

THE MISSING SALMON ALLIANCE



Proposals for a risk-based framework for managing interaction between sea lice from marine finfish farm developments and wild Atlantic salmon in Scotland: Missing Salmon Alliance Consultation Response

The MSA brings together leading salmon conservation organisations across the UK - the [Atlantic Salmon Trust](#), [Game & Wildlife Conservation Trust](#), [the Angling Trust with Fish Legal](#), [the Rivers Trust](#), and [Fisheries Management Scotland](#) - to fight to reverse the devastating collapse in wild Atlantic salmon around the UK. By combining expertise, coordinating activities and advocating effective management solutions we can help wild Atlantic salmon survive and thrive in our rivers and seas for the next generation.

We welcome the underlying principle of managing the overall number of infective-stage sea lice in the marine environment at a level below which sea lice would be expected to result in significant impacts on wild salmon. We strongly believe that this principle is the correct approach to managing interactions related to sea lice, but we highlight a number of concerns below in relation to the scope and detail of the proposed framework.

Section 2.5 states that the proposed regulatory framework will deliver on the Scottish Government's response to the Salmon Interactions Working Group Recommendations. We hope that this will be the case once the full framework is delivered, but in terms of the proposals set out in the consultation, we do not consider this to be accurate for the following reasons:

- The SIWG recommendations were clear that they relate to wild salmonids (Atlantic salmon **and** sea trout);
- The SIWG recommendations apply to **all** farms (new and existing);
- Related to the above, the Scottish Government response made reference to our international obligations under NASCO, which includes “**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 the farms**”.

We expand on these points within this consultation response. We have not used Citizen Space to submit our comments, preferring to provide a full response directly within one document.

We are aware that SEPA received strong feedback that the management of sea lice from existing farms within the framework has not been set out clearly. We also seek further clarity on how the regulatory framework will work in practice to ensure that sea lice levels remain below the exposure threshold. Where impacts are detected, it is vital that there is effective enforcement and further explanation from SEPA on how the framework will implement adaptive management, and over what timescales are required. We would emphasise that the principle behind the framework should be to *prevent* impacts

in the first place. We would therefore encourage SEPA, at the earliest possible opportunity, to provide more detail on how these issues will be addressed.

The regulatory framework is intended to “form part of a single, enhanced, and comprehensive risk assessment framework” to cover all pressures from marine finfish farms (5.3) and to deliver on the Scottish Government’s response to the SIWG to deliver a robust licencing and enforcement system (2.5). In order to do this, sea lice arising from existing farms need to be fully considered, in parallel with assessment of proposals for new or expanding farms. With this in mind, robust licence conditions to manage infective-stage sea lice in the marine environment from existing farms are fundamentally important, however, we do not feel that the consultation was clear on these vital issues. For example, section 5 is not clear on how the lice load from existing farms will feed into the process to consider the total infective-stage sea lice concentration within a wild salmon protection zone when a new development is under assessment. It is also not clear from section C14 whether updated and consolidated farm permits to cover farm discharges will apply to all farms. Based on feedback from consultation sessions attended by Fisheries Management Scotland, it is our understanding that this section refers to all farms and therefore we expect SEPA to set a clear timeline for implementation of these licence consolidations. We would like to see this delivered within the same timeframe that SEPA implement the regulatory framework for new farms.

Section 5.4, 6.1 and 6.2 appear to assume that the current lice load (however defined) from existing farms will not damage wild fish and states that the focus of the framework is “to protect wild salmon populations against harmful increases in infective-stage sea lice concentrations”. We do not agree that conditions should be drafted to prevent sea lice from significantly increasing – rather the conditions should be constructed with the purpose of keeping sea lice below the exposure threshold, in order to protect wild salmonids. SEPA’s intent for the framework should be on protecting the environment, through protecting wild salmonid populations from impacts from sea lice, and ensuring that we meet the NASCO International Goal: “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 the farms.” The framework should reflect this by focussing on avoiding harmful **overall** concentrations of infective-stage sea lice in the environment which may arise from both existing and new/expanding farms. To allow appropriate regulation of 6.2 (b), and in line with the SIWG recommendations for a regulatory system that is “robust, transparent, enforceable and enforced” (as accepted by the Scottish Government), it is crucial that both farmed fish numbers and on-farm sea lice levels are published in real-time.

