

## **Proposals for a risk-based framework for managing interaction between sea lice from marine fish farm developments and wild Atlantic salmon in Scotland**

### **Cooke Aquaculture Scotland Ltd – Consultation Response**

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#### **Summary**

Cooke Aquaculture Scotland Ltd (CAS) operates primarily in the Northern Isles of Scotland. The current proposed framework only applies to wild salmon, and West Coast/Western Isles production areas. Nevertheless, SEPA has made clear the longer term ambition is to include sea trout within the framework as soon as possible. This would extend the scope of the framework to Orkney and Shetland and so would have similarly significant potential ramifications for CAS.

CAS has reviewed the consultation materials with regards to the proposed framework. It is the opinion of CAS that the proposed framework, in its current state, is not suitable for implementation. Based on the incomplete information available it is clear that the proposed framework would not only damage the aquaculture industry, but may also have no positive effect on wild salmon numbers and no way of quantifying the success or failure of the proposed framework in this regard.

#### **High Level Pressures on Wild Salmon**

The Scottish Government (2019) has identified 12 high level pressures which are thought to be impacting salmon in Scottish waters and beyond. The pressures are listed below:

- Exploitation
- Predation / Competition
- Fish Health
- Genetic Introgression
- Invasive non-native Species
- Habitat - Water Quality
- Habitat – Water Quantity
- Habitat – Thermal
- Habitat – Instream
- Habitat – Riparian
- Barriers to Migration
- Coastal and Marine

Within the 12 high level pressures, sea lice constitute only 1 of 3 separate components of the ‘Fish Health’ pressure. It is evident that Habitat is the most significant factor affecting wild salmon survival as there are 5 habitat specific high level pressures. It is also evident that some pressures are intrinsically more significant and quantifiable than others. Barriers to migration is the best example in that without appropriate mitigation, such barriers have the potential to completely sterilize certain river systems in terms of salmon reproduction.

In this context, CAS is of the very strong opinion that the targeting of a single component of one higher level pressure (sea lice) is not only disproportionate, but will not markedly change wild salmon population dynamics as a stand alone measure. If we look at the predation /competition pressure for example, wild

salmon fishing interests this month (March 2022) have called for the ability to shoot 'rogue seals' which are decimating spawning salmon on redds.

Another example is the continuing consenting of new hydro schemes which are known to have very significant impacts on wild salmonids. For example the EIA report associated with the 1,500 MW SSE Coire Glas Pumped Storage Scheme (SSE, 2018 – executive summary) states the following:

*'Significant negative effects during the operational phase are predicted on a precautionary basis on the Atlantic salmon, brown trout/sea trout and ferox trout populations in Loch Lochy from changes in water level. No mitigation is possible.'*

It is simply not proportionate or reasonable to implement a framework which could in effect lead to a moratorium on further development of one of Scotland's most important sectors when corresponding measures are not taken with regards to other pressures, or indeed when the relationship between the 12 high level pressures (and 46 component pressures) and impacts on wild salmon populations are not clearly understood.

### **Sea Trout**

Section 9 of the consultation document states that an appropriate and proportionate risk based regulatory framework will be brought forward once sufficient knowledge is available. Section 9.2 states that sea trout catches began to decline in the 1950's which was before the development of the aquaculture sector in Scotland. The same section goes on to state that catches appear to have recently stabilized or even increased. This calls into question whether aquaculture is even a pressure on sea trout in Scotland.

Section 9.2 also states that there is no systematic catch data available for Orkney. There is also a lack of data for Shetland when compared to the West Coast of Scotland. Without any historical data on population trends it is not only difficult to assess the current health of sea trout populations in these areas, but it would be impossible to evaluate the success of any future sea trout framework as the baseline information simply does not exist.

Section 9.4 states that SEPA and Marine Scotland are going to follow developments of a potential sea trout framework in Norway. This is worrying as it follows the current strategy of importing concepts and scientific thresholds from a separate country with a very different geography/bathymetry and salmon farming practices. Surely the significant knowledge gaps with regards to sea trout in Scotland should be filled with Scottish studies and data rather than waiting for the Norwegians to act and again copying their approach.

