioned Report 341). This report recommends a two tier approach: National Marine Objectives aimed at improving the management of Scotland's seas, and achieving the agreed Vision for Scotland's Seas; 'Bottom-line' targets (termed marine ecosystem standards) to ensure that human activities are not damaging marine ecosystems and the environmental goods and services they provide. We support this process and believe that such bottom line targets, which should take into account cumulative impacts, are vital to ensure that marine activities occur within environmental limits. We also believes that each sectoral chapter should cross reference the marine ecosystem objectives in order to ensure that sectoral objectives are consistent with the overall plan objectives and to ensure that the contribution of each sector to meeting the objectives can be assessed.

Chapter 8

Section 8.2: We support the statement that 'a healthier ecosystem will deal with the impact of climate change more easily than a less healthy ecosystem and therefore the ecosystem objectives set in the marine plan will have a role to play in managing the adaptation to climate change'. However, the document fails to highlight a key strategy for managing adaptation to climate change which was included in a previous draft: '*Healthy ecosystems are likely to be more resilient [to climate change] and this could mean offering protection to species and habitats at risk by minimising additional pressures such as those which are man induced*'. This approach has long been identified as the most appropriate way to manage adaptation to climate change in features of conservation importance or those providing essential ecosystem goods and services (see for example: Scheffer *et al.* (2001)¹; Folke *et al.* (2004)²; Levin & Lubchenco (2008)³)

Chapter 9

It is totally inappropriate to have a 'presumption in favour of development' within the National Marine Plan, without any qualification with regard to the sustainability of that development. Section 5 of the Marine (Scotland) Act 2010 states that marine plans are documents which state the Scottish Ministers' policies (however expressed) for and in connection with the sustainable development of the area to which the plan applies. Any development within the Scottish marine area should be in line with the 5 principles of sustainable development⁴ the goals of which are *living within environmental limits* and *achieving a just society* by means of a *sustainable economy, good governance* and *sound science*.

Section 9.3/Section 9.14: It is not clear why there should be a presumption in favour of the conservation of designated heritage assets but no such presumption in favour of the conservation of designated sites or species of nature conservation importance.

¹Scheffer, M., Carpenter, S., Foley, J.A., Folke, C. & Walker, D. (2001) Catastrophic shifts in ecosystems. *Nature***413**: 519-596.

²Folke C., Carpenter, S., Walker, B., Scheffer, M., Elmqvist, T., Gunderson, L. & Holling, C.S. (2004) Regime shifts, resilience, and biodiversity in ecosystem management. *Annu. Rev. Ecol. Evol. Syst.***35**: 557-581.

³Levin, S.A. & Lubchenco, J. (2008) Resilience, robustness, and marine ecosystem -based management. *Bioscience***58**: 27-32.

⁴ UK Sustainable Development Strategy (UK SDS), *Securing the Future* (2005)

Chapter 10

It is not clear how the interactions matrix has been developed but we have significant concerns that many of the potential interactions with wild salmonids are given too low a rating. Whilst the matrix appears to be a basic attempt to assess the interactions between sectors, there does not appear to be any attempt to assess the *sensitivity* of each sector to those interactions. Unless a robust, scientific justification for the assessment can be provided we believe that Chapter 10 should be removed. Of particular concern are the ratings of low-medium for commercial sea fisheries (see our comments on section 1.1 below), low for aquaculture (whilst this rating may take into account the presumption against development on the north and east coasts we do not believe that this is appropriate given the significant concerns regarding the potential negative effects of sea lice and escapes on wild salmonids) and low for telecoms and cabling (especially given the high degree of uncertainty regarding the potential effects of electro-magnetic fields on migratory fish – see below). We believe that these ratings should be altered to medium-high/high for commercial sea fisheries (particularly in the case of sea trout which remain in coastal waters throughout the marine phase of their lifecycle); high for aquaculture (in relation to disease/parasite transfer and escapes); and, given the lack of information on the effects of EMFs on migratory fish but the clear potential for negative effects, we believe that the rating for telecoms and cabling should be altered to low-medium/medium-high on a precautionary basis.

