

## Environment, Climate Change and Land Reform Committee

### Environmental impacts of salmon farming

#### Written submission from Scottish Association for Country Sports Wild Fisheries Expert Group

##### General

We are pleased that the report acknowledges the relative importance of the Scottish recreational salmon fishing sector in comparison with the commercial fishery of salmon, as ensuring the former has a long-term future should be the priority.

We note the report mentions that the impacts of salmon farming are cumulative, both within the industry itself and with other industries that impact the marine environment such as agriculture and manufacturing. When making decisions about aquaculture, it is important to do so in this context.

We note the different interpretations of the term 'significance' in assessing effects; we hope that the Committee is mindful that past environmental atrocities have been committed where the subsequently harmful action was deemed 'not significant' at the time. We are custodians of an increasingly fragile, finite planet; consequently, we are obligated to act ethically, and not to seek short-term justifications for environmentally harmful actions that happen to be commercially profitable.

We are pleased that the report includes wild salmon in the 'protected species' category, since it is well-established that wild salmon – a keystone species – is vulnerable and in current jeopardy.

It should be noted that community evidence suggests that sea trout suffer from the effects of aquaculture at a minimum of the same level as do wild salmon; this is another topic to add to the long list of research gaps identified in the report.

We remain astounded that the public apparently perceives farmed salmon to be 'natural' when it is not. There is work to do on educating the public about the reality of aquaculture so that people can make informed consumer choices, and about why doing so is important.

While it is vital to understand and eliminate research gaps, we are concerned about the timeframe for doing this given that the conservation of wild salmon stocks is time-critical. Too much time has been wasted already.

##### Subject-specific comments

**RAS and AM** – We note that RAS is stated as having high capital and running costs; with the present net-pen system, the full costs are not properly accounted for: they are deferred. The environment/ecosystem bears the cost of sea lice, disease, waste, eutrophication, diffuse and point source pollution, escapes, and natural resource inputs. The salmon farming industry is currently subsidised by the environment, which is effectively the industry's creditor; however, the debt continues to increase as the sector continues to expand, but the sector does not appear to understand that

it is obligated to pay back. Ultimately the consumer – actively eating salmon or passively accepting the environmental impacts – bears the cost, and at the moment, the active consumer is not paying the true cost of salmon meat.

If an accurate quantum was applied to the environmental services that are currently taken ostensibly ‘for free’ by the aquaculture industry, it is our belief that the production of farmed salmon under the current system would not be considered viable. Instead of focusing on the traditional economics of aquaculture as being separate to the environmental relationship, the Scottish Government should be looking at the full picture; otherwise, poor policy decisions will continue to be made.

Scotland has a proactive record on renewable energy. Is it the case that even with high energy consumption, if this was from renewable sources RAS would have a lower environmental cost per unit of production than net-pen farming (on a full-costs basis as described previously)? The report appears (probably unintentionally) to infer an equivalency between the environmental cost of energy usage in RAS and the environmental cost of continuing the aquaculture status quo; we do not believe that these costs would be equivalent in a renewables-based scenario.

We are deeply concerned by the report’s assertion that net-pen farming will predominate for the next decade. Another ten years of environmentally-impactful practice may be the death-knell for our wild salmon population. Both ScotGov and the industry have had the opportunity to take early action but have not done so; there is now no time left to lose.

We are familiar with Adaptive Management from our partnership work elsewhere in the land management sector. Given the potential significance of the consequences of aquaculture management practices, and the length of time over which monitoring must necessarily take place, we do not believe that AM should take precedence without incorporating the precautionary principle.

**Sea Lice** - It is an established fact that current salmon farming practice promotes the proliferation of lice, and that increased lice burdens (artificially high numbers caused by the presence of abundant farmed salmon) have a cumulative impact along with other negative pressures on wild salmon. Further, no treatments are fully effective and worryingly, lice are developing resistance to treatment. This is a damning position, created by the industry. The mitigation measures proposed in the report focus on the symptoms rather than the cause. The continued expansion of the salmon farming industry appears to be accepted as inevitable, rather than something the Government can actively control and limit. Why is this?

When considering sea lice, we hope that the Committee has noted the report’s reference to both mortality and morbidity; death of wild salmon and sea trout from lice burden is a significant threat, but so is the impact of lice burden on the quality of individual live fish forming a vulnerable population that is already suffering from a number of other stressors.

It is extraordinary that there are no studies relating specifically to the effects of sea lice on wild salmon in Scotland. That the Scottish Government has sanctioned aquaculture expansion without understanding this most crucial of threats to wild

salmon stocks beggars belief. That lice abundance will continue to increase even without industry expansion must surely be reason enough for the Government to take decisive and timely action.

**Disease** – Just as with sea lice, the report appears to accept that current salmon farming practice encourages the proliferation of pathogens and parasites. Given that “*water currents can spread pathogens*” it would seem that the open water environment is not suitable for salmon farming because the risks cannot be contained. Proposed mitigation focuses on chemicals and genetic engineering – the latter in itself a risk to the integrity and survival of wild salmon populations – which would appear to be out of step with trends in terrestrial food production as well as with the views of the Scottish Government. The report states that “*enhanced biosecurity*” in hatcheries and RAS would mitigate disease risk, but it is not clear how enhanced biosecurity would be achieved in the dominant open water environment that represents the greatest risk for wild salmon.

As others have stated, the Scottish salmon farming industry’s mortality rates would not be tolerated in any other livestock production system. It would appear that there is a two-tier system in Scotland, where agriculture is held to a higher standard than is aquaculture.

