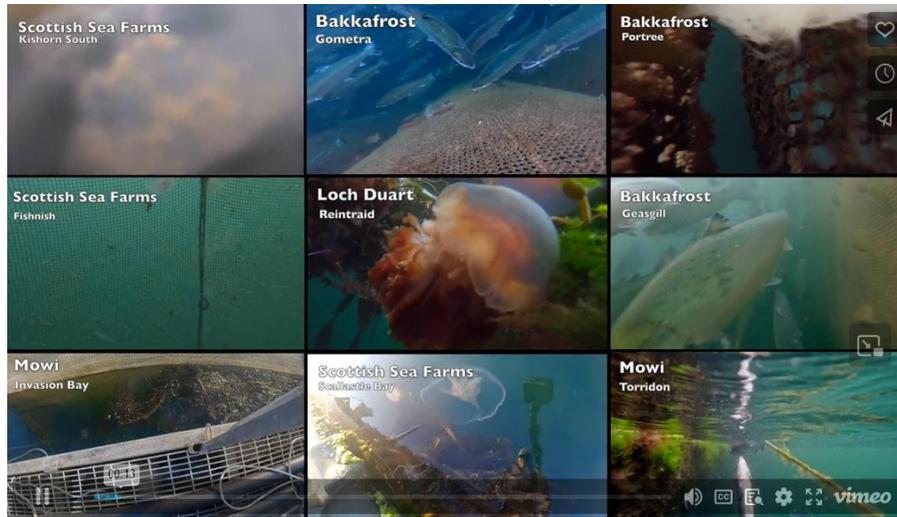


Summary of [Silent Sting](#) (4 October 2023):

Video evidence shot between March and August 2023 inside and outside salmon cages exposes how swarms of jellyfish and microjellies are plaguing fish farms around Scotland. Footage was captured at over a dozen salmon farms including at Bakkafrost (Geasgill, Gometra, Portree & West Strome); Scottish Sea Farms (Scallastle Bay, Fishnish, Fiunary & Kishorn); Mowi (Torridon & Invasion Bay); Loch Duart (Reintraid) and Wester Ross (Corry & Ardmair). Watch ‘Silent Sting’ [online here](#)



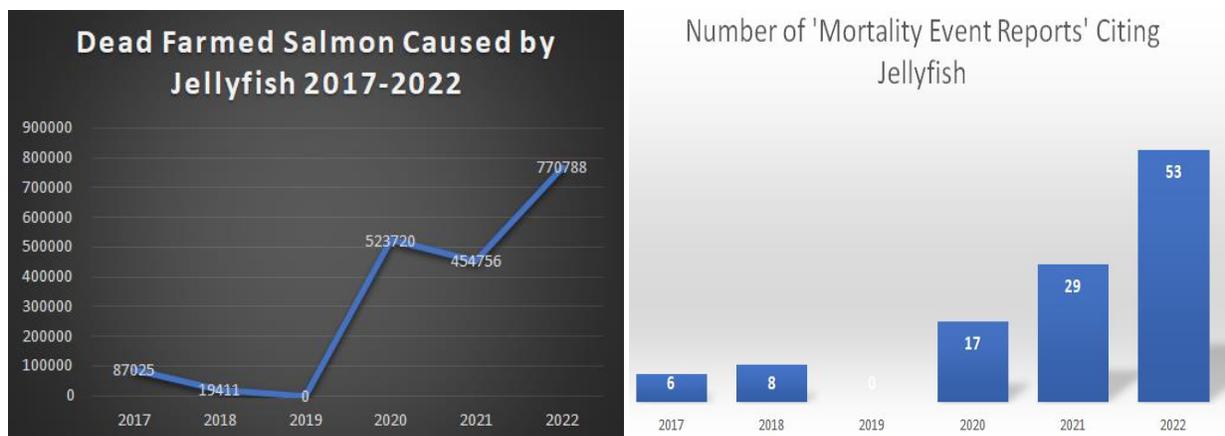
Larger jellyfish species such as Lion’s Mane and Moon Jellyfish are clearly visible with their tentacles stinging through the nets and swarming outside the cages. A jellyfish expert has identified *Pleurobrachia pileus* (sea gooseberry) – which can clog the gills of farmed salmon and *Pandeidae* – it has bell-shaped medusa and threadlike tentacles – from the video footage. ‘Mortality Event Reports’ and ‘Case Information’ [published by the Scottish Government](#) has cited *Obelia*, *Muggiaea Atlantica*, *Solmaris* and *Sarsia tubulosa* as impacting salmon farms.

Mortality data [published by the Scottish Government on 2 October 2023](#) (information up to early September 2023) details 16 ‘Mortality Event Reports’ where jellyfish or microjellyfish are cited since 1 August 2023 involving 362,244 dead salmon. The mass mortalities are headed by [Bakkafrost’s Portree salmon farm off the Isle of Skye](#) with a staggering 175,115 deaths “as a result of suspected *Solmaris* jellyfish bloom”; “high levels of *Muggia Atlantica* and *Solmaris*” at [Bakkafrost’s West Strome salmon farm in Loch Carron](#) and “gill damage the result of microjellies” and “large numbers of jellyfish reported” at [Bakkafrost’s Gometra salmon farm off the Isle of Mull](#).

