

The Global Alliance Against Industrial Aquaculture, 5 March 2017

**[Damning Report on Toxic Salmon Farms Buried](#)
[- SEPA finally acts on lobster-killing chemical](#)**

The [Global Alliance Against Industrial Aquaculture](#) (GAAIA) is calling for a ban on the use of Emamectin benzoate (trade name SLICE) citing a [damning scientific report](#) detailing lethal impacts on shellfish including lobsters [1]. FOI documents reveal that [the report commissioned by the Scottish Aquaculture Research Forum](#) was buried last year after lobbying from the Scottish salmon farming industry who successfully argued that publicity "could undermine commercial confidence in the industry" and "damage all of our reputations" [2].



The report [published in August 2016](#) to zero publicity or media coverage concluded that "a reduction in crustacean richness and abundance by 63-96% respectively could be expected" following the use of Emamectin benzoate on salmon farms in Scotland. The report - "[Towards Understanding of the Environmental Impact of a Sea Lice Medicine – the PAMP Suite](#)" - was [finally acted upon this week](#) by SEPA following last weekend's [front page article in The Sunday Herald](#) and the [disclosure of damning documents this week to GAAIA.](#)

Read more in today's Sunday Herald: "[Crackdown on fish farm pesticides after Sunday Herald investigation](#)" [3]

"We have been trying to agree a common media position with all parties in order to minimize the controversy as and when it is noticed by the media," [wrote the Scottish Salmon Producers Organisation in an email to the Scottish Environmental Protection Agency](#) in August 2016.

"Your statement concerning the fate of SLICE is pre-emptive, controversial and could undermine commercial confidence in the industry," stated [another email from the SSPO to SEPA](#). "Should you publish this statement in its current format, I suspect that it will lead to a good deal of media scrutiny which will seek to undermine the industry's reputation and will probably damage all of our reputations," begged SSPO's Chief Executive Scott Landsburgh.

Read the documents obtained via FOI from SEPA on 1 March 2017:

[SSPO lobbying of SEPA in August 2016](#)

[SSPO proposal to SEPA on an agreed media position](#)

[SEPA dinner in Nov 2015 with SSPO and MDs of Marine Harvest, Scottish Sea Farms and Scottish Salmon Company](#)

[£30 & £50 dinners paid by the SSPO for SEPA's Chief Executive in Nov 2015 and April 2016](#)

[Letter from Marine Harvest's MD Ben Hadfield to SEPA's Chief Executive in July 2016](#)

[Letter from Marine Harvest's Ewan Gillespie to SEPA's Chief Executive in August 2016](#)

[SEPA's Douglas Sinclair to SEPA's Chief Executive in February 2016](#)

[Letter from SSPO to SEPA on "alignment of actions" in January 2016](#)

[Letter from SEPA to SSPO on "common ground" in November 2015](#)

[Agenda of SSPO & SEPA meeting in May 2016](#)

Read more in [today's Sunday Herald](#):



"Based on this new evidence, SEPA is reviewing all fish farm licences permitting the use of SLICE, tightening conditions for the medicine's use after discussions with VMD," stated [SEPA View](#) finally on 1 March 2017 (some seven months after SEPA drafted a statement).

"We are beginning the issuing of these new licences this week, and this will be completed by the end of April. This restriction will remain in place while SEPA and the industry carry out further research to either confirm or confound the apparent link between SLICE use and possible environmental effects" [4].

In January 2017, The Sunday Times [revealed](#) that the use of toxic chemicals on Scottish salmon farms leapt over 1000% between 2005 and 2015 - including a [six-fold increase in the use of Emamectin benzoate](#) [5].

"It is shameful that SEPA has once again cravenly kowtowed to pressure from the salmon farming industry," said [Don Staniford](#), Director of the [Global Alliance Against Industrial Aquaculture](#). "Judas's price of betrayal was thirty pieces of silver - the price for SEPA's Chief Executive seems to be a £30 slap-up dinner. Given the [shocking scientific assessment](#), SEPA had no choice but to take drastic action. However, SEPA cannot stop short of an outright ban on Emamectin benzoate use. The use of Teflubenzuron was [stopped in 2015](#) following similar damning data on impacts on lobsters - now SEPA must ban the use of Emamectin benzoate on salmon farms."

This is not the first time SEPA have bowed down to pressure from the salmon farming industry. In 2013, The Sunday Herald [reported](#) that SEPA "agreed to delete information on millions of fish deaths from a public database on fish farming launched this month because the SSPO argued it would be commercially damaging" (read more via "[Environmental watchdog labelled 'lapdog' after agreeing to keep fish farm deaths secret](#)").



[Photo](#): Scott Landsburgh, Chief Executive of the SSPO, with his pet lapdog named SEPA

In January 2017, The Sunday Herald [revealed](#) that SEPA "is about to propose abandoning long-established limits on the mass of salmon that can be farmed in cages at particular

locations in order to support the industry's 'growth agenda'" (read more via "[Recipe for Ruin - SEPA Lifts Limits on Salmon Farms](#)").

In February 2017, The Sunday Herald [reported](#) that SEPA "has been privately considering proposals for a 6,000-8,000 tonne caged fish farm that its own expert says would be "utterly unsustainable", threaten Sepa's credibility, and profit the fish farm industry to the tune of tens of millions of pounds" (read more via "[Super-sized Scottish Salmon - 8,000 tonnes of trouble on the horizon!](#)").

Other documents obtained by GAAIA from SEPA via FOI on 1 March 2017 reveal that the Scottish salmon farming industry have [wined and dined](#) SEPA's Chief Executive on at least two occasions - [in November 2015 when the SSPO and SEPA were joined by the Managing Directors of Marine Harvest, Scottish Sea Farms and possibly the Scottish Salmon Company](#) and in April 2016 just before SEPA bowed to the SSPO's demands to muzzle criticism [6].

FOI F0187330

Scottish Salmon Producers

Hospitality - Dinner received on 2.11.15 - <£30.00

Hospitality – Dinner received on 22.4.16 - £50.00

Following a meeting in 2016, Marine Harvest's Managing Director Ben Hadfield gushed in a [letter to SEPA's Chief Executive](#) [7]:

Mr T A'Hearn
SEPA
Strathallan House
The Castle Business Park
STIRLING
FK9 4TZ



Dear Terry

I was very pleased to take our recent meeting together; I enjoyed the open discussion regarding the salmon industry and the regulation of it. I strongly believe that we can re-invigorate the relationship between Marine Harvest and SEPA and will make this a personal and professional focus for myself and my team.

During our meeting we discussed the number of unsatisfactory benthic conditions around Marine Harvest sites and the urgent need to address this, I can assure you that we have resourced this matter, giving it the highest priority. We would re-iterate our request to be allowed a number of weeks and months to put those mitigation measures in place.

Last weekend (26 February 2017) the Sunday Herald [revealed](#) that toxic pollution in 45 lochs around Scotland - including many lochs contaminated by Marine Harvest [8].

Read more via:

- ☪ [Press Release: "Toxic Toilets: Salmon Farms Pollute Scotland's Lochs"](#)
- ☪ [Press Release: "Failing Fish Farms - 18% rated "poor" by SEPA in 2015"](#)
- ☪ [Front Page of Sunday Herald: "Revealed: Scandal of 45 Lochs Trashed by Pollution"](#)

In 2006, Marine Harvest was named by the Sunday Herald as one of "[Scotland's Dirty Dozen](#)" and "[the worst pollution manager in Scotland in 2005](#)". In 2009, Marine Harvest was named by the Sunday Herald as one of "[Scotland's Dirty Three Dozen](#)".