### **Scientific Evidence**

CAS has a number of concerns regarding the underpinning scientific evidence which has been used to inform the proposed framework. The list of concerns relating to specific sections with the SEPA consultation document are listed below:

- **1.3.** The evidence provided isn't necessary relevant in a Scottish context. Further work is required to ensure any scientific evidence is applicable before being incorporated within regulatory guidance.
- **2.3.** The statement that evidence from Ireland and Norway makes it clear that 'sea lice from open pens in Scotland can pose a significant risk to wild salmon populations' is a bold one. Not only is there uncertainty over the results of the studies quoted, the mere fact they were not conducted in Scotland makes it impossible to state with any certainty that the same risks exist. The supporting references that specify substantial impact on salmon survivability has been caused from sea lice infections from finfish aquaculture is not necessarily the correct interpretation. There is debate over the statistical level of impact, where the actual impact on survivability maybe considered as minimal.
- **4.4. (B.5) and 4.5 (B.6)** In order to transplant a threshold from Norway to Scotland there would need to be some form of validation or scoping study to assess the validity of this assumption. The paragraph mentions that Norwegian results have been subject to 'separate analyses by Marine Scotland'. These analyses and findings require peer review and publication if the sector is to have any confidence in the thresholds.
- **4.5.** In B.8 the threshold is stated to be equivalent to 0.1 sea lice per gram of wild salmon and equates to "impact unlikely" or "Substantial stress-related effects and impaired swimming ability" (table B1). In the text in paragraph 4.5 it suggests mortality occurs if the threshold is exceeded. This would be the case if the threshold was set at 0.2 lice/gram of wild salmon. This may suggest that the 0.1 value is overly precautionary if this statement is correct
- **7.1.** Some of these suggestions, such as evidence from monitoring distributions of sea lice and evidence of timings and duration of salmon migration (transit through protection zones) should be a key part the initial framework, but are considered as an option to add at a later stage. This suggests the current framework is poorly tied to scientific evidence. Furthermore, it is not possible to assess the success or otherwise of any framework implemented unless an initial baseline is established.
- **9.4.** The development of the sea trout framework in Norway has geographical limitations. These issues have previously been discussed in regard to the transferal of thresholds for wild salmon. The same logic is applied here, additional monitoring data in the Scottish context will be required. This is specifically mentioned in paragraph 9.1.
- **B.5.** The specified lice threshold is described as 0.7 infective-stage sea lice-days-m<sup>2</sup> integrated over the upper 2m is not implemented in the same way as described in the academic study (ref 33). In order for the threshold to be applicable and the model to have results that relate to the sentinel infection levels, the same method must be applied. The sea lice framework suggested does not

replicate the modelling process, therefore any thresholds are not comparable to potential infection levels.

### **Validation / Evaluation**

It is the opinion of CAS that the effectiveness of the proposed framework will be impossible to validate. It is not competent to introduce regulation without the ability to validate its effectiveness.

The current framework makes no effort to measure/validate the sea lice pressure on wild salmon populations in Scotland. This is a key aspect of why the framework is being implemented and should be a core aspect. There is no mention of quantification of uncertainty or validation of the framework. Yes, the risk assessment is adaptable, but there are no commitments to determining if the framework is working and to what extent. This is very concerning.

SEPA have made clear that the proposed framework borrows heavily from Norwegian data as well as the Norwegian Traffic Light system (NTS) which the proposed SEPA framework has been influenced by. The effectiveness of the NTS has been recently evaluated by a team of experts from around the world. The authors prepared a report of their findings (Eliassen et al, 2021).

The Evaluation group identified that within the NTS there was no mechanism for assessing the effectiveness of actions nor any ongoing assessment of the framework assumptions or for informing expert judgment. They proposed an iterative framework (DPSIR) to support such assessments. For any system to work correctly, there requires to be a clear and transparent process by which SEPA will appraise the framework in its entirety, at regular intervals.

### **Modelling**

The implementation of the proposed model relies heavily on unsubstantiated results in the context of Scotland. With no data collection, calibration or validation there is no way of quantifying uncertainty or even assessing the effectiveness of the framework. The results from this model are then solely used to determine potential growth of a site (or decline in a later iteration). While modelling can be a very useful tool to help quantify risk, the lack of validated, verifiable data used in the current framework is concerning.

