14th March 2022

SEPA Consultation:

Proposals for a risk-based framework for managing interactions between sea lice from marine finfish farm developments and wild Atlantic salmon in Scotland.

Mowi Scotland Consultation Response

Executive Summary

Mowi Scotland does not support the proposed framework, as we have significant concerns with the underlying principles and evidence on which it has been based. We do not believe there is sufficient scientific evidence to support a claim that fish farming is having a significant impact on wild Atlantic salmon populations. Farm-derived sea lice represent just one of a range of pressures on wild Atlantic salmon and the disproportionality of the proposed framework is evident. Additionally, the proposed framework places undue reliance on the availability of a yet unestablished modelling approach which means it is impossible to validate the proposed framework or consider the effectiveness of the proposed regulation. Furthermore, the implementation of the framework as presented will result in a clear (and unquantified) risk to the economic sustainability of the sector to support the pursuit of unclear and unsubstantiated environmental benefit.

We believe in wild Atlantic salmon conservation but not at any cost to the sector, especially when stock exploitation and impacts from other pressures continues without equivalent focus.

Introduction

Mowi acknowledges that uncontrolled, farm-derived sea lice may present a hazard to wild salmonids, especially in areas of restricted water exchange such as the upper sections of sea lochs or potentially within constrained passages of coastal waters through which migrating smolts may pass through. However, we stand firm that this particular pressure on wild salmon should not be exaggerated beyond the evidence available, recognising that wild salmon populations face numerous other pressures not related to finfish aquaculture in both their marine and freshwater phases. We would highlight that the aquaculture sector is frequently forced to address misinformation on our interactions with the marine environment, commonly arising from misunderstanding or misrepresentation of data. New regulation should always have a clear justification and be under-pinned with a robust evidence base.

We welcome engagement with all parties who wish to positively contribute to a process that strengthens the scientific evidence base on the environmental effects and performance of fish farms. For the avoidance of doubt, we support the principle of an evidence-based

approach to the regulation of fish farming, including sea lice. However, we also feel strongly that it is important for SEPA to avoid employing a prescriptive approach that goes beyond the evidence available and take an unjustifiable, ultra-precautionary stance at the expense of the industry's ability to operate within conservation thresholds and to grow sustainably in the right locations. To do so would result in SEPA falling short of its role "*to ensure that Scotland's natural resources and services are used as sustainably as possible and contribute to sustainable economic growth*," as it would unduly inhibit the growth and success of fish farming, and negatively impact the thousands of Scottish families in coastal communities who rely on the industry for employment.

The consultation states that "*sea lice from open-net pen finfish farms in Scotland can pose a significant risk to wild salmon populations*" (paragraph 2.3). However, it then goes on to further detail a number of factors that make this highly conditional. Mowi is of the opinion that it has not been demonstrated that sea lice from fish farming, in the areas of Scotland where this is practiced, poses a significant risk to the conservation status of Scotland's wild Atlantic salmon populations.

Fundamentally we question the evidence base underpinning this consultation and the need for added regulation of the industry. Setting aside the principle as to whether such regulation would create any benefit, we have a number of concerns on the proposed framework presented in the consultation which we will attempt to outline more fully in this response.

Potential contribution to ineffective regulation: We are extremely concerned about the potential for the proposed consultation to drive policy development on the regulation of fish farming in Scotland. There are key guiding principles being laid out within this consultation that if implemented will set or impact on wider Scottish aquaculture policy in a number of areas. On this it is relevant and appropriate to highlight Professor Griggs's recent independent review which recognised that regulation of aquaculture is not working effectively, and that policy and regulation have become intertwined and need to be separated. We would reiterate these conclusions; it is key that it is Government which makes policy and the sectoral frameworks within which policy operates. Agencies and regulators should then implement, not create policy as a by-product of regulation.

Limited industry input: We would highlight that to date the opportunity for engagement by the industry on the development of these proposals has been limited. Despite repeated requests, SEPA has been unable to provide a working model of how the proposed framework would be put into use. As a result, there are a range of critical issues that Mowi believes have not been given proper consideration within the consultation or lack information. This includes:

- the justification and evidence base for the framework.
- the proportionality of the framework as a tool to protect the conservation status of wild Atlantic salmon in Scotland.
- the significant uncertainties associated with sea lice modelling and outputs that will be utilised in due course to prescribe legally binding licence conditions.

- the absence of an assessment of the potential economic impact such a framework would have on the sector; and
- concerns on SEPA's ability to implement such a framework.

