

Responsibly farmed?

Investigating the
certification of
Scottish farmed
salmon

September 2023



Executive summary

This report uses cases studies from three of the most widely recognised farmed salmon certification schemes in Scotland - Aquaculture Stewardship Council (ASC), RSPCA Assured and Soil Association's Organic standards - to demonstrate the systemic failures of these schemes to improve the environmental, animal welfare and sustainability performance of the Scottish open-net salmon farms they certify.

Not raising the bar

The case studies examined in this report show that the purported 'higher standards' claimed by these schemes are often not enough to significantly improve farm operations, as they still allow considerable damage to the environment, poor welfare on farms and unsustainable practices, such as the use of large volumes of wild-caught fish as feed.

Indeed, in many instances these standards do not go significantly beyond the baseline regulatory requirements set out in law, statutory permissions, and regulatory licences.

For example, contrary to what consumers might reasonably believe, the Soil Association's Organic certification permits the use [and therefore discharge] of chemical treatments, including pesticides that are known to be toxic to marine life. This report details Soil Association certified farms using the chemical pesticide Deltamethrin, which is known to persist in marine sediment for prolonged periods and be highly toxic to lobsters as far as 39km² from the farm.

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Similarly, the RSPCA Assured standard, which claims to be welfare led, sets no maximum mortality threshold limits on certified farms. Consequently, Scottish salmon farms reporting as many as 74% of its fish dying in a single month can continue to sell the remaining fish as RSPCA Assured-certified "high welfare" farmed salmon. In 2022 more than 16.7 million salmon died prematurely on Scottish salmon farms, with no loss of RSPCA Assured certification publicly reported because of these record high mortalities.



Farmed salmon missing an eye on an ASC and Soil Association certified Scottish salmon farm, June 2023

Not enforcing the requirements

Additionally, and critically, this report finds extensive evidence that farms remain certified even if they breach the standards, meaning that there is effectively no penalty for failing to comply.

This can be seen with the latest version of ASC's salmon standard, in relation to sea lice numbers. Whilst at the same time increasing the number of sea lice permitted on its certified farms, the new standard claims to set a "far stricter" deadline than previous versions for reducing numbers once the farm sea lice limit is breached. According to the standard, farms have 21 days to reduce sea lice levels, otherwise salmon from the farm is "not eligible to be sold as certified and the certificate shall be cancelled".

However, this report details repeated cases in which this has not been enforced, with farms reporting sea lice levels exceeding ASC's 0.5 average adult sea lice per fish threshold for up to 8 weeks, with no loss of ASC certification. This failure to enforce a standard, set to protect wild salmonids, demonstrates how certification schemes are failing to safeguard our wildlife and the environment they inhabit.

Financial conflicts

All certification schemes examined in this report are reliant on income from licencing fees. For example, 97.6% of ASC's annual income is derived from this source, with the result that ASC is strongly incentivised to maximise this income revenue. Similarly, RSPCA Assured received more than £500,000 from salmon farming companies in 2019, for membership to the scheme. Consequently, these schemes are financially incentivised to increase the number of certified farms, and potentially disincentivised to revoke certification from farms that have failed to meet standards.

Perception gap

These significant shortcomings arguably lead to a perception gap between what consumers believe about the "responsibly produced" certified product they are buying, and the reality.

The report demonstrates that, collectively, these shortcomings reveal the true nature of third-party certification schemes for open-net farmed salmon – a greenwashing tool, exploited by both the producers and retailers, to command a premium price, and to convince consumers that the product is 'sound' when the detail does not stand up to basic scrutiny.



Introduction

Over the last 50 years, open-net salmon farming has expanded exponentially into a large scale intensive industrial operation in Scotland. It is now Scotland's largest food export, worth £578m in 2022.[1]

With this expansion, open-net salmon farming has also grown in complexity with global supply chains and a truly global business model. However, the method by which vast numbers of fish are being farmed, can result in considerable environmental and welfare impacts.

Extensive disease interventions are now necessary to sustain production. Wildlife, including wild Atlantic salmon and sea trout, can be put at risk by the parasites, chemicals and faeces that wash out in huge volumes from farms directly into the surrounding sea lochs. Furthermore, escaped farmed salmon compete and hybridise with wild Atlantic salmon, leading to a loss of genetic quality and population decline. Within the farms themselves the farmed salmon are in constant contact with the surrounding environment, which raises significant and unique biosecurity issues.

Welfare concerns are also growing as disease and mortality rates hit record highs in 2022, with over 16.7m fish deaths on Scottish farms. This comes despite calls from Scottish Ministers to improve mortality rates on farms, which have remained consistently high as the industry continues to try to expand; on average 25% (or 1 in 4 farmed Atlantic salmon) die prematurely during the seawater phase of production.

In the face of these issues, and partly to compensate for the absence of effective government regulation, the use of certification schemes for Scottish farmed salmon has proliferated.[2] These schemes – the Aquaculture Stewardship Council (ASC), Soil Association's Organic standard, and RSPCA Assured – are supposed to fill the regulatory gap by providing guidelines for higher standards of production than those set out by the Scottish Government.

Through use of a recognisable logo, they also incentivise consumers to buy certified salmon at a premium price, and incentivise businesses to follow the guidelines to receive this price premium and/or gain access to markets where certification is required. In theory, this improves the environmental and welfare performance of certified farms.

However, certification can be very misleading. As this report outlines, the purported 'higher standards' are often not enough to significantly improve farm operations, as they still allow considerable damage to the environment, and poor welfare on farms. Indeed, these standards are often no stricter than the baseline regulatory requirements set out in law, statutory permissions, and regulatory licences.

This arguably leads to a perception gap between what consumers believe about the "responsibly produced" product they are buying, and the reality. Additionally, and critically, this report finds extensive evidence that farms remain certified even if they breach the standards. As long as the breaching farm asserts that they have a plan to return operations to within the specified standard that is sufficient to retain certification.

The report outlines case studies of farms certified by all three certification schemes – ASC, RSPCA Assured and Soil Association Organic – which have either breached the requirements of the standard, or else performed in a way that the consumer would not associate with what the scheme supposedly represents (for example, high mortalities on farms certified as RSPCA Assured; chemicals use on farms certified Organic).

In each case, it appears the farms have been permitted to retain their certification, and salmon from these farms continued to be sold to consumers as "responsibly produced".[3]



CERTIFICATION MARK

100% OF
SALMON IS R
SOURCED IN
AND HIGH IN

Serves 2 Per fillet (pan fried)

SATUR
2.8

SUGAR
<0.5g

SALT
0.31g

What is certification?

In recent years, certification schemes have proliferated across almost all consumer industries, from fashion to forestry, paper to fish. They have emerged in the absence of effective national regulation, combined with the increasingly global operations of these industries. Often identified with the use of a logo on a product's marketing and/or packaging, certification schemes are used as a proxy for sustainability, both for consumers and business-to-business relationships.

Through achieving a market premium for certified products, certification schemes could theoretically drive improvements in an industry, that go beyond national regulations, but they seldom do.

On the consumer side, certification schemes are intended to help businesses seeking to demonstrate that their product is produced in line with standards above the regulatory requirements of national governments. In doing so, certification theoretically offers the consumer an assurance that the product being purchased was produced in a more socially and environmentally responsible way than an equivalent uncertified product.

On the business side, both salmon farmers and retail suppliers, such as supermarkets or restaurants, use these schemes as a form of risk management.

Specifically, having third party certification allows the salmon farming industry in Scotland to try to counter the frequent negative publicity it experiences, particularly regarding sea lice, effluent, escapes, disease, and other welfare concerns.

However, there are two issues that arise with this. Firstly, where supermarkets are not setting their own criteria, certification schemes allow those supermarkets to market the product while evading responsibility for determining what exactly constitutes "responsible production". In essence, they can hide behind what the certified industry, in this case the salmon farming industry, considers to be the typical standards that should be associated with the certification.

In this way, certification enables the wholesale and retail trades to delegate some or all of their due diligence to ensure farms are well-managed.

Secondly, where the certification criteria are not properly enforced by the certification body, the assurances made to both the retailer and consumer cannot be guaranteed. There is rarely significant penalty for breaching the standards set within a certification scheme and the loss of certification is an extremely rare event. In other words, consumers can be misled, if the claims made by certification do not match the reality of the practical application of certification schemes. The product consumers are being sold is not, in fact, what they think it to be.



At a glance: what are the main issues with certification schemes?

Financial conflicts

All certification schemes examined in this report are reliant on income from licencing fees. For example, 97.6% of ASC's annual income is derived from this source, with the result that ASC is strongly incentivised to maximise this income revenue. Similarly, RSPCA Assured received more than £500,000 from salmon farming companies in 2019, for membership to the scheme. More certified farms equals more revenue for the certification schemes, which arguably leads to a potential conflict of interest when determining at what level the bar should be set for entry.

Lack of transparency

While ASC is the most transparent of the three certification schemes examined in this report, and publishes audits of its certified farms, there is still a lack of transparency about how it investigates and enforces breaches of the standard. RSPCA Assured and Soil Association Organic are even more opaque, with the latter disclosing only the names of the farms certified via a hard-to-use database, and the former failing to publicly disclose the names of its certified farms at all. This lack of ability to scrutinise demonstrates why certification is not an adequate substitute for regulation, as public bodies such as SEPA and the Fish Health Inspectorate (FHI) are obligated by law to publish details of farm inspections.