At present, the outcomes of the proposed model lead directly to decisions around consenting without any further assessment of risk, proportionality or balance regarding other factors that may be relevant (other pressures on wild salmon, current and historical lice management, current and emerging lice management tools). CAS has a number of specific concerns relating to the role of modelling within the proposed framework:

- **4.2.** A methodology for the identification of these protection areas needs to be properly set out. While the identification of salmon rivers is appropriate, the determination of boundaries of sea lochs opening onto open coast is not classified. In addition, the 5km river mouth radius is based on a single river mouth. It seems these boundaries have been arbitrarily specified. This is very significant in the Northern Isles, as if a 5km radius around sea trout burns is used in the future

then this would effectively cover the entirety of Orkney and Shetland with protection zones. Further definition of the classifications of water bodies is required.

- **5.4.** This paragraph states that “we would require the developer to quantify the proposal’s effects on sea lice concentrations in the protection zone using appropriately detailed 3-D hydrodynamic marine models”. Creating a 3D HD model for sea lice application isn’t as simple as other SEPA regulated activities (solid dispersal or bath treatments). Sea lice models require higher resolutions over a wider area. To develop and run models would take vast amounts of time and is just not feasible. Additional complications will arise as the outputs from separate models covering the same area may produce conflicting results.

The most logical solution would be to provide a standardised 3D HD model that was sufficiently resolved on a regional scale. This could be an expanded/improved WeStCOMS or Scottish Shelf Model. This would provide a consistent input to the particle tracking model that would maintain a certain level of continuity at this early stage in the lice modelling process. In cases where the standardised HD model was proven to be inadequate, it would then be possible to use our own or a third-party model. Although, the standard model should be a sufficient quality that it would be used in most cases.

- **5.6. / C4.** Alterations to the screening model should be discussed within the proposed modelling consultations.
- **3.4.** Development time of sea lice larvae can affect infection pressure. This is not included in the statement.
- **5.2.** This section specifies that increases in fish numbers at existing farms will be subject to an assessment of risk posed to wild salmon post smolts. Will the maximum number of fish be specified on future CAR licenses? And how will fish numbers from existing farms be calculated?
- **6.2. (a)** What are appropriate control factors? Reduction in biomass? Implementation of site-specific maximum sea lice infection rates? The latter may encourage increase in the use of chemical treatments with unintended negative consequences on fish welfare for example. Reduction in biomass will not lead to a reduction in sea lice numbers, the only way to achieve this is to lower the population of infectious sea lice stages.

### **Economic Impact on the Salmon Sector**

CAS understands that SEPA has not conducted a Business and Regulatory Impact Assessment (BRIA) with regards to the proposed framework. Whilst we appreciate that further consultation and assessment is planned prior to implementation, the proposed timeline is exceptionally tight and so it would have been prudent to carry out a BRIA before this stage in the process.

Salmon operators on the West Coast and Western Isles firmly believe that the implementation of the proposed framework will lead to a moratorium on future development of the industry. Indeed SEPA has gone farther than that in section 6.4 of the consultation document by stating that existing farms which SEPA considers to pose a hazard to wild salmon populations will be targeted for action to reduce sea lice densities. It is clear that this is likely to include reductions in permitted fish numbers or possibly even site closures.

The potential economic impacts of such measures would be extreme and would threaten the livelihoods not only directly in terms of the thousands of well paid staff within the sector, but also amongst thousands of business which are reliant on the sector. This is totally contrary to the Scottish Government's well publicised commitment to support fragile remote and island communities.

### **Summary**

CAS do not support the current SEPA proposals for a sea lice risk assessment framework. It is our opinion that the effectiveness of the proposed framework will be impossible to validate and that it is not competent to introduce regulation without the ability to validate its effectiveness. Furthermore, the proposed framework is not proportional as other marine and terrestrial activities contributing to identified high level pressures on wild salmonids such as water abstraction and barriers to migration are not facing a potential moratorium on further development or punitive sanctions on existing developments under a similar framework. CAS also has significant concerns regarding the underpinning principles of the framework, with no apparent validation of underlying Norwegian data in the Scottish context.