Consultation bias: We also find that the consultation structure itself is not neutral, appearing predicated on securing a presumption in favour of the need for such a framework, evidenced by the presentation of risk and leading questions on which responses are sought. As a result, we have elected not to respond to the stated questions, instead we have chosen to structure this response focused on a number of key issues that are of direct relevance and where we provide detailed comments and observations.

Justification for the framework

There are a number of comments on the justification for the proposed framework that we wish to highlight before turning to the scientific evidence base that has been presented as underpinning the framework.

It is important to point out that there is already a significant presumption in favour of protection towards Scottish stocks of wild Atlantic salmon from increased fish farm derived sea lice infestation pressure through the development moratorium on the North and East coasts of the Scottish mainland. On a population level basis, the North and East coasts account for approximately 80% of Scottish wild Atlantic salmon stock (including the proportion with the highest conservation value). This is a surprising and concerning omission from the consultation, especially in relation to the discussion in Section 2 – Requirement for regulation – protection of wild salmon. In terms of the assessment of risk to west coast populations of Atlantic salmon from fish farming, it would allow the following statement in para 2.1 to be considered in better context: "*Scotland is renowned worldwide for the quality of its rivers, lochs and seas. Despite this, in nearly 60% of salmon rivers across Scotland, including on the West Coast and Western Isles, salmon populations are in poor conservation status.*"

There is no evidence within the consultation that the limited proportion and conservation value of the wild salmon population which occurs in the areas where fish farming is undertaken has been considered when determining the need for a sea lice framework in terms of protecting the conservation status of Scottish wild salmon stocks.

We would also query whether it is appropriate to propose to include all marine coastal waterbodies in the farming area of the west coast in the framework considering that freshwater habitat pressures may be a limiting factor on wild fish populations in a number of freshwater catchments. The proposed framework places a disproportionate focus on the pressure to wild Atlantic salmon populations from fish farms and does not appear to be consistent with the management of other pressures on wild Atlantic salmon in their freshwater phase where there are recognised unequivocal impacts. In this regard there is a degree of irrationality with the proposed framework and the intention to introduce regulatory controls on

sea lice.

To illustrate, the pressure to take action on fish farm derived sea lice is frequently driven by angling interests. However, this is a pressure where Marine Scotland have accepted at least 10% mortality from catch & release angling which affects the majority of the Scottish wild Atlantic salmon population. It is also a sector in need of change, with the notable absence of a rod licensing regime that is common in other countries. A previous attempt to modernise the outdated management structures that underpin our wild fisheries including the introduction of a rod licencing scheme that could have been used to fund chronic under investments in freshwater habitat improvement and fisheries protection did not proceed. A `pay to play` system in respects of the potential benefits that a rod licensing system would bring is difficult to argue against. If Scotland is serious about conservation of wild Atlantic salmon stocks there should be a coordinated approach across all potential sources of pressure rather than creating a situation that disproportionately and solely focuses on fish farming.

Where there are unequivocal impacts from identified pressures on wild Atlantic salmon populations in freshwater catchments, we would ask what measurable outcomes would be applied to assess the benefits that a sea lice risk framework would bring?

It is widely recognised that wild Atlantic salmon face significant pressures during their marine phase and are in decline across their former strong holds in the western Atlantic. These factors include increasing high seas fishing by-catch, reduced marine feeding and changing migration pathways due to warming seas and increased predation. SEPA has previously acknowledged these pressures as being the principal mortality impact on the status of Scottish wild Atlantic salmon stocks. It is disappointing that there is a lack of balance presented in the consultation as to the contribution to marine mortality of wild Atlantic salmon assumed to be caused by sea lice from fish farming. No recognition or allowance appears to have been made during the development of these proposals for mortality from other marine factors in determining the specific risk to wild Atlantic salmon from fish farming.

Sea lice from farm-raised salmon represent just one of a wide range of pressures on wild Atlantic salmon and a risk assessment framework must consider the full range of pressures if measurable outcomes are to be delivered.

We mention elsewhere in this response of our concern that the structure of the consultation has been designed to elicit a presumption in favour of the need for a sea lice risk framework. This is very evident within the consultation discussion (Section 2) on the requirement for regulation.

The evidence base for the framework

Despite the statement in the consultation that "*Substantial impacts on the marine survival of wild Atlantic salmon resulting from sea lice from finfish farms have been demonstrated in Ireland and Norway*" (paragraph 2.3), the evidence in the literature is in fact far from clear. In Norway, studies found that post-smolt mortality in Trondheimsfjord is only "*marginally*

influenced by sea lice infection"[1]. Studies in Ireland found that "*Results from this study over a period of 9 years point to infestation with the salmon louse (L. salmonis) as being a minor component of marine mortality in the stocks studied*"[2] and "*The results of a meta-analysis of the combined data suggest that while sea lice-induced mortality on outwardly migrating smolts can be significant, it is a minor and irregular component of marine mortality in the stocks studied and is unlikely to be a significant factor influencing conservation status of salmon stocks*"[3]. The same authors estimated that lice-induced mortality had remained relatively constant at approximately 1% of migrating post-smolts[4].

