

RURAL ECONOMY AND CONNECTIVITY COMMITTEE

SALMON FARMING IN SCOTLAND

SUBMISSION FROM FISHERIES MANAGEMENT SCOTLAND

Fisheries Management Scotland is the representative body for District Salmon Fishery Boards and Fisheries Trusts. We work closely with Scottish Government, Agencies, Crown Estate Scotland and the aquaculture industry to ensure that wild salmonid fish are protected from the environmental effects of aquaculture. District Salmon Fishery Boards are statutory consultees in the aquaculture planning process. Fisheries Trusts undertake annual monitoring of wild fish, in order to understand and quantify impacts.

We welcome the opportunity to provide views to the REC Committee. We provided written evidence to the ECCLR Committee and we welcome, and endorse, the report of that Committee. In particular, we would emphasise the following points:

- there appears to have been too little focus on the application of the precautionary principle in the development and expansion of the sector;
- adaptive management which takes account of the precautionary principle, (using real-time, farm by farm data) could have the potential to reduce environmental impacts but additional detail is needed on how it would be applied in practice
- the status quo is not an option;
- the current consenting and regulatory framework, including the approach to sanctions and enforcement, is inadequate to address the environmental issues;
- the ECCLR Committee is not convinced the sector is being regulated sufficiently, or regulated sufficiently effectively.

Do you have any general views on the current state of the farmed salmon industry in Scotland?

We concur with the ECCLR Committee view that *'the sector is not being regulated sufficiently, or regulated sufficiently effectively'* particularly in relation to the protection of wild migratory fish. The powers of the Fish Health Inspectorate (limited to the health and welfare of farmed fish) cannot be used to regulate any impacts on wild fish. SEPA's process for consenting biomass does not take into account any impact of sea lice on wild fish which may be associated with that biomass.

Whilst monitoring of impacts on wild fish has become a condition of recent planning decisions through a requirement to produce an Environmental Management Plan, local authorities accept that this is an imperfect solution and we are not sure whether this approach has been adopted beyond Highland and Argyll Councils. We consider that there should be a root and branch review of the planning and regulatory system for aquaculture. Specifically, it is crucial that monitoring of wild fish, with an appropriate and precautionary feedback to farm management, should become a statutory responsibility on all farms, including currently consented farms. All regulatory bodies should be given appropriate legal powers and duties to protect wild fish. Until such time as a new regulatory regime is in place we do not believe that changes, such as SEPA's DZR approach, should be taken forward in isolation.

We recognise that aquaculture is one of a number of potential impacts on wild fish. Some of these impacts on the high seas (such as climate change induced changes in food availability) are out with our control. However, of those potential impacts within human control, the impacts of fish farming *on wild fish* is the only example that does not have a regulatory system in place in Scotland.

There have been several recent reports which suggest how the farmed salmon industry might be developed. Do you have any views on action that might be taken to help the sector grow in the future?

We recognise that aquaculture is vital to Scotland's economy and the West Coast of Scotland in particular. However, our focus is on ensuring that the development of the industry is firmly grounded in the principles of sustainable development.

The growth targets included within *Aquaculture Growth to 2030* are industry targets, not Government targets. There has been no assessment of the environmental sustainability of these targets, nor have they been subject to Strategic Environmental Assessment. The report includes only passing mention of the environmental challenges facing the industry and no mention at all of wild fish interactions.

The Aquaculture Industry Leadership Group (AILG) was discussed in Committee on 25th April. What was not clarified was that the AILG has effectively replaced the Ministerial Group for Sustainable Aquaculture (MGSA), thereby leaving a significant gap in addressing interactions between farmed and wild fish and the wider environment. Fisheries Management Scotland and Scottish Environment LINK both contributed to the MGSA but are not involved in the AILG. Given that salmon farming takes place within a shared space, we are concerned that discussions with a direct bearing on interactions are now taking place in isolation from wild fish and wider environmental interests.

We do not consider that industry growth targets should be adopted by Scottish Government, or included in the National Marine Plan, without a robust assessment of the environmental carrying capacity for increased growth, including existing farms.

The current regulatory system does not sufficiently protect wild fish and we consider that a new regulatory system should be put in place prior to any growth in consented biomass. Further planning applications for new sites, or increased biomass at current sites, should be deferred until a new regime is in place. We would emphasise that this would still allow growth in overall production, through reduction in mortalities.