The proposed framework is currently being rushed through within a 12month period. The significant issues identified in the draft proposals require further research and data collection. The scale of the additional work required makes it highly improbable to achieve this target date. These decisions have significant implications and merit thorough consideration before being brought into effect.

The Griggs review of aquaculture consenting (Griggs, 2022) includes calls for a single consenting document and body, which oversees the entire consenting process, as well as recommendations around the use and improvement of science to inform decision making. It also recommends the formation of a Project Board to produce a 10-year framework for the aquaculture sector. The Cabinet Secretary for Rural Affairs and Islands has accepted all recommendations in principle.

It is the opinion of CAS that the implementation of the proposed framework is paused and further discussion of the management of potential risks to wild salmonids as a result of aquaculture is transferred into the process recommended by the Griggs review.



## References

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## CAS Response to Consultation Questions

### Your Details

**1. What is your name?**

**2. What is your email address?**

**3. What is your organisation? (if applicable)**

### Wild Salmon Protection Zones

**4. Do you think that there are important areas for wild salmon post-smolt migration that we have not identified as wild salmon protection zones?**

- Yes  
 No  
  
 Not sure

**5. If yes, please identify these areas, explaining why they should be protection zones and the evidence to support this.**

There are a number of question marks over the delineation of salmon protection zones. The complete process of area selection has not, to CAS's knowledge, been made publicly available. As mentioned within our consultation response, the rationale behind the selection of 5km buffer zones around watercourses is particularly questionable. We would request that SEPA provide more information on the complete process of zone selection and delineation in order to allay any concerns in this regard.

**6. Do you think that any of the areas we are proposing as wild salmon protection zones should not be so identified?**

- Yes  
 No  
 Not sure

**7. If yes, please identify these areas, explaining why they are not important for wild salmon post-smolt migration and the evidence to support this.**

See response to Q.5. The river mouth 5km buffer in particular seems entirely arbitrary.

### Proposed Sea Lice Exposure Threshold

**8. Do you have any scientific evidence that should be considered to ensure the sea lice exposure threshold is**



**effective in protecting wild salmon populations? This includes any evidence for a refinement of the threshold.**

Please note our overarching response, which covers fundamental underpinning issues with the overall sea lice risk assessment framework. CAS maintains that thorough validation of international data within the Scottish context is a critical step which seems to have been missed. If Marine Scotland and SEPA have carried out such validation and data collection then this needs to be made publicly available ASAP.

## Implementation

**9. Which groups and organisations do you think we should include on technical advisory groups to assist us with the development of the detailed working arrangements and methods needed to implement the framework?**

CAS believes that the implementation of the proposed sea lice risk framework be suspended pending further development and actioning of the recommendations made in the review by professor Griggs in his review of consenting in Scottish aquaculture. Prof. Griggs' report articulates the need for a consenting framework that includes a single licencing document and body, which is developed through a defined Project Board. Any further discussions relating to wild/farmed salmon interactions in farm consenting must be managed through that process, as a key component of the overall consenting process for marine fish farms.

Furthermore, Prof. Griggs' report states that decisions relating to farm consenting must be science-led. The development of any framework must follow a completely transparent, science-led process and any implementation process (managed through the overarching consenting framework proposed by Prof. Griggs) must include relevant academic and sector representatives / oversight, with a defined structure that manages the inclusion and use of appropriate data and science. The implementation of any new framework must also include a system of regular review and assessment – to ensure the most relevant science is included and that the efficacy of the framework is continually assessed. The Scientific Evaluation of the Norwegian Traffic Light System proposes an iterative process for such assessment.

## Modelling Protocols

**10. Do you have relevant expertise or experience that you would be happy to share with us during implementation planning to help us develop modelling protocols?**

- Yes
- No
- Possibly

**11. If yes, please tell us about your area of expertise:**

CAS does not believe it is appropriate to progress with the implementation of any new framework, until Scottish Ministers have responded to the recommendations of Prof. Griggs' report into the consenting of Scottish aquaculture, and until those recommendations are delivered, noting that the recommendations have been agreed in principle by the Cabinet Secretary for Rural Affairs and Islands. Thereafter, any new framework must be developed and implemented through the processes and procedures put in place by the overall consenting framework and body, that the Prof. Griggs' report identifies as required to improve the overall consenting process.