Other authors[5,8] publish higher lice-induced mortality rates by calculating the lice effect as a proportion of fish that would not have otherwise died; this approach ignores the fact that most post-smolt mortality is caused by other factors than sea lice.

There is no evidence within the consultation that the potential for increased sea lice infestation pressure from fish farming poses a significant risk to the conservation status of the Scottish salmon population. The disproportionality of the proposed framework, which tackles a small (though undetermined but likely 1-2%) proportion of the mortality in a small proportion of Scotland's wild Atlantic salmon populations, is evident.

The proposed framework also relies heavily on a published threshold for mortality of wild fish due to lice burdens[7]. However, this threshold also appears to be extremely uncertain. The Evaluation Committee of the Norwegian Traffic Light system, after speaking to the authors of the published literature, found that there is a "*lack of solid empirical evidence for the thresholds*" (Norwegian Traffic Light System Evaluation Committee report, 2021)[6]. While Mowi recognises that thresholds must be utilised within any proposed framework, such uncertain thresholds must be established with caution and incorporated in such a way that new evidence can be easily assimilated, and thresholds updated.

Similarly, the proposed lice density threshold 0.7 lice-days/m2 is a modelled number taken from the Norwegian modelling system. The validity of transferring a modelled threshold number to a different model system is highly questionable. There are no data supporting such a threshold value currently available from Scotland. In the Norwegian system, a lice density of 0.7 lice-days/m2 is equated to a lice burden on migrating fish of 1 louse per fish, a highly precautionary value.

Initial consultation and engagement activity with the industry on the early development of this proposal promoted a sea lice threshold of 2 lice-days/m2. No justification is provided for moving from a sea lice threshold of 2 to 0.7 lice-days/m2? In the absence of justification, we would conclude that this was a policy led decision by SEPA and if so, contradicts with the principles of better regulation, outlined in the Scottish regulators Code of Practice, that is founded on the need for a proportionate, evidence led, and risk-based approach to regulation.

Sea lice dispersal modelling

The scientific basis for the proposed modelling framework is largely taken from the published literature relating to the "Traffic Light" management system implemented in Norway over the past 3 – 4 years. The Traffic Light system is a specific centralised modelling approach developed for Norway that provides consistent modelling predictions across all farming regions for all operators. This is a fundamentally different approach to that proposed for Scotland, where operators are expected to develop their own models; even with modelling protocols and guidance in place, this is likely to lead to confusing and contradictory model predictions.

Setting aside concerns about the fundamental justification for the framework, Mowi has serious concerns about the timescales proposed for implementation in Scotland. The Norwegian Institute for Marine Research spent many (*ca.* 15) years developing a coupled hydrodynamic and sea lice dispersal modelling system before the Traffic Light System was introduced. In contrast, the proposed framework in Scotland is planned for introduction within a year with no specific modelling system yet identified.

A full lice dispersal modelling system requires a fully three-dimensional baroclinic (includes temperature and salinity) regional hydrodynamic model. Such models are time-consuming to develop and calibrate. For example, the Scottish Shelf Model developed for Marine Scotland took about 3 years to build (2012 – 2015), and still contains known flaws. The WestCOMS model, developed by oceanographers at the Scottish Association for Marine Science, also took a number of years to develop and requires ongoing development and maintenance. It is extremely optimistic to think that the fish farming industry in Scotland can develop a similar model (or models) within much shorter timescales. The outcome, unless transitional arrangements are agreed, will be a *de facto* freeze on industry development and growth for a number of years.

The potential hazards from sea lice occur on regional, rather than local, spatial scales. This is different to the usual spatial scales over which aquaculture regulation works in Scotland. We are concerned that SEPA has not fully recognised this difference in their framework modelling proposals. Local calibration of a hydrodynamic model using data collected at a site is not appropriate for assessing effects that may occur many kilometres away. Proper implementation of the framework, at least in the first iterations, will require a single West Coast model, properly calibrated, that can be used by all operators. The alternative, which is what is currently proposed, will result in a plethora of weakly-calibrated local area models which will produce confusing and conflicting results. Such a framework will quickly become unmanageable, as different operators and other stakeholders submit contrasting model studies; the burden on regulators to assess all these models will be enormous.