Not raising the bar

As shown in Table 1 of this report, in many instances the requirements for certification schemes do not go significantly beyond the baseline regulatory requirements set about in law, statutory permissions and regulatory licences. The report also outlines instances where certification requirements have been weakened, to avoid removing certification from salmon farms (see pages 15 to 16).

Not enforcing requirements

This report outlines numerous case studies, across several different environmental and sustainability indicators, in which certification requirements have been breached. However, there is no evidence that any of the farms involved lost their certification as a result of the breaches. Research by the Canadian NGO Sea Choice in 2018 found that ASC certification allows for numerous deviations from the standard, without the farm losing its certification (examples can be seen in correspondence with ASC in Appendix A).

Perception gap

All these factors arguably create a 'perception gap' between what the consumer is being told about a certified product, and the reality 'on the ground'. This has the potential to mislead consumers, many of whom will be purchasing certified farmed salmon at a price premium, in the belief that the product has been "responsibly produced" to a significantly higher standard than uncertified equivalents.

What are the key certification schemes for Scottish salmon?

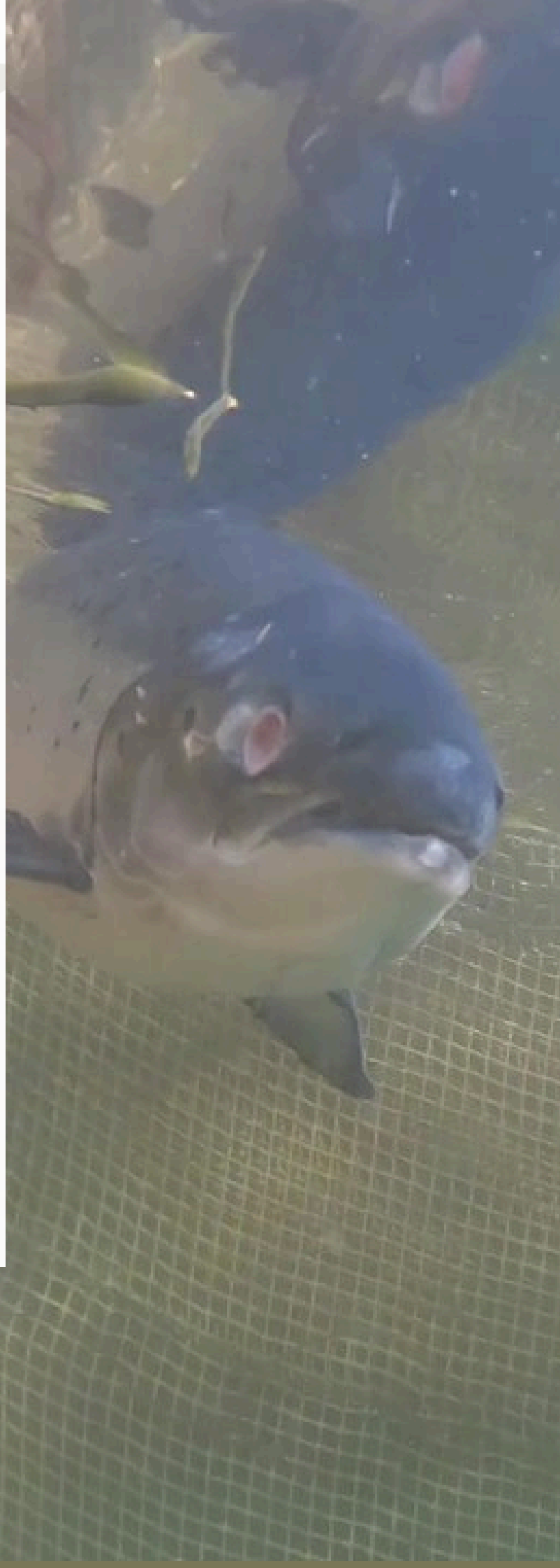
This report covers three certification schemes used in the Scottish salmon farming industry – RSPCA Assured, Aquaculture Stewardship Council (ASC) and the Soil Association's Organic standard.[4]

These three schemes have different main areas of focus: as its name would suggest, RSPCA Assured focuses on fish welfare indicators, while ASC covers a wide range of indicators of "responsible farming". The Soil Association Organic standards focus around biodiversity and ecosystem health, with other areas such as welfare, being covered in less detail than both ASC and RSPCA Assured (see Table 1 on page 24 for an overview of each standard).

The requirements for each scheme focus on key welfare and environmental criteria, and how these compare to both the salmon farming industry's own guidelines (the Code of Good Practice, CoGP) and Scottish Government regulations can be seen in Table 1.

As the table shows, in many cases the certification schemes simply align with the Scottish Government regulation and/or industry CoGP, raising the question of whether there is any added value for the consumer.

Moreover, if these schemes do not set and enforce standards that are significantly stricter than those already required by law, statutory permissions or regulatory licences, it is unclear how they provide additional protection to both the environment and the farmed fish that they certify.



“We set the standard for seafood. If you see the ASC label on pack, you can be sure that your seafood was farmed with care... By choosing ASC labelled seafood, you are making a proven, positive impact on people and the planet.” [5]

The Aquaculture Stewardship Council (ASC) was developed in 2010, in partnership with the World Wildlife Fund (WWF) Netherlands and the Dutch Sustainable Trade Initiative (IDH). The aim of the scheme was “to make aquaculture more sustainable”.^[6] A global certification scheme, it first began certifying farms in Scotland in 2013, amid widespread criticism from environmental NGOs. In response to this criticism, WWF Scotland stated that certified farms would lose accreditation if they failed to meet standards.^[7] However, a global review of the ASC Salmon Standard by Canadian NGO Sea Choice in 2018 found that, despite ASC’s proclamation that certified salmon farms “must meet 100 per cent of the [Standard] requirements” to remain certified, in reality the standard allows for a number of deviations from the requirements, without the farm losing its certification.^[8]

Of the three main certification schemes covering Scottish salmon, ASC has the most expansive remit. According to its website, ASC standards cover legal compliance; impact on the local natural habitat and diversity; water conservation; energy and feed; conservation of wild populations; fish welfare and workers’ rights.^[9]

It claims to certify only those farms which comply with “best practice”; the organisation measures “best practice” as achievable by 15% of farms at the time of the launch of the standard (in theory to incentivise the rest to improve their practices).^[10] As of 2018, ASC certified 27 per cent of the global salmon industry’s production by volume.^[11] By 2021 the number of ASC certified farms had almost doubled, certifying more than half of the world’s salmon aquaculture (52.3%).^[12]

According to its CEO, ASC’s expansion into Scotland over the past few years has been driven by “market demand”.^[13] For example, Sainsbury’s supermarket announced in April 2022 that it would solely source ASC certified Scottish salmon.^[14] When this announcement was first made, just 9 salmon farms in Scotland had ASC certification (5% of 226 active farms). At the time of writing this report, the number was 44, with a further 22 farms in the process of being certified .

As an independent third-party certification body, the ASC is reliant on income from licencing fees. In fact, 97.6% of its €12.36m annual income is derived from this source. As a result, ASC is strongly incentivised to maximise this income revenue; more certified farms create more revenue and in turn a greater brand awareness and market share.





RSPCA Assured

“When you see an RSPCA Assured label on a meat, fish or dairy product, it means that the hatchery, farm, haulier and abattoir were all assessed and confirmed to have met the RSPCA’s higher farm animal welfare standards.”[15]

The RSPCA Assured salmon standard was established, initially as “Freedom Food” in 2002. [16] It is the most widely used certification scheme for Scottish salmon; in 2020, RSPCA Assured certified 158 salmon farms in Scotland, out of 232 active sites. Every single salmon farming company that operates in Scotland has RSPCA Assured certification for at least some of their farms.

RSPCA Assured does not publish a list of its certified farms, and companies advertise their ‘membership’ to the scheme on their websites. There is therefore a danger that this could be interpreted by consumers that RSPCA Assured applies to all farms operated by that company. RSPCA Assured also does not publish details of its audits or internal investigations, and so the scheme is highly opaque for consumers.

A number of UK supermarkets, including Sainsbury’s and Marks & Spencer are reported as exclusively sourcing RSPCA Assured salmon. [17]

As a welfare certification, it’s perhaps surprising to note that RSPCA Assured does not have any stipulations on maximum levels of permitted mortalities on its certified farms. Although the certification includes guidelines around mortality rates on farms, there appears to be no method of sanction or penalties for persistent and/or high mortality rates; the only requirement in relation to mortalities is that incidents be reported within 72 hours, and that the farm has a plan to address the cause of mortality. This means that farms reporting mortality rates of as high as 82.1%, in the case of Bakkafrost Scotland’s Druimyeon Bay in 2021, can retain their certification status.

The scheme has also been criticised for its financial links to the salmon farming industry; an investigation by the UK Sunday Times in 2020 found that the RSPCA had received more than £500,000 from the industry in 2019.[18]



Soil Association Organic

**Organic farmers must
"ensure that their farms
sustain the health of soils,
ecosystems, animals,
people." [19]**

Within the UK, the charity organisation Soil Association is the biggest and most recognisable certifier of organic farmed salmon. Its Organic standard, run as a not-for-profit subsidiary of the Soil Association, uses EU organic regulation (EC 834/2007 & EC 889/2008) as the baseline for many of its requirements.[20] The Soil Association has had a set of organic standards for terrestrial farming since the 1960s, although the Aquaculture Standard, which covers farmed salmon (and other types of finfish farming), was not developed until 2006.

