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Dear Mr Dey,

ECCLR Committee inquiry into the environmental impacts of salmon farming

Thank you for your letter of 13 March. Marine Scotland welcomes the recent report published by the ECCLR and are currently analysing its conclusions alongside the current considerations of the REC.

Please find below detailed responses to the points raised in your letter. My Team and I are, of course, happy to discuss any of these in greater detail if that would be of assistance.

On setting of 'trigger levels' for the reporting of the action associated with sea lice levels within fish farms.

You indicate that the Committee is unclear as to the process for setting the 'trigger 'levels' for the reporting of action associated with sea lice levels within fish farms. I should explain that Marine Scotland has never set a trigger level for sea lice but instead the reporting and intervention levels are used by the Fish Health Inspectorate (FHI) to assess the measures which individual companies and sites require to demonstrate that they have satisfactory measures in place for the prevention, control and reduction of parasites, defined as *Caligus elongatus* and / or *Lepeophtheirus salmonis* (hereafter referred to collectively as sea lice) as required by the Aquaculture and Fisheries (Scotland) Act 2007 (AFSA).

The reporting level of three and the intervention level of eight adult or ovigerous female sea lice were developed following detailed and lengthy discussions within Marine Scotland and with stakeholders. It was a significant development of lice management policy and largely measures with observations made of the average lice loadings on farmed salmon populations [in Scotland] over the previous three years. A paper describing this analysis, Hall & Murray (2018), is enclosed. While the copyright is reserved to Elsevier, the paper is publicly available at <https://www.sciencedirect.com/science/article/abs/pii/S0044848617318367>

This is the modelling work that Rob Raynard referred to when he provided evidence.

There will be an opportunity for these levels to be revisited when the policy is reviewed later this year (July 2018).

I should also explain that the suggested criteria for treatment defined in the Code of Good Practice for Scottish Finfish Aquaculture (CoGP) are a starting point for discussions between farmers and their consulting veterinary surgeons to consider whether a sea lice treatment (medicinal, biological or physical) is appropriate. These systems are used to consider different requirements, so it is perhaps not surprising that they differ significantly.

National sea lice numbers falling

As you may be aware, a publication scheme for all sea lice data held by the FHI is in development. Information developed by epidemiologists (Hall & Murray (2018)) in Marine Scotland Science from the Scottish Salmon Producers Organisation published data suggests that the average adult and ovigerous female sea lice numbers are at their lowest for four years – this cannot be attributed to any single factor, but may suggest improved management of sea lice on farmed salmon stocks in Scotland.

Technical mitigations – development of RAS

There are a series of technical mitigations which have been introduced to the commercial production of salmon in Scotland. The introduction of vaccines in the 1990's massively decreased the industry's reliance on antibiotic use and at the time dramatically improved farmed fish survival. Vaccines are now widely used against a range of viral diseases also. Innovations in sea lice prevention and treatment have decreased industry reliance upon veterinary medicine usage – these methods include the use of cleaner fish (both farmed and wild caught), physical lice removal using pumping, freshwater and warm water, physical barriers such as lice skirts and snorkel cages. Recirculating aquaculture systems (RAS) in the production of smolts have been in use in Scotland for the last decade or so and their use is expanding, with one site opening at Inchmore, near Inverness and another in the construction phase near Oban. RAS in themselves do not necessarily mitigate the effects of disease in farmed salmon populations – this may be improved with the introduction of closed containment systems, and these systems do introduce their own unique set of challenges, particularly with regards water quality, water chemistry and dissolved gas management – each of which produces their own health challenges.

The introduction of the Code of Good Practice for Scottish Finfish Aquaculture (CoGP) has seen the underlying principles of the industries operation enshrined in one document, with the description of operations such as farm management area operation, the requirement for biosecurity and risk assessments prior to the movement of fish all requiring to be addressed by all companies and operations audited by an independent third party.