Data [published by Salmon Scotland in September 2023](#) cited 10 cases where jellyfish/plankton – along with gill health and viral disease - caused mortalities at salmon farms in July 2023 (by comparison with the same time last year, there were [no mortality incidents citing jellyfish in July 2022](#)). No jellyfish-related mortalities were [reported by Salmon Scotland between January and June 2023](#) (the [previous citation of jellyfish was in November 2022](#)). The salmon farming industry has [published monthly data on mortalities since January 2021](#) – including 22 cases in

2022 where ‘jellyfish’ are cited as a cause of mortality (spiking in [September 2022](#) with 13 cases including 56% mortality at Loch Duart’s RSPCA Assured Loch Carnan salmon farm and 38% mortality at Mowi’s RSPCA Assured Stulaigh salmon farm) and 9 cases in 2021. The month of May was the earliest report of jellyfish problems in any year with the month of September accounting for 16 of the 22 cases in 2022 and 2021. Data for August 2023 is expected to be [published by Salmon Scotland in early October 2023](#).

Mortality data [published by the Scottish Government’s Fish Health Inspectorate on 3 July 2023](#) (data up to the end of May) detailed 115 ‘Mortality Event Reports’ totaling 1.86 million farmed salmon where jellyfish or microjellyfish were cited as ‘explained reasons’. Cases citing jellyfish or microjellyfish increased with 770,788 morts reported in 2022 via 53 incidents compared to 454,756 morts via 29 incidents in 2021; 523,720 morts via 17 incidents in 2020; zero reported in 2019; 19,411 morts via 8 incidents in 2018; and 87,025 morts via 6 incidents in 2017.



Dr Lisa-ann Gershwin – author of [Stung! – On Jellyfish Blooms and the Future of the Ocean](#) – told [Salmon Scotland](#) via a Zoom call from Tasmania:

“Salmon farming makes jellyfish worse and jellyfish kills salmon so it’s a vicious cycle where salmon farming is exacerbating this problem that’s actually a problem for themselves. They’re kind of doing themselves in – suffering from their own success. It’s a self-inflicted wound - it’s the Sorcerer’s Apprentice. It’s insane. If you formed a committee to help jellyfish flourish and you white-boarded this with all the experts in the world the salmon farming system is what you’d come up with. Jellyfish love warming water – you haven’t seen anything yet...the jellyfish go into super-amped up mode. Global warming is a dream come true for jellyfish.”

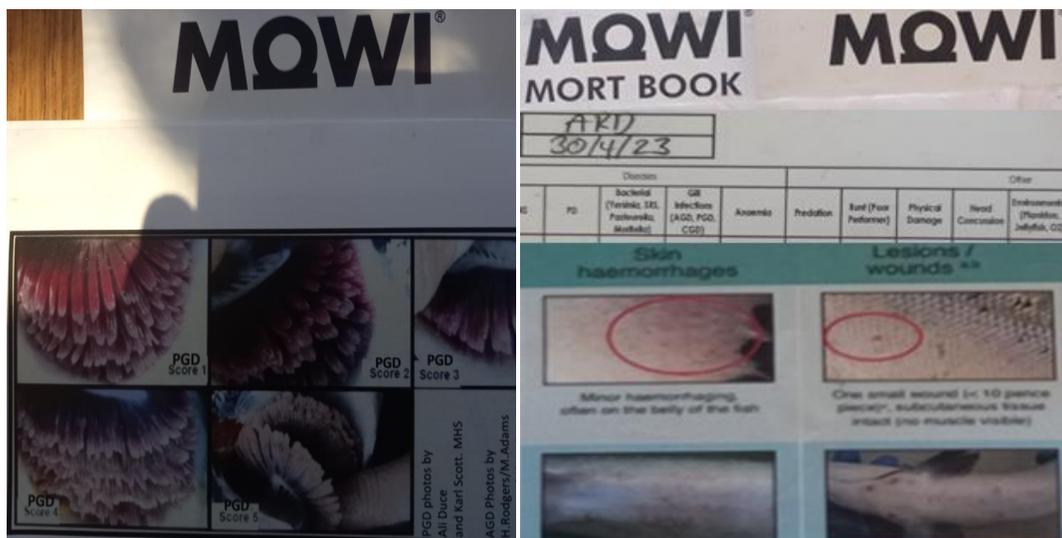


‘Case Information’ [published by the Scottish Government’s Fish Health Inspectorate in September 2023](#) reported on inspections to salmon farms in July 2023 – including [Mowi’s Loch Duich salmon farm](#) where “gill issues via increased numbers of microjellyfish on site” was cited as the main cause of mortalities; [Scottish Sea Farms in Loch Kishorn](#) where “poor gill health and AGD/CGD combined with the prolonged presence of jellyfish in the area” leading to harvesting; and [Mowi’s Ardintoul salmon farm in Loch Alsh](#) where “micro jellyfish were present in the water” from June.