Section 6.3 states that more information is required to enable an accurate assessment of whether existing finfish farm operations are causing a hazard to wild salmonid populations. It is therefore vital that a precautionary approach is adopted by SEPA, and that the associated implementation of the framework is designed to ensure that any such information gaps are addressed. However, we would emphasise that the approach set out in the current consultation of managing the overall number of infective-stage sea lice in the marine environment is equally applicable to existing farms, and indeed we consider that modelling could be swiftly employed to derive on-farm sea lice thresholds for existing farms that are necessary to maintain infective-stage sea lice below the exposure thresholds in the environment. We recognise that such thresholds are a function of both the number of lice per farmed fish and the total number of fish farmed within the area and therefore that the on-farm thresholds would be expected to differ between different production areas.

Section B1 states “To protect wild salmon populations, sea lice from marine finfish farm developments must not increase the exposure of wild salmon post-smolts to numbers of infective-stage sea lice **likely to put a significant proportion of the post-smolts at risk**”. Again, we do not consider that this approach is in line with the NASCO International Goal for “**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 the farms**".

We do not consider that the application of this framework during April and May is sufficient to protect migrating post-smolts. A key principle behind the framework should be the **prevention** of impacts on wild fish. It is, therefore, necessary to ensure that sea lice levels are maintained below the exposure threshold at any point when sensitive life stages of Atlantic salmon are present. We note that the industry's own 'Code of Good Practice' defines the sensitive period for wild fish as 01st February to 30th June inclusive and that some Environmental Management Plans already in place do not define a 'sensitive period' and include a single sea lice threshold which applies year-round. We are also conscious that recent and predicted warm, dry springs may mean that smolts are delayed in their migration to the sea. For example, Ayrshire Rivers Trust in 2021 recorded that salmon smolts were still present in the middle reaches of the River Ayr on 16th June and would therefore be expected to be travelling up the West Coast until at least late June. We would also highlight work by the University of Glasgow which suggests that smolts leaving catchments where they must navigate large lochs, such as Loch Lomond, can be significantly delayed in their migration.

Whilst we understand that the focus is on wild smolts, we would also draw SEPA's attention to the risk to adult salmon upon their return to coastal waters. In 2018, returning wild Atlantic salmon returning to the Blackwater (which drains into Loch Roag), were heavily impacted by sea lice in the sea pool downstream of the Blackwater, which they were unable to enter due to low-flow conditions. NatureScot has recognised this issue and has instigated a Loch Roag Emergency Action Plan with a view to preventing this from reoccurring in future.

As SEPA are aware, the marine phase of sea trout is designated as a Priority Marine Feature, in recognition of the conservation importance of sea trout in their own right. We are therefore particularly disappointed to see that the protection of sea trout is not being taken forward alongside that of Atlantic salmon. We do not consider that this is in line with the SIWG recommendations, or the Scottish Government response. We do not agree that the transitional arrangements for sea trout should rely on the *status quo* as currently undertaken by local authorities.

Whilst we recognise that the development of a regulatory framework for sea trout is more challenging, particularly in relation to the time of exposure to sea lice due to their migratory behaviour, this is a significant gap that needs to be urgently addressed. However, as highlighted above, we believe that a degree of protection could be afforded to sea trout by extending the protection period beyond April and May. It is our view that this should be SEPA's approach until such time as a bespoke approach for sea trout is developed.