Chapter 12

Section 1: Food – Introduction

Whilst fishing may produce less greenhouse gas than other sources of dietary protein, it is disingenuous to mention only one aspect of the environmental effects of fishing in isolation here. Whilst the other environmental impacts of commercial fishing are mentioned later this section is misleading.

The only reference to seawater and freshwater angling comes in the last paragraph and it is revealing that these activities are highlighted as being important as *recreational resources* and for the *tourism industry* (see our comments below regarding the inclusion of salmon and freshwater fisheries in Section 1).

Section 1.1 – Fishing

Scotland's Marine Atlas and Section 5.9 of the pre-consultation document identify '*fishing, which impacts the seabed and species*' as one of the two significant, widespread pressures on the Scottish marine area. It is therefore unacceptable that reduction of this pressure is not addressed as either a key challenge or an objective for commercial fisheries. Qualitative Descriptor 6 of the Marine Strategy Framework Directive requires that: *Sea-floor integrity is at a level that ensures that the structure and function of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected*. This is reflected in the plan objectives (Section 7.4) but not in Section 1.1. Like all other species, wild salmonids rely on a healthy, well-functioning marine environment during the marine phase of their life-cycle and some commercial fishing gear has the clear potential to adversely affect large areas of seabed. Page 149 of Scotland's marine atlas identifies the following pressures and impacts, all of which could potentially impact upon wild salmonids:

Pressure	Impact
Abrasion due to disturbance from fishing gear	Damage to, or loss of, habitats
Selective removal of species	Impacts on non-target species (by catch) due to non-selective extraction
Selective removal of species	Indirect impacts on community structure and food webs, loss of biological productivity and biodiversity

It is vital that the national marine plan addresses these issues. Page 39 states that '*it may be possible to do this [protect the seabed] by identifying areas which are unfished and controlling fishing activities there to help ensure any damage to the seabed is minimised*'. We would argue that strategic protection of the seabed is an essential step in recovering our marine environment. In many inshore areas there could be a win-win for wider environmental concerns (such as sensitive benthic habitats included on the draft list of priority marine features) and wild salmonid stocks, particularly sea trout.

Section 1.2 – Wild salmon and freshwater fisheries

General Comments

We believe that the inclusion of Wild Salmon and Freshwater Fisheries in Section 1 is inappropriate and does not reflect:

- That the Atlantic salmon is a European protected species. Indeed there is no mention of this in section 1.2, nor of the fact that there are 17 SACs designated for this species in freshwater. In an SAC, member states must take measures to maintain or restore the listed species and such measures may need to be implemented outside the SAC (i.e. within the marine environment).
- That the marine phases of both Atlantic salmon and sea trout are included on the draft list of Priority Marine Features - the habitats and species of *greatest conservation importance* in inshore waters. They are therefore candidates for protection, particularly under the 'wider seas' pillar of the Scottish Government's Marine Nature Conservation Strategy.
- That only net caught salmon can be sold – it is illegal to sell rod caught salmon or sea trout.

Our preferred approach would be to split the information contained in section 1.2 into two sections. Issues relating to net-caught salmon fisheries should remain in Section 1 and a new sub-section should be created for rod fisheries in either Section 3 (Tourism and Recreation) or Section 7 (Marine Environment). We note that recreational sea angling is included in Section 3.

Key challenges

The second key challenge should be expanded to encompass 'marine activities and developments'. The third key challenge is important and we welcome its inclusion. We also believe that this key challenge should be referenced in Sections 1.3 and 2.3 as the locational decisions on both aquaculture and marine renewables should take full account of the potential effects on salmon and freshwater fisheries. Indeed, it is arguable that these industries should be funding research into the identification of such areas and migratory routes. The document should make reference to two current projects relating to this key challenge: Rivers and Fisheries Trusts of Scotland (RAFTS) has recently been awarded Scottish Government funding to undertake a project examining interactions between aquaculture and wild salmonids, which includes the development of a credible risk assessment tool that will enable planners and regulators to properly assess what the likely site-specific impacts of fish farm activity on wild salmonids might be; in addition SNH has been tasked with the production of sensitivity maps for aquaculture. Both of these projects should be referenced in the National Marine Plan, and particularly in Section 1.3, as they will clearly have a bearing on future planning decisions on aquaculture and potentially other marine developments.