**12. If you would like to be involved, are you happy for us to contact you by the email address you have provided?**

Yes

No

#### Permitting and Site Regulation

**13. Do you have any suggestions for how SEPA could most efficiently and effectively assess compliance?**

CAS takes issue with the overarching justification for the proposed framework given the apparent absence of equivalent and proportional action which is proposed on the other 12 high level pressures on wild salmon populations. For example there are five high level pressures which relate specifically to habitat, and yet CAS is not aware of any impending moratorium on agricultural or forestry related developments.

Compliance against requirements of the proposed framework (should it become active) do not answer the wider question of whether or not the framework is actually effective. This was a key finding of the review of the Norwegian traffic light system whereby areas has been classified and enforcement actions taken against operators – but there was/is apparently no assessment on whether such actions are actually materially improving wild fish populations.

#### Monitoring the Effectiveness

**14. Do you have any suggestions on how we should develop a monitoring plan to assess the effectiveness of the framework and what it should include?**

Yes

No

Not Sure

Please see our answer to question 13 above as well as our overarching response, which covers this area (see Validation section).

In summary, In the Northern Isles (where CAS operates) there is no baseline data on wild salmonid populations and distribution. It is therefore impossible to assess the effectiveness of any future framework which includes sea trout as there is no baseline to compare against. This is possibly the most significant issue with the proposed extension of the draft framework to include sea trout (and by implication the Northern Isles).

**15. Do you think there are components that should be included in an effectiveness monitoring programme that you would be able to help deliver?**

Yes

No

Not Sure

With specific reference to the Northern Isles and baseline conditions, it would be up to SEPA, MSS and central government to establish reliable data on sea trout abundance and behaviour. CAS would expect that several years (ideally >10 yrs) of all-encompassing baseline data would be required before any such framework could be applied to the Northern Isles.

**16. If you would like to be involved in the development of a monitoring plan, are you happy for us to contact you by the email address you have provided?**

Yes

No

#### **Adaptive Approach**

**17. Are there other types of information that you think could usefully inform the adaptive development of the proposed framework?**

Yes

No

Not Sure

Continual and independent oversight of the effectiveness of the proposed framework (should it be implemented) is the key information in this regard. In order to justify likely significant constraints on the development of the industry, the framework must achieve tangible and measurable benefits in the status of wild salmon populations. If no benefit is achieved the justification for the framework would be compromised.

#### **The Proposed Framework's Implications for You**

**18. Do you think the design of the proposed framework, or how it is implemented, could affect your community or business interests?**

Yes, in a positive way

Yes, in a negative way

I'm not sure

No

Please see our more detailed, overarching response.

In summary CAS agrees with other aquaculture operators located on the West Coast and Western Isles that the implementation of this framework could constitute an effective moratorium on development in multiple areas. SEPA makes clear that this framework is to be extended to sea trout (and by implication the Northern Isles) as soon as there is enough information to do so. This is where more significant impacts on CAS would be felt and as such we are equally concerned about the potential economic effects this framework as it is currently proposed.

**19. Do you have suggestions how any potential negative effects could be reduced or avoided without compromising the environmental protection purpose of the proposed framework?**

- Yes  
 No  
 Not Sure

We believe there will be very significant, detrimental impacts arising from the implementation of the proposed framework (see our overarching response). However, to understand how any impacts could be reduced or minimised without compromising the environmental protection provided by the proposed framework, we must first assess the level of environmental protection provided by the framework – how this will be achieved has not been evidenced in the consultation documentation. Further, in reference to our response to Q14 and in our overarching response, we do not believe it is possible to assess the efficacy of the framework – no scientific studies to date have quantified the impact (if any) of salmon farms on wild salmon, including separating out the impacts of other pressures on wild salmon populations.

**20. Do you have any suggestions how potential positive effects delivered or enhanced without compromising the environmental protection purpose of the proposed framework?**

- Yes  
 No  
 Not Sure

See response to Q19

**Overall Framework Proposal**

**21. Do you have any additional feedback on the proposed framework?**

Yes – see our overarching response.