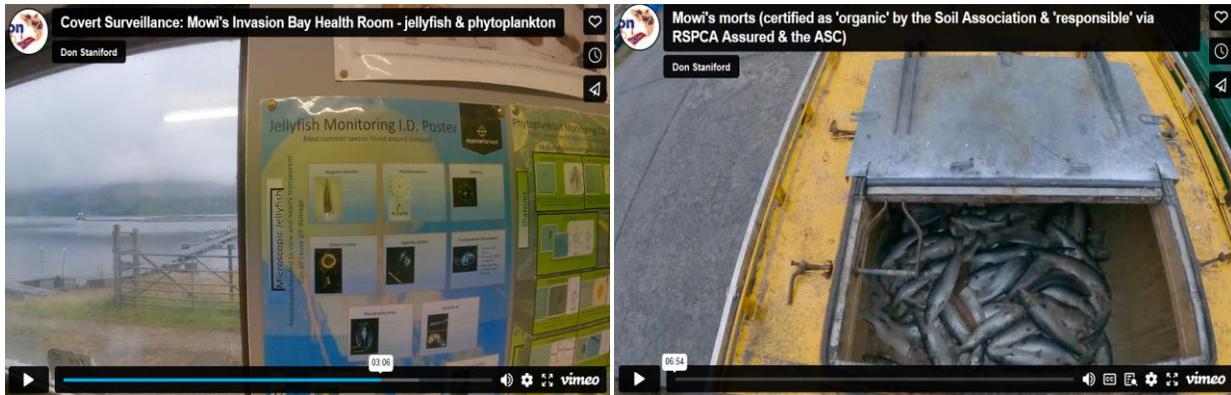
When Scamon Scotland visited Mowi’s Ardintoul salmon farm in June 2023 we [filmed mortalities piled up in bins and a macerator unit for disposing of dead fish with Formic Acid](#):



A Mowi ‘Mort Book’ – found at Ardintoul salmon farm - includes photos of gill disease with different scales of damage and contains various mortality factors including ‘Environmental’ (Plankton, Jellyfish, Oxygen):



When Scamon Scotland visited Mowi's Invasion Bay salmon farm in Loch Sunart in August 2023 we saw [warnings of jellyfish, microjellies and plankton on the walls of the 'Health Room'](#) and [dead fish in a skip and oxygen tanks outside](#):



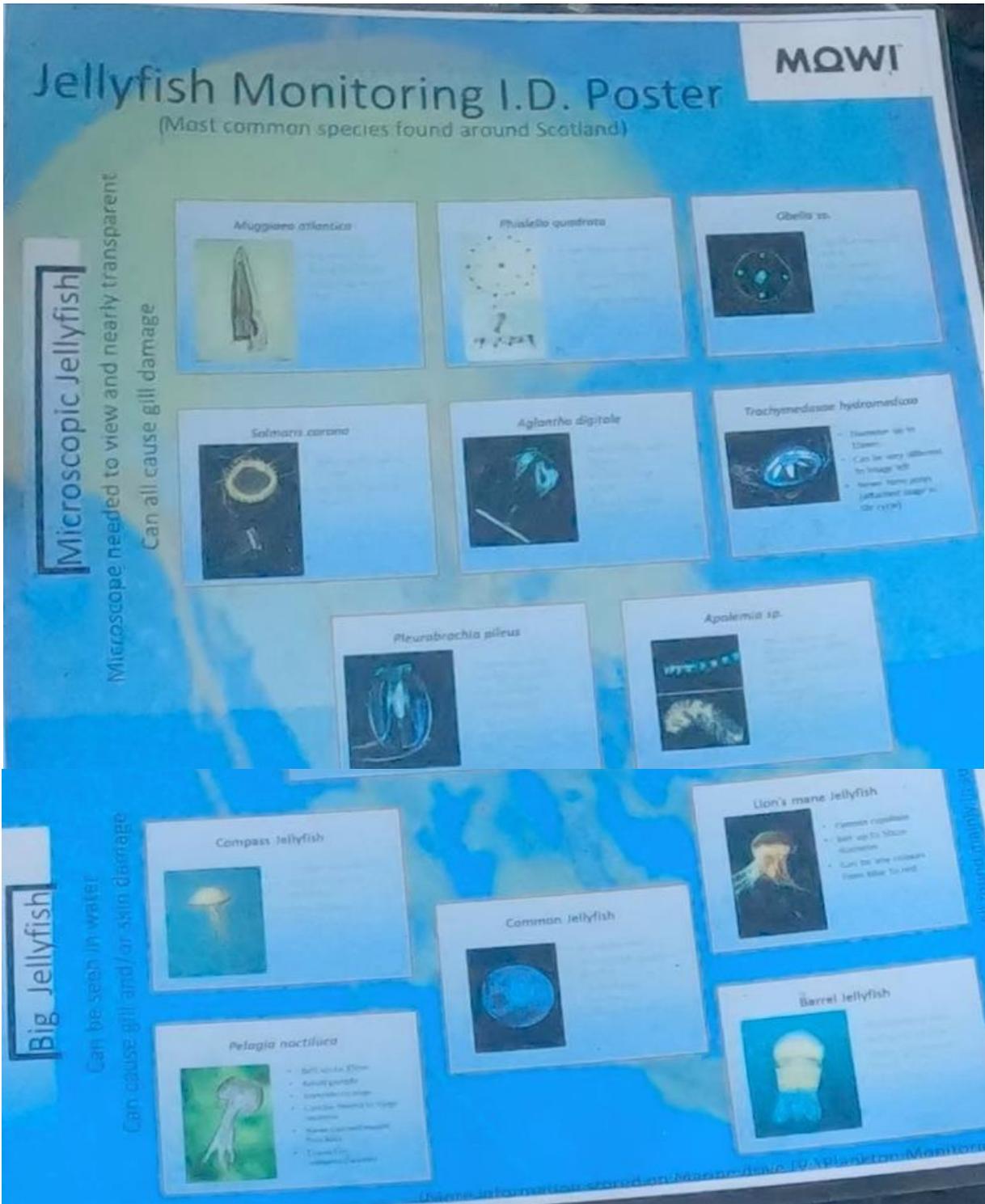
Emails from 2013 warning about jellyfish were found inside Mowi's 'Health Room' as well as a 'Jellyfish ID Card' - [published by the Scottish Association of Marine Science, the Scottish Salmon Producers Organisation \(Salmon Scotland\) and the Crown Estate in 2010](#) – and a 'Micro Jellyfish Response Plan'. The [video surveillance](#) found various guides on jellyfish and phytoplankton. A 'Hydrozoan Identification Guide' details various jellyfish including *Solmaris corona*, *Obelia* spp, *Phialella quadrata*, *Aglantha digitale*, *Lizzia Blondina*, *Muggiaea atlantica*