In 2011, [The Sunday Herald revealed](#) that toxic pollution had contaminated nine lochs around Scotland. "I'm convinced that the prawns were killed by the chemicals used by fish farmers to treat sea lice," said creel fisherman Donald Macleod.

20.11.11



There's hardly any prawns to be found in Loch Shell any more unless you go some distance from the salmon cages, he claimed. And prawns aren't that different from the sea lice that the chemicals are designed to kill. "It has become obvious that fish farmers can do almost anything they want and no-one has the ability to deal with the mess they can create," Macleod [told Rob Edwards](#). "My income dropped by half because the prawns weren't there, so I had to give up."

In 2013, The Sunday Herald [reported](#): "By far the worst pollution was found in Loch Shell on the east of Lewis near a fish farm operated by the Norwegian-owned company, Marine Harvest".

The Guardian [reported](#) in 2013:

Fish company investigated after salmon farm pollutes Scottish loch

Marine Harvest, one of the largest fish-farming companies, is under investigation after polluting loch with pesticide



 Caged Scottish Salmon. Photograph: Alamy

Marine Harvest, one of the world's largest fish-farming companies, is under investigation after its salmon farms polluted a Scottish loch with toxic pesticide residues hundreds of times above environmental limits.

Sampling tests around salmon cages on Loch Shell in the Outer Hebrides by the Scottish Environment Protection Agency (Sepa) found that levels of [Teflubenzuron](#), used to kill sea lice parasites which affect hundreds of thousands of caged fish each year, were up to 450 times higher than recommended levels.

The agency could now cut back [Marine Harvest's](#) operations on Loch Shell where the firm has three fish farms, including one which was already under Sepa investigation, after it launched a review of its operations there.

Sepa's tests, carried out in 2012, found that Teflubenzuron levels were well above the recommended limits at 20 of the 21 sediment sampling sites on the loch, suggesting long-term problems with its treatment regime there.

In another [letter obtained via FOI dated August 2016, former SEPA biologist Ewan Gillespie \(now working for Marine Harvest\) said to SEPA's Chief Executive](#): "My own view on regulation is that both regulator and 'regulatee' must work in close co-operation with one another to achieve the aims of the prescribed legislative framework; there is not 'one side or another'." [9]

Other documents obtained via FOI from SEPA last week (1 March) included an [email dated 10 February 2016 from Douglas Sinclair \(SEPA's Aquaculture Specialist\) to SEPA's Chief Executive Terry A'Hearn](#) pointing to 'dramatic' changes in regulation which "will give the salmon sector what they seek in terms of bigger sites and a lighter day-to-day regulatory touch".

A [letter from the SSPO's Chief Executive to SEPA's Chief Executive in January 2016](#) agreed that "some work has to be done on the relationship and understanding between the industry and SEPA to try to achieve alignment of actions":

A [letter from SEPA's Chief Executive to the SSPO dated November 2015](#) stated that "I've very much enjoyed our meetings over the last couple of months" and stressed the "need to find some new approaches to reach common ground".

The [agenda for a meeting between SEPA and the salmon farming industry in May 2016](#) included a discussion on "future regulatory requirements to enable development of open sea aquaculture".

"So it looks like SEPA delayed expressing concerns about pollution because the fish-farming industry was unhappy, but then eventually acted after public attention was drawn to the issue by this paper," states today's [Leader Comment in The Sunday Herald](#). "Is this how a regulator should behave? We have expressed concern before that SEPA is getting too close to the businesses it is meant to be regulating. There is now substantial evidence that like this is the case with the £1.8 billion multinational fish-farming industry".



Here's the [Leader Comment in The Sunday Herald](#) (5 February 2017):

A poodle cannot be a watchdog

SINCE 2017 dawned the Scottish Environment Protection Agency (Sepa) has not exactly covered itself in glory.

It has proposed scrapping limits on salmon farmed in cages around the coast. It has admitted asking industrial polluters to help hire senior pollution regulators and top government officials to help choose senior Sepa managers. And as we report today, it has been caught secretly considering plans for the world's biggest salmon farm, which would create more sewage waste than Glasgow.

Sepa, let us not forget, is meant to protect us from pollution. But it almost seems more concerned to

grease the wheels of industry. This is disturbing. As one former Sepa official told us, there's a tricky balance between being close enough to industry to understand it, and getting too close.

Sepa is in the midst of a major overhaul of its regulatory arrangements, and it is under budgetary pressure.

Its managers need to ensure that it effectively monitors and reports pollution, and forcefully reprimands offenders. It must be a lively and sharp-toothed watchdog, not a sleepy and soft-hearted poodle.

Scottish ministers, too, should ensure that their regulatory agency doesn't grow flabby and weak.

"The salmon farming industry's *modus operandi* of muzzling and menacing behaviour is lifted straight out the mafia's handbook," concluded Staniford (author of '[Silent Spring of the Sea](#)'). "Instead of reducing the use of toxic chemicals the salmon farming mafia have focussed attention on lobotomizing SEPA and silencing criticism of this polluting industry.

That SEPA has been gripped by the mafia's 'omerta' code of silence shows how far the salmon farming industry has corrupted Government. The Scottish salmon farming industry has been allowed to spiral so far out of control it is now a law unto itself."

A scientific paper [published in Environmental Science & Technology in October 2016](#) revealed how Emamectin benzoate "may cause collateral damage" in shellfish such as lobsters (read more via "[Anti-sea lice drugs may pose hazard to non-target crustaceans](#)" and [Scientific Backgrounder: Ecotoxicity & Chemical Resistance](#)). For more background on toxic chemicals used by salmon farming please read a "[Scientific Backgrounder: Ecotoxicity & Chemical Resistance](#)" [10].

The UK's Veterinary Medicines Directorate (VMD) has reported Emamectin contamination of farmed salmon on numerous occasions in the last decade. In December 2016, the VMD [reported](#):

Farmed Fish				
Farmed Trout	Dieldrin 180 ug/kg 1801859		Great Britain	Awaiting investigation report.
Farmed Salmon	Emamectin 120 ug/kg 1801859	N/A	Great Britain	Linked with 1801858 and 1801857. The investigation established that there was an error in the biomass calculation which led to an incorrect split of the medicated feed between the cages being treated and resulted in an overdose. The farm has implemented additional control check points with regard to biomass calculations to prevent this type of error re-occurring in future. The farmer has been given written advice on the requirements for responsible use of veterinary medicines.
Farmed Salmon	Emamectin 150 ug/kg 1801858	N/A	Great Britain	Linked with 1801859 and 1801857. The investigation established that there was an error in the biomass calculation which led to an incorrect split of the medicated feed between the cages being treated and resulted in an overdose. The farm has implemented additional control check points with regard to biomass calculations to prevent this type of error re-occurring in future. The farmer has been given written advice on the requirements for responsible use of veterinary medicines.
Farmed Salmon	Emamectin 170 ug/kg 1801857	N/A	Great Britain	Linked with 1801858 and 1801859. The investigation established that there was an error in the biomass calculation which led to an incorrect split of the medicated feed between the cages being treated and resulted in an overdose. The farm has implemented additional control check points with regard to biomass calculations to prevent this type of error re-occurring in future. The farmer has been given written advice on the requirements for responsible use of veterinary medicines.