The Soil Association summarises organic farming in the following way: "Organic farmers aim to produce high-quality food, using methods that benefit our whole food system, from people to planet, plant health to animal welfare." [21]

Contrary to this fundamental principle, certified "organic" salmon are reared using a very similar production method as uncertified farms; reared in open-net cages, the waste from the fish and chemicals used to treat them discharge directly into the surrounding environment. It is perhaps then no surprise that the introduction of the Soil Association's scheme in 2006 prompted a former chairman of the Association's Standards Committee to state that "salmon farming in cages has nothing at all to do with organic principles". [22]

As with RSPCA Assured, information relating to Soil Association certified organic farms lacks transparency. For a member of the public to identify a certified farm or product on the Soil Association website, they must first know the names of the specific farms and/or companies. Once found, only the farm name and business address are given; no further information is provided, such as the date certification was granted or any detail of audits or inspections.

A total of 14 seawater salmon farms in Scotland are currently Organic certified – seven Mowi Scotland farms, five farms run by Cooke Aquaculture, and two farms run by Organic Sea Harvest Ltd. A further nine freshwater salmon farms and hatcheries are Soil Association Organic certified in Scotland.



Certification breaches

This section explores case studies where farms have either not complied with the requirements of either ASC, RSPCA Assured or Soil Association Organic, without losing their certification status, or else performed in a way that consumers would not associate with what the certification is supposed to represent.

These case studies are by no means exhaustive, but are intended to demonstrate the widespread nature of certification breaches, across a number of welfare and environmental parameters.

WildFish offered all three certification schemes the opportunity to respond to the examples cited in this report; there was **not a single report of the loss of certification** for the salmon farm(s) in question detailed in their responses.[23]

*For ease of reference, the case studies align with the indicators listed in Table 1 (page 24 – 31).

Fish welfare

Mortality

All three certification bodies reviewed in this report state that high welfare is fundamental to their certification scheme. It is a surprise that none of these standards specify maximum mortality rates, an established health and welfare performance parameter.

In 2022 alone there were 170 reports of monthly mortality rates above 5% on Scottish salmon farms[1]. A loss of 5% of a population on farms holding 100,000 to 2,000,000 farmed salmon can be substantial; Bakkafrost's Eughlam farm for instance, reported a weekly mortality rate of 5.18% in 2021, equating to the loss of over 55,000 1.8kg farmed salmon. Mortality issues can be so severe that more than half of the fish on the farm may die in a single month; in 2022, at least 3 RSPCA Assured farms (Loch Duart's Loch Carnan, Scottish Sea Farms' Nevis B and Kerrera B) reported monthly mortality rates above 50%. Because none of the certification schemes assessed in this report set a maximum accepted mortality limit, it would appear that farms reporting such high mortality rates do not lose their certification. There were no public reports of loss of RSPCA Assured

certification in any of these instances, nor for the 170 reports of high mortality rates where the affected farm held RSPCA Assured certification. [1] By buying farmed salmon certified by ASC, RSPCA Assured or Soil Association Organic, there is therefore no guarantee that the fish has not come from a farm with high disease and mortality incidences.

This is perhaps a reflection of the high mortality rate across the Scottish salmon farming industry generally, which saw 25.6% of fish dying prematurely in 2022 during the seawater phase alone. Far higher than any other livestock industry, there has been little to no improvement in production mortality rates over the last 20 years, despite numerous independent government reports highlighting the need for the industry to urgently address the issue. In fact, in 2022 the Scottish salmon farming industry reported the premature death of over 16.7million farmed salmon, close to double that of 2021 (8.5million).

Scottish Sea Farms ASC and RSPCA Assured

Scottish Sea Farm's Loch Nevis site is composed of three neighbouring farms – A, B and C. In September and October 2022, 323,784 farmed salmon were reported to have died on Nevis B, closely followed by 229,484 farmed salmon on the Nevis A site. Reported weekly mortality rates were as high as 59.8%, with over half a million fish dying during this short period. Upon inspection by the Fish Health Inspectorate (FHI), fish were found to be suffering from a multitude of diseases including complex gill disease, heart and skeletal muscle inflammation (viral) and aeromonas salmonicida (bacterial infection).

Despite this, these sites remained RSPCA Assured. Furthermore, ASC granted these sites ASC certification in January 2023.

Organic Sea Harvest Soil Association

Contrary to the Soil Association's promise to "ensure the highest possible standards of animal welfare", organic certification is also no guarantee of low levels of suffering or mortality. Organic Sea Harvest's Culnacnoc farm suffered a serious mortality event at the end of 2022, losing more than half a million (520,638) farmed salmon over a 6-week period. Suffering from a multitude of conditions (parasitic, viral, and environmental damage) causing severe gill disease, as many as 325,000 fish died in a single week.

Those fish that survived remained certified as organic by the Soil Association.

ASC and lack of veterinary care

ASC's current standard requires "site visits by a designated veterinarian at least four times a year". However, in ASC's most recent annual audit of Mowi's Rum farm (performed on 13 July 2022), it was found that a veterinarian had only visited the site twice in the 14 months since the last inspection (ASC requires 4 visits by a designated veterinarian per year). The two veterinary visits were in June and September 2021, with no further veterinary inspections of the fish at this site for 10 months thereafter.

Concerningly, during this 10-month period the farm reported weekly mortalities as high as 52,589 fish, with fish suffering from a multitude of diseases including cardiomyopathy syndrome (viral), salmon rickettsial syndrome (bacterial) and complex gill disease (parasitic, viral, environmental). Not only did this farm not comply with ASC requirements, but the producer, Mowi, seemingly deemed it unnecessary for a designated veterinarian to visit a farm reporting high disease and mortality incidences. Mowi's Rum farm received no repercussions from ASC for this lack of veterinary care.

Similarly, during Mowi's Sconser Quarry farm initial certification audit, it was found that only a single farm visit had been made by a veterinarian over the previous 12 months. Despite this being raised as a non-compliance at the time of inspection, this site was still awarded ASC certification.

Freedom from suffering: RSPCA Assured and Loch Duart

As a welfare-led certification body, a consumer buying RSPCA Assured farmed salmon could fairly assume it comes with assurance that the farmed salmon had been granted basic welfare. The requirements for the RSPCA Assured certification seem to support this, with statements such as:

H 1.7 Any fish suffering from overt physical damage, or disease symptoms, must be: a) segregated, b) treated/humanely euthanised without delay.

H 2.1 Any seriously sick or injured fish, or fish found not to be recovering, must be humanely killed without delay. Records of this must be made available on request.

However, RSPCA Assured declined to take any action last year when WildFish submitted evidence of cases in which lack of intervention had led to chronic suffering and disease on one of its certified farms. WildFish reported Loch Duart's Sound of Harris farm in 2022, after discovering that a plethora of diseases (Neoparamoeba perurans, Paranucleospora theridion and salmon gill poxvirus, as well as the bacteria Vibrio sp..) had led to chronically high

mortality rates for 18 weeks (above FHI reporting threshold of 1%). In some weeks, as many as 18,000 fish were reported to have died on the farm. Such persistently high disease and mortality rates should have triggered immediate action by Loch Duart, preventing disease, injury and suffering. Instead, the company opted to slowly harvest fish from this site over a 22-week period. This inaction would have contributed to the site reporting a total marine production mortality rate of 50.3%, more than double the industry average. The surviving 49.7% of salmon were harvested over a period of five months.

In correspondence following this incident, RSPCA Assured advised WildFish that it would take no disciplinary action over Loch Duart's decision to allow diseased fish to slowly die over a prolonged period, stating the following: "We have thoroughly reviewed this report which included contacting the farms to verify the information as well as checking our own assessment records and have concluded that there were no breaches of the RSPCA welfare standards....The loss of fish lives is very upsetting but sadly there are a number of environmental factors beyond anyone's control which could lead to mortalities, such as bad weather, jellyfish and plankton blooms and increased water temperatures due to climate change."



Cleaner fish mortality

Used by the industry as a method of parasite control, cleaner fish experience similar disease and mortality issues to farmed salmon. Neither ASC nor Soil Association Organic standards contain minimum requirements for cleaner fish welfare. The RSPCA Assured certification does stipulate some requirements but, again, these are mostly focused on the need to report mortalities incidents, as opposed to implementing a limit on these incidents occurring.

During an investigation by the FHI, Bakkafrost's RSPCA Assured Plocrapol farm was found to have lost 99.71% of its cleanerfish (lumpfish) in one week due to freshwater treatments in October 2022. In correspondence with WildFish in May 2023, RSPCA Assured said that it was investigating the issue – on the basis that it should have been reported to RSPCA Assured. The outcome of this investigation has not yet been communicated to WildFish.

Farms commonly report cleaner fish mortality rates of up to 100% across the production cycle; the few that do survive to the end of a production cycle are typically culled, as per the industry's CoGP recommendations. Because of the widespread use of cleaner fish in the salmon farming industry, plus a lack of reporting on mortalities, the number of annual cleaner fish deaths in Scotland is unknown. However, it's estimated to be in the millions. Whilst lumpfish are exclusively farmed in Scotland, wrasse are commonly wild-caught. Wrasse are a keystone species within the inshore rocky reef and kelp beds they inhabit. A highly territorial species, local populations are highly vulnerable to collapse, over exploitation and localised depletion. The use, and subsequent loss, of these keystone species by the Scottish salmon farming industry is the antithesis of "responsible farming". Despite this, all three certification schemes allow or even support their use.

