

Response to the Scottish Government's submission to Rural Affairs and Islands Committee on Persistent elevated mortality in salmon farming in Scotland – Update to methodological approach and preliminary findings¹

On 5th March, the Scottish Government submitted an update to the RAI Committee on the preliminary findings of its analysis of persistent elevated mortality in salmon farming in Scotland. There has been very little time for response, or for the Committee members to read and digest the analysis.

CCN submitted an analysis of the same data to the Committee in February.²

We fundamentally disagree with the Government's conclusion that elevated mortality is not a systemic problem for Scottish marine salmon farms, and that further regulatory action is not warranted at this stage. The Government's reasoning is that the salmon farmers are trying to mitigate the causes of mass death. Official mortality figures show little evidence that this is working.

The Scottish Government's Fish Farm Production Survey shows that 21 million of the 2022 smolt year-class died prematurely at sea. These are the most recent cohort of fish for which there are complete records. The last were harvested in 2024. Record numbers of fish would not be dying if the sector's innovations and mitigations were working.

Turning around persistent mortality in fish farms (i.e. mortality occurring in more than one successive production cycle, according to the Government's own definition) cannot be proven in less than one production cycle. It is therefore unreasonable to conclude that this problem has been solved in the 11.6% of salmon farms that the Government's analysis shows had persistent elevated mortality, let alone the many others that repeatedly experience very high mortality.

If mortality has fallen since the last of the 2022-2024 fish were harvested, as the sector claims, it is most likely because the sea became cooler for a while, compared to the marine heatwave years 2023-24. The sea temperature rose again in autumn 2025 and farmed salmon almost immediately began to suffer high mortality. Heatwaves are a feature of climate change.

As CCN's letter to the RAIC anticipated, the Scottish Government's analysis has found several ways to exclude a significant number of farms that have experienced persistent elevated mortality.

Even with the very high bar set by the Government's researchers, 25 farms satisfied all the screening criteria in their analysis, but only 9 farms remained on the list after the FHI and the sector had explained why the very high mortality was not really high, or not really persistent, or both.

This drop in the number of problem farms has been achieved in several ways:

¹ <https://www.parliament.scot/-/media/files/committees/rural-affairs-and-islands-committee/correspondence/2026/salmon-farming-cab-sec.pdf>

² <https://www.parliament.scot/-/media/files/committees/rural-affairs-and-islands-committee/correspondence/2026/salmon-farming-ccn-12-february.pdf>

- We disagree strongly that this method is “fair and pragmatic for assessing long term trends of mortality in an animal production sector”.

The Government’s definition of persistent elevated mortality is unreasonably strict. The analysis admits that the choice of criteria was a matter of judgement for Government officials.

- CCN’s own assessment found that 24 farms fit the Government’s criteria, but if the worst 10% of mortality events are included, rather than only the worst 5%, then 79 farms (38% of the total) would qualify. Dropping the need for the cause of mortality to be the same would put 36 farms on the list, and including the worst 10% of mortality as well would include 96 of Scotland’s roughly 205 farms.
- The Government’s analysts admit that their focus has only been on those causes of mortality that might respond to mitigation, so they have deliberately excluded events that kill many fish but do not last very long.³ This excludes a significant number of farms that experience these events.
- Within this already narrow definition, the sector and FHI have been allowed to retrospectively redefine the causes of mortality. For example, the most common general cause of mass death (in 65% of cases) is poor gill health. By sub-dividing this into different underlying causes, some farms appear to have had different causes for mass mortality in successive production cycles, which removes them from the list of problem farms.

Another example is that “handling references were linked to treatment interventions, rather than true mortality drivers”. Handling fish is stressful and a major cause of death. It is vital that deaths caused by these common operations are seen for what they are.

The analysis also admits that, “detailed sector records confirmed that very few mortality events can be attributed to a single, easily identifiable cause”. This is why it is misleading to rely on the judgement of officials and the sector to disqualify problem farms by subdividing these complex events into different causes.

- The unreasonableness of allowing this to happen is highlighted in the analysis: “...it was also clear that previous health challenges ... may have predisposed the stocks to higher mortality during subsequent stressors. Managing these multifactorial challenges often requires different layered and sequential interventions, each of which can introduce additional pressures if combined or poorly timed.” In other words, it is not possible to sub-divide mortality into single, simple causes. A better definition of persistent mortality would be that many fish have died in a given farm, year after year. CCN’s analysis shows that that is true in many more than the nine farms identified by the Government. These unhealthy farms should be closed.
- The effects of climate change are not mentioned, despite two the authors of this document having also written a peer-reviewed paper⁴, showing that more than 80% of the variation in farmed salmon mortality can be explained by the number of farmed fish in an area and by the minimum winter temperature. Warmer winters allow more gill disease pathogens and sea lice to survive, to impact the fish the next year. This is a direct impact of climate change – a current and existential threat to salmon farming in Scotland.
- Even after the Government had allowed the sector to explain away more than half of the farms experiencing repeated mass deaths, the number of problem farms still stands at nine,

³ “The current framework parameters therefore prioritise patterns which are repeated and where mitigation or intervention is most likely to yield meaningful benefits for farmed fish. Mortality events of short duration, but possibly involving large quantities of fish, would not feature using these parameters.”

⁴ <https://www.sciencedirect.com/science/article/abs/pii/S0167587719308530>

representing more than 4% of the total. This is far from trivial, yet the sector's mitigation efforts are deemed sufficient to dismiss any need for action, even though no evidence is given that these mitigations have eliminated persistent high mortality in any of the nine farms, or in the initial 25. The analysts admit, for example, that there is no effective mitigation for one of the worst (climate change-related) killers, planktonic blooms, including microjellyfish.

- Apparently, mitigations for infectious diseases, “have made substantial progress in addressing disease challenges and have also alleviated some gill health issues”. If so, why are tens of millions of farmed salmon still dying prematurely each year?
- The analysis simultaneously claims that there is no persistent mortality problem in Scotland's salmon farms, while urging the need for a streamlined consenting process, in order to move farms “experiencing specific health issues”, or to change their layout, to improve fish health.⁵

Annex B in the document also reinforces the RAIC's view that mortality reporting is inadequate, saying that, “no single dataset provides a complete picture across the entire production cycle, or for any single fish species or production phase (seawater or freshwater)”, and that, “datasets cannot be directly compared”. The analysis points out that there are “some discrepancies” between the four different datasets on farmed salmon mortality.

An overhaul is long overdue

After this inadequate process, the mortality in Scotland's salmon farms remains massively higher than in any other type of livestock farming, and higher than the levels that Norway's fish vets' union recently found unacceptable in that country.⁶

The RAIC's recommendation that the Government acts to reduce persistent high mortality has not been addressed by this analysis.

⁵ “To address some of the challenges seen in the analysis, several companies have already begun or are actively seeking to relocate portions of their production to locations with more favourable environment conditions ... There is also growing interest among producers experiencing specific health issues to transition to sites with fewer, but significantly larger, pens ... Faster decision-making for new site applications has been requested to enable more proactive and strategic health management planning, helping the sector adapt more effectively to emerging environmental and biological pressures...”

⁶ <https://weareaquaculture.com/news/aquaculture/norwegian-fish-health-biologists-call-for-strict-regulation-of-salmon-mortality-rates>