GAAIA has asked for a review of the VMD's refusal to name the companies involved. In 2012, GAAIA [revealed](#) other cases of Emamectin contamination of farmed salmon - including:

2012 - Scottish Salmon Company, Lamlash Bay, Isle of Arran, North Ayrshire

2010 - Lakeland Marine, Bagh Dail Nan Cean, Loch Melfort, Argyll & Bute

2009 - Skelda Salmon, Sian Bay in Setter Voe, Shetland

2006 - Scottish Sea Farms, Hoy, Orkney

2005 - Marine Harvest, Loch Shell, Outer Hebrides

Read the FOI documents disclosed by the Scottish Government in 2012 [online here](#) and read more on GAAIA's appeal to the VMD via [Press Release: "Toxic Toilets: Salmon Farms Pollute Scotland's Lochs"](#).

Contact:

Don Staniford: 07771 541826 (dstaniford@gaaia.org)

Notes to Editors:

[1] Download the report - "[Towards Understanding of the Environmental Impact of a Sea Lice Medicine – the PAMP Suite](#)" - in full [online here](#)



SARF098: Towards Understanding of the Environmental Impact of a
Sea Lice Medicine – the PAMP Suite



A REPORT COMMISSIONED BY SARF

The report [includes](#) (p51):

4.3 EMB-associated macrobenthic change

These results indicate that EMB was associated with a major reduction in both the richness and abundance of crustacea and that this effect extended beyond the cage-edge and to the Reference stations.

[Note that EMB is Emamectin benzoate]

And (p52):

Crustacean diversity associated with EMB use per production cycle was highly variable, with an expected reduction of 40% (ranging between 4 and 63%) at the maximum usage rate of 3 kg per production cycle. This pattern was reflected in predicted crustacean abundances; at an average Site and production cycle abundances at Reference stations were predicted to decline by 79%. The relationship with EMB was non-linear, with the rate of change decreasing as the amount of EMB increased (over the range 0 – 3 kg per production cycle). These data indicate that even at low-dose rates, EMB will cause a reduction in crustacean richness and abundance: there was no evidence of a threshold beneath which change did not occur.

And (p52-3):

The patterns of reduction in crustacean richness and abundance, per production cycle, are reflected when crustacean metrics are compared with the total EMB used, per site. Data analysis in this way allows an assessment of the association between long-term EMB use and crustacean metrics. These data suggest that continued use of EMB, over several production cycles, is associated with an ongoing decrease in both crustacean richness and abundance: the models predict that at an average Site, treated with 10 kg of EMB over an extended period (up to 12 years), and under average conditions (current speed, sediment type etc) a reduction in crustacean richness and abundance by 63 – 96% respectively could be expected. These effects are more severe than those observed on the per-production cycle basis, suggesting that crustacean recovery is not complete between production cycles where EMB is used. Long-term chronic effects of EMB have not been properly evaluated but EMB is known to disrupt reproduction in *H. americanus* at very low concentrations (Waddy et al., 2010). The apparent sensitivity of non-target crustacea and the fact that major changes were found at reference stations (which are typically several hundred metres from the farm edge, as supported by the Reference-only analysis) suggests that repeated, large-scale EMB use may adversely affect crustacean populations at the scale of an entire sea-loch. It also indicates that the current recommended distance-to-farm of 'Reference stations' should be re-evaluated.

The Sunday Herald [reported](#) (5 March 2017):

"A major scientific study had found “unexpected” links between “very low” levels emamectin and the loss of crabs, lobsters and other crustaceans, Sepa said. The agency is now reviewing its environmental safety limits for the pesticide to check they provide “adequate environmental protection”.

The study, commissioned by Sepa from the Scottish Aquaculture Research Forum, concluded that the use of emamectin at fish farms “was associated with substantial, wide-scale reductions in both the richness and abundance of non-target crustacea”.

It said that “toxic effects occur at levels much lower than those that are currently detectable”, and suggested that there was no threshold below which emamectin would be harmless.

“The evidence suggests that benthic crustacea may not be adequately protected by the current regulation of emamectin use in Scottish salmon farms,” the study warned.”

More details on PAMP-1 can be found via the Scottish Association of Marine Science [online here](#)

Read more via:

["Big Catch: Toxic chemicals used by salmon farms could be killing off tiny animals that are vital to the marine food chain, scientists warn in a confidential report for the British government leaked to New Scientist"](#) (New Scientist, 27 April 2002)

["Fish farmers 'blocked' vital safety study - Salmon farmers impeded a major government investigation into the environmental damage they cause, according to a secret report obtained by the Sunday Herald"](#) (The Sunday Herald, 28 April 2002)

[2] The following documents ([obtained from SEPA via FOI87330 on 1 March 2017](#)) suggest that SEPA were lobbied successfully by the Scottish Salmon Producers Organisation not to comment publicly in August 2016 on the publication of the [SARF PAMP-2 report](#):

From: [Scott Landsburgh](#)
To: [Ahearn, Terry](#)
Cc: [John Webster](#)
Subject: FW: Confidential - SEPA sea lice article for contributions
Date: 08 August 2016 15:42:27
Attachments: [image001.png](#)

Hi Terry,

I hope you are well. I am forwarding a copy of recent correspondence I have had with Stuart Baird whilst Andy Rosie is on holiday.

The SARF PAMP-2 Report is due to be published on Wednesday and we have been trying to agree a common media position with all parties in order to minimize the controversy as and when it is noticed by the media. I believe that it is in all our interests to deal with such a sensitive subject delicately and proportionately.

I am therefore disappointed that SEPA is proposing to publish a statement of intent with regard to the future use of SLICE in Scotland and to seek to justify that with pieces of information collated to justify a position. The industry has been very concerned with regard to the future use of SLICE and we have been involved in numerous discussions with your colleagues to seek to find a way forward to the mutual benefit of all. At a stroke, a published position like this will become the centre of media attention and will make it difficult for some accommodation in the future.

I would ask you, at this point, to ask your colleagues to reconsider the specific point regarding SLICE in the paper and to engage with us to find a solution for the future use of SLICE which will be acceptable to all.

Regards

Scott

**Scott Landsburgh, Chief Executive,
Scottish Salmon Producers' Organisation**
Durn – Isla Road – Perth PH2 7HG
01738 587000
dslandsburgh@scottishsalmon.co.uk
www.scottishsalmon.co.uk

From: Scott Landsburgh
Sent: 08 August 2016 15:25
To: 'Baird, Stuart' <stuart.baird@sepa.org.uk>
Cc: John Webster <JWebster@scottishsalmon.co.uk>; Julie Edgar

<JEdgar@scottishsalmon.co.uk>
Subject: RE: Confidential - SEPA sea lice article for contributions

Dear Stuart,

Thank you for the proposed SEPA article to be posted on your website. It is a fairly sizeable document and would not be the style (or content) to which SSPO would use when advising the public and the media. It is therefore not possible for us to make a contribution to your article as it would be critical of the stance you have taken on the future of SLICE.

However, I do recognize that you are a regulator and have a different perspective on public comment than we do.

There is some misrepresentation within your paper and pieces of information have been collated to justify a position with which we don't agree. In particular, your statement concerning the fate of SLICE is pre-emptive, controversial and could undermine commercial confidence in the industry.

Should you publish this statement in its current format, I suspect that it will lead to a good deal of media scrutiny which will seek to undermine the industry's reputation and will probably damage all of our reputations. I had hoped on Friday to agree a consensual position based upon mutual respect for all parties and to hold a media line based on openness (without divulging unestablished concerns) and reassurance, along with a professional determination to gain more understanding of the data to enable future decision making.

I still hope that we can issue a common statement to the media that we can all support. I will get something out tomorrow for approval.