As with farmed salmon, lumpfish and wrasse can also suffer from sea lice infestation; one species of sea lice, *Caligus elongatus*, can spread between farmed salmon and cleaner fish. In 2020, Organic Sea Harvest's Invertote farm, certified by the Soil Association, reported weekly lumpfish mortality rates as high as 25%. The on-site vet report stated that "mortality [was] most likely [be] attributed to increased stress due to high *Caligus* [lice] burden and secondary skin infections from opportunistic bacteria". This is perhaps no surprise when the site reported as many as 65 *Caligus* sea lice per lumpfish and 45 *Caligus* sea lice per salmon. The site was subsequently treated with deltamethrin, a pesticide highly toxic to marine life. It remains certified Organic by the Soil Association.





Sea lice

ASC: lowering the bar

In September 2022, ASC introduced its updated Salmon Standard, which came into effect in February 2023. This update included a significant watering down of sea lice limits, permitting five times as many sea lice per fish as the previous version of the standard in Scotland.[25,26] As demonstrated in the following case studies, Scottish farms were not able to meet the previous threshold of 0.1 lice per fish during the sensitive period (1st February to 30th June).

The effect of lowering the bar to 0.5 lice was that many farms were not then subject to withdrawal of certification. Despite this, a number of farms are still not complying with the standard requirements – again, seemingly without losing their certification.

Mowi and historic breaches of ASC sea lice requirements

In 2022, half of the weekly average sea lice counts provided by ASC certified farms were above ASC's previous on-farm sea lice threshold of 0.1 adult sea lice per fish during the sensitive period. During this 5-month period, some ASC certified farms, such as Greanem and Loch Duich, both run by Mowi, failed to report any weekly average sea lice counts below the stipulated on-farm level. Mowi's Greanem farm reported an average adult sea lice per fish level of 2.88, with weekly average sea lice counts as high as 8.2 sea lice per fish.

However, these persistent and, at times, 82-fold breaches in ASC's sea lice standard did not result in loss of certification and, to date, have not resulted in any further action by ASC.

Failure to monitor wild salmonid sea lice levels under ASC

ASC's certification standard requires farms within 75km of a wild salmonid migration route or habitat to publicly disclose sea lice monitoring data on wild out-migrating salmon juveniles and coastal sea trout. Farms must then use this data to feedback into maximum on-farm sea lice loads for the following cycle. Theoretically this requirement relates to "all of the salmon-growing areas in the northern hemisphere". Despite this, Scottish ASC certified farms have failed to meet this requirement, resulting in no loss or suspension of ASC certification.

For example, during ASC's most recent annual inspection of Mowi's Rum farm in July 2022, it was found that "there was no evidence that the process to review the sea lice load for the farm incorporated feedback from the monitoring of health and lice burden on wild salmonids sampled in the vicinity of the Isle of Rum".[31] This is understood to be because, at the time of inspection, Mowi had only produced a draft plan for sea lice monitoring on wild salmonids. So, despite not actually carrying out the required wild salmonid sea lice monitoring, a key component of ASC certification for Scottish salmon farms, this farm remained ASC certified.

Mowi and breaches of new ASC sea lice requirements

ASC's most recent standards received widespread criticism from environmental and animal welfare NGOs after the certification body increased its sea lice threshold from 0.1 to 0.5 adult female sea lice per fish.[27,28,29] In response, ASC assured critics that the standards introduced a "far stricter" deadline for reducing numbers once the limit is breached.

As of week 17 in 2023 (w/c 24 April), five ASC certified farms had breached the new 0.5 limit, thereafter failing to "reduce on-farm sea lice levels below the thresholds within 21 days after the last day of sea lice sampling" as per the new standard. Some farms, such as Mowi's Muck, remained above ASC on-farm sea lice threshold (0.5 adult sea lice per fish) for as many as 8 weeks (peak of 4.1 sea lice per fish in week 14). As per ASC's standard, fish from these sites are then "not eligible to be sold as certified and the certificate shall be cancelled." However, ASC confirmed that this was not the case for any of these five farms (Mowi's Lober Rock, Leven, Muck, Torridon and Marulaig Bay), stating that "that circumstances have not arisen which would have resulted in cancellation of a farm certificate".

ASC stated the following justification for its decision to not cancel certification in these cases: "Appendix III-3 in v1.4 of the Salmon Standard enables a veterinary exemption for treatments to be in place where justified and the reason is documented". Put simply, these farms breached on-farm sea lice limits, but did not lose certification due to exemptions built into ASC certification standards.



Over the course of the 2023 Sensitive period (1st February to 30th June), ASC certified Scottish Sea Farm's Lober Rock, reported a weekly average sea lice count below ASC's 0.5 limit on only two occasions (2 of 22 weeks, or 9%). Over the course of the 2023 sensitive period, this farm had an overall average adult female sea lice count of 1.31, nearly three times the ASC limit; this farm reported sea lice levels above the Scottish Government lower limit of 2.0 on 4 occasions, with a peak of 2.73 adult sea lice per fish reported in week 13 (w/c 27th March). This farm remains ASC certified.[30]

Sea lice reporting loopholes:

ASC and RSPCA Assured

In March 2021, The Fish Farming Businesses (Reporting) (Scotland) Order 2020 (the “2020 Order”) set out requirements for all marine fish farming sites to report an average number of adult female sea lice (*Lepeophtheirus salmonis*) counted per fish per fish farm site every week.[32] However, this legislation permits farms to provide “no counts” for a variety of reasons, including “veterinary advice, weather and withdrawal period prior to harvest”, enabling farms to not submit a weekly average sea lice count for an indefinite period of time, without recourse.

Consequently, there are substantial data gaps in on-farm sea lice data, with nearly 1 in 5 of the counts provided by farms in 2022 reported as “no count”. From October 2021 to April 2022, RSPCA Assured Hunda farm, run by Scottish Sea Farms, failed to report weekly sea lice counts for 25 consecutive weeks (one third of the site’s full production cycle). Despite the apparent absence of on-farm sea lice monitoring, and the resultant lack of control or response to any increase in sea lice posing a significant risk to both farm animal welfare and wild salmonid survival, RSPCA Assured concluded that “there were no breaches of the

RSPCA welfare standards. We are also satisfied that the reporting of sea lice numbers to Marine Scotland followed the correct regulations.”

There was no recognition by the welfare-led certification body of the impact that lack of monitoring may have on the farmed salmon that its standard is designed to protect.

ASC’s most recent standard states that “weekly [on-farm sea lice] sampling during the sensitive period” is required of all ASC certified farms. However, as with government legislation, exceptions are permitted under specific conditions, which include “immediately after smolting and stocking, undergoing a disease event and/or being treated (including treatment for sea lice). In case the reason for the exemption is related to fish treatment, the maximum duration for the exemption shall be 2 weeks”.[33] Perhaps unsurprisingly, the ASC standard sets no maximum duration for exemption relating to “withdrawal period prior to harvest”, the most commonly used exemption. An example of how this reporting exemption is exploited can be seen with ASC-certified Loch Leven (run by Mowi Scotland): after reporting weekly adult sea lice counts above the ASC 0.5 threshold for six weeks in January–March 2023, this site then failed to report a weekly average sea lice count for nine consecutive weeks, instead citing “withdrawal period prior to harvest”.





Certification schemes

At a glance

Aquaculture Stewardship Council (ASC)

Whilst ASC certification has the most expansive remit of the three certification schemes, and provides the most transparency about its certified farms, its drive for market share expansion has arguably contributed to its Salmon Standard being significantly weakened in relation to sea lice, a key environmental impact performance indicator. Additionally, the scheme fails to take meaningful action against farms proven to have breached the requirements; even going as far as to certify new farms that have already breached the standard during or immediately prior to the assessment period.



RSPCA Assured

RSPCA Assured certifies every single salmon farming company in Scotland, and supposedly assures “higher farm animal welfare standards”. However, the certification has no limits on fish mortalities, and so continues to certify farms with production cycle mortality rates exceeding 75%. Additionally, the scheme does not publish details of its audits or investigations, and so its certification process and corresponding disciplinary processes are highly opaque.

Soil Association Organic

The Soil Association Organic scheme defines organic farming as “using methods that benefit our whole food system, from people to planet, plant health to animal welfare.” However, its Aquaculture Standard allows use of chemical treatments, including pesticides known to be toxic to marine life. This scheme also encourages the use of cleaner fish, which includes the capture and eventual culling of wild wrasse, a keystone species which are essential to the inshore ecosystems they inhabit. This gap between what the Soil Association Organic standard represents to consumers, and the reality on its certified farms, is highly concerning.



Wildlife interactions

Escapes on ASC certified farms

The ASC Salmon Standard stipulates that certified farms must not exceed 300 escaped fish in the most recent production cycle. There is a caveat that exceptions may be made for “an escape event that is clearly documented as being outside the farm’s control”; this exception may only apply to one incident within a 10-year period. Despite this requirement, this section outlines two farms that experienced major escape incidents last year – one immediately prior to receiving ASC certification, and one soon after. Both farms remain ASC certified.