The farmed salmon industry is currently managing a range of fish health and environmental challenges. Do you have any views on how these might be addressed?

Fisheries Management Scotland participate (as observers) in the Strategic Farmed Fish Health Strategy Working Group. Whilst we support the fundamental aims of this process, we remain concerned that the health of farmed fish is being considered in isolation from the potential associated impacts on wild fish. The health of farmed fish is an operational issue for the industry, but we have a clear interest in any impacts on wild fish, arising from these health issues. Much of the focus in recent years has been on sea lice, but the potential for transfer of the current gill challenges and various diseases to wild fish, are also key issues which must be investigated further.

We provided a detailed description of recent research on population level impacts of sea lice on wild fish from Norway and Ireland in our evidence to the ECCLR Committee¹. Estimates of population-level impacts of lice infestation on wild fish have been made through a series of long-term studies. This involves the release of paired groups of smolts (juvenile salmon/sea trout which migrate to sea), half of which are protected from sea lice infestation, and half of which are untreated.

Whilst there is considerable variation in the measured impact on wild fish over time and between areas, these studies demonstrate an approximate 20% loss in *adult* salmon abundance due to sea lice – for every 5 fish that return in the treated groups (95% mortality), four fish return in the untreated group (96% mortality). In other words, 1 in 5 (20%) *returning* fish are lost to sea lice.

There are differing interpretations of data on the impact of lice. Jackson *et al.*² have interpreted the data as showing only a small ‘additional’ mortality in comparison with overall marine mortality. However, the majority of studies (e.g. Gargan *et al.*, 2012³, Krkosek *et al.* 2013⁴, Skilibrei *et al.*, 2013⁵, Sheppard & Gargan, 2017⁶) have all interpreted this data according to the impact on adult salmon abundance.

This issue was discussed at the North Atlantic Salmon Conservation Organisation (NASCO) 2017 Annual Meeting⁷. The Irish ministry with responsibility for natural resources (including conservation and protection of wild fish), indicated that the results of such work reveal that that on average, 39% of salmon mortalities were attributable to sea lice.

More recent work in Ireland (also reported to NASCO) to evaluate the effect of sea lice from salmon aquaculture on wild Atlantic salmon indicate that returns of wild adult salmon can be reduced by more than 50% in years following high lice levels on nearby salmon farms during the smolt out-migration. Modelled lice impact levels and a fitted stock-recruitment relationship were used to estimate how annual returns of Erriff salmon might have looked over the last 30 years in the absence of a serious impact of sea lice from aquaculture. The results suggest that Erriff salmon returns could now be twice as large without the observed anthropogenic lice impacts.

These studies show that a small increase in mortality of wild fish, due to sea lice arising from fish farms, may be the difference between a river meeting its conservation limit or not. Not only are Atlantic salmon and sea trout vital components of west coast fisheries they are also Priority Marine Features in their own right.

It is important to emphasise that the research detailed above does not allow us to understand the effect of specific farms, on specific river stocks. A linkage between wild fish monitoring and farm management, is a vital missing element of the current regulatory regime. The thresholds for impacts on wild fish, and the resulting management prescriptions, must be clearly defined according to the precautionary approach and there is a clear role for the appropriate regulator to establish these thresholds and ensure appropriate management action on farms.

Do you feel that the current national collection of data on salmon operations and fish health and related matters is adequate?

No. We welcome the commitment from SSPO to publish all data on sea lice counts on farms in Scotland on a farm-by-farm basis. We believe that *weekly*, farm by farm publication of data on sea lice, mortalities and disease should be a statutory

requirement and should be published by the individual companies, rather than the SSPO. This is because not all salmon farms are members of the SSPO and such data should also be available for rainbow trout reared in the sea. We also consider that the number of fish on a farm, in addition to the biomass, or weight of fish, should be published, as without this information, data on sea lice per fish is meaningless.

We would also emphasise that there is no requirement for a significant time lag in publishing such data. There is already a precedent in Scotland for publishing sea lice data within seven days of collection – Marine Harvest do this for their two Aquaculture Stewardship Council certified farms in Scotland⁸.

Do you have any views on whether the regulatory regime which applies to the farmed salmon industry is sufficiently robust?