Kind regards

Scott

**Scott Landsburgh, Chief Executive,
Scottish Salmon Producers' Organisation**
Durn – Isla Road – Perth PH2 7HG
01738 587000
dslandsburgh@scottishsalmon.co.uk
www.scottishsalmon.co.uk

From: Baird, Stuart [<mailto:stuart.baird@sepa.org.uk>]
Sent: 05 August 2016 17:29

To: Scott Landsburgh <SLandsburgh@scottishsalmon.co.uk>; John Webster
<JWebster@scottishsalmon.co.uk>
Subject: Confidential - SEPA sea lice article for contributions

Dear Scott and John,

as discussed during the teleconference, please find a draft article attached, for your information, which aims to present a balanced view of some of the issues surrounding the control of sea-lice in light of the imminent publication of the SARF PAMP-2 report. We plan to publish the article on SEPA's online magazine 'SEPAView', shortly before the SARF report is published, on Wednesday 10 August.

We would very much like the article to be inclusive and would therefore like to offer SSPO the opportunity to provide a contribution to the article. If you would like to make a contribution to the article then can you please send this to me by the end of the day on Monday 8th August.

Once we have received all contributions we will re-circulate the article for a quick accuracy check before publishing.

Please note that SEPA did not publish any statement criticising the [SARF PAMP-2 report](#) in August 2016.

It appears ([from more emails sourced via FOI on 1 March 2017](#)) that a media position agreed between the SSPO, Veterinary Medicines Directorate and [Merck Sharpe & Dohme \(MSD\) - manufacturers of SLICE \(Emamectin benzoate\)](#) - was either agreed upon by SEPA or SEPA agreed to stay silent (further FOIs filed last week by GAAIA may provide answers to that):

From: [Scott Landsburgh](#)
To: [Ahearn, Terry](#)
Subject: FW: Amended media position
Date: 09 August 2016 15:06:42
Attachments: [image001.png](#)

Terry,

Please see below an agreed (between SSPO, MSD, SAMS) media position to coincide with the publication tomorrow. It would be very helpful if SEPA were also to agree this line.

Kind regards

Scott

**Scott Landsburgh, Chief Executive,
Scottish Salmon Producers' Organisation**
Durn – Isla Road – Perth PH2 7HG
01738 587000
dslandsburgh@scottishsalmon.co.uk
www.scottishsalmon.co.uk

From: Scott Landsburgh
Sent: 09 August 2016 15:00
To: 'chris.beattie@merck.com' <chris.beattie@merck.com>; kenny.black@sams.ac.uk; 'Baird, Stuart' <stuart.baird@sepa.org.uk>
Cc: John Webster <JWebster@scottishsalmon.co.uk>; Julie Edgar <JEdgar@scottishsalmon.co.uk>; RichardSlaski@aol.com
Subject: Amended media position

Dear All,

Further to Kenny's earlier email, please find below the new media position.

I hope that you can confirm that you support this and we will accredit accordingly on our website tomorrow.

“The salmon farming industry, SEPA and research institutions are agreed that sound scientific evidence is the best basis on which to run and develop the industry. A recent study commissioned by SARF and undertaken by SAMS to explore any potential environmental impacts of a sea lice treatment and deficiencies in the data required the use of complex statistical models. The SARF Board and other parties agreed that further research is required to reach a firm

conclusion. This new research proposal will follow soon.

“Meanwhile, the industry continues to invest in new ways to manage sea lice such as cleaner fish and thermolicers

Regards

Scott

Scott Landsburgh, Chief Executive,
Scottish Salmon Producers' Organisation
Durn – Isla Road – Perth PH2 7HG
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www.scottishsalmon.co.uk

Please note that no media statements on the SARF report - "[Towards Understanding of the Environmental Impact of a Sea Lice Medicine – the PAMP Suite](#)" - can be found online anywhere.

[3] The Sunday Herald [reported](#) (5 March 2017):



Crackdown on fish farm pesticides after Sunday Herald investigation

Rob Edwards

The Scottish Environment Protection Agency is cracking down on toxic pollution from fish farms blamed for wiping out wildlife across widespread areas of the seabed.

The government watchdog has begun a review of the discharge licences of 360 fish farms around the coast to restrict the use of a pesticide called emamectin. The chemical is fed to caged salmon to kill sea lice.

Sepa's surprise move follows last week's Sunday Herald revelation that emamectin had contaminated 45 sea lochs in breach of environmental limits since 2006, putting marine wildlife and human health at risk.

A major scientific study had found “unexpected” links between “very low” levels emamectin and the loss of crabs, lobsters and other crustaceans, Sepa said. The agency is now reviewing its environmental safety limits for the pesticide to check they provide “adequate environmental protection”.

The study, commissioned by Sepa from the Scottish Aquaculture Research Forum, concluded that the use of emamectin at fish farms “was associated with substantial, wide-scale reductions in both the richness and abundance of non-target crustacea”.

It said that “toxic effects occur at levels much lower than those that are currently detectable”, and suggested that there was no threshold below which emamectin would be harmless.

“The evidence suggests that benthic crustacea may not be adequately protected by the current regulation of emamectin use in Scottish salmon farms,” the study warned.

Sepa is now reviewing all fish farm licences and “tightening conditions” for the use of emamectin after discussions with the UK government’s Veterinary Medicines Directorate. “We are beginning the issuing of these new licences this week, and this will be completed by the end of April,” Sepa said.

Sepa’s announcement was “welcome but overdue”, according to Dr Richard Luxmoore, the senior nature conservation adviser with The National Trust for Scotland. “It is worrying to see confirmation that these chemicals are having a seriously detrimental effect on marine wildlife over a far wider area than has previously been acknowledged,” he said.

Guy Linley-Adams, from the wild fish campaign group, Salmon and Trout Conservation Scotland, called on Sepa to cut the amount of salmon that could be kept at fish farms. “Sepa should now also scrap any idea of allowing across-the-board increases in permitted biomass. The fundamental problem here is that Scottish Government policy, to expand fish farming at all costs, is way out of step with what the sea lochs can actually support.” The Scottish Government has backed a fish farming industry plan to double production by 2030.

Don Staniford from the Global Alliance Against Industrial Aquaculture described the findings of the scientific study as “shocking”. Fish farmers had been stopped from using another pesticide to kill sea lice, teflubenzuron, in 2015, he said. “Now Sepa must ban the use of emamectin.”

Sepa’s chief executive, Terry A’Hearn, stressed that it was not banning the use of emamectin. “We have not published a new policy on emamectin, but are tightening Sepa licences.”

A Scottish Government spokesman said: “The Scottish Government has a proportionate approach to balance growing aquaculture sustainably and protecting the environment.”

Revealed: how Sepa bowed to industry pressure on fish farm pollution

The Scottish Government's green watchdog suppressed a critical report on pollution after pressure from the fish farming industry, according to internal emails seen by the Sunday Herald.

Sepa bowed to private lobbying from the Scottish Salmon Producers' Organisation (SSPO) not to publish an article in August 2016 highlighting concerns about a fish farm pesticide killing wildlife.

The decision followed SSPO paying for two dinners out for Sepa executives. One at a restaurant in Perth in November 2015 included four senior Sepa staff and fish farm company directors, and the other in April 2016 involved Sepa chief executive Terry A'Hearn.

On August 5 2016 Sepa emailed SSPO with a draft of an article on the use of pesticides to control sea lice.

SSPO chief executive Scott Landsburgh told Sepa: "Should you publish this statement in its current format, I suspect that it will lead to a good deal of media scrutiny which will seek to undermine the industry's reputation and will probably damage all of our reputations."