Mowi’s Colonsay farm experienced a mass escape of 15–20,000 fish on 16 June 2022; one month later it received ASC certification (July 2022). The initial audit report shows that on 13 June 2022, Argyll Fisheries Trust submitted a stakeholder comment to ASC, warning that Colonsay had experienced a mass escape in January 2020 (73,684 fish), and stating: “We would like to ensure that the farm operator can demonstrate that all the factors related to the escape event have been addressed through the ASC standard and that any similar future event can be avoided.” [34]

Three days later the farm experienced the mass escape of 15–20,000 fish. However, the initial audit report, published on 18 July, does not reference the most recent escape – despite

Scottish Government correspondence, obtained via a Freedom of Information request, confirming both that the Fish Health Inspectorate (FHI) had been notified of the event, and that the escape was due to a “passive grading event... adding strain to the already weakened net structure causing it to tear.” Just one month after this incident, the farm received ASC certification.

Another farm run by Mowi, Greanem/Grey Horse Channel Outer, lost 32,463 fish in June 2022, two months after receiving ASC certification in April 2022. Scottish Government correspondence, obtained via an FOI request, confirms the cause of the incident as a hole in the net, stating: “Nothing untoward was noticed at the time [the incident took place] and the damage was identified and repaired quickly. Weather conditions were good.”

When questioned about both escape events, ASC responded as follows: “These incidents were raised as non-conformities by the CAB. A root cause analysis was carried out by both farms which identified the cause of the failure. A corrective action plan was then followed. The non-conformities have now been closed by the CAB and no further action will be taken. More information will be made available once the reports are published.”

Both farms remain ASC certified.

Chemical use of Soil Association Organic certified farms

Deltamethrin on sea farms

Contrary to what consumers might reasonably believe, the Soil Association Organic certification permits the use of chemical treatments, including pesticides that are known to be toxic to marine life. The current standard permits “two allopathic [chemical] treatments ... per year.” An example of this is Organic Sea Harvest’s Invertote farm, where the chemical pesticide, Deltamethrin, was used on two occasions during a 12-month period (30g in August 2020 and 20g in July 2021).[35]

Deltamethrin is a bath treatment used to reduce on-farm sea lice levels. After use, the pesticide is discharged directly into the surrounding waterbody, where it is reported to disperse as far as 39km from the farm, persisting in marine sediment for several months (the chemical has a half-life of 140 days). [36]

Highly and acutely toxic to the European lobster, the pesticide also represents a significant risk to particle ingesting organisms and burrowing invertebrates.[37] Similar to the role of worms in a terrestrial ecosystem, these invertebrates play an invaluable role in the food chain, break down organic matter and fertilize the seabed; in doing so, they significantly enhance ecological biodiversity and health.

The Soil Association permitting use of such a pesticide starkly contrasts with its commitment to “sustain and enhance the health of soil, plant, animal and human as one and indivisible”.

Formalin on freshwater farms

The Soil Association Organic standard also permits use of toxic chemicals during the freshwater phase of production. Formalin, a carcinogenic liquid which is acutely toxic, corrosive and can cause severe skin burns and eye damage, is commonly used to treat fungal infections in farmed salmon. Formalin is administered to the fish as a bath treatment, which typically lasts 15–60 minutes. Once complete, it is then discharged by the farm into the site’s receiving water (freshwater loch or river).

Formalin is an extremely reactive chemical, and commonly causes water oxygen levels to reduce significantly; under certain conditions formalin can also form a precipitate called paraformaldehyde, which is highly toxic to fish. Because of this, the margin between concentrations needed to kill target organisms and those which might harm fish stocks can be small and vary with changing external conditions, such as water quality and flow.

Formaldehyde use was recorded 4 times in 2018, 3 times in 2019, and on at least one occasion in 2020 and 2021 at Mowi’s Loch Arkaig freshwater farm, which is certified by the Soil Association as organic.[38,39] Similarly, a report by the Fish Health Inspectorate (FHI) in 2022 found that Cooke Aquaculture Scotland used formalin (Aquacen) on its Soil Association certified organic freshwater hatchery, Cairndow Hatchery, in 2021.[40]



Formaldehyde containers on Mowi’s Loch Arkaig farm.

ASC – no limits on chemical use

Despite ASC's mission statement to "promote the best environmental and social aquaculture performance towards environmental sustainability and social responsibility", the ASC certification scheme sets no limit on the frequency or volume of pesticides and chemicals used on Scottish salmon farms beyond those set out in law, statutory permissions and regulatory licences.

Mowi's ASC certified Macleans Nose farm used six different types of medicinal and chemical treatments over its most recent full production cycle. This included the chemical pesticides Deltamethrin, Emamectin benzoate, azamethiphos and hydrogen peroxide. All these chemicals have been shown to have negative impacts on marine life, with acute toxicity in some cases.

Not only can these chemicals be acutely toxic to marine life, such as the European lobster, shrimp and burrowing invertebrates, but their impacts can also be long lasting and cumulative. An investigation by the Scottish Environment Protection Agency (SEPA) in 2017 found that emamectin benzoate does not break down (degrade) in sediment, suggesting it may persist in the environment indefinitely under certain conditions.[41] Mowi's Macleans Nose farm used all four of these chemical pesticides, as well as two types of antibiotics (oxytetracycline and florfenicol).

It remains certified by ASC.



ASC and 'sustainable feed'

A case study of certification loopholes

One of the most contentious issues with the long-term sustainability of salmon farming is the use of wild-caught fish to feed farmed salmon.

The ASC Salmon Standard has a requirement for all marine-derived feed ingredients used by an ASC-certified farm to be 100% certified by a relevant body (such as Marine Stewardship Council, MSC), within five years of the farm's original certification.

However, in 2016, ASC published an 'Interim Feed Standard', which stipulated that it was removing the timeframe on this requirement, due to "insufficient availability of fish meal and fish oil that meets the requirements as set in the ASC Farm Standards" creating "compliance challenges for ASC-certified farms."^[a]

In other words – since ASC's own definition of what constitutes 'sustainable feed' was not achievable by its certified farms, ASC weakened its requirements. In doing so, it avoided the need to de-certify farms.

In January 2023, ASC released its Feed Standard, and stated that all ASC-certified salmon farms must source 100% of feed from ASC-certified feed producers by January 2025.^[b,c]

The Feed Standard states that 100% of marine-derived feed ingredients used by a certified feed producer must be MSC certified – but lacks any concrete timeline for this, instead stating that this time period "will be determined through the Standard revision process and on the basis of careful considerations of volume demand and availability."



Bags of fish feed containing fish meal and fish oil, at Mallaig Harbour, northwest Scotland, April 2023

The ASC Salmon Standard also requires a FishSource Score of A or B1 for the "fishery(ies) from which all marine raw material is derived."^[d] However, the 'interim feed standard' from 2016 states that, due to the downgrading of the Peruvian northern-central Anchoveta stock, ASC-certified farms are permitted to source from fisheries categorized as A-B2. This is another example of ASC's requirements being influenced by what the salmon farming industry can already achieve, as opposed to being driven by science to determine what is truly sustainable.

^[a] ASC. (2016). Proposed Interim Amendment of ASC Farm Standards. https://www.asc-aqua.org/wp-content/uploads/2017/07/ASC-Feed-Interim-solution-Marine-Ingredients_FINAL_20161213.pdf

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^[c] The Fish Site. (2023, January 16). ASC-certified farms given 24 months to meet new feed standards. <https://thefishsite.com/articles/asc-certified-farms-given-24-months-to-meet-new-feed-standards>

^[d] FishSource, run by US organisation Sustainable Fisheries Partnership, is an online resource that claims to "[summarize] publicly available scientific and technical information and presents it in an easily interpretable form... to provide major seafood buyers with up-to-date, impartial, and actionable information on the sustainability of fisheries and the improvements they need to make to become more sustainable."

Conclusion

Certification schemes have emerged and proliferated as a means of trying to assure consumers that the products they are buying have been produced in an environmentally- and welfare-friendly way. However, as this report has shown, in reality this is not the case with farmed salmon. As the salmon farming industry has grown in Scotland, so too has the complexity of its operations, with negative consequences for the environment, fish welfare and the overall sustainability of the industry.

Collectively, the three certification schemes reviewed in this report – RSPCA Assured, ASC and Soil Association Organic – cover almost all the farmed salmon being produced in Scotland. However, as the report outlines, the purported ‘higher standards’ set by certification schemes are not rigorous enough to significantly improve farm operations across a number of key environmental and welfare performance indicators.

In addition to this, the enforcement attached to certification schemes is often not robust, as shown via numerous case studies highlighting issues across veterinary care, sea lice, escapes and chemical use.

Both these factors (higher standards not being applied and the lack of robust enforcement) risk misleading consumers about the product they are buying.

If certification is to have a serious role in improving any industry, the requirements must be truly ambitious, setting a high bar to reward the best performing companies, with immediate withdrawal of certification for farms breaching the standards.

Unfortunately, this is far from the reality of how the current certification schemes are operating in relation to Scottish farmed salmon, with the emphasis seemingly on gaining market share, rather than driving meaningful improvement on environmental, welfare and sustainability issues.

Until ASC, RSPCA Assured and Soil Association Organic improve their standards to a meaningful level, and strictly enforce those standards, certification of farmed salmon in Scotland will continue to be little more than a greenwashing tool.



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References

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Appendix

ASC Correspondence

WildFish enquiry email, 17.05.23

I'm writing to you from WildFish (<https://wildfish.org/>) with an information request in relation to a number of recent breaches of the ASC requirement. This information may be used in an upcoming report that will be published by WildFish.

The WildFish team has come across a number of instances of non-compliance with the ASC Salmon Standard. We would be very appreciative if you could take a look at the following list, and outline in response what action ASC has taken (or plans to take) in each case.