An obvious solution to this potential chaos is to update and improve the climatological products of the Scottish Shelf Model suite (the current versions of which have some known flaws) to provide a consistent hydrodynamic basis on which all operators can perform the lice dispersal modelling. As well as hydrodynamic consistency, this approach would have other

benefits: a climatological forcing removes the uncertainty of using flow fields from specific years, which may contain anomalous or rare hydrodynamic events thereby distorting the dispersal simulations. In an ideal world, some comparison between dispersal simulations using specific year hydrodynamics and the climatological hydrodynamics would be performed before any such framework is launched.

Having said all the above, there may be cases where application of a separate hydrodynamic model may be more appropriate than using a "default" model, and this option should remain open. This approach, with a standardised hydrodynamic model as default and the option of using a different calibrated model instead, would be analogous to the current SEPA deposition modelling guidance.

The introduction of the sea lice risk framework and the implementation of a modelling regime that is created in such a short period of time, such that it is impossible to address the inherent uncertainties with the outputs and which leads to disproportionate and unjust regulatory control, would invite a challenge by judicial review.

Proportionality in the context of other pressures on salmon

The consultation states that "*The causes of the poor conservation status of wild salmon stocks are complex and believed to be due to a range of different factors rather than a single cause.*" The Scottish Government has identified twelve high-level pressures affecting wild salmon populations. These include `fish health`, one component of which is sea lice, (noting that sea lice are not a high-level pressure in their own right).

While we acknowledge that the industry has a responsibility to manage our marine farming operations responsibly to reduce any potential risk and conflict with wild salmon interests there is a lack of visibility on regulatory or improvement actions being taken on other more significant pressures to the extent we would question whether any meaningful action has been or is intended to be taken. The proposed framework does not balance the risk that may be posed by a farm development, with other pressures that may be far more significant on wild salmon populations, both locally and nationally. It is reasonable to question whether SEPA's proposed sea lice framework is proportionate relative to risk posed by other identified pressures.

As an example, we would highlight Mowi's fish farming operations in upper Loch Linnhe, a coastal waterbody with restricted water exchange where intuitively you would reasonably expect that a sea lice framework, if introduced, would apply high risk factors to wild Atlantic salmon from fish farm derived sea lice pressures. This is a coastal waterbody where we recognise our responsibility to manage and effectively control sea lice and where we have been working in partnership with wild fish stakeholders to manage risk. However, there are also significant pressures on wild Atlantic salmon in the main freshwater waterbody within the Loch Linnhe catchment, namely the river Lochy. There are eight river waterbodies in the upper Lochy catchment area that at present are in less than Good Ecological Condition. For six of the waterbodies, including four that are in Bad Ecological Condition, the pressures causing the

downgrades are hydro electricity generation.

The foundations for hydro storage scheme development in the Lochy catchment, and indeed across Scotland, are historical and in many cases there has been no change in the operation of these schemes since the Acts of Parliament that introduced them in the 1950's and 1960's, some earlier. The impact of pressures associated with hydro at given locations are unequivocal; for example, barriers that partially or fully obstruct the passage of salmon, over-abstraction of water, the absence of compensation flows or morphological alterations to terrestrial freshwater habitats. In the river Lochy water system approximately 2/3 of the catchment is impacted by hydro related pressures and a fish pass at Mucomir power Station which has recognised flaws. SEPA's River Basin Management Plan (RBMP) does promise to deliver improvements in river flows and levels and fish passage pressures from hydro pressures but we are now into RBMP cycle 3 and its unlikely there will be any significant regulatory action by SEPA before 2027. Regulatory action on hydro pressures is also subject to derogation testing on feasibility, disproportionate costs and benefits which limits change which significantly compromises generating capacity (above an agreed cap). The perception exists that impacts on wild Atlantic salmon should be expected from pressures such as hydro electricity generation while disproportionate and unfair frameworks and regulatory controls are considered appropriate for the fish farming sector.

We have no wish to single out other sectors as we recognise we have shared responsibilities on this issue. However, the foregoing example is illustrative of an inconsistent application by SEPA of regulation versus risk. The Scottish Wild Salmon Strategy is framed around a high-level vision and objectives that guide collective action to address pressures. It is vital however that the priorities and the specific actions taken in its implementation do not exist in isolation. This is not an unreasonable expectation of the sector.

Noting that aquaculture is identified with group of 12 high-level pressures on the status of salmon stocks we would seek answers to the following questions not addressed in the consultation.