Landsburgh also emailed Sepa boss A'Hearn saying he was "disappointed" that Sepa was proposing to publish its plans for emamectin. SSPO had been "trying to agree a common media position with all parties in order to minimise the controversy," he said.

No statement on emamectin was published by Sepa in 2016, though it did post online a statement announcing a "tightening" of the pesticide's conditions of use last week. This immediately followed Sepa's release of the emails in response to a freedom of information request by Don Staniford from the Global Alliance Against Industrial Aquaculture.

"It is shameful that Sepa has once again cravenly kowtowed to pressure from the salmon farming industry," alleged Staniford.

SSPO confirmed that Landsburgh had requested A'Hearn not to publish. This was "because the article to be put into the public domain was going to be out of context," said an SSPO spokeswoman.

"The idea that SSPO could influence Sepa executives over a couple of dinners is risible. The dinners were arranged to discuss general environmental policies."

A'Hearn confirmed that four Sepa staff had attended a dinner hosted by SSPO, and that he had attended an SSPO dinner.

"Engagement between Sepa and other organisations, including regulated operators, occasionally includes hospitality, subject to strict rules," A'Hearn said.

“Sepa considers a wide range of views in its decision-making process, but the final decision is always our own, as it was in this case.”

[4] SEPA waited until 1 March 2017 before publishing the following [via SEPA View](#):

Managing fish health

The second major issue arises from the management of fish health, in particular the control of sea lice. These small marine parasites occur naturally on many species of fish, but can become a problem when large numbers of fish are concentrated in fish farms. The most common method for controlling sea lice on farmed fish is the use of a medicine authorised by the Veterinary Medicines Directorate (VMD), either in a bath or in feed. The use of in-feed medicines, and any associated release into the marine environment, is regulated by SEPA, under conditions included in a fish farm licence. SEPA ensures adequate monitoring of dose rates and levels, and any impacts of the medicine on the environment. Where robust evidence shows that current regulatory arrangements are not providing the expected and required level of environmental protection, SEPA takes action to reduce those environmental effects.

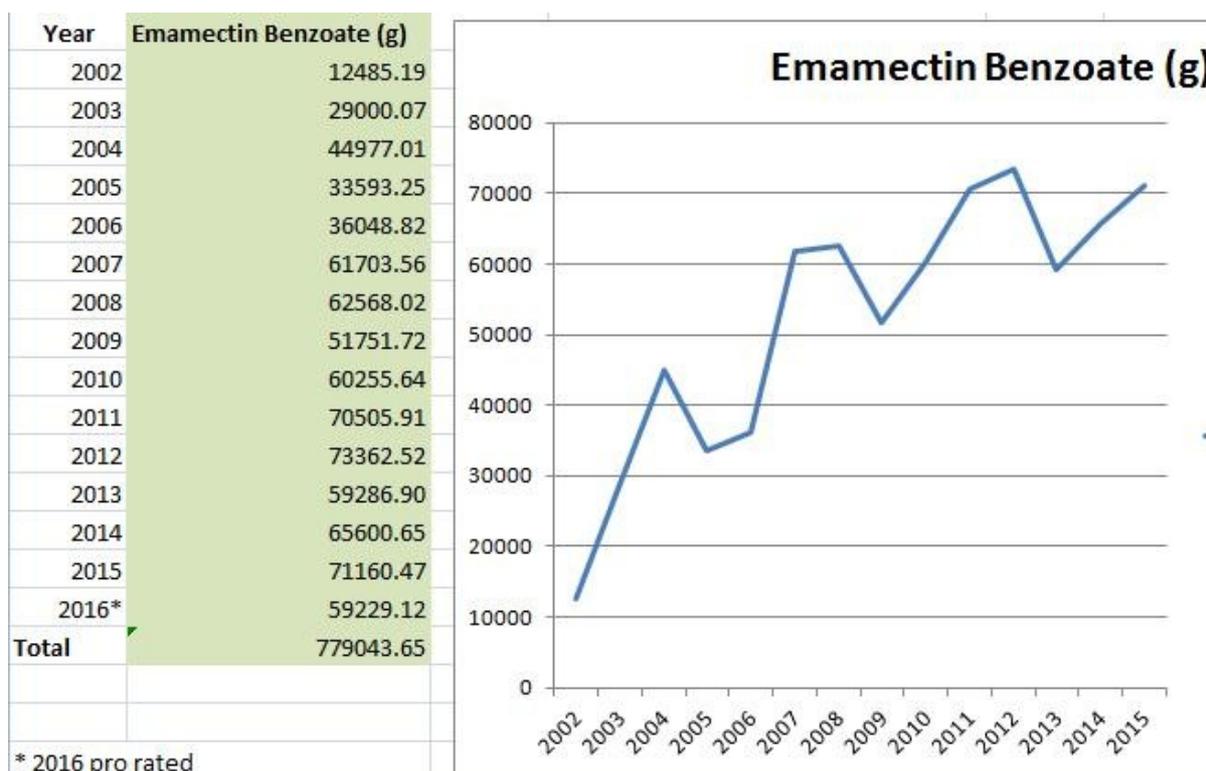
For example, in 2013 evidence convinced us that the ongoing use of the sea louse medicine Calicide (with the active ingredient teflubenzuron) was causing failures in environmental quality standards, despite licence conditions significantly restricting its use. Following discussions between SEPA and the company marketing the product, Calicide was removed from the market in Scotland.

More recently, SEPA proposed and part-funded a Scottish Aquaculture Research Forum (SARF) investigation into the environmental impacts of the sea louse medicine SLICE (with the active ingredient emamectin benzoate). This study, completed last August, confirmed a subtle but detectable, and unexpected, association between impacts on the marine environment and the use of SLICE, where very low concentrations of the medicine may have affected crustaceans in the seabed. Based on this new evidence, SEPA is reviewing all fish farm licences permitting the use of SLICE, tightening conditions for the medicine's use after discussions with VMD. We are beginning the issuing of these new licences this week, and this will be completed by the end of April. This restriction will remain in place while SEPA and the industry carry out further research to either confirm or confound the apparent link between SLICE use and possible environmental effects.

We are also now considering the findings of a review we commissioned of the environmental quality standards for SLICE to ensure they are up to date and provide adequate environmental protection. In this way, the impacts of sea louse medicines are monitored by SEPA on an ongoing basis, and corrective regulatory actions taken where necessary.

As part of our sector approach, we will continue to encourage and support efforts to develop and implement alternative sea louse treatments. For example, novel in-feed medicines are already in use, or undergoing trials, in other countries, but as yet have not been authorised for use in Scotland. Thermal treatment, cleaner-fish which feed on lice, ultrasound, and lasers which target individual lice, are other innovations being developed by the industry as alternatives to medicine-based solutions.