Sea lice

3.1.9 In areas with wild salmonids, maintenance of on farm sea lice levels below the thresholds during the sensitive period, as outlined in Appendix III-3 45: 0.5 adult female sea lice from 1st February to 30th June.

3.1.11 In areas with wild salmonids, reduction of the onfarm sea lice levels below the thresholds during the sensitive period within 21 days after the last day of sea lice sampling. If the reduction within this time window is not achieved, the product is not eligible to be sold as certified and the certificate shall be cancelled.

The following four sites have already breached this requirement:

- Mowi Lober Rock – 0.85 week 6 (6th Feb 2023) – subsequent weekly sea lice levels did not fall back to below ASC's requirement of 0.5 adult female sea lice (AFSL) per fish until week 11 (13/03/23) – 5 weeks.
- Mowi Muck – 0.8 week 10 (06.03.23) – subsequent weekly sea lice levels have failed to fall back to below ASC's 0.5 average weekly AFSL per fish in any subsequent counts (SEPA weekly sea lice count data UTD to week 17). Site has been actively harvesting during this time. Highs of 4.1 AFSL per fish (week 14).
- Mowi Torridon – 1.67 week 6 – subsequent weekly sea lice levels did not fall back to below ASC's requirement of 0.5 adult female sea lice (AFSL) per fish until week 11 (13/03/23) – 6 weeks.
- Marulaig Bay – 0.5 week 14 – subsequent weekly sea lice levels have failed to fall back to below ASC's 0.5 average weekly AFSL per fish in any subsequent counts (SEPA weekly sea lice count data UTD to week 17)

Could you please confirm whether these farms have had their certificates cancelled, as per the Standard outline?

ASC v1.3: 3.1.7 In areas of wild salmonids, maximum on-farm lice levels during sensitive periods for wild fish. 47 See detailed requirements in Appendix II, subsection 2 0.1 mature female lice per farmed fish.

Some examples of persistent breaches in 2022, when ASC v1.3 was active as follows:

- Camas Glas (ASC certified) – 90% (19 out of 21) counts given (excl 1 "No count given in sensitive period) were above 0.5 AFSL per fish. Peaks of 4.19 and average 2.02 AFSL per fish during sensitive period. 95% (20 out of 21) of the counts given during the 2022 Sensitive period were above the 0.1 Average AFSL per fish as stipulated in v1.3 ASC Standards (active at the time).
- Loch Duich (ASC) – 86% of counts above 0.5 during Sensitive period 2022. (19 of 22). 100% (22 out of 22) of the counts given during the 2022 Sensitive period were above the 0.1 Average AFSL per fish as stipulated in v1.3 ASC Standards (active at the time).
- Greanem (Grey Horse Channel Outer) – ASC – 93% of counts (13 of 14) were above 0.5 AFSL per fish, with peaks of 8.2 sea lice per fish. Average 2.88. 100% (14 of 14) of the counts given during the 2022 Sensitive period were above the 0.1 Average AFSL per fish as stipulated in v1.3 ASC Standards (active at the time).

Could you please detail in each instance what action was taken in response to these non-compliances?

Mortality

Scottish Sea Farms Nevis A

Nevis A reported weekly mortality rates of up to 26.6% (83,900 fish) in Q4 of 2022. All mortality attributed to gill disease. Loss of 229,484 fish over a 7-week period. A Fish Health Inspectorate inspection at this site found the following:

- 15 – 35 sea lice per fish recorded by the Fish Health Inspectorate officer (Site had reported “No count” to Marine Scotland in the same week, citing “Withdrawal period prior to harvesting”).

Could you please detail what action was taken in response to this incident and related unreported sea lice numbers?

Escapes

3.4.1 Maximum number of escapees in the most recent production cycle: 300*. * A rare exception to this standard may be made for an escape event that is clearly documented as being outside the farm’s control. Only one such exceptional episode is allowed in a 10-year period for the purposes of this standard. The 10-year period starts at the beginning of the production cycle for which the farm is applying for certification. The farmer must demonstrate that there was no reasonable way to predict the events that caused the episode. See auditing guidance for additional details.

Major non-conformities were raised against Colonsay and Greanham/Grey Horse farms (both run by Mowi) in relation to mass escapes. Could you please provide an update on these cases?

In particular in relation to Greanem, the loss of 32,463 fish was not attributable to exceptional circumstances ‘clearly documented as being outside the farm’s control’; the company’s report documented ‘nothing untoward’ in relation to the escape, with good weather conditions.

Benthic Monitoring

5.2.5 The farm shall publicly report (via Appendix VI) the: 1. Weighted Number of Medicinal Treatments (see Appendix VII) for each production cycle 2. The parasiticide load for each agent over the production cycle 3. The benthic parasiticide residue levels

Loch Leven – cycle complete in April 2021 – Mowi’s ASC Dashboard public reports did not provide Benthic parasiticide residue levels following ‘final treatment of production cycle’ as required and stated in the report. End of production report ([April 2021 report](#)) continued to report “Samples to be collected following final treatment of cycle”

Marulaig Bay – cycle complete in July 2021 – Mowi’s ASC Dashboard public reports did not provide Benthic parasiticide residue levels following ‘final treatment of production cycle’ as required and stated in the report. End of production report ([July 2021 report](#)) continued to report “Samples to be collected following final treatment of cycle”

Could you please detail what action was taken by ASC in response to this?

Should the Benthic parasitic residue levels for the above farms been published for public use, please could you kindly provide a link to these documents.

Farm visits from veterinarians

5.1.2 Site visits by a designated veterinarian at least four times a year, and by a fish health manager⁹⁴ at least once a month

Mowi Rum – ASC Surveillance Audit report conducted on 13th July 2022. No vet visits to farm since 7th September 2021. In the following week (w/c 13th Sept) site reported a weekly mortality rate of 6.22% (52,598 fish). During the 10-month period that the site was not visited by a vet, 209,082 fish were reported to died. The following diseases/conditions were present on the site during this 10-month period:

- Cardiomyopathy Syndrome (CMS)- viral
- Salmon Rickettsial Syndrome -bacterial infection
- Complex gill disease including amoebic gill disease
- Mass mortality event following micro-jellyfish bloom

Could you please detail what action was taken by ASC in response to this?

ASC response email, 05.06.23

Sea lice

3.1.9 In areas with wild salmonids, maintenance of on farm sea lice levels below the thresholds during the sensitive period, as outlined in Appendix III-3 45: 0.5 adult female sea lice from 1st February to 30th June.

3.1.11 In areas with wild salmonids, reduction of the onfarm sea lice levels below the thresholds during the sensitive period within 21 days after the last day of sea lice sampling. If the reduction within this time window is not achieved, the product is not eligible to be sold as certified and the certificate shall be cancelled.

The following four sites have already breached this requirement:

- Mowi Lober Rock – 0.85 week 6 (6th Feb 2023) – subsequent weekly sea lice levels did not fall back to below ASC's requirement of 0.5 adult female sea lice (AFSL) per fish until week 11 (13/03/23) – 5 weeks.
- Mowi Muck – 0.8 week 10 (06.03.23) – subsequent weekly sea lice levels have failed to fall back to below ASC's 0.5 average weekly AFSL per fish in any subsequent counts (SEPA weekly sea lice count data UTD to week 17). Site has been actively harvesting during this time. Highs of 4.1 AFSL per fish (week 14).
- Mowi Torridon – 1.67 week 6 – subsequent weekly sea lice levels did not fall back to below ASC's requirement of 0.5 adult female sea lice (AFSL) per fish until week 11 (13/03/23) – 6 weeks.
- Marulaig Bay – 0.5 week 14 – subsequent weekly sea lice levels have failed to fall back to below ASC's 0.5 average weekly AFSL per fish in any subsequent counts (SEPA weekly sea lice count data UTD to week 17)

Could you please confirm whether these farms have had their certificates cancelled, as per the Standard outline?

The sites you have queried have either not yet received a surveillance audit or have not had a surveillance audit report published yet. ASC has contacted the certificate holders and the respective CAB (Conformity Assessment Body = certifier) and confirmed that circumstances have not arisen which would have resulted in cancellation of a farm certificate. Appendix III-3 in v1.4 of the Salmon Standard enables a veterinary exemption for treatments to be in place where justified and the reason is documented. Further information will be available on publication of surveillance audit reports.

ASC v1.3: 3.1.7 In areas of wild salmonids, maximum on-farm lice levels during sensitive periods for wild fish. 47 See detailed requirements in Appendix II, subsection 2 0.1 mature female lice per farmed fish.

Some examples of persistent breaches in 2022, when ASC v1.3 was active as follows:

- Camas Glas (ASC certified) – 90% (19 out of 21) counts given (excl 1 "No count given in sensitive period) were above 0.5 AFSL per fish. Peaks of 4.19 and average 2.02 AFSL per fish during sensitive period. 95% (20 out of 21) of the counts given during the 2022 Sensitive period were above the 0.1 Average AFSL per fish as stipulated in v1.3 ASC Standards (active at the time).
- Loch Duich (ASC) – 86% of counts above 0.5 during Sensitive period 2022. (19 of 22).100% (22 out of 22) of the counts given during the 2022 Sensitive period were above the 0.1 Average AFSL per fish as stipulated in v1.3 ASC Standards (active at the time).
- Greanem (Grey Horse Channel Outer) – ASC – 93% of counts (13 of 14) were above 0.5 AFSL per fish, with peaks of 8.2 sea lice per fish. Average 2.88. 100% (14 of 14) of the counts given during the 2022 Sensitive period were above the 0.1 Average AFSL per fish as stipulated in v1.3 ASC Standards (active at the time).