Objectives

A previous draft included 'managing interactions with aquaculture' as an objective. We believe that the potential negative interactions between aquaculture and wild fisheries are significant and acute and therefore this objective should be reinstated in its own right. A similar objective should also be included in the aquaculture section.

Objective 4: It may not always be possible to resolve key issues through negotiations. There are legal powers to resolve some of these issues, and whilst we agree that the use of such powers should not always be the first route of action, we also believe that these powers were taken for good reason. We would recommend the removal of the words 'through negotiation'.

Background

There are currently 41 District Salmon Fishery Boards, not 42. The role of fisheries trusts should also be highlighted here.

Current Situation

Reference is made to the fact that Scotland's river systems support one of the largest and most diverse Atlantic salmon resources in Europe. The diversity of Scotland's salmon runs is also highlighted. However, no reference is made to the detailed seasonal analysis of the 17 Scottish rivers designated as SACs undertaken by Marine Scotland Science on behalf of the Mixed Stock Fisheries Working Group⁵. This paper shows that there has been a decline in the salmon caught in the spring stock component in the majority of the rivers, since records started in 1952. Reference should be made to the decline in the spring stock component as it clearly has an important bearing on the above statements.

Environmental Impact of Sector

The purpose of this section is not immediately clear – the equivalent subsections for other sectors are entitled *Environmental impacts* and these sections appear to relate to the impacts of those sectors on the wider environment. We do believe that it is appropriate that impacts *on* the sector are included, but perhaps it would be more appropriate to include these in a separate sub-section. In the case of wild salmon and freshwater fisheries the wider environmental impacts differ between the rod and net fisheries but are largely limited to removals of the target species.

Rod fisheries: Whilst there might be circumstances where the rod fishery has an environmental impact through the removal of salmon, this section correctly points out the marked decline in rod caught and retained removals and the general increase in catch and release. This section should also make reference to the work of Fisheries Boards and Trusts in protecting and enhancing salmon fisheries and the habitats on which they depend: for example in removing barriers to fish migration (and subsequently opening up previously unavailable habitat) or programmes of riparian restoration.

Net fisheries: With regard to net fisheries, it is inappropriate that no reference is made to the International concerns regarding mixed stock fisheries. The North Atlantic Salmon Conservation Organisation (NASCO) has defined Mixed Stock Fisheries (MSFs) as '*fisheries exploiting a significant number of salmon from two or more river stocks; NASCO has also agreed that management of homewater fisheries should be based on the status of individual river stocks and management of distant water fisheries on the status of the stock complexes defined by managers*'. In addition, ICES has advised that '*the management of all fisheries should be based upon assessments of the status of individual stocks. Fisheries on mixed stocks, particularly in coastal waters or on the high seas, pose particular difficulties for management, as they cannot target only stocks that are at full reproductive capacity if there are stocks below conservation limits⁶ within the mixed-stock being fished*'.⁷ Finally, the European Commission Staff Working Document "Report on Mixed Stock Fisheries for Salmon in Atlantic Community Waters" (SEC(2006) 590, 04.05.2006)⁸, states: "*In the present conditions, MSFs for salmon are widely considered to be inappropriate because the lack of information on the stocks being exploited make the conservation and rational management of individual river stocks very difficult. It is therefore widely agreed that there should be a general presumption against operating MSFs unless they can be shown not to contravene basic conservation policies*".

⁵ *Mixed Stock Fisheries Working Group Paper (MSFWG0910)*

⁶ In Scotland there are some concerns that the conservation limit approach lacks adequate resolution in assessing complex salmon population structures typical of Scotland, but not necessarily typical of stocks in other NASCO jurisdictions. Marine Scotland Science and salmon managers are looking at developing alternative stock assessment tools that may be more appropriate for assessing Scottish stocks.