[5] Here's [data on Emamectin benzoate use obtained from SEPA via FOI](#):



Top 20 Uses of Emamectin Benzoate (2002-2016)					
Year	Em benz (g)	Site Name	Operator	Receiving Water	Local Authority
01-Dec-11	1474	Vidlin North	Scottish Sea Farms Ltd	Vidlin Voe	Shetland Islands
01-Jun-04	1313	Scallastle Bay	Scottish Sea Farms Ltd	Sound of Mull	Argyll and Bute
01-Jan-13	1272	Camas an Leim (Torrison)	Marine Harvest (Scotland) Ltd	Loch Torrison	Highland
01-Dec-11	1200	Bellister	Scottish Sea Farms Ltd	Dury Voe	Shetland Islands
01-Dec-03	1190	Binna Ness	Scottish Sea Farms Ltd	Stromness Voe	Shetland Islands
01-May-12	1175	Invasion Bay	Marine Harvest (Scotland) Ltd	Loch Sunart	Highland
01-Mar-11	1088	Ardgour (Linnhe)	Marine Harvest (Scotland) Ltd	Loch Linnhe	Highland
01-Feb-13	1064	Ardgour (Linnhe)	Marine Harvest (Scotland) Ltd	Loch Linnhe	Highland
01-Jun-04	1055	Greshornish	Marine Harvest (Scotland) Ltd	Loch Snizort	Highland
01-Jul-04	1050	Eishort	Marine Harvest (Scotland) Ltd	Loch Eishort	Highland
01-Dec-04	1049	Skipport Outer (Ornish)	Marine Harvest (Scotland) Ltd	Loch Skipport	Eilean Siar
01-Aug-11	1045	Ardgour (Linnhe)	Marine Harvest (Scotland) Ltd	Loch Linnhe	Highland
01-Oct-09	1007	Druimyeon Bay	The Scottish Salmon Company Ltd	Sound of Gigha	Argyll and Bute
01-Nov-11	1001	Maol Ban	Marine Harvest (Scotland) Ltd	Inner Sound	Highland
01-Dec-04	996	Gorsten	Marine Harvest (Scotland) Ltd	Loch Linnhe	Highland
01-Aug-04	978	Duich	Marine Harvest (Scotland) Ltd	Loch Duich	Highland
01-Mar-09	975	Gorsten	Marine Harvest (Scotland) Ltd	Loch Linnhe	Highland
01-Dec-04	975	Ardgour (Linnhe)	Marine Harvest (Scotland) Ltd	Loch Linnhe	Highland
01-Jun-04	969	Skipport Outer (Ornish)	Marine Harvest (Scotland) Ltd	Loch Skipport	Eilean Siar
01-Jun-12	945	Scallastle Bay	Scottish Sea Farms Ltd	Sound of Mull	Argyll and Bute

Online via "[Press Release: Scottish Salmon's Lethal Legacy](#)" (1 January 2017)

[6] Here's [emails between SEPA's Chief Executive Terry A'Hearn and the SSPO's Chief Executive Scott Landsburgh](#):

> On 23 Oct 2015, at 19:17, Ahearn, Terry <terry.ahearn@sepa.org.uk> wrote:
 >
 > Hi Scott,
 >
 > Thanks for your letter of the 2nd of October. Sorry for the delay in replying.
 >
 > I am still very interested in having dinner with a couple of your members, you Paul Tebo and one or two of my colleagues on the evening of Monday the 2nd of November. Would 7.00pm suit you?
 >
 > If you can confirm numbers, I'll book a restaurant and let you know details next week.
 >
 > I've cc'd Cat Cunningham from SEPA's Change Team who is co-ordinating Paul's visit.
 >
 > Looking forward to seeing you.
 >
 > Cheers,
 > Terry.

From: Scott Landsburgh [dslandsburgh@scottishsalmon.co.uk]
Sent: Sunday, October 25, 2015 10:35 AM GMT Standard Time
To: Ahearn, Terry
Subject: Re: Dinner on the 2nd of November

Hi Terry,

Thanks very much for getting back to me. That would be great.
7pm will be fine.

I will have the MDs of Marine Harvest & Scottish Seafarms with me & possibly the MD of the Scottish Salmon Company who will confirm tomorrow .

Happy to cover costs and suggest restaurants etc.

Kind regards

Scott

From: Ahearn, Terry [<mailto:terry.ahearn@sepa.org.uk>]
Sent: 25 October 2015 11:14
To: Scott Landsburgh
Subject: RE: Dinner on the 2nd of November

Scott,

That's great. Very kind of you.

It will be Paul Tebo, Andy Rosie (our North a Regional Manager who I think you know), me and one other SEPA officer (I'll confirm who this week).

Cheers,
Terry.

Here's details ([obtained from SEPA via F0187330](#)) of two 'hospitality dinners' paid by the Scottish Salmon Producers Organisation for SEPA's Chief Executive Terry A'Hearn:

FOI F0187330

Scottish Salmon Producers

Hospitality - Dinner received on 2.11.15 - <£30.00

Hospitality – Dinner received on 22.4.16 - £50.00

[7] Here's a [letter obtained from SEPA via FOI](#):

Mr T A'Hearn
SEPA
Strathallan House
The Castle Business Park
STIRLING
FK9 4TZ



Dear Terry

I was very pleased to take our recent meeting together; I enjoyed the open discussion regarding the salmon industry and the regulation of it. I strongly believe that we can re-invigorate the relationship between Marine Harvest and SEPA and will make this a personal and professional focus for myself and my team.

During our meeting we discussed the number of unsatisfactory benthic conditions around Marine Harvest sites and the urgent need to address this, I can assure you that we have resourced this matter, giving it the highest priority. We would re-iterate our request to be allowed a number of weeks and months to put those mitigation measures in place.

We look forward to working with your local teams and I think it would be useful for you to visit some of our operations on the West Coast. In due course I would like to arrange a date for you to visit our freshwater lochs/recirculation hatcheries and seawater sites.

Yours sincerely

Ben Hadfield
Managing Director

15 JUL 2016
SECRETARIAT

[8] On 26 February 2017, GAAIA published other documents obtained from SEPA via FOI which [revealed](#):

- Marine Harvest is the worst operator with 13 "failing" salmon farms in 2015 (that's 27% of the 49 marine salmon farms it operates)

Data on non-compliances of Emamectin benzoate contamination of sediment under salmon farms included:

2015:

Marine Harvest:

CAR/L/1028518	Marulaig Bay MCFF, Loch Boisdale, South Uist
---------------	--

Marulaig Bay marine cage fish farm is Poor for 2015 due to a cage edge Emamectin Benzoate residue failure and a breach in the stocking density licence condition. SEPA is working with the operator to improve licence compliance and reduce the environmental impact from the farm.

2014:

Marine Harvest:

CAR/L/1009963	Seaforth MCFF, Loch Seaforth, Isle of Harris
---------------	--

The operator exceeded their permitted use of sea louse medicine Emamectin Benzoate (Slice). SEPA is working with the operator to prevent any future recurrence.

2013:

Marine Harvest:

Camas Glas MCFF, Loch Sunart

Late reporting of monitoring data. Exceedence of sediment SLICE EQS.

2012:

Marine Harvest:

CAR/L/1004218	Mid Loch Shell East MCFF, Loch Shell
---------------	--------------------------------------

This site is poor due to an unsatisfactory benthic seabed survey and a far field exceedence was recorded in the slice residual survey.

Read more via "[Failing Fish Farms - 18% rated "poor" by SEPA in 2015](#)"

[9] Here's a letter [from former SEPA biologist Ewan Gillespie \(now working for Marine Harvest\) to SEPA's Chief Executive in August 2016:](#)

Mr T A'Hearn
Chief Executive
SEPA
Strathallan House
Castle Business Park
STIRLING, FK9 4TZ



23 AUG 2016
SECRETARIAT

19 August 2016

Dear Mr A'Hearn,

I would like to take this opportunity to introduce myself to you and to begin an open and constructive dialogue with you and your SEPA colleagues.