Disease management areas and movement controls on fish, equipment and personnel are used in the case of the outbreak of listed diseases – powers given to Scottish Ministers in the Aquatic Animal Health (Scotland) Regulations 2009 regs 23-31 and may also be invoked to control emerging diseases. The last two incidents where these powers were invoked were an outbreak of viral haemorrhagic septicaemia (VHS) in populations of cleaner fish in the Shetland Islands in the winter of 2012/13 and an outbreak of infectious salmon anaemia (ISA) in salmon in the Shetland Islands in the autumn and winter of 2009/10. The development of the disease management area system arose from the Final Report of the Joint Government / Industry Working Group on Infectious Salmon Anaemia (ISA) published in January 2000 – following the first outbreak of ISA in Scotland.

Locally the impact of the statutory controls is severe – in the case of the ISA outbreak, in the protection area (an area within the disease management area, centred around farms confirmed as being infected) farms had to be cleaned and disinfected, prior to lying fallow for significant periods of time. These two simple procedures have a significant direct and indirect cost associated with them.

On licensing of fish farms

You have asked a number of questions regarding the licensing of fish farms by Marine Scotland (MS-LOT) and how MS-LOT interacts with statutory consultees.

Operation of a fish farm requires a marine licence, issued by Marine Scotland MS-LOT, and an Aquaculture Production Business (APB) authorisation, issued by Marine Scotland Fish Health Inspectorate. This is in addition to planning permission, issued by the local authority, a CAR licence, issued by SEPA and a seabed lease, issued by the Crown Estate.

To assist your understanding of MS-LOT operations it may be helpful to briefly rehearse the licensing requirements of the Marine (Scotland) Act 2010. Although detailed, I think this might address some of the apparent misunderstandings.

I should begin by referencing Part 4 of the Marine (Scotland) Act 2010, Marine licensing, which makes it a licensable marine activity to deposit or remove substances and objects from a vehicle, vessel...etc. in the 'Scottish marine area'. Marine licences are determined by MS-LOT on behalf of Scottish Ministers.

The Marine Licensing (Consultees) (Scotland) Order 2011 lays down the 'statutory consultees' for marine licensing, these are:

1. the Commissioners of Northern Lighthouses (NLB);
2. the Maritime and Coastguard Agency (MCA);
3. the Scottish Environment Protection Agency (SEPA); and
4. Scottish Natural Heritage (SNH).
5. Any delegate for a region is specified as a person who must be consulted in relation to any application for a marine licence for an activity which is to be carried out in that region*

* - refers to marine planning partnerships.

Marine licences are required for, among other things, construction, dredging and deposit of dredged spoil. In relation to seawater finfish aquaculture, marine licences are required for (1)- the deposit of aquaculture equipment (for the purpose of mitigating navigational risk only) and (2) - for the deposit of chemotherapeutant from a vessel, following sea lice treatment in the wells of a wellboat. The former (1) shall be referred to as a 'navigational marine licence', the latter (2), a 'wellboat licence'.

It is also a 'licensable marine activity' to remove substances and objects, so the taking of sediment for routine testing by fish farm operators is classed as a licensable marine activity. However, this activity, where the removal activity is carried on as a condition of an authorisation of a controlled activity granted by the Scottish Environment Protection Agency

under Part II of the Water Environment (Controlled Activities) (Scotland) Regulations 2011, is exempt from the requirement for a marine licence. The relevant Article is 18B of the Marine Licensing (Exempted Activities) (Scottish Inshore and Offshore Regions) Amendment Order 2012 and effectively exempts fish farm operators from the requirement for a marine licence to remove sediment for testing.

'Navigational marine licences'

Article 12 of The Marine Licensing (Exempted Activities) (Scottish Inshore Region) Order 2011, exempts deposits in relation to the propagation and cultivation of fish from the requirement for a marine licence. More specifically, the exemption applies to the deposit of any trestle, raft, cage, pole, rope or line in the course of the propagation or cultivation of fish. The article does not apply to a deposit made for the purpose of disposal; made for the purpose of creating, altering or maintaining an artificial reef; or that causes or is likely to cause obstruction or danger to navigation.

Advice given to the Scottish Ministers by its navigational consultees (MCA and NLB) considers fish farms likely to cause obstruction or danger to navigation and, as such, the exemption is not used. Advice received through consultation with MCA and NLB regarding safe navigation, includes marking and lighting requirements and is included as conditions of 'navigational marine licences'.