1. How is the level of risk to wild salmon population status from fish farming pressure going to be determined to allow for proportionate assessment and justified regulatory control especially where significant pressures exist in freshwater catchments?
2. In terms of determining the conservation objective of implementing the framework what percentage of total wild Atlantic salmon mortality has been assumed because of fish farm derived sea lice pressure?

The potential consequences of the framework on the economic sustainability of the sector

The consultation states (page 14) "*The purpose of the proposed framework is to help us ensure Scotland's environment is protected and improving. It is important for everyone that, as far as possible, this purpose is delivered in ways that also contribute to improving people's health and wellbeing and to achieving sustainable economic growth*."

The `Better Regulation` agenda aims to reduce unnecessary burdens on business by ensuring all regulation follows the better regulation principles of being proportionate, consistent, accountable, transparent and targeted only where needed. This agenda has been promoted by SEPA; however, better regulation is supported by a wider range of complementary measures including Business and Regulatory Impact Assessments (BRIAs). BRIAs are recognised good practice and help to assess the likely costs, benefits and risks of any proposed regulation, codes of practice, or guidance that may have an impact on the public, private or third sector.

In addition to better regulation programmes setting out measures to improve the way legislation is developed and applied in practice, The Regulatory Reform (Scotland) Act, gave SEPA its statutory purpose, to protect and improve the environment (environmental success) in ways that, as far as possible, create health and well-being benefits (social success) and sustainable economic growth (economic success). The proposed sea lice risk framework is potentially a direct contradiction of this statutory duty having the potential to create significant impact on the economic success of Scotland's leading food production sector.

Through the Act the Scottish Regulators' Strategic Code of Practice was developed, which describes how regulators should apply regulatory principles and good practice to contribute towards sustainable economic growth. Frequently SEPA states that its regulatory processes comply with the principles of better regulation and adhere to the duties recommended in the Code of Practice, as indeed this consultation expressly states, but in reality the common perception of the sector is that this is merely lip service. Specifically, we fail to see how the proposed framework addresses the requirement of the Code to "*Adopt risk and evidence-based protocols which help target action where it's needed and help to ensure the achievement of measurable outcomes*."

Additionally, the Water Environment (Controlled Activities) (Scotland) Regulations 2011 expressly impose requirements on SEPA's decision-making process. In particular, before determining an application SEPA must, if the application is in respect of an activity that it considers has or is likely to have a significant adverse impact on the water environment, consider the likely environmental, social and economic benefits of the activity. There is no visibility at present of socio-economic considerations within SEPA's regulatory decision making relating to fish farming and no confidence that this would change with the regulatory introduction of the framework.

The consultation poses the following question, "*Do you think the design of the proposed framework, or how it is implemented, could affect your community or business interests either positively or negatively? Please tell us what you think the effects could be and why?*". In the absence of an economic impact assessment, it is simply not possible to consider whether any environmental benefits arising from implementation of the proposed framework outweighs any adverse socio-economic consequences? There is also no reference in the framework of a decision-making process that considers the social and economic benefits of fish farms, particularly given that this is something SEPA is legally required to consider in determining an application for a controlled activity licence. Such derogation assessments are embedded

within certain aspects of SEPA's licensing framework and frequently applied to regulation of other sectors and we therefore question the absence here.

To conclude on this aspect, the framework proposed by SEPA in the consultation does not reference the social or economic benefits of fish farming. The risk assessment approach that is set out does not account for salmon farming being a key provider of employment (particularly in remote rural communities), capital investment, tax revenue or the provision of food with health benefits at affordable price points, for example. The framework appears to fail to properly and fully apply the legislative requirements imposed on SEPA by The Regulatory Reform (Scotland) Act and the Water Environment (Controlled Activities) (Scotland) Regulations 2011.

A recent example of disproportionate regulatory behaviour not linked to sound science and justification impacting the economic sustainability of fish farming is available from British Columbia. The decision in 2021 by the federal government not to renew licences for fish farming led to the closure of a number of fish farms in the Discovery Islands accounting for 30 per cent of Mowi's production in British Columbia. The driver for this action was the perception, led by unsubstantiated claims from fish farming opponents, of impacts to local wild salmon populations from farm derived sea lice. There was no evidence to support such course of action, recently confirmed by the National Oceanic and Atmospheric Association (NOAA) who found that marine finfish aquaculture had little to no negative impact on native species, such as endangered salmon. This situation is now the subject of a court challenge. The Canadian governments own scientists at the Department of Fisheries and Oceans also came to similar conclusions, with other studies showing that indeed salmon bound for British Columbian rivers are being intercepted by Alaskan fishermen enroute from the northern pacific feeding grounds (Pacific Marine Conservation Caucus Report January 2022).