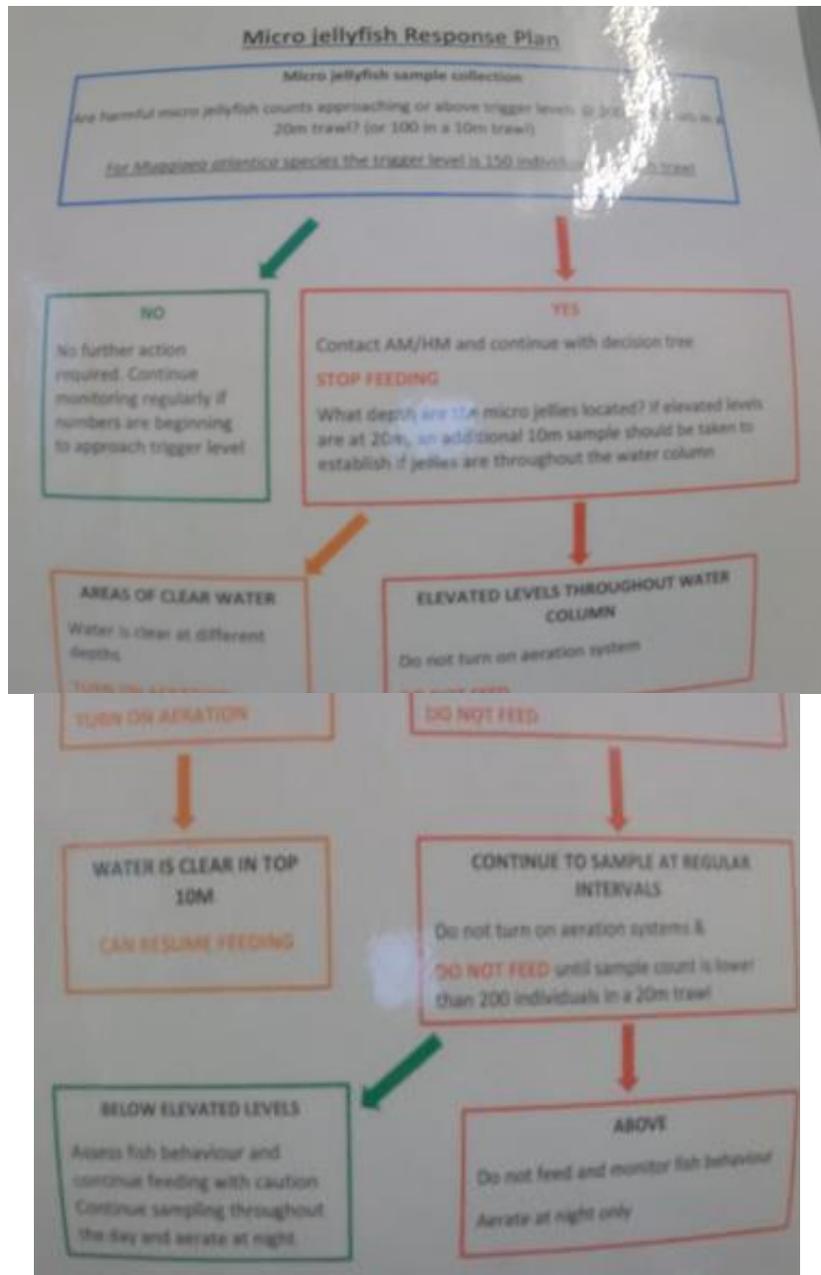
A Mowi 'Salmon Health Training' report dated May 2023 – authored by [Mowi Scotland's Alistair Duff](#) - references six microjellyfish including *Obelia*, *Solmaris corona* and *Muggiaea atlantica* and listed symptoms of toxic phytoplankton and hydrozoan species including head shaking, gasping, suffocation and cardiac paralysis.