We are therefore of the view that a year-round protection threshold should apply. This would have the added benefit of protecting returning adults where flow conditions mean they are held within coastal areas, and would also extend a degree of protection to sea trout prior to the development of a specific framework. At the very least, the sensitive period should encompass February to June in line with the industry's Code of Good Practice, and we seek assurance that any proposed timescale provides sufficient time for smolts to migrate from sea lice protection zones in the south of the country, through to zones further north as they migrate to the high seas.

Section 9.3 states that there is evidence that "at least some sea trout can re-enter freshwater to rid themselves of sea lice infestations". Whilst this is correct, it does not recognise the significant

physiological and growth consequences that arise from lost feeding opportunities in the sea^{1,2}. It's also important to emphasise that physical damage from sea lice can result in secondary infections when sea trout re-enter freshwater, and these considerations must be reflected in the developing risk assessment framework for sea trout.

Whilst SEPA does not propose that the framework will be protective of wild sea trout populations in the first instance, it is stated that the framework intends to encompass some areas for the protection of the freshwater pearl mussel as they are "dependent on salmonids" (4.3). Freshwater pearl mussels in some Special Areas of Conservation are entirely dependent upon sea trout populations (for example, Ardnamurchan freshwater pearl mussel SAC covers four rivers, but three of these rivers are dependent on sea trout and do not have salmon populations), and the omission of sea trout will therefore mean that the framework will not protect freshwater pearl mussels in these rivers. In addition, one of the biggest freshwater pearl mussel populations in Scotland is not currently within an SAC. Again, we consider that the protection period should be extended to provide protection for these critically endangered species.

The Rural Economy and Connectivity Committee report on Salmon Farming in Scotland was published in November 2018. The SIWG report was published in May 2020. It is now 2022 and there remains no meaningful protection from sea lice infestation for wild salmonids. We are aware of a number of planning applications already within the planning system, and it is therefore disappointing that it is SEPA's intention to take a further 12 months to implement these proposals. We urge SEPA to move this process forward with urgency. Should SEPA issue any CAR licences before the risk assessment framework is in place, we would expect SEPA to be clear that these licenses will be amended to reflect the new regime as soon as the framework is finalised.

Section 8.4 states that local authorities "will remain the lead bodies for considering the risk posed to wild salmonids from marine finfish farm developments". However, local authorities have no role in relation to wild-farmed interactions for the majority of existing farms in Scotland (which have permanent planning permission and no EMPs), and only a very limited number of farms have any oversight by local authorities through EMP conditions. Where EMPs do exist, they are inconsistently applied between different areas and operators, are recognised as not being fit-for-purpose and local authorities do not have the capacity or expertise to properly enforce these conditions. EMPs are mentioned again in section C21, and we would emphasise that EMPs should not have a role in the new regulatory framework. Specific conditions in the CAR licence should be used to create a fit-for-purpose, enforceable system for the management of sea lice.

Section C13 covers the inter-relationship between access to sea lice medicines and control of sea lice and states that operators "will need to demonstrate...access to alternative and adequate sea lice infestation prevention or control measures" to combat sea lice infestation in the absence of anti-sea lice medicines. We consider that this needs to go further and operators should be required to demonstrate the effectiveness of such methods on an ongoing basis (particularly in the dynamic nature of the environment in which finfish aquaculture occurs, and in light of climate change) for the protection of wild fish. Ultimately, we consider that the regulatory system should be based on the outcome of maintaining sea lice below the exposure threshold. It is up to the operators to farm at a scale and location that allows them to meet this outcome, and for SEPA to regulate on this basis.