In terms of managing the pressure on wild Atlantic salmon from fish farming the British Columbia experience demonstrates a need for calm, sensible heads where exaggeration and hysteria is replaced with sober minds that allows a proper scientific appraisal of risk and if appropriate the development of proportionate and appropriate controls over time.

The framework proposed by SEPA does not reference the social or economic benefits of fish farming. The failure to address the potential impacts on the sustainability of the sector is a clear omission and a breach of SEPA's statutory obligations and recognised best regulatory practice. The proposed framework presents a clear (and unquantified) risk to the economic sustainability of the sector.

Implementation

There are significant questions and concerns regarding how SEPA would effectively introduce the management of sea lice on farm raised salmon into CAR licence regulatory controls. The consultation is light on detail as to how such a framework could be implemented with the

inference that many of the key aspects will be subject to other work streams and consultation over the following 12 months. This is not acceptable; for such an important area of regulation.

The critical components of a sea lice risk framework are interrelated and should be considered together in a holistic manner. The following range of questions are examples of the areas where there is a lack of clarity and understanding at present.

The sea lice framework is centred on managing the risk to wild Atlantic salmon in the sensitive months of April and May. Nowhere in the consultation can we see if the proposed regulatory approach and licence conditions would only apply to these months, the perception is that they would apply across a 12-month period.

Para 5.7 – How will multiple fish farms within neighbouring protection zones be considered by SEPA where there is potential sea lice connectivity that may affect the same protection zone?

Para 6.2 – How is SEPA going to control with licence conditions "*the factors determining the number of juvenile sea lice emanating from the farms so that those numbers cannot significantly increase without prior authorisation*"? Sea lice levels on farm raised salmon can change quickly, influenced for instance by environmental variables that are outside of an operators' control. Similarly, management measures implemented by operators can also result in quick and responsive control. It is difficult to see how a fine level of licence controls relating to sea lice thresholds and sea lice infestation rates could work in practice.

The 2011 Regulations allows SEPA to exert regulatory control on activities that directly or indirectly have or are likely to have a significant adverse impact on the water environment. Para 6.2 infers that this conclusion has already been reached with the discussion on proposed licence conditions. In turn Para 6.3 appears directly contradictory by stating that "*more information is needed to enable an assessment of whether the operation of existing farms is resulting in a hazard to wild salmon populations. Some of this information will be provided through the implementation of the proposed framework*".

Para 6.4 – How does SEPA intend to utilise the proposed framework to "*identify wild salmon protection zones where densities of infective stage lice resulting from the operation of existing farms is posing a hazard to wild salmon populations?*" How will SEPA identify the most appropriate way to reduce lice levels in areas where there are multiple sites and operators?

Annex C.14 states "*We will incorporate authorisation conditions relating to sea lice in updated and consolidated farm permits that also cover all discharges from farms to the water environment. To prepare for implementation, we will develop appropriate permit conditions for appropriately controlling the combination of factors (numbers of fish farmed and number of gravid sea lice per fish) that determines the number of juvenile sea lice emanating from farms.*" How will SEPA achieve this and does SEPA have the competence to regulate in this area potentially in conflict with advice of licensed veterinarians? The criteria defining appropriate sea lice interventions selected for a site is determined based on many different decision criteria to ensure a diverse range of treatments are applied for continued treatment efficacy and minimal development of resistance. These include the type of treatment last

applied, level of efficacy achieved, health status of the fish, as well as the availability and capacity of specific treatment options. Sea lice levels on fish farms can be highly variable, changing potentially over the course of a few days. Fast responsive actions are required, and we are concerned that such licence conditions will not be agile enough in the key area of animal health and welfare.

The proposed framework is also likely to result in increased levels of management interventions for sea lice in order to meet regulatory thresholds. It is anticipated this would require a need for increased use of medicines and freshwater treatments which in turn presents the risk of an increase in development of sea lice resistance to such treatments. At a time when SEPA is introducing licence conditions relating to medicine minimisation the framework conversely is likely to result in an increased use of medicines.

Para 8.5, 8.6 and Annex C.21 – Mowi has worked hard to develop effective Environmental Management Plans (EMPs) supported by meaningful local wild fish monitoring studies, and we are on track to have 80% of our fish farms covered by EMPs. EMP's are designed to collect data to determine where there is an impact on wild salmonids from farm derived sea lice and if so, provide the mechanism that allows implementation of agreed adaptive action. The proposed sea lice risk framework as presented would appear to operate differently, namely there is the presumption of impact at identified sea lice thresholds.