⁷ http://www.nasco.int/pdf/far_fisheries/Fisheries%20Guidelines%20Brochure.pdf

⁸ See: http://ec.europa.eu/fisheries/legislation/reports_en.htm

ASFB accepts the international advice that mixed stock fisheries, as defined by NASCO, are a threat to the effective conservation and management of Atlantic salmon. Indeed, the Fisheries Management Focus Area Report (FAR) prepared for NASCO by the Scottish Government Marine Directorate states: *'Reduction in netting exploitation has been a factor in maintaining the relatively stable numbers of returning spawners and rod catches in the face of declining numbers of fish returning to the coast. However, the remaining MSFs, as any other form of exploitation, present a threat to conservation of stocks'*. The FAR has been reviewed and the review group's findings for Scotland included the following text⁹. *'A strategy is being developed for the management of mixed-stock fisheries, but at present there is no clear policy. The Group is concerned that these fisheries are still being operated despite a lack of information to characterise the exploited stocks. These issues are not consistent with the NASCO agreements and guidelines and need additional actions.'* On this basis, we strongly suggest that, as an absolute minimum, the original text be reinstated - *Limit impact of coastal mixed stock fisheries and encourage reduction in annual catches to help preserve stocks.* This is particularly relevant in the light of the decline in the spring stock component (see above).

The first paragraph relates to an impact on the sector and therefore should be included alongside the other pressures which have an impact on fresh water fisheries. The list of other pressures should make clear that these are limited (quite correctly) to marine pressures as there are clearly also a number of pressures within the freshwater environment.

Low Carbon energy developments: We welcome the reference to sub-sea grids and cabling here. However, these effects should also be cross-referenced in section 2.3 (see further comments below).

Aquaculture: We welcome the reference to the effects of aquaculture on populations of wild fish including sea lice, disease, the influence of escaped farmed fish interbreeding with local wild stocks and the potential demographic consequences. We would also highlight the following statement from Marine Scotland Science: *'It should be noted that adherence to Integrated Sea Lice Management (ISLM) as described in the industry Code of Good Practice may not necessarily prevent release of substantial numbers of lice from aquaculture installations. The CoGP takes no account of farm size, or number of farms in an area, in setting threshold levels for sea lice treatments. This may be appropriate when the aim is to protect the welfare of farmed fish but it will not necessarily prevent significant numbers of larval lice being shed into the environment, and posing a risk for wild fish particularly in the case of larger farms or management areas holding a large biomass of farmed fish.'* Marine Scotland Science also stated: *'There is evidence of an effect of lice from fish farms on sea trout, although the extent to which the fish populations are affected is not clear... There is no published evidence of an effect of lice on sea trout at a population level, however, such an effect would be expected in view of the high infestation intensities observed near farms in the second years of salmon production cycles.'*

Commercial sea fisheries: We welcome the reference to the effects of commercial sea fisheries here, but it is not clear whether this section includes salmon netting. We reiterate our concern that these impacts are not adequately addressed in Section 1.1.

Environment: We are not clear why this is a separate section. The reference to bacterial and viral diseases and parasites should be included within the aquaculture section. The second sentence does not appear to relate to the first. Is this a wider statement that was originally intended to summarise the bullets?

Additionally, this section should make reference to climate change as it is recognised that salmon are likely to be negatively impacted by climate change. The National Marine Plan has a vital role to play in building the resilience of species and habitats at risk from climate change impacts, by reducing other human induced pressures (e.g. fisheries, aquaculture, other developments) in order to preserve stocks (see comments under Chapter 8 above).

⁹NASCO Council document CNL(09)11 (2009).

Economic Impact

It should be noted that the economic impact of game and course angling is now somewhat out of date (2004) and therefore the quoted figures are likely to be an underestimate.