Could you please detail in each instance what action was taken in response to these non-compliances?

At the time of the 2022 sensitive period, there was no requirement, under v1.3 of the ASC Salmon Standard, for farms to report these non-conformities to their CAB (Conformity Assessment Body = certifier). However, these incidents would have been picked up at the next farm audit and a decision on conformity or non-conformity would be made by the CAB. In the event of a non-conformity, a root cause analysis and a corrective action plan would be required from the farm.

These audit reports are currently pending and will be made publicly available.

Version 1.4 of the ASC Salmon Standard now requires certificate holders to report threshold exceedances to their CAB.

Mortality

Scottish Sea Farms Nevis A

Nevis A reported weekly mortality rates of up to 26.6% (83,900 fish) in Q4 of 2022. All mortality attributed to gill disease. Loss of 229,484 fish over a 7-week period. A Fish Health Inspectorate inspection at this site found the following:

- 15 – 35 sea lice per fish recorded by the Fish Health Inspectorate officer (Site had reported "No count" to Marine Scotland in the same week, citing "Withdrawal period prior to harvesting").

Could you please detail what action was taken in response to this incident and related unreported sea lice numbers?

The ASC Salmon Standard has requirements related to viral disease related mortality and unexplained mortality. Farms must also provide their CAB with evidence of an effective fish health management plan and a farm-specific mortality reduction plan. This incident does not represent a non-conformity against any requirements in the ASC Salmon Standard or against any indicators linked to this type of mortality.

In future, the ASC Farm Certification and Accreditation Requirements (CAR) 2.3, becoming effective on July 14 2023, will help to ensure that certificate holders inform their CAB of massive mortality events promptly as a contractual obligation:

7.5.13. That the Client has the responsibility to inform the CAB within fourteen (14) days of the occurrence of any of the following situation(s): ... d) Escapes or massive mortality events that affect the compliance against the applicable ASC standard.

In relation to the sea lice query, as stated previously, there was no requirement, under v1.3 of the ASC Salmon Standard, for farms to report on sea lice numbers to their CAB. Any relevant incidents would be identified at the next farm audit and a decision on conformity or non-conformity would be made by the CAB. In the event of a non-conformity, a root cause analysis and a corrective action plan would be required from the farm.

Escapes

3.4.1 Maximum number of escapees in the most recent production cycle: 300*. * A rare exception to this standard may be made for an escape event that is clearly documented as being outside the farm's control. Only one such exceptional episode is allowed in a 10-year period for the purposes of this standard. The 10-year period starts at the beginning of the production cycle for which the farm is applying for certification. The farmer must demonstrate that there was no reasonable way to predict the events that caused the episode. See auditing guidance for additional details.

Major non-conformities were raised against Colonsay and Greanham/Grey Horse farms (both run by Mowi) in relation to mass escapes. Could you please provide an update on these cases?

In particular in relation to Greanem, the loss of 32,463 fish was not attributable to exceptional circumstances 'clearly documented as being outside the farm's control'; the company's report documented 'nothing untoward' in relation to the escape, with good weather conditions.

These incidents were raised as non-conformities by the CAB. A root cause analysis was carried out by both farms which identified the cause of the failure. A corrective action plan was then followed. The non-conformities have now been closed by the CAB and no further action will be taken. More information will be made available once the reports are published.

As referenced in the previous answer, the ASC CAR 2.3 requirements will also help to ensure that certificate holders inform their CAB of escapes promptly as a contractual obligation, as per clause 7.5.13.

Benthic Monitoring

5.2.5 The farm shall publicly report (via Appendix VI) the: 1. Weighted Number of Medicinal Treatments (see Appendix VII) for each production cycle 2. The parasiticide load for each agent over the production cycle 3. The benthic parasiticide residue levels

Loch Leven – cycle complete in April 2021 – Mowi's ASC Dashboard public reports did not provide Benthic parasiticide residue levels following 'final treatment of production cycle' as required and stated in the report. End of production report ([April 2021 report](#)) continued to report "Samples to be collected following final treatment of cycle"

Marulaig Bay – cycle complete in July 2021 – Mowi's ASC Dashboard public reports did not provide Benthic parasiticide residue levels following 'final treatment of production cycle' as required and stated in the report. End of production report ([July 2021 report](#)) continued to report "Samples to be collected following final treatment of cycle"

Could you please detail what action was taken by ASC in response to this?

Should the Benthic parasitic residue levels for the above farms been published for public use, please could you kindly provide a link to these documents.

Indicator 5.2.10, which defines the requirement for sampling for benthic parasiticide residues, is not a requirement for farms at present until guidance on sampling and analysis methodology has been developed and published. As a result, there is no associated reporting requirement (in 5.2.5) and, as such, no information on the benthic parasitic residue levels for these farms has been reported or is held by ASC.

Farm visits from veterinarians

5.1.2 Site visits by a designated veterinarian at least four times a year, and by a fish health manager⁹⁴ at least once a month

Mowi Rum – ASC Surveillance Audit report conducted on 13th July 2022. No vet visits to farm since 7th September 2021. In the following week (w/c 13th Sept) site reported a weekly mortality rate of 6.22% (52,598 fish). During the 10-month period that the site was not visited by a vet, 209,082 fish were reported to died. The following diseases/conditions were present on the site during this 10-month period:

- *Cardiomyopathy Syndrome (CMS)- viral*
- *Salmon Rickettsial Syndrome -bacterial infection*
- *Complex gill disease including amoebic gill disease*
- *Mass mortality event following micro-jellyfish bloom*

Could you please detail what action was taken by ASC in response to this?

There should have been two more veterinarian visits to the farm over this time period. A minor non-conformity was consequently raised by the CAB against this breach. A root cause analysis was carried out by the farm, a corrective action plan was provided and the non-conformity was then closed by the CAB. The next report will be publicly available after the farm's next surveillance audit in Summer 2023.

In the interest of being able to include corrective action taken by ASC in our report, please can I ask that you respond to this email no later than Wednesday 31 May 2023.

Finally, we would make you aware that if there are any reports of non-compliance of ASC-certified farms, ASC encourages stakeholders to contact the respective CABs for investigation, assessment and correction, in the first instance, since any certification decision of ASC farms is taken by the CAB and not ASC in order to ensure impartiality and independency. ASC and ASI (the accreditation body) can be included in the communication to monitor the response of the CAB to stakeholder concerns as part of the certification maintenance process.

Appendix

RSPCA Assured Correspondence

WildFish enquiry email, 17.05.23

I'm writing to you from WildFish (<https://wildfish.org/>) with an information request in relation to a number of welfare-related incidents on RSPCA Assured farms. This information may be used in an upcoming report that will be published by WildFish.

We would be very appreciative if you could take a look at the following list, and outline in response what action RSPCA Assured has taken (or plans to take) in each case.

Organic Sea Harvest Culnacnoc

Mass mortality – report of 520,638 fish over a 6-week period (Nov-Dec 2022). Weekly mortality rates reached as high as 75.52% (325,551 fish). Diseases diagnosed on site/noted causes: Severe Amoebic gill disease causing severe gill pathology (*Paranucleospora theridion* and *Neoparamoeba perurans*), salmon gill poxvirus, micro-jelly fish bloom in September 2022.

Could you please detail what action was taken by yourselves and the producer in response to this, given the mortality rates reported far exceed the RSPCA Assure reporting threshold of 1% weekly mortality (>750g) stipulated in H 4.9 of the RSPCA welfare standards for Farmed Atlantic salmon.

Scottish Sea Farms Nevis A, B, C

Nevis A reported weekly mortality rates of up to 26.6% (83,900 fish) in Q4 of 2022. All mortality attributed to gill disease. Loss of 229,484 fish over a 7-week period. A Fish Health Inspectorate inspection at this site found the following:

- 15 – 35 sea lice per fish recorded by the Fish Health Inspectorate officer (Site had reported “No count” to Marine Scotland in the same week, citing ‘Withdrawal period prior to harvesting’). Following conditions: Amoebic gill disease (*Paranucleospora theridion*, *Neoparamoeba perurans*), salmon gill pox virus (viral gill pathology), *aeromonas salmonicida* (bacterial infection), Heart and Skeletal Muscle Inflammation (viral).
- Images ([report pg40-48](#)): anorexic fish, external lesions (secondary to sea lice, may be *aeromonas* (bacterial) involvement), high sea lice loads, blood in abdomen.

Nevis B reported a weekly mortality rate of 59.8% in week 43 of 2022 (reporting threshold for RSPCA Assured is 1% weekly mortality). Mortality rate on this farm across the month of October was 74%. Over a two-month period (September to October) a total of 323,784 mortalities were reported.

Could you please detail what action was taken by yourselves and the producer in response to both these incidences, given the reported mortality rates reported far exceed the RSPCA Assure reporting threshold of 1% weekly mortality (>750g) stipulated in H 4.9 of the RSPCA welfare standards for Farmed Atlantic salmon.