I have recently taken up a position with Marine Harvest as their Head of Environment and Regulatory Affairs, based in their Fort William office. I have been given a fairly wide-ranging remit, covering a number of activities, some of which have potential negative impacts upon the environment. For example, one of the important work areas is the need for Marine Harvest to improve its ability to reduce the benthic impact below and around its marine sites and to better meet SEPA's environmental standards. As a company we are committed to reducing our environmental footprint and overall use of finite resources and are investing heavily in technology and systems to achieve this. Another of my more pressing tasks is to prepare the company for the forthcoming change to the way that SEPA operates its licensing regime for marine aquaculture, with the pending launch of the Deposition Zone Regulations (DZR). We are hopeful that this system may be of use to us but at this late point in the process we do not know the detail of how it will work and are having to make some fundamental assumptions in our preparations. We look forward to being able to take part in the formal consultations that will be forthcoming and hope that the final package will have benefits to us.

My own view on regulation is that both regulator and 'regulatee' must work in close co-operation with one another to achieve the aims of the prescribed legislative framework; there is not 'one side or another'. In order to do this we must be able to conduct open and, sometime, frank discussion with each other.

In summary, I look forward to my new role within Marine Harvest and to working constructively with you and your staff.

Yours sincerely

Ewan Gillespie
Head of Environment and Regulatory Affairs

Cc D.Sinclair – Orkney
A.Rosie - Dingwall

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	POSTAL	MAIL ewan.gillespie@marineharvest.com	
		WEB http://marineharvest.com	

[10] Here's a "[Scientific Backgrounder: Ecotoxicity & Chemical Resistance](#)" published by GAAIA on 1 January 2017:

The toxic chemicals used on salmon farms - specifically labelled by chemical manufacturers as "Marine [Pollutants](#)" - were designed for use in terrestrial farming systems to kill pests on land with specific caution that they are "very toxic to aquatic organisms" and hence must not be used near waterways let alone in the sea on salmon farms (read more via "[Silent Spring of the Sea](#)").



The chemicals used on salmon farms target and are designed to kill sea lice parasites which are crustaceans. "Deltamethrin is a potent biocide, which formulated as AlphaMax is designed to kill small crustaceans in the form of sea lice," [admitted SEPA in 2008](#). You therefore do not need to be a rocket scientist to work out that chemicals designed to kill sea lice can also kill lobsters and other shellfish (read more via "[Silent Spring of the Sea](#)"; "[Scottish Salmon's 'Silent Spring of the Sea'](#)"; and "[New Scientific Paper: Salmon Farming Chemical Kills Lobsters!!](#)").



The salmon farming industry's increasing dependence on toxic chemicals has led to drug resistance as well as significant environmental concerns (read more via "[Drug resistance in sea lice: a threat to salmonid aquaculture](#)" published in Trends in Parasitology in 2015; "[Chemical use in salmon aquaculture: a review of current practices and possible environmental effects](#)" published by WWF in 2008 and "[A Review and Assessment of Environmental Risk of Chemicals Used for the Treatment of Sea Lice Infestations of Cultured Salmon](#)" published in [Environmental Effects of Marine Finfish Aquaculture](#) in 2005).

Chemical resistance has been reported since the 1980s when sea lice developed resistance to the organophosphate Dichlorvos and salmon farmers responded by developing more lethal weapons in the 'war on sea lice' (read more via '[Silent Spring of the Sea](#)'). A chemicals 'arms race' has been waged ever since as salmon farmers fight a losing battle against their nemesis - the sea louse (read more via "[Sea lice - a never ending battle](#)"; "[Sea lice resistance to chemotherapeutants](#)" and "[Plague of 'Super-Lice' Threatens Wild Salmon](#)"). Scientific papers reported sea lice resistance to [Azamethiphos](#) in 2004, [Deltamethrin](#) and [Cypermethrin](#) in 2005 and [Emamectin benzoate](#) in 2008.

A scientific paper - "[Repeated sublethal exposures to the sea lice pesticide Salmosan® \(azamethiphos\) on adult male lobsters \(Homarus americanus\) causes neuromuscular dysfunction, hypoxia, metabolic disturbances and mortality](#)" - published in Ecotoxicology and Environmental Safety in December 2016 adds to the weight of scientific evidence detailing lethal and sub-lethal impacts of Azamethiphos on lobsters and in mussels (read more via "[Sublethal impact of short term exposure to the organophosphate pesticide azamethiphos in the marine mollusc Mytilus edulis](#)" published in Marine Pollution Bulletin in 2006; "[Seasonal lethality of the organophosphate pesticide, azamethiphos to female American lobster](#)" published in Ecotoxicology and Environmental Safety in 2005; "[The lethality of](#)

[Salmosan \(Azamethiphos\) to American lobster \(*Homarus americanus*\) larvae, postlarvae, and adults](#)" published in Ecotoxicology and Environmental Safety in 1999; and "[The effects of cypermethrin \(Excis\) and azamethiphos \(Salmosan\) on lobster *Homarus americanus* H. Milne Edwards larvae in a laboratory study](#)" published in Aquaculture Research in 1999).

Resistance to Azamethiphos has been reported for over a decade (read more via "[Mechanism behind Resistance against the Organophosphate Azamethiphos in Salmon Lice \(*Lepeophtheirus salmonis*\)](#)" published in PLoS One in 2015; "[Evidence for occurrence of an organophosphate-resistant type of acetylcholinesterase in strains of sea lice \(*Lepeophtheirus salmonis* Krøyer\)](#)" published in Pest Management Science in 2004; and "[Analysis and management of resistance to chemotherapeutants in salmon lice, *Lepeophtheirus salmonis* \(Copepoda: Caligidae\)](#)" published in Pest Management Science in 2002).

Emamectin benzoate use is increasing (up from 34 kg in 2005 to 71 kg in 2015) and not surprisingly the scientific community is reporting resistance issues (read more via "[Transcriptomic responses to emamectin benzoate in Pacific and Atlantic Canada salmon lice *Lepeophtheirus salmonis* with differing levels of drug resistance](#)" published in Evolutionary Applications in 2015; "[Emamectin benzoate resistance and fitness in laboratory reared salmon lice \(*Lepeophtheirus salmonis*\)](#)" published in Aquaculture in 2013; and "[The Efficacy of Emamectin Benzoate against Infestations of *Lepeophtheirus salmonis* on Farmed Atlantic Salmon \(*Salmo salar* L\) in Scotland, 2002–2006](#)" published in PLoS One in 2008).

The ecological impacts of Emamectin benzoate have long been recognized by the scientific community (read more via "[Joint Action Effects of Emamectin Benzoate and Cypermethrin on the Marine Copepod *Tigriopus californicus*](#)" published in Ursidae in 2016; "[Toxic Effects of Antiparasitic Pesticides Used by the Salmon Industry in the Marine Amphipod *Monocorophium insidiosum*](#)" published in Archives of Environmental Contamination and Toxicology in 2014; "[Effect of emamectin benzoate on the molt cycle of ovigerous American lobsters *Homarus americanus* is influenced by the dosing regimen](#)" published in Aquatic Biology in 2010; "[Chemical use in salmon aquaculture: A review of current practices and possible environmental effects](#)" published in Aquaculture in 2010; "[Environmental effects of the anti-sea lice \(Copepoda: Caligidae\) therapeutant emamectin benzoate under commercial use conditions in the marine environment](#)" published in Aquaculture in 2006; "[Relationship between dose of emamectin benzoate and molting response of ovigerous American lobsters \(*Homarus americanus*\)](#)" published in Ecotoxicology and Environmental Safety in 2007; "[Acute toxicity of emamectin benzoate \(SLICE™\) in fish feed to American lobster, *Homarus americanus*](#)" published in Aquaculture Research in 2004; and "[Toxicity of emamectin benzoate in commercial fish feed to adults of the spot prawn and dungeness crab](#)" published in OCEANS 2003).