Spatial constraints

We don't understand the content of this paragraph. We believe that the sentence on post-escape farmed fish should be moved to the Environmental Impact section. This section should reiterate the Key challenge – to identify priority areas for migratory and freshwater fish and fisheries, and investigate salmon marine mortality and migratory routes – a key aspect in making informed decisions on aquaculture, marine renewables and associated cabling. The last sentence in this section relates simply to conflicting uses in freshwater and therefore should be removed. These conflicts will not be addressed by the marine planning system!

Future

Short term plans: Management of our wild salmon stocks for diversity and abundance should be supported, *including by statutory means where necessary.*

Whilst we agree in principle that compensation is appropriate where voluntary agreements to reduce exploitation can be agreed, we would also reiterate the International concerns relating to mixed stock fisheries. There are likely to be circumstances where the conservation imperative to protect fragile stocks is such that a net fishery must be closed by statutory means. It should be noted that, in recognition that that netting rights are separate, private, heritable rights, compensation may be offered on a case by case basis. However, there is no legal requirement for compensation under such circumstances.

Section 1.3 – Aquaculture

Key challenges

Whilst we recognise that these key challenges represent Scottish Government policy we do not believe that a 50% increase in production of marine finfish or juvenile salmon and trout can be considered sustainable unless the industry can demonstrably operate in a manner consistent with the North Atlantic Salmon Conservation Organisation International goals (as agreed by the International Salmon Farmers' Association):

- 100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to aquaculture
- 100% of farmed fish to be retained in all production facilities

The NASCO International goals should be referenced in this section.

Objectives

Bullet 4: This objective should be strengthened. Given that this presumption has been in place since 1999 there should be a clear statement that salmonid aquaculture is inappropriate on the north and east coasts.

Bullet 5: This bullet needs to make reference to the interactions between wild and farmed fish. There is a recognised need to control lice to a level below that at which deleterious effects are seen on farmed fish in order to protect wild fish.

The objective to '*Reduce the environmental impact of aquaculture through good husbandry practice and bioremediation*' has been removed. We are extremely concerned that there is now no reference to reducing the environmental impact of aquaculture. This objective should be broadened to encompass locational considerations with regard to the sensitivity of wild salmonids (see comments under key challenges for Section 1.2 above) and make specific reference to the RAFTS and SNH projects. The reinstated objective must explicitly include the possibility of relocation (and/or removal of discharge consent) where necessary. The ultimate aim of the industry should be to move to closed containment systems such as those currently under development by Preline (Norway) and Aquamarine (Canada). The move to closed containment could be phased in over time and would remove many of the environmental concerns surrounding the industry including those regarding escapes and negative effects of sea lice on wild fish.

Environmental Impact

This section states that fish farms can have a significant but localised environmental impact. However, given the paucity of information on salmonid migration routes, and inshore marine habitat preference for sea trout it is impossible to state with any certainty that the environmental impact of fish farms are localised.

The only reference to the impact of sea lice (the reference in the document is to 'parasite') is in the bullets. However, clear reference should be made to the Marine Atlas which identifies, '*Increased numbers of sea lice*' as a pressure and '*Infection of wild salmonids by sea lice from farmed fish*' as the associated impact. The document states that these potential impacts are tightly regulated by domestic and European legislation to ensure the sustainability of the industry, but the paragraph on licensing etc. makes no reference to sea lice or how these effects are regulated.

The cumulative effects of aquaculture developments in areas where fish farms exist in high densities, or near strategic migration routes, must also be considered as an important area for future research. Marine Scotland Science have stated: '*The area [Loch Linnhe] has a relatively high concentration of farms and consideration should be given to the potential cumulative effect that may lead to a detrimental impact upon wild salmonids in the area. However, the current state of knowledge does not allow us to quantify the severity of that impact if any.*'

Spatial Constraints

There is a reference to a move to off-shore or exposed salmon farms here. If such sites prove technically feasible, the National Marine Plan should make reference to the corresponding opportunity to remove small, sensitive inshore sites as part of the same process.