Given that the environmental effects are considered through the Planning system, SEPA has no objection to applications for 'navigational marine licences' recognising that other aspects of fish farms are dealt with under other regulatory regimes.

SNH is consulted on the applications for 'navigational marine licences'. Where SNH advises that there is likely to be significant effects on European sites, MS-LOT refers to the advice given to Local Authorities by SNH during the planning process and adopts any 'appropriate assessment' carried out during the planning process by the Local Authority as the competent authority under The Conservation (Natural Habitats, &c.) Regulations 1994. A similar process occurs where SNH advises that an activity may affect the feature of a Marine Protected Area (MPA).

'Navigational marine licences' are not issued in the absence of valid planning permission. 'Navigational marine licences' are for six (6) years and must be re-applied for every six (6) years.

'Wellboat licences'

Wellboat licences are issued by MS-LOT to fish farm operators to permit the discharge of chemotherapeutants following treatment for sea lice in a vessel (a wellboat). Such licences are only issued where a valid Controlled Activity Regulations (CAR) licence has been issued to the relevant fish farm site for discharge of chemotherapeutants following in-cage treatments by SEPA following its consideration of the environmental effects. The volumes permitted for discharge are the same as the CAR volumes and Marine and CAR licences are conditioned to prohibit the release of chemotherapeutant under one regime at the same time as the other, thereby avoiding cumulative effects.

Wellboat licences are issued for three (3) years.

MCA and NLB have confirmed they will not provide routine comment on the applications for 'wellboat licences' as there is not a navigational element.

SEPA has provided standing advice that it has no objection to 'wellboat applications' provided the type and amount of chemical used and discharged will not exceed that specified in the respective CAR licence. An agreed condition is added to licences which prevents the simultaneous discharge from both treatments.

SNH is consulted where such activity takes place in a European site, and advise of the likely significant effects. SNH directs MS-LOT to advice given by SNH during the CAR licensing process. MS-LOT would look to adopt the 'appropriate assessment' carried out by the SEPA as the competent authority under The Conservation (Natural Habitats, &c.) Regulations 1994. Again, a similar process occurs where SNH advise that an activity may affect the feature of a Marine Protected Area (MPA).

With regard to your other specific points:

How it takes account of the representations of those organisations and if, and how often, decisions are taken to grant licences, contrary to the advice of these agencies;

MS-LOT determines licence applications based on the representations received during consultation. Where statutory consultees advise the requirement for condition, MS-LOT issues a marine licence with an advised condition where appropriate.

What triggers intervention from Marine Scotland Licencing in the operation of a fish farm, and what and how information flows influence a decision to undertake an investigation.

Potential intervention relating to fish farms could come from a number of 'sources' such as:

1. Information from a third party
2. Information from Marine Scotland
3. Information from NLB (NLB routinely visit fish farm sites to check navigational requirements are met)
4. Site visits by MS to follow up information provided by other sources

The Marine (Scotland) Act 2010 provides Marine Scotland, on behalf of Scottish Ministers, powers to investigate potential breaches of the licensing requirements and take enforcement action where appropriate.

Whether a licence has ever been refused or revoked based on environmental concerns (please provide details of the cases)

In respect of 'navigational marine licences', prior to the issuing of a marine licence, the environmental aspects will have been dealt with through the Planning system and any concerns addressed. As such, to date, MS-LOT has not refused or revoked a licence based on environmental information.

MS-LOT may refuse a licence application where unacceptable levels of risk to safe navigation are identified and where no satisfactory mitigation is available. To date, this has

not been necessary, but a small number of fish farm sites have made adjustment to the location during the determination process to meet the stakeholder concerns.

In respect of 'wellboat licences', the environmental effects of chemotherapeutant release are considered by SEPA during the CAR process. Prior to approval of a 'wellboat licence' application by MS-LOT, SEPA will have addressed the environmental concerns regarding release of chemotherapeutant at a certain site in order to issue a CAR licence. Therefore the environmental concerns relating to wellboat licences have been addressed through that process.