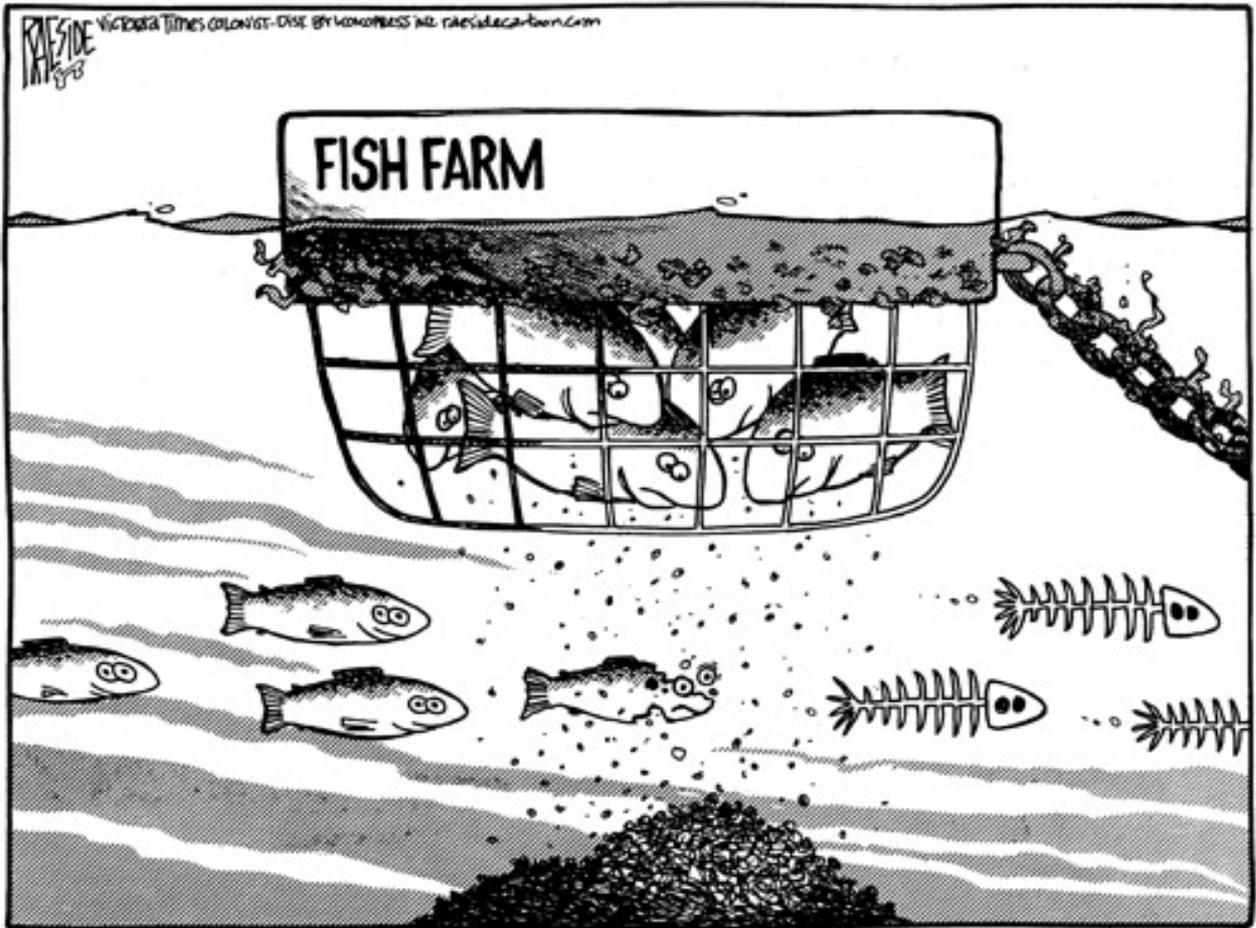
Whilst the use of Cypermethrin ceased in 2012 (due to resistance issues) the use of Deltamethrin has taken over but there are now resistance concerns to both Deltamethrin and Azamethiphos (read more via: "[Surveillance of the Sensitivity towards Antiparasitic Bath-Treatments in the Salmon Louse \(*Lepeophtheirus salmonis*\)](#)" published in PLoS One in 2016; "[Mechanism behind Resistance against the Organophosphate Azamethiphos in Salmon Lice \(*Lepeophtheirus salmonis*\)](#)" published in PLoS One in 2015; and "[Determination of reduced sensitivity in sea lice \(*Lepeophtheirus salmonis* Krøyer\) against the pyrethroid deltamethrin using bioassays and probit modelling](#)" published in Aquaculture in 2003).

Scientific research has reported that Cypermethrin can impact on the reproductive functions of wild salmon as well as impacts on shellfish (read more via "[The effects of a synthetic pyrethroid pesticide on some aspects of reproduction in Atlantic salmon](#)" published in Aquatic Toxicology in 2001; "[Cypermethrin induces glutathione S-transferase activity in the shore crab](#)") published in Marine Environmental Research in 2002; "[Effects of cypermethrin on marine plankton communities: a simulated field study using mesocosms](#)" published in Ecotoxicology and Environmental Safety in 2004; "[Toxicity of the aquaculture pesticide cypermethrin to planktonic marine copepods](#)" published in Aquaculture Research in 2004).

The use of Deltamethrin has also caused concerns regarding ecosystem impacts on non-target species such as shellfish (read more via "[Dispersion and toxicity to non-target crustaceans of azamethiphos and deltamethrin after sea lice treatments on farmed salmon, *Salmo salar*](#)" published in Aquaculture in 2014; and "[Toxic Effects of Antiparasitic Pesticides Used by the Salmon Industry in the Marine Amphipod *Monocorophium insidiosum*](#)" published in *Archives of Environmental Contamination and Toxicology* in 2014).

The use of Teflubenzuron ceased in 2014 due to scientific concerns regarding lethal and sub-lethal impacts on lobsters (read more via "[Transcriptional responses to teflubenzuron exposure in European lobster](#)" published in Aquatic Toxicology in 2015 and "[Mortality and deformities in European lobster juveniles exposed to the anti-parasitic drug teflubenzuron](#)" published in Aquatic Toxicology in 2014) and negative media coverage on Teflubenzuron persistency in sediments (read more via "[Fish company investigated after salmon farm pollutes Scottish loch](#)" published in The Guardian in 2013; "[Pesticides from salmon farms poison Scotland's lochs](#)" published in The Sunday Herald in 2013; "['Dynamite' report reveals fish pollution](#)" published in The Sunday Herald in 2001 and "[Shellfish at risk from sea louse 'cure'](#)" published in The Sunday Herald in 2000).

In 2015 Teflubenzuron was withdrawn from the market "after scientists found that that it can leak into lochs and kill crabs, shrimps and lobsters" (read "[Salmon farm drug that kills wildlife to be withdrawn from market](#)" and "[The drug that's meant to save Salmon but is killing the creatures on the Ocean floor](#)" published in The Sunday Herald in 2015). "SEPA should now ban all the other toxic chemicals used on salmon farms which kill shellfish," said Don Staniford of GAAIA in [The Sunday Herald](#). "Teflubenzuron is just one of the lethal cocktail of chemicals used by Scotland's toxic salmon farming industry".



Read more background on the environmental and public health impacts of chemical use in salmon farming via "[Silent Spring of the Sea](#)" (a chapter in the award-winning book '[A Stain Upon the Sea](#)').

Online via "[Press Release: Scottish Salmon's Lethal Legacy](#)" (1 January 2017)