¹https://www.researchgate.net/publication/235635708_Physiological_consequences_of_premature_freshwater_return_f_or_wild_sea-run_brown_trout_Salmo_trutta_postsmolts_infested_with_sea_lice_Lepeophtheirus_salmonis

²https://www.researchgate.net/publication/348458474_Development_of_a_risk_assessment_for_sea_trout_in_coastal_areas_exploited_for_aquaculture

Section 6.2 states that permits for all existing farms that can contribute to infective-stage sea lice in wild salmon protection zones would be changed to include various conditions. We believe that screening models to be used by SEPA should be applied to **all** farms and if these models demonstrate that infective-stage sea lice are likely to accumulate in areas outside the proposed protection zones, but in areas of the marine environment in which it is reasonable to assume that wild salmon or sea trout are likely to pass through, then those farms should be included in the overall regulatory framework. In particular, during our engagement sessions with SEPA, we highlighted concerns about the apparent exclusion of farms in the Summer Isles, West Sutherland and the Inner Hebrides.

SEPA has recognised the need for the regulatory framework to be adaptive, and within section 7.1 have highlighted that they will include consideration of technological innovation. As set out above, we believe that an outcome-based approach is fundamental in these circumstances, with a review of the CAR licence in any case in which a specified innovation does not deliver its intended outcomes.

We consider that a central pillar of the regulatory framework must be the inclusion of farm-specific sea lice thresholds (with the intention of ensuring that the exposure threshold in the relevant water body is not exceeded) with enforcement action for breaches of these thresholds. We would emphasise that we would not support a threshold for treatment, or management action, but rather an absolute threshold that should not be exceeded. We recognise that SEPA has existing powers for fixed and variable monetary penalties, enforcement undertakings and have the ability to review (including reductions in maximum consented biomass where appropriate) and revoke licenses. We wish to see a clearly defined regulatory approach set out, which meets the tests of being robust, transparent, enforceable and enforced.

Monitoring the effectiveness of the framework is fundamental to generating public acceptance of the approach. In particular, monitoring the distribution and densities of infective-stage sea lice in the environment, and infestation pressure on wild fish where possible, will be crucial. We are of the view that a degree of compliance monitoring by SEPA, including unannounced audit inspections, is important to ensure transparency in the process.

We recognise that the classification of river mouths, sea lochs and sounds as wild salmon protection zones is a useful starting place, but feel there are gaps in this information, such as the Summer Isles, West Sutherland and the Inner Hebrides where further attention would be warranted, and as our understanding of smolt migration pathways improves, it is likely that some additional areas may require inclusion into the framework. Additionally, the duration of exposure needs to be considered on a cumulative basis as fish travel through multiple zones. It is currently possible to identify areas where smolts are likely to pass through several zones, particularly where these are adjacent to each other.

There are a number of examples where minimum passage time for smolts appears to have been considered only in relation to the specific protection zones identified in figure B2. However, in some cases, we already have good data which shows that a significant proportion of smolts will pass through adjacent zones. For example, around two-thirds of smolts from the River Lochy pass through Loch Linnhe, the Sound of Mull and the various zones marked in yellow around Ardnamurchan Point. It is not clear from the consultation document whether the exposure time for these smolts will be calculated from the total time taken to traverse these adjacent zones. In our view, it is fundamentally important that the total exposure time across these zones is used. Figure B2 shows estimated minimum passage times for smolts through wild salmon protection zones. However, we do not consider that **minimum** passage times are the most appropriate metric. In order to determine exposure times, the best available information should be used. We have included below (Table 1) a summary of preliminary data collected on passage times and swimming speeds in year one of the West Coast Tracking Project, highlighting the variation in passage times for tracked smolts. The West Coast Tracking Project will

continue in 2022, and we would be happy to provide further input on this to SEPA, through our Missing Salmon Alliance members, Fisheries Management Scotland and the Atlantic Salmon Trust, and project partners, Marine Scotland Science.