However, there are examples of applications for wellboat licences in protected areas where MS-LOT has concerns about impacts. In such cases, and where no assessment has been carried out by SEPA, applicants must demonstrate the acceptability of the proposal to MS-LOT. In a small number of cases this has not been supplied and as a result MS-LOT has not issued licences.

Why licences are granted in perpetuity;

That is not the case - Marine licences are not granted in perpetuity, 'navigational marine licences' are for six (6) years and wellboat licences are for three (3) years.

Your views on the merits of granting licences for a limited time period with fixed conditions and examples of where this might be practical.

Marine licences are never granted in perpetuity and do have conditions attached.

Wild Salmonids

You ask about the extent to which I consider Marine Scotland has the necessary capacity, expertise and necessary information to make an informed assessment of the interaction between wild salmon and aquaculture. This is of course an ongoing challenge for any organisation, notwithstanding the particular policy interest, but I remain confident in the ability of the personnel within Marine Scotland and across the broader Government bodies to be able to make informed and evidence based science and policy determinations in this area. That is not to say that we are complacent or that we are not prepared to seek further information and data when required, notwithstanding the difficulty in generating scientific evidence cannot be underestimated.

I should explain that Marine Scotland have studied distributions of salmon and sea trout smolts in relation to salmon farms to help to inform planning of site placement. Work is ongoing, but some results have been published in peer-reviewed literature.

- Middlemas, S. J., Stewart, D. C., Mackay, S., & Armstrong, J. D. (2009). Habitat use and dispersal of post-smolt sea trout *Salmo trutta* in a Scottish sea loch system. *Journal of Fish Biology*, 74(3), 639-651.
- S. Middlemas, D. Stewart, J. Henry, M. Wyndham, L. Ballantyne & D. Baum. (2017). Dispersal of post-smolt Atlantic salmon and sea trout within a Scottish sea loch system. In: *Sea Trout: Science & Management: Proceedings of the 2nd International Sea Trout Symposium* (Harris, G. ed.). pp 339-353.

The potential for impacts of sea lice on sea trout have also been identified in two separate studies (the SAMS report suggests that it is a single study):

- Middlemas, S. J., Raffell, J. A., Hay, D. W., Hatton-Ellis, M., & Armstrong, J. D. (2010). Temporal and spatial patterns of sea lice levels on sea trout in western Scotland in relation to fish farm production cycles. *Biology letters*, rsbl20090872.
- Middlemas, S. J., Fryer, R. J., Tulett, D., & Armstrong, J. D. (2013). Relationship between sea lice levels on sea trout and fish farm activity in western Scotland. *Fisheries Management and Ecology*, 20(1), 68-74.

The potential for using direct experimental methods to assess the impact of sea lice on salmon (as done in Norway) has been examined through a SARF project that will be published in due course. Further work to examine potential to estimate impacts of sea lice on sea trout at a population level is on-going. Patterns of dispersion of sea lice from farms has been reported in numerous papers by Salama, Murray, and others from MSS together with publications on the development of novel investigatory methods.

The overall conclusion of this research effort is that although it has not yet been possible to quantify impacts of sea lice on populations of sea trout and salmon in Scotland, knowledge of the distributions of the fish and sea lice, and hence the information available for informing salmon farm planning, is steadily increasing.

The Planning System

On the wider issue of a potential and alternative consenting regime, the Committee will be aware that this proposal first emerged as part of the Independent Review of Scottish Aquaculture Consenting published in July 2016 which was commissioned by Marine Scotland and The Crown Estate to consider whether there were inefficiencies, duplication or unnecessary complexities across the current consenting regimes; and whether the overall system fits the requirements and operation of the industry. These themes were subsequently picked up in the industry's "Aquaculture Growth 2030" strategy.

The Review made a number of recommendations for improvement (quick wins and longer-term options including an alternative consenting regime). Marine Scotland have now looked to see how we might move that longer term proposal into a working group discussion to consider and explore options for an alternative consenting regime. Those discussions have not been based on a predetermined view that wild salmonid impacts should be removed from the planning system.

I anticipate that we may be able to say more about that thought process later next month.

I hope that is helpful.

Yours faithfully

GRAHAM BLACK

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