

Environment, Climate Change and Land Reform Committee

Environmental impacts of salmon farming

Written submission from The Atlantic Salmon Trust

The Atlantic Salmon Trust was established in 1967. It is a registered charity in Scotland, England and Wales with the primary objective “To promote the conservation, protection and improvement of wild Atlantic salmon and sea trout stocks in the countries bordering the North Atlantic Ocean for the public benefit”. With this aim the Trust works with partners throughout the Atlantic salmon’s range, to conduct, assist in conducting and stimulate laboratory and field research; and develop and refine principles and methods for the management of salmon and sea trout stocks and fisheries.

The Atlantic Salmon Trust (AST) is committed to the protection of wild migratory salmonids and the ecosystems that sustain them. We believe that any industry can only claim to be sustainable if it protects and safeguards the surrounding natural habitat. This is particularly true in the case of salmon farming, where the welfare of the industry itself is in the longer term totally dependent on the quality and integrity of the surrounding aquatic environment.

AST recognises the economic and social importance of fish farming in remote rural areas but it is our view that this must not be allowed to override the need to conserve natural ecosystems and maintain the high conservation status of wild salmonids. Implicit in the adoption by governments of the ecosystem approach to managing our natural aquatic resources is a requirement for the salmon farming industry to be sustainable both economically and environmentally, operating in harmony with its surrounding environment.

The AST also believes that reducing sea lice infestation levels, treating / eradicating diseases from fish farms and preventing the escape of fertile farmed salmon are goals shared by both the wild fish and fish farming sectors. For example in the case of sea lice, mutual concerns relate not only to the direct physical and physiological impacts of the lice themselves but also to their role as disease vectors.

Written Evidence on the “Review of the Environmental Impacts of Salmon Farming in Scotland”

The AST welcomes the comprehensive review conducted by SAMS Research Services Ltd (‘The Report’).

The Report reviews current and planned growth of salmon aquaculture in the sea lochs and sheltered coast waters of the Scottish West Coast and Hebrides and in Orkney and Shetland and considers the main associated environmental impacts, their mitigation and monitoring assessment.

Section 1

The literature review provides a detailed and very helpful update, but the AST does not believe that it is as comprehensive as possible, especially regarding 'grey literature' on sea lice impacts of wild salmon and particularly sea trout, much of which is already in the public domain, including AST conference books compiled from the conference papers, all 'peer reviewed' by invited specialists.

Sections 2 – 7

The Report provides a comprehensive review of pressures, or impacts, of the salmon farming industry on the environment and wild salmonids, however we feel that The Report lacks definitiveness in many of the critical issue prognoses provided. Many are fairly equivocal and the AST believes that there is current scientific basis for more certainty in the prognosis. For example:

- Page vi: "sea lice populations also **appear to be developing resistance** to many existing treatment medicines and therapeutants"
- Page vii: "Increased numbers and sizes of farms **could lead to** increased risk of infection of wild fish.."
- Page x: "Increased production is **likely to** require additional use of existing or newly developed chemicals "
- Page xi: "Increase in numbers of farmed salmon **is likely** to result in more escapees .."

Section 5

This section provides an excellent summary of the potential impact of escapes on wild fish. However, with the exception of the genetic impacts on wild salmon populations we believe The Report largely neglects impacts in freshwater ecosystems through salmon smolt production intended for coastal aquaculture.

Cage farming of fin-fish, particularly in freshwater lochs, has the potential to generate significant amounts of organic waste from unconsumed fish feed and faecal matter. This can enrich sediments, alter macro-invertebrate community composition and fish population structure. In the case of brown trout, increased food availability risks lowering the physiological drive to migrate to the marine environment and may increase the proportion of resident trout, reduce the number of migratory sea trout and increase the incidence of predatory, ferox trout.

Section 8 Discussion and Conclusions

Mitigation Measures

The Report provides two main mitigation measures on which we would like to comment:

- **Recirculation Aquaculture Systems (RAS)**

The Executive Summary concludes that nearly all the environmental impacts, including: pollution, escapes and cross-breeding genetic concerns, the proliferation

of sea lice external parasites, and potential incubation and dispersal of potent diseases likely to increase natural mortality levels among many already seriously wild salmon and trout populations, can be addressed by a shift from open net cages to Recirculation Aquaculture Systems (RAS) technology. However, it also acknowledges that RAS technology is still being refined and its commercial profitability established.

We believe that RAS will be an important element in the future sustainability of the salmon farming industry. The Report does not conduct a full audit of the financial costs of all existing and projected mitigation measures, research and monitoring. However we believe that RAS could be a cheaper and environmentally safer method of salmon farming in the future.

We believe that RAS requires and should receive far greater support and encouragement from Government, not least during a transition period from traditional open cage farming practices.

Incentives are already being provided by the Norwegian Government for their salmon farming industry to develop RAS technology, and we would like to see similar incentives from the Scottish Government in the investment of RAS for the Scottish salmon farming industry.

- **Adaptive Management**

The AST supports the principle of adaptive management. The Atlantic Salmon Trust and Fisheries Management Scotland recently co-hosted a workshop for local fisheries managers, salmon farmers, Local Authorities, SEPA, Marine Scotland and Auditing bodies, to explore the potential benefits of the Aquaculture Stewardship Council (ASC) certification. The ASC standards include many examples of adaptive management and we believe that if rigorously implemented the ASC standards have many benefits for wild salmon and sea trout.

Although we support the principle of adaptive management, we also recognise that it has potential pitfalls. The approach proposed by The Report will require more detail on how it would be applied in practice, how it would operate, what methods would be applied, what teeth it would have, what investment would be required for its implementation, what standards would be applied, and whether it would form part of a regulatory framework.

We believe there must be an appropriate regulatory framework by which to implement and underpin an adaptive management process.

The AST thanks the Scottish Parliament for the opportunity to express its views on the SAMS report and looks forward to the publishing of the Environment, Climate Change and Land Reform (ECCLR) Committee report and the Rural Economy and Connectivity (REC) Committee's forthcoming inquiry.