**Organic waste** – It is indeed a highly anthropocentric position that some degradation of the natural environment is deemed acceptable; clearly this is a value judgement, but we remind the Committee of our previous comments about sustainability and custodianship.

We note that seabed biodiversity is “*much reduced*” where farms are sited in a low-dispersion environment, and that this can be addressed by siting farms in high-dispersion areas or by mechanical increase of water-flow; we also note the risks associated with spread of disease in high-dispersion environments. It would seem that no location is entirely suitable for the net-pen system, because it has so many flaws; some of which conflict in terms of mitigation measures.

**Eutrophication** – the report states that “*Increased salmon production will lead to increased nutrient input and... could result in greater risk of eutrophication or other undesirable change, especially when coupled with effects of other pressures.*” This reiterates the significance of cumulative effects. If we know that eutrophication is undesirable, why would we tolerate practices that cause it to continue or increase, particularly when the full consequences in the marine context are not yet known? The impact of eutrophication caused by aquaculture is even more concerning when considered alongside the increasing scientific understanding of the importance of phytoplankton in the global carbon cycle.

**Medicines/Chemicals** – We note that “*Increased production is likely to require additional use of existing or newly developed chemicals.*” There is a significant primary resource requirement in chemical production (which we anticipate has not been factored into the industry’s true accounts); is an industry that relies so heavily on manufactured inputs, and still has extraordinary mortality rates, really sustainable

given the ongoing progression in global understanding of sustainability? Never has there been a greater case for change.

Further, the debate over the competence of EQS is not acceptable given ongoing credibility/transparency issues in the sector and the overwhelming need for clear high standards.

**Escapes** – We note that the annual quantum of escapes is likely to be inaccurate (too low), and that escapes will increase in direct correlation with production expansion. Again, the mitigations proposed here do not appear to be sufficient; for example, monitoring the genetic interchange is unlikely to impact the balance of predator/prey populations. Developing sterile strains of farmed salmon would be beneficial, but as this issue is time-critical we believe that the focus must be on stopping escapes, which are occurring at an unacceptable rate. In parallel, a switch to triploids should be prioritised, incentivised by Government to help the industry adopt timely change.

**Feed sustainability** – We are pleased to see that the report acknowledges the finite nature of natural resources; this relates to the wider, global issue of food production systems. Infinite expansion on a foundation of finite natural resources is not possible. Addressing the cause of the drivers for increasing amounts and availability of cheap protein (i.e the unsustainable expansion of human consumption) should also be addressed by global Government partnerships as part of the solution.

Dynamic solutions to the feed sustainability question are positive, but the industry must buy-in and adapt its business plans accordingly. To be truly sustainable, the industry would do this willingly and seek to own the process, rather than being forced by legislative change; but legislation must not be the last resort. Clearly the voluntary approach is neither sufficient nor effective.

We note the reference to ‘certified sources’, which no doubt is caveated by the common understanding that not all certification schemes are equal.

**Predators** – We note that predator interactions will increase as production increases. Seals and birds are also significant predators of wild salmon, and we do not wish to see populations of these predators (which are already out of balance with their vulnerable wild prey) artificially increased by the availability of farmed fish. Imbalance requires redress, with which the land management community is deeply concerned. Welfare is undeniably a leading consideration when culling individuals in order to manage the local population of a predator species, and we would be interested to understand the evidence for the report’s concerns in this regard. We reiterate that locally-abundant predator species must be actively managed in the context of other stressors (lice, disease, habitat degradation etc) on wild salmon populations. Non-intervention would be preferable, but this would require robust populations of all the species concerned, which will in turn require human intervention to achieve.

**Wrasse/Lumpfish** – We recognise that this is a welcome ‘natural’ alternative to chemical treatments, but we are concerned about the lack of regulation and interference with wild wrasse populations to solve a man-made problem. If fishing

and export of live wild wrasse is “*of commercial importance*”, then presumably there is a commercial incentive to make sure exploitation of wild stocks is sustainable. We note that the industry wishes to produce its own cleaner-fish stocks, which would be preferable to exploiting wild populations; we would be interested to know if wrasse production will have its own environmental impacts: has this been modelled?

## Summary

It is clear from the report that there are significant gaps in proper research relating to Scottish populations of farmed and wild fish. It is also clear that there are large areas of regulatory inconsistency compounded by a lack of transparency and clarity. There is a Government ambition to expand the salmon farming industry, but a considerable amount of work is required before an environmentally-friendly (i.e. sustainable) expansion of the industry can go ahead. It is also likely that proper protection of the environment, in particular wild salmon stocks, would inevitably lead to higher costs to the fish farming industry and altered profitability.

Norway is leading on robust regulation and Scotland should follow suit; for example, Norwegian lice limits of 0.5 lice per fish (maximum), and below 0.2 lice per fish for future aquaculture growth. Scottish lice limits seem laughable in comparison. In particular, we note: “...*However, there is no published scientific account of the basis for the setting these levels. Furthermore, it is not clear why these trigger levels are above the recommended CoGP levels requiring treatment, which are 0.5 or 1 lice per fish depending on the time of year. No data have yet been published on the results of this new approach. Therefore, it is unclear how successful it has been in keeping sea lice numbers down. This lack of transparency has led organisations to submit Freedom Information (FOI) requests to Scottish Ministers.*”

The report leads us to conclude that the Scottish salmon farming industry is not in a fit state to achieve Government expansion aspirations without an unacceptable level of environmental compromise. Ministers would be better advised to establish competent monitoring, evaluation and assessment of the existing salmon farming system in order to sufficiently understand environmental interactions, and introducing robust evidence-based environmental protection measures in conjunction with a meaningful enforcement strategy. Until then, there should be a moratorium on industry expansion.