	<p>Many of the toxic phytoplankton and hydrozoan species produce the following symptoms in fish:</p> <ul style="list-style-type: none"> • Scale sloughing • Head shaking • Loss of appetite • Stacking up , facing current • Gasping • Disorientation • Fin reddening • Reddening of iris • Fluttering gills • Mucus build up on gills • Brownish/reddening gills • Destruction of gill tissue • Suffocation • Respiratory and cardiac paralysis <p>• Can also cause rashes and swelling to human skin- some, esp <i>Karenia</i> sp. can produce aerosols which cause respiratory problems in humans</p>	
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Here is a copy of [Mowi's 'Jellyfish Monitoring I.D. Poster'](#) which features 'microscopic jellyfish' and 'big jellyfish':



Mowi's 'Health Room' at Invasion Bay in Loch Sunart had a copy of a 'Micro Jellyfish Response Plan' on the wall [when Scamon Scotland visited in August 2023](#):



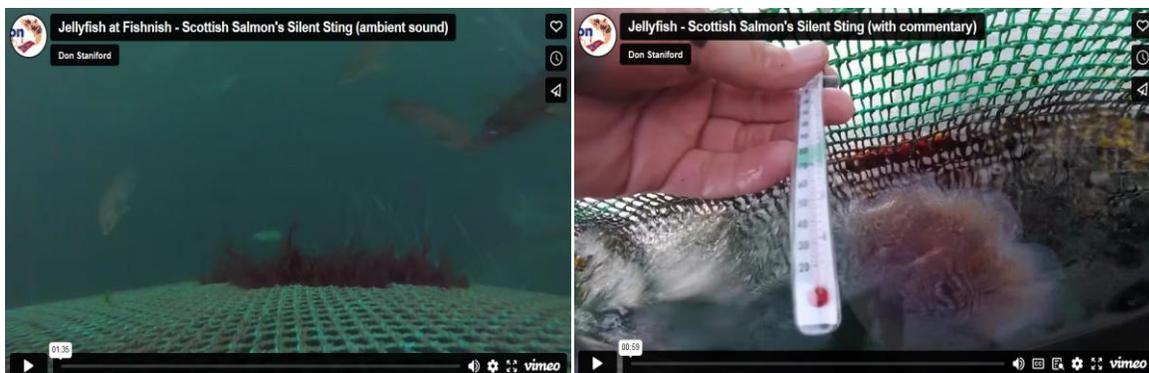
Mowi's Q2 2023 report – [published in August 2023](#) – flagged up “higher than normal” seawater temperatures and the “increased presence of plankton, algae and jellyfish”. Mowi's Q4 2022 report – [published in February 2023](#) – cited “significant issues with micro-jellyfish in the aftermath of a record warm summer” and “relocation to inshore sites during the jelly fish bloom”. Mowi's Q3 2022 – [published in November 2022](#) – cited how “micro-jellyfish impacted growth and harvest volumes” leading to relocation to other sites and “accelerated harvesting”.

In June 2023, [covert filming at Mowi's Loch Torridon salmon farm](#) captured footage of microjellyfish and a toxic soup of zooplankton and phytoplankton.



Mowi's '[Salmon Farming Industry Handbook 2023](#)' includes: “The optimal temperature range for salmon is between 8 and 14 degrees C”. Temperatures in Scotland – as [published by the Scottish Government's Fish Health Inspectorate](#) – have reported temperatures in excess of 14 degrees C with [14.8 degrees C reported at Bakkafrost's East Tarbert Bay salmon farm off the Isle of Gigha in August 2022](#); [16.8 degrees C off Islay in August 2022](#); [14.3 degrees C in Loch Broom in August 2022](#) and [14.2 degrees C in Loch Kanaird in August 2022](#). Data for the summer of 2023 – to be published [online here](#) - may report even higher temperatures in view of an “unheard of” [Category 4 marine heatwave](#) with a [five degree increase in some UK areas](#).

When Scamon Scotland [visited Fishnish salmon farm operated by Scottish Sea Farms \(Norskott Havbruk\) in the Sound of Mull in August 2023](#) we found Lion's Mane jellyfish swarming outside a cage and their stinging tentacles encroaching inside the net:



In June 2023, [covert filming at Scottish Sea Farms \(Norskott Havbruk\) in Loch Kishorn \(Kishorn South\)](#) found moon jellyfish swarming around the cages.

In [video footage shot at Bakkafrost's Portree salmon farm off the Isle of Skye in late June 2023](#) you can see jellyfish congregating outside the salmon cage with the tentacles of one medusa reaching out into the net where the farmed salmon are swimming. Two months later in early September 2023, Bakkafrost's Portree salmon farm suffered a horrific mass mortality event (175,115 deaths "as a result of suspected Solmaris jellyfish bloom" were [reported to the Scottish Government on 11 September 2023](#) with a mortality rate of 31%). The Sunday Mail [reported \(24 September 2023\)](#):

CAMPAIGNER'S FEARS OVER ANIMAL WELFARE AT FARM SITE

■ Dawn Thompson
The deaths of thousands of salmon at a controversial fish farm have been exposed by shocking drone footage.

The surveillance pictures of the Bakkafrost Scottish farm show large containers packed with lifeless salmon being offloaded on to the 27m wet boat Bakkafrost for removal.