There is a lack of understanding on the present use of EMP's illustrating the potential confusion with the proposal to draw EMP elements into the SEPA licensing process. Currently, Local Authorities require applicants to develop an EMP to support the management of interactions between farm raised salmon and wild salmonids (including both salmon and sea trout). With the proposed introduction of a risk framework for Atlantic salmon, it is likely that Local Authorities will require to continue its requirement for EMPs to cover sea trout with the consequence that fish farmers face the prospect of "double regulation". This is in direct conflict with the principles of better regulation, and the requirements of The Scottish Regulators' Strategic Code of Practice. SEPA need to explain how, as the proposed lead regulator for sea lice interactions between farm raised salmon and wild Atlantic salmon, they will provide advice to Local Authorities to avoid "double regulation" of the salmon farming sector. This is an important issue that does not appear to have been subject to any material consultation with local authorities.

Finally, we would note that SEPA does not have a good track record with regards to implementation of regulatory change. SEPA's Aquaculture Sector Plan was launched on the 1st June 2019 in the same manner as this proposed framework, namely high-level principles for change with the promise that the detail would quickly follow. Approaching three years later many key aspects of SEPA's new regulatory approach are still not formally established with modelling requirements for applications in particular subject to continuing and evolving change. New processes such as screening modelling, heavily promoted in this consultation, have not resulted in the anticipated benefits to either SEPA or the sector. The scale of what SEPA is proposing in terms of this proposed new regulation should not be underestimated. Accordingly, there is no confidence that SEPA has the competence to regulate in this area

nor the ability to deliver the implementation of such a framework within the stated period. On the basis of previous performance levels, it is likely that this will lead to a prolonged period of regulatory delays that would lead to business uncertainty and delayed investment decisions ultimately impacting on sustainable growth.

Concluding Remarks

For the avoidance of doubt, we are opposed to the introduction of the proposed framework for the reasons highlighted throughout this response, specifically:

- **There is no evidence within the consultation that the limited proportion and conservation value of the wild salmon population that occurs in the areas where fish farming is undertaken has been considered when determining the need for a sea lice framework in terms of protecting the conservation status of Scottish wild Atlantic salmon stocks.**

- **Sea lice from farm-raised salmon represent just one of a wide range of pressures on wild Atlantic salmon and a risk assessment framework must consider the full range of pressures if measurable outcomes are to be delivered.**

- **There is no evidence within the consultation that the potential for increased sea lice infestation pressure from fish farming poses a significant risk to the conservation status of the Scottish salmon population. The disproportionality of the proposed framework, which tackles a small (though undetermined but likely 1-2%) proportion of the mortality in a small proportion of Scotland's wild Atlantic salmon populations, is evident.**

- **The scientific basis for the proposed modelling framework is largely taken from the published literature relating to the "Traffic Light" management system implemented in Norway over the past 3 – 4 years. The traffic Light system is a specific centralised modelling approach developed for Norway which provides consistent modelling predictions across all farming regions for all operators. This is a fundamentally different approach to that proposed for Scotland, where operators are expected to develop their own models; even with modelling protocols and guidance in place, this is likely to lead to confusing and contradictory model predictions.**

- **The framework proposed by SEPA does not reference the social or economic benefits of fish farming. The failure to address the potential impacts on the sustainability of the sector is a clear omission and a breach of SEPA's statutory obligations and recognised best regulatory practice. The proposed framework presents a clear (and unquantified) risk to the economic sustainability of the sector.**

In this response we have highlighted that the development of regulatory controls should follow the principles of better regulation, principally that it should be evidence based, protects and improves Scotland's environment and at the same time contributes to sustainable economic

growth. Included within these guiding principles is the concept that regulators should be enabling and help to effect change in a way that gives a positive end result rather than the imposition of unnecessarily restrictive conditions that simply stop certain activities. The proposed sea lice risk framework has the potential to be the most significant regulatory change since the fish farming sector was first developed in Scotland. It also comes at a time when the Scottish Government is developing its strategic Vision for Aquaculture and immediately follows the publication of the conclusions of Griggs's independent review of how fish farms are regulated in Scotland.

A key aspect of the conclusions of the Griggs report was that the present regulatory regimes in Scotland for controlling aquaculture activities were not fit for purpose. A number of important and welcome recommendations were made on a regulatory solution for fish farming based on a framework specifically designed for the sector and in which the consenting and all other regulatory processes will sit and be driven by. We are of the opinion that the development of the proposed framework and the subsequent consultation demonstrates many of the regulatory behaviours and actions that were identified by Griggs as areas of concern where alternative approaches were required to build trust in regulation for the benefit of all stakeholders. It is important that significant new regulation such as the proposed framework are not considered in isolation from the Griggs recommendations.