Chronic high mortality rate

Bakkafrost's East Tarbert Bay reported monthly mortality rates above 10% from 6 consecutive months in Q3 and Q4 of 2022. Mortality rates and reported causes as follows:

Month (2022)	Monthly mortality rate (%)	Reported cause (Salmon Scotland)
July	10.2	Environmental / Sea lice management
August	11.7	Environmental / Handling
September	18.4	Gill Health / Environment
October	38.5	Gill Health/ Viral / Bacterial
November	44.4	Gill Health / Bacterial / Viral
December	17.5	Gill Health / Viral / Bacterial disease

Please provide a comment as to whether such chronic high levels of mortality conform to the RSPCA Assured fundamental principle that “Fish need to be protected from pain, injury and disease, through good management and husbandry practice, and by rapid detection and treatment of disease”

High monthly mortality rates

Four RSPCA Assured farms in 2022 reported monthly mortality rates above 50%:

- Bakkafrost Scadabay (June 2022)
- Loch Duart Loch Carnan (September 2022)
- Scottish Sea Farms Nevis B (October 2022)
- Scottish Sea Farms Kerrera B (November)

Please could you confirm that these sites were RSPCA Assured at the time of the high mortality incidences above.

Please could you detail what actions, if any, were carried out by yourselves to ensure welfare standards stipulated in RSPCA welfare standards for Farmed Atlantic salmon were being met.

Additionally, we would like to follow up on your investigation of four Scottish Sea Farms sites in July 2022 (Sound of Mull – Fiunary, Fishnish B, Scallastle Bay; Loch Creran – Creran A) following a complaint made by Scamon Scotland. Would it be possible to share details of how this investigation was carried out?

100% Cleanerfish mortality on farms (during production cycle) – Bakkafrost Plocrapol

- Fish Health Inspectorate (FHI) report (Oct 2022 Case 2022-0446) found that Plocrapol experience cleaner fish (lumpfish) weekly mortality rates of 99.71% due to freshwater treatments in 1 week.
- Loss of 14,394 lumpfish on site reported during production cycle, with no remaining lumpfish on site reported by the FHI at the time of inspection.

Please confirm that this site adhered to the following requirement stipulated in RSPCA welfare standards for Farmed Atlantic salmon: *“CF 1.2 Exceptional mortality, or compromises to cleanerfish welfare arising from any single event, along with the causes, must be recorded and reported to RSPCA Assured within 72 hours.”*

Please also confirm whether this site adhered to the following recommendations stipulated in RSPCA welfare standards for Farmed Atlantic salmon: *“Where possible, cleanerfish should be removed from the crowd or prevented from participating in the crowd prior to any salmon operation, such as thermolicing, hydrolicing, bath treatments or wellboat treatments AND Cleanerfish should only be given freshwater treatments after being: welfare risk assessed against such a treatment, in terms of potential for injury etc. The welfare outcomes of freshwater treatments should be recorded in the VHWP.”*

Please also provide supporting information and justification for not removing cleanerfish from pens prior to treatment and where the welfare risk of giving cleanerfish freshwater treatments is justified.

Appendix

RSPCA Assured response email, 07.06.23

Thank you for your email and apologies for the delay in coming back to you.

Firstly, let me begin by saying that the loss of fish lives is deeply upsetting and not something anyone wants to see happen.

We've looked into the points you have raised in your email which I will address below.

In regards to high mortality rates at Organic Sea Harvest Culnacnoc, we believe this was due to an unprecedented micro jellyfish bloom. This contributed to severe gill disease which sadly resulted in high levels of mortality. However, we have requested further information from this site so that we can look into this thoroughly.

Your email also mentions mortality rates on Scottish Sea Farms Loch Nevis, A, B and C. We understand that this incident was due to environmental factors which were beyond the farm's control. It was swiftly reported to us by Scottish Sea Farms at the time, with a comprehensive explanation of what happened and how they tried to mitigate against this incident.

The three sites all saw an unprecedented bloom of naturally occurring micro jellyfish which resulted in poor gill health and the subsequent death of a large number of fish. Under the RSPCA welfare standards, all farms are required to have a good bio-security policy to reduce infectious disease risk but it is also important to note that the marine environment is uniquely dynamic. And it is sadly a reality of salmon farming that from time to time there may be external environmental factors which can change rapidly beyond anyone's control, such as changes in weather, climate patterns and tidal conditions, which can result in fish mortalities.

We are satisfied that these three farms complied with the RSPCA's welfare standards and are working hard to mitigate and reduce the impact of any future occurrences.

In relation to Bakkafrost East Tarbert Bay, these concerns were raised by yourselves previously and we have responded fully to these issues. As outlined before, we had very recently carried out inspections at the two sites on the Isle of Gigha and were satisfied that the RSPCA's welfare standards were being maintained. Both farms also followed the correct process in reporting these mortalities to us as required in our welfare standards.

Unfortunately, it is a sad reality of any farming system that from time to time there will also be disease and parasite outbreaks. This is particularly the case in the marine environment, where disease can be ubiquitous but in RSPCA Assured's experience these instances are uncommon.

I can confirm that Bakkafrost Scadabay is not an RSPCA Assured member. The other farms listed, Loch Carnan and Kerrera B are members and we are currently investigating the issues raised.

Finally, with regards to Bakkafrost Plocrapol, reporting exceptional Cleanerfish mortalities is required under the standards and we are now fully looking into this matter.

Thank you for bringing these incidents to our attention and for continuing our open and transparent lines of communication. We take all reports of animal welfare problems on RSPCA Assured farms extremely seriously, which is why the RSPCA welfare standards require that any incidences of mass fish mortalities are reported to the scheme within 72 hours. This means we can investigate swiftly and work with producers to look at ways to help prevent similar incidents occurring in future.

Improving the welfare of all farmed animals, including salmon, is our absolute priority and the reason RSPCA Assured exists. This is why we continue to work with the salmon farming industry and have helped make significant improvements to the welfare of farmed fish.

Appendix

Soil Association Correspondence

WildFish enquiry email, 18.05.23

I'm writing to you from WildFish (<https://wildfish.org/>) with an information request in relation to a number of welfare-related and environmental concerns on Soil Association Organic certified farms. This information may be used in an upcoming report that will be published by WildFish.

I would be very appreciative if you could take a look at the following cases and supporting questions:

Use of pesticides and chemicals toxic to marine life

Over the period of 2020-22 farms certified by yourselves as Organic used the following chemical treatments (over 12months of a single production cycle) (Source - SEPA <https://informatics.sepa.org.uk/MarineFishFarm/>):

- Org Sea Harvest Culnacnoc: 200g Deltamethrin 2021
- Mowi Invasion Bay: 82.81g Deltamethrin, 36651L Hydrogen peroxide 2021
- Mowi Invasion Bay: 87.5g Deltamethrin AND 3400g Azamethiphos same month 2020
- Organic Sea Harvest Invertote: 60g Dethamethrin and 20g deltamethrin same cycle 2021

Please could you provide the Soil Association's justification for the allowed use of allopathic drug/chemical treatments, including deltamethrin, azamethiphos and hydrogen peroxide, on Organic farms given the known toxic and negative impacts these chemicals have on marine wildlife such as crustaceans and the wider benthic community.

Impact on wildlife

In 2021, on behalf of Scottish Ministers Marine Scotland Directorate published a review of scientific literature related to the impact of sea lice emanating from salmon farms on our wild Atlantic salmon and sea trout "Impacts of lice from fish farms on wild Scottish sea trout and salmon: summary of science" (Available at <https://www.gov.scot/publications/summary-of-information-relating-to-impacts-of-salmon-lice-from-fish-farms-on-wild-scottish-sea-trout-and-salmon/>). The Conclusion from this report was that "The body of scientific information indicates that there is a risk that sea lice from aquaculture facilities negatively affect populations of salmon and sea trout on the west coast of Scotland. Risks can be mitigated by reducing sea lice on farms or locating farms in areas that reduce interactions with wild salmonids." and "In Scotland, salmon farms have been shown to be a much more important contributor than wild fish to the total numbers of sea lice in the Scottish coastal zone".

Given the Soil Association's commitment to "support a transition to nature-friendly farming" please could you provide reasoning for your current Soil Association's Standard for Aquaculture not having any sea lice per fish limit requirements.

As per the Soil Associations definition of Organic "A certified example of an agroecological system. Governed by legal standards, and regularly and independently inspected, organic systems deliver produce in ways that benefit people, animals, wildlife, society and the natural world."

Please could you provide justification, including examples, as to how Soil Association Organic certified Scottish salmon farms benefit wildlife.

Appendix

Soil Association response, 01.06.23

The use of allopathic chemicals can only be used to conserve the welfare of animals where alternative treatments are not available or not effective. In instances where allopathic treatments have been used, objective evidence must be provided to demonstrate the need for their intervention.

Sea lice limits are not part of the core EU organic regulations, there are already limits in place through the code of good practice and current regulations. Where animals contract a disease, or illness it is important that remedial action (treatment) is carried out quickly and effectively. Measures must be put in place to keep animals pest and disease free, through a robust veterinary health and welfare plan. Sea lice infection records are reviewed during onsite audits, and monitored as far as possible through the SEPA website. Instances of high sea lice numbers must be explored in detail, what preventative measures were in place, what action was taken and what ongoing corrective action will be taken. This should be reflective of what is already set out in their veterinary health and welfare plan.

Lower biomass on sites reduce the organic load on the benthos. Reduced capacity for using strong chemical baths helps protect animals in the surrounding water column. Organic sourcing requirements for feed ingredients both terrestrial and marine create a chain that benefits much more than the immediate area. Collectively this serves to safeguard the wider natural environment.