Dead fish were floating in cages as a live trapped salmon struggles to free itself from a net across the top.

Secret underwater filming at the same site - previously revealed by the Sunday Mail - showed horrific images of 'zombie salmon' swimming dead, despite missing large chunks of flesh.

The farm have blamed jellyfish for the deaths, with Scottish Government inspectors being called to investigate.

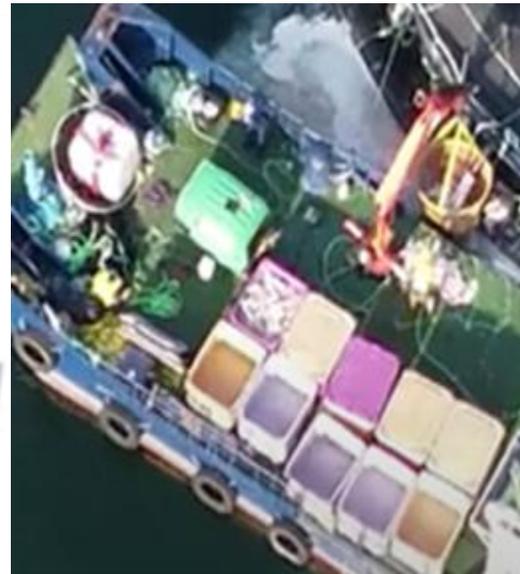
Campaigner Iain MacIntyre said the images raise concerns over animal welfare and biosecurity at Bakkafrost Scotland's Portree site.

Last night he said: "Salmon farming is a welfare nightmare and must be immediately closed down to protect millions of fish."

There could be over 500 tons of dead fish in this single incident.

This is an estimate but having watched events from elsewhere and having reviewed the footage, there is a credible argument to say we could be talking 500 tons of dead fish in this single incident. It could be over 1000.

The images show some 30 tonnes of salmon in cages and the response to whatever caused them to die took place over at least four days. The Bakkafrost transport manager said: "Consumers should avoid BSNCA. Answered Scottish salmon like the plague. A deadly cocktail of warming water temperatures, presence of fish gill problems, infectious diseases, plaques of parasites and toxic algae and the natural environment. We would strongly disagree with any suggestion not to learn from repeated sit



Daily Record [Bookmark](#)

Iain MacIntyre, director of marine operation at Bakkafrost Scotland, admitted to an issue with its salmon and blamed jellyfish.

He said: "Salmon farming takes place in the natural environment and can face unique and difficult biological challenges, particularly when the water is warmer.

"This has been the case at Portree when, following a prolonged period of hot weather, a jelly fish bloom moved through the area. We immediately deployed additional resources and equipment to resolve the issue and the relevant authorities were notified.

"Our staff worked diligently and went above and beyond to manage a challenging set of circumstances and deal with the problems caused by the jelly fish bloom.

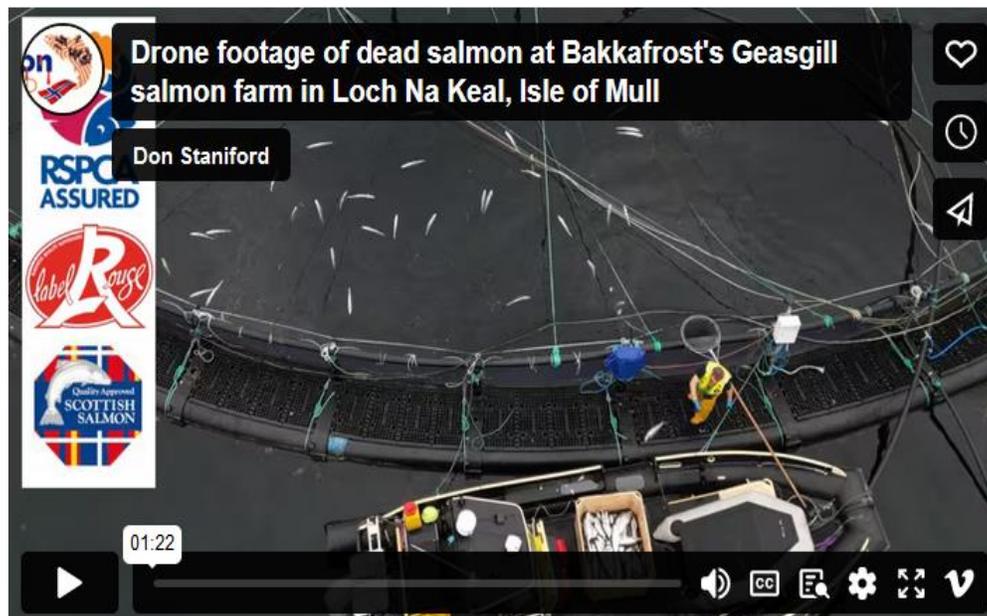
"This was carried out in a matter of days and the jelly fish bloom has now passed through the site and the incident-based mortality has ceased.

Bakkafrost's [2021 Annual Report](#) – published in October 2022 – referenced the “deadly cocktail” of micro-jellyfish and reduced gill health.