We believe that all considerations relating to the risk to wild salmonids from farm raised salmon and sea lice must be transferred into the future fish farming framework and consenting system recommended by the Griggs report. This includes firstly establishing a clear evidence base on the risk to wild salmonids supported by an increased level of research that is subject to independent review to ensure it is the best and most up to date available. Should an absolute need for regulation be established then those structures should at their heart contain the principles of better regulation and be designed to ensure that they deliver the objectives of measurable environmental outcomes and economic success. To achieve this and embed trust in the process it is important for proper, detailed and meaningful consultation that considers the necessity, effectiveness, proportionality, implementation and economic impact of any proposed regulatory approach. Additionally, it is important that any proposed new regulation in this area is supported by a robust and validated modelling system, relevant in a Scottish context, with implementation initially on a small scale allowing tried and tested methods to be developed prior to any wider scale roll out.

To conclude we are disappointed with the development of the framework to date and the rush to launch a consultation which has resulted in a proposed regulatory framework that is not evidence or risk based, proportionate nor considers the economic impact on the sector. We support the Scottish Wild Salmon Strategy and as one of the 12 groups of high-level pressures on the status of wild Atlantic salmon stocks, we acknowledge that fish farming has to contribute actions that support the objectives of the strategy and Mowi is committed to play a full and leading part on this.

References

1. Hvidsten, N. A., Finstad, B., Kroglund, F., Johnsen, B. O., Strand, R., and Arnekleiv, J. V., Bjorn, P. A. 2007. Does increased abundance of sea lice influence survival of wild Atlantic salmon post-smolt?. Journal of Fish Biology, 71: 1639–1648.
2. Jackson, D., Cotter, D., OMaoileidigh, N., O'Donohoe, P., White, J., Kane, F., Kelly, S. et al. 2011. An evaluation of the impact of early infestation with the salmon louse Lepeophtheirus salmonis on the subsequent survival of outwardly migrating Atlantic salmon, Salmo salar L., smolts. Aquaculture, 320: 159–163.
3. Jackson, D., Cotter, D., Newell, J., McEvoy, S., O'Donohoe, P., Kane, F., McDermott, T. et al. 2013. Impact of Lepeophtheirus salmonis infestations on migrating Atlantic salmon, Salmo salar L., smolts at eight locations in Ireland with an analysis of lice-induced marine mortality. Journal of Fish Diseases, 36: 273–281.
4. Jackson D, Cotter D, Newell J, O'Donohoe P, Kane F, McDermott T, Kelly S, Drumm A. 2014. Response to M Krkošek, C W Revie, B Finstad and C D Todd's comment on Jackson et al. 'Impact of Lepeophtheirus salmonis infestations on migrating Atlantic salmon, Salmo salar L., smolts at eight locations in Ireland with an analysis of lice-induced marine mortality'. Journal of Fish Diseases, 37: 419-21.
5. Krkošek, M., Revie, C. W., Finstad, B., Todd, C. D., Comment on Jackson. et al. 2014. Impact of Lepeophtheirus salmonis infestations on migrating Atlantic salmon, Salmo salar L., smolts at eight locations in Ireland with an analysis of lice-induced marine mortality'. Journal of Fish Diseases, 37: 415–417.
6. Norwegian Traffic Light System Evaluation Committee. An evaluation of the Scientific Basis of the Traffic Light System for Norwegian Salmonid Aquaculture, December 2021, 37 pp. Available at: https://www.forskningsradet.no/siteassets/publikasjoner/2021/an-evaluation-of-the-scientific-basis-of-the-traffic-light-system-for-norwegian-salmonid-aquaculture.pdf
7. Taranger, G. L., Karlsen, Ø., Bannister, R. J., Glover, K. A., Husa, V., Karlsbakk, E., Kvamme, B. O. et al. 2015. Risk assessment of the environmental impact of Norwegian Atlantic salmon farming. ICES Journal of Marine Science, 72: 997–1021.
8. Vollset, K. W., Dohoo, I., Karlsen, Ø., Halttunen, E., Kvamme, B. O., Finstad, B., Wennevik, V., Diserud, O. H., Bateman, A., Friedland, K. D., Mahlum, S., Jørgensen, C., Qviller, L., Krkosek, M.,A˚ tland, A., and Barlaup, B. T. Disentangling the role of sea lice on the marine survival of Atlantic salmon. – ICES Journal of Marine Science, 75: 50–60.