Table 1: Preliminary results from the West Coast Tracking Project on passage time and swimming speeds detected by tagged smolts in 2021.

| Start | End | Number of smolts detected | Average Rate of Movement (bodylength/s) | Minimum passage time (days) | Maximum passage time (days) | Average passage time (days) |
|--|---------------------|---------------------------|---|-----------------------------|-----------------------------|-----------------------------|
| Mouth of River Lochy | Sound of Mull | 48 | 2.08 ± 0.81 | 1.26 | 18.87 | 5.14 ± 3.85 |
| Mouth of River Lochy | Sound of Lorne | 26 | 1.81 ± 0.67 | 1.62 | 11.55 | 4.65 ± 2.61 |
| Mouth of River Etive | Connel Bridge | 61 | 0.68 ± 0.43 | 1.14 | 11.25 | 4.58 ± 2.19 |
| Mouth of River Awe | Connel Bridge | 88 | 0.82 ± 0.82 | 0.18 | 9.47 | 2.22 ± 1.76 |
| Connel Bridge | Sound of Mull | 23 | 1.02 ± 0.36 | 0.75 | 8.52 | 3.53 ± 2.35 |
| Connel Bridge | Sound of Lorne | 46 | 1.52 ± 0.68 | 0.44 | 3.61 | 1.64 ± 0.95 |
| Mouth of Rivers Laxford and Allt Bad na Baighe | Exit Loch Laxford | 65 | 1.89 ± 2.47 | 0.72 | 17.32 | 4.82 ± 2.30 |
| Mouth of Abhainn Lacasaigh | Exit Loch Eireasort | 64 | 1.17 ± 0.73 | 0.99 | 14.07 | 5.10 ± 2.75 |
| Mouth of River Leven | Cumbræ | 38 | 0.81 ± 0.44 | 3.3 | 16.21 | 4.75 ± 1.25 |
| Mouth of River Gryffe | Cumbræ | 80 | 1.06 ± 0.43 | 2.66 | 16.05 | 5.18 ± 2.12 |

The Scottish Government's approach to biodiversity loss is to conserve **and** restore biodiversity. It is therefore important that SEPA's approach is in line with Scottish Government policy and we consider that rivers that previously held, or are able to hold, wild salmon populations should be included. Exclusively using Marine Scotland's 2021 list of graded rivers will not encourage the restoration of salmon and sea trout to other rivers previously populated by wild salmonids, and these rivers would also benefit from protection from sea lice infestation.

In modelling the densities of infective-stage sea lice within a protection zone, it will be vital that the spatial and temporal scale used accurately reflects the risk to wild salmonids. It will be important to ensure that the approach used does not miss peak sea lice densities, thereby potentially underestimating the level of risk presented to wild salmonids.

We believe that SEPA should define common and consistent modelling protocols to be used by developers. It is not appropriate for different companies to use different modelling assumptions, and we would welcome an opportunity to discuss this further.

Within section C11 (and mentioned elsewhere), SEPA has indicated that the intention is to use gravid female lice numbers as the starting data point for calculating the juvenile sea lice emanating from a given farm site. As highlighted at the recent meeting regarding the Evaluation of the Scientific Basis of the Traffic Light System for Norwegian Salmonid Aquaculture there are a number of reasons why this is problematic. For example, there is a risk that weekly sea lice counts could miss gravid females who have already dropped their egg strings. Whilst we accept that it is gravid female lice that produce eggs, we believe that it would be sensible to use the data which is collected currently (adult female lice per fish) as the basis for these calculations.

We support SEPA's proposals on data sharing within C16 and C17, and strongly suggest that this data is published in real-time in order that all stakeholders fully understand, and engage with, the process. The current timescale for aquaculture data publication within Scotland's Aquaculture website and Scotland's Environment Web does not provide sufficient transparency.

Finally, we believe that the principles set out in this consultation, if delivered appropriately, have the potential to significantly improve the regulation of wild-farmed interactions. However, in order for this to be the case, they need to be delivered at pace, cover existing farms and provide protection to sea trout. The regulatory framework must deliver on our International Commitments and meet the tests set out in the Salmon Interactions Working Group of being robust, transparent, enforceable and enforced.

Missing Salmon Alliance
14th March 2022.