When Scamon Scotland visited Bakkafrost's Geasgill salmon farm in Loch Na Keal off the Isle of Mull in late June 2023 we found [swarms of jellyfish](#) and a toxic soup of microjellies and zooplankton with [oxygen being pumped into the cages](#).

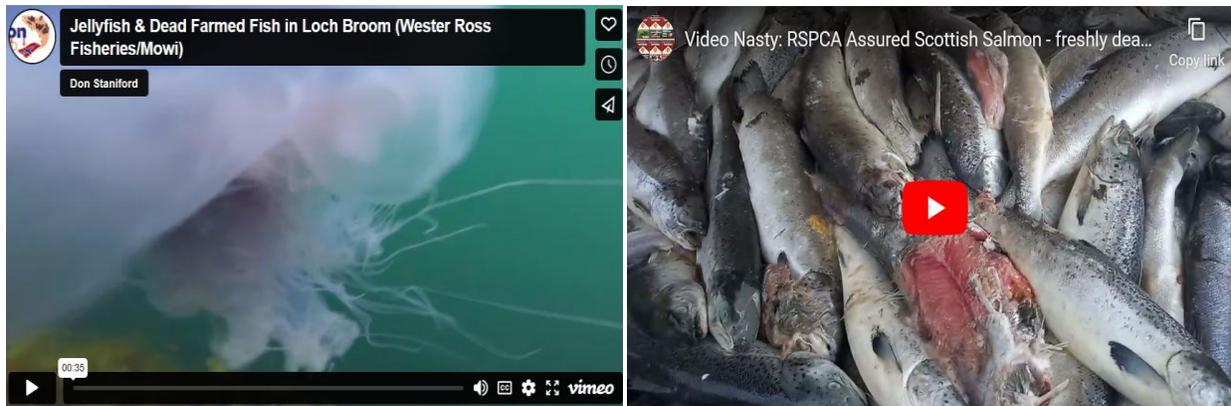


Weeks later in late July and early August 2023, Bakkafrost's Geasgill salmon farm suffered mass mortalities with a [staggering 24% mortality just in the month of July 2023](#) (data for August 2023 is [expected in early October 2023](#)). The Herald reported on the mass mortality in [September 2023](#) and [August 2023](#).



When Scamon Scotland visited Bakkafrost's Gometra salmon farm in August 2023 we [captured evidence of microjellies inside and outside the cages along with dead fish floating on the surface](#). The Scottish Government's Fish Health Inspectorate [reported on 2 October 2023](#) that Bakkafrost's Gometra salmon farm suffered "gill damage the result of microjellies" with "large numbers of jellyfish reported" and 14,994 dead fish in late August 2023.

When Scamon Scotland [filmed at Wester Ross Fisheries \(Mowi\) in Loch Broom in June 2023](#) we saw jellyfish surrounding the cages at the Corry salmon farm. At the land base near Ullapool we [filmed RSPCA Assured mass mortalities piled up in bins](#):



When Scamon Scotland [visited Ardmair salmon farm operated by Wester Ross Fisheries \(Mowi\) in Loch Kanaird in June 2023](#) we saw swarms of jellyfish but the farm had just been harvested out (a week later the site was restocked with fish moved from Loch Broom).



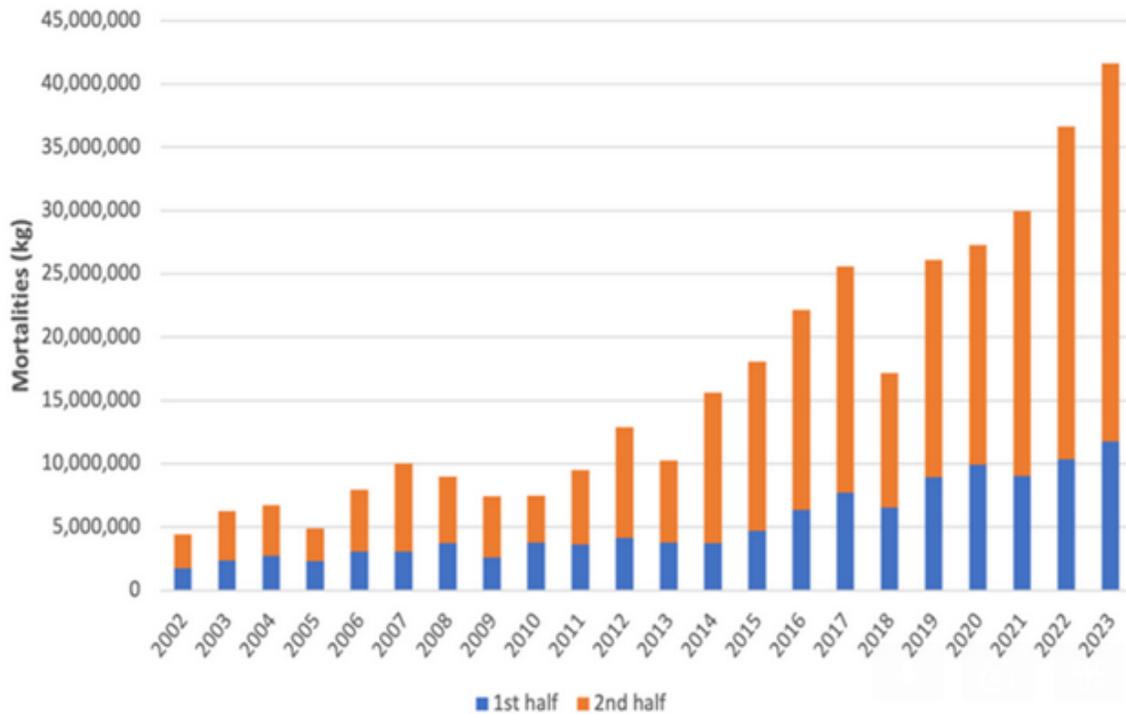
Video footage [shot at Scallastle Bay salmon farm operated by Scottish Sea Farms \(Norskott Havbruk\) in the Sound of Mull in June 2023](#) shows jellyfish stuck on the outside of the net and a toxic soup of microjellies and zooplankton:



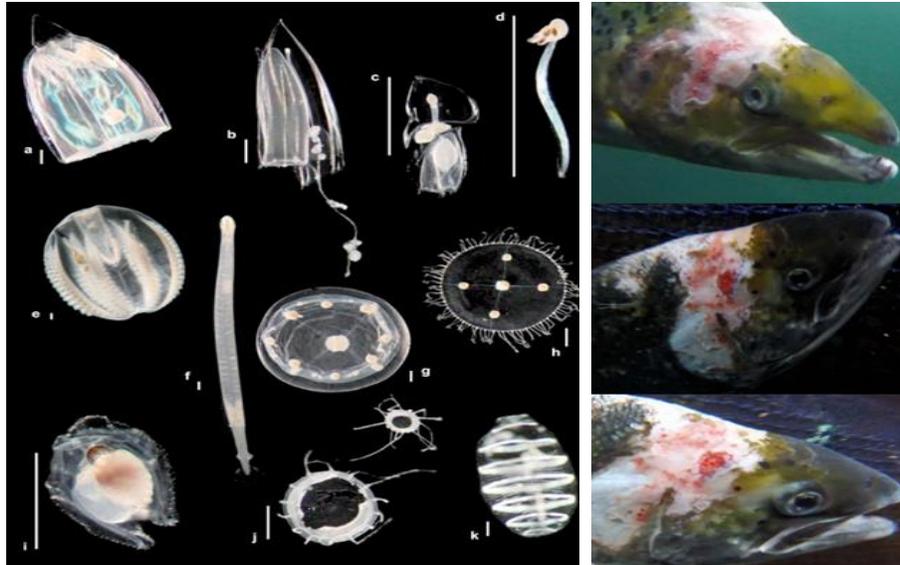
In Norway, jellyfish problems are increasing too although not on the scale of Scotland's. The [Norwegian Fish Health Report 2022](#) – published by the Norwegian Veterinary Institute in March 2023 - cites jellyfish in relation to four 'welfare-related incidents' in 2022. The physical injuries and painful deaths caused by jellyfish and microjellyfish are detailed in [scientific research from Ireland](#).



Mortalities on salmon farms in Scotland in 2023 are [shaping up to be the worst ever with a record 11,761 tonnes of morts reported in the first six months of this year and 41,623 tonnes predicted by the end of 2023](#).

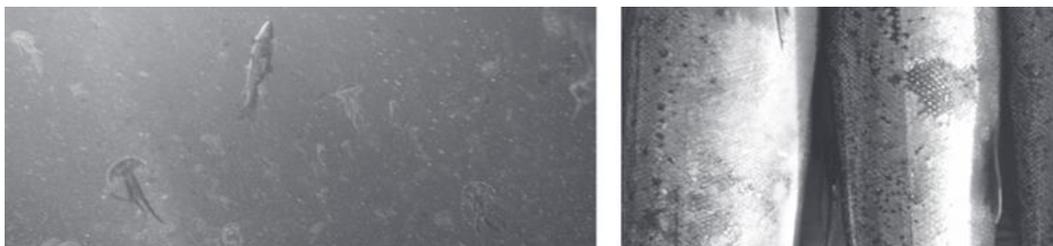


Mass mortalities at Scottish salmon farms – and jellyfish blooms - could increase even further during 2023 if the marine heatwave has accelerated mortality ([satellite data from the European Space Agency in June 2023 showed sea surface temperature more than 5°C higher than the average during this time of year](#)).



Increases in mortalities on salmon farms have been correlated with rising water temperatures. “At salmon farms, a strong link between milder winter temperatures, disease and increased fish mortality has been identified,” reported a ‘Marine Climate Change Impacts Partnership’ paper co-authored by Marine Scotland Science and the Institute of Aquaculture in Stirling [published in November 2022](#). “We have statistical evidence of an existing association of salmon mortality with milder winters and evidence of the emergence of amoebic gill disease in UK waters in association with warm summers and persistence with mild winters.”

The [Silent Sting](#) report provides further background via a Freedom of Information disclosure by the Scottish Government in September 2023, scientific research by the University of Stirling on the impact of climate change on salmon farming; media coverage; industry perspectives and an overview by Don Staniford.



For more information contact Don Staniford on 07771 541826 (salmonfarmingkills@gmail.com)

Updated data via: [Media Backgrounder - Dead in the Warming Water Addendum](#) (13 October 2023)