Section 2.3 –Renewables& Section 5 – Telecommunications and Cables

Page 71 – Grid: This section mentions the studies that the Scottish government has supported on the technical, economic, social and financial feasibility of the development of an offshore transmission network or grid, but no mention is made to the potential environmental effects of HVDC Cabling. In fact the only mention of electromagnetic fields is in Section 5. However, given that marine renewables cannot function without the associated cabling it does not seem to make sense to separate these issues. As detailed below, there are significant uncertainties as to the effects of EMFs on migratory salmonids and these should be addressed by the National Marine Plan. This is particularly important given that nearly all the HVDC sub-sea links detailed in this section would pass through important parts of the coastline for migratory salmonids and would have the potential to impact upon all Scottish SAC's designated for Atlantic salmon. There is a clear research requirement to further investigate the migratory routes of salmonids and potential effects of EMFs and such research should be funded by the Renewables Industry and/or Scottish Government.

Page 73 – Environmental Impacts: This section details the effects of noise with regard to salmon, but does not address the potential effects of electro-magnetic fields (EMFs) resulting from operation and cabling. A recent SNH commissioned report¹⁰ made the following recommendations for future research to attempt to:

- *Definitively determine whether these species will respond to the likely electric and magnetic field strengths associated with each MRE source and assess the potential significance of any effects for each of the critical life cycle stages identified. This could include studies of how exposure to EMF causes effects (e.g. physiological and biochemical stress resulting from EMF).*
- *Identify how each of the species interacts with the EMFs when free swimming and during the migration phases of their life cycles. This is likely to vary between species according to their habits, and needs to consider different life stages of each fish.*

¹⁰Gill, A.B. & Bartlett, M. (2010). Literature review on the potential effects of electromagnetic fields and subsea noise from marine renewable energy developments on Atlantic salmon, sea trout and European eel. *Scottish Natural Heritage Commissioned Report No.401*

- *Determine the threshold levels at which the three species detect and respond to the subsea noise during the construction and operation phases, separately using noncaged experiments from a range of different sound sources on the behaviour of each species of fish. This too could include studies of how exposure to noise causes effects (e.g. resulting physiological and biochemical stress; see Slabbekoorn et al., 2010).*
- *Specifically consider the cumulative impacts of adjacent developments, and determine the effects of constructive and destructive interference patterns and interactions between EMFs and noise from cables or marine renewable devices associated with whole developments.*

In addition, the potential effects of EMFs and sub-sea noise should be considered in the light of the considerable uncertainties regarding behaviour and migratory routes as highlighted in the recent Marine Scotland Science review of the migratory routes and behaviour of Atlantic salmon, sea trout and European Eel¹¹.

Page 74: The correct reference should be to **survey**, deploy and monitor. This approach should not be limited to collision risk, but rather, should encompass all environmental consequences of deployment of devices with uncertain ecological effects. This should include monitoring of the effects of noise and electromagnetic fields on migratory salmonids during the operation of such devices.

Page 97: The potential environmental effects of electromagnetic fields should be included here. In addition to the information included above, EMFs are listed as a pressure in the Marine Atlas (p184).

Annex A: Food Webs

It is unclear what the purpose of this section is or how it will be used in the marine planning process.

For further information please contact:

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¹¹ Malcolm, I.A., Godfrey, J. & Youngson, A.F. Review of migratory routes and behaviour of Atlantic salmon, sea trout and European eel in Scotland's coastal environment: implications for the development of marine renewables. Scottish Marine and Freshwater Science Volume 1 No 14.

RESPONDENT INFORMATION FORM

Please Note this form **must** be returned with your response to ensure that we handle your response appropriately

1. Name/Organisation

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Title Mr Ms Mrs Miss Dr Please tick as appropriate

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Please tick as appropriate

- (a) Do you agree to your response being made available to the public (in Scottish Government library and/or on the Scottish Government web site)?

Please tick as appropriate Yes No

- (b) Where confidentiality is not requested, we will make your responses available to the public on the following basis

Please tick ONE of the following boxes

Yes, make my response, name and address all available

or

Yes, make my response available, but not my name and address

or

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Are you content for your **response** to be made available?

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- (d) We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Scottish Government to contact you again in relation to this consultation exercise?

Please tick as appropriate

Yes