In addition to our previous comments relating to monitoring for sea lice, we also emphasise the international concern relating to the impact of escapes – in Norway, escapes of farmed fish are considered to be the greatest threat to wild salmon. Despite significant investment by the Scottish industry, escapes continue to happen. It is not an offence to have an escape – the only offence is failure to report an escape or failure to report circumstances that may have led to an escape. Given the significant potential impact of escapes on wild fish, we consider that the loss of farmed fish should result in an automatic fine. There should also be a requirement for each farm to retain genetic samples, or otherwise mark fish, to allow the source of escapes to be identified. Such genetic techniques were recently used by Marine Scotland Science to demonstrate that escaped farmed salmon captured in Loch Shin originated from both of the freshwater producers operating in the loch.

The potential transfer of disease between farmed and wild fish is a key concern. This was identified as a research priority in the 2014 Scottish Government Aquaculture Science & Research Strategy⁹, but we are not aware that this work has progressed substantially. The highest priority identified in that strategy, relating to wild-farmed interactions, was to identify the dispersal patterns of sea trout and salmon and subsequent distribution in relation to the Scottish Coast. Such information is fundamental in understanding the sustainability of farming in higher energy sites. We note that these concerns were also highlighted in the ECCLR Committee report and we support the view that ‘in order to mitigate the risk of transfer of sea-lice, fish farms should be located away from salmon migration routes’.

We support the presumption against further finfish farm development on the north and east coasts of Scotland to help safeguard migratory fish species. We would also emphasise there are also important salmon and sea trout fisheries (from both a socio-economic and conservation perspective, including SAC rivers) within the aquaculture zone which could and should benefit from further area-based protection.

The Aquaculture Stewardship Council (ASC) certification scheme sets out many of the principles that could and should form the basis of a world-class regulatory regime for Scotland. For example, the ASC standards set a threshold of 0.1 mature female lice per fish, but also take into account the overall number of fish in the management area by setting an additional area lice threshold. This would be a huge improvement on the arbitrary lice per fish targets currently used. The standard also requires monitoring of wild fish, with feedback to farm management, and requires weekly farm-by-farm data to be published within a week of collection. The standard also

includes a very low tolerance for escaped fish and several criteria are included relating to disease.

The current version of the ASC standard prohibits the production of smolts in open cages in freshwater. There are proposals to relax the prohibition of farming of smolts (primarily due to low take-up of the standard by the Scottish Industry) which, if agreed, would require operators to establish a genetic baseline for local wild salmon which should be monitored appropriately to demonstrably ensure there is no (further) introgression, and a minimum stocking size to prevent 'drip' escapes in freshwater lochs. Whilst these safeguards are welcome, we emphasise that the technology to produce smolts in full closed containment is well established in Scotland and we consider that the production of smolts in freshwater cages should be phased out over an appropriate timescale.

There is currently no mechanism to move production from sensitive inshore marine sites, to less sensitive locations. If the industry is seeking to move production to larger, higher energy sites, we believe that there should be a mechanism to require an associated reduction in production from sensitive inshore sites.

We consider that Recirculating Aquaculture Systems (RAS), or closed containment, have a significant role to play in the future of the Scottish salmon farming industry. Whilst we recognise that the technology is not currently ready to roll out in the marine environment in Scotland, we are aware that significant investment is occurring in Norway, incentivised by the Norwegian Government. We are strongly of the view that incentives should be made available in order to facilitate the development of such technology in Scotland. Various forms of semi-closed production, such as deployment of sea lice skirts, are now being used in Scotland and we are keen to understand the benefits of such systems to wild fish. We are also aware that it is now possible to reduce the marine phase of production to less than one year through growing fish to 1kg or greater in closed containment, prior to on-growing in sea cages. We believe that this, coupled with area fallow periods during the wild smolt run, could be a significant step forward. There is now a great deal of evidence that lice levels in the environment are significantly higher in the second year of the production cycle. By harvesting fish before production moves into the second year, and fallowing the whole production area, there is the potential to reduce the number of sea lice in the environment to the benefit of wild fish.

References

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5. Skilbrei et al. 2013. *Journal of Fish Diseases*, 36: 249–260.
6. Shephard & Gargan 2017. *Aquaculture Environment Interactions*, 9:181-192.
7. CNL(17)53 Summary of discussions during the Special Session on the evaluation of Annual Progress Reports (APRs) under the 2013 - 2018 Implementation Plans.
8. <http://marineharvest.com/planet/asc-dashboard/>
9. <http://www.gov.scot/Resource/0045/00456584.pdf>