

PS/ Cabinet Secretary

## **Sea Lice Management and Impacts on Wild Salmonids**

### **Purpose**

1. To provide background to the recent press release by Salmon and Trout Conservation Scotland (S&TCS).

### **Background**

2. Sea lice are parasites which are ubiquitous in the marine environment. Numbers of sea lice are elevated on salmon farms due to the increased numbers of hosts in the environment. Sea lice transfer from farmed fish to wild fish and vice versa.

3. S&TCS focus on the conservation of wild salmon and trout and have consistently campaigned on the negative impacts of aquaculture on wild salmonids. They blame aquaculture for (they suggest) a larger decline in wild salmonids on the west coast compared to east coast rivers. Their arguments are mostly one-sided and there is a lack of rational debate on the subject, with full closed containment salmon farming (on-land) being their only goal. The S&TCS also lodged a public petition (PE01598) at the Scottish Parliament in February 2016 in relation to protecting wild salmonids from sea lice from Scottish salmon farms.

4. No evidence yet exists on the scale of any impacts of lice on wild populations of salmon or sea trout for Scotland. However, studies carried out in Norway and Ireland suggest increased returns of wild salmon and sea trout which have been treated with anti-sea lice medicines.

5. Marine Scotland Science has recently commenced a long term project to address this data gap for Scotland. It will complement another project currently being undertaken by the Scottish Aquaculture Research Forum (SARF), looking at the scale of sea lice impact on numbers of wild salmon returning to spawn.

6. Sea lice management in aquaculture is regulated by the Aquaculture and Fisheries Act 2007 and the Aquaculture and Fisheries Act 2013. Marine Scotland's fish health inspectorate operate a risk ranked enhanced sea lice inspection regime, and fully investigate sea lice control practices against legislation on all registered fish farms. However, this legislation relates to farmed fish and does not consider any impacts on wild fish.

7. In addition to the regulatory regime, the majority of the industry are signed up to the voluntary Code of Good Practice for Scottish Finfish Aquaculture (CoGP) which represents a standard against which farms are independently audited. The CoGP includes a National Treatment Strategy for sea lice and Integrated Sea Lice Management plans which are also currently being reviewed and updated.

8. Sea lice figures are published by the Scottish Salmon Producers Organisation on a quarterly basis by region. They provide information for 30 regions of the north-west coast, western and northern isles. The reporting regions broadly mirror those for the wild salmon and sea trout fisheries. The sea lice numbers reported are average adult female lice count per fish for each reporting region.

9. It is the aim of both the Scottish Government and the Scottish aquaculture industry to reduce interactions of aquaculture with wild fish - managing on site sea lice to the lowest achievable level.

10. Scottish Government have, over the last year worked cooperatively with the aquaculture industry to agree a new sea lice management policy, including a redefining of “satisfactory measures” for the prevention, reduction and control of sea lice on farms as required by the Aquaculture and Fisheries (Scotland) Act 2007. This includes agreed reporting levels and increased monitoring and intervention. It also includes a backstop limit at which point enforcement action will be taken. The new policy was introduced at the end of May.

11. We believe that this new policy will result in improvements to the management of sea lice by the aquaculture industry in Scotland, however this will take time. We are working with industry to address this issue including investing significantly in biological management techniques such as cleaner fish and trialling other new technologies. Work is being supported by the latest research particularly in relation to area management and dispersal modelling.

12. There is the option to regulate further and potentially introduce legislative sea lice limits, however given the willingness of the industry to cooperate with the improved policy we would advise that this is given the opportunity to take effect and that the results are evaluated in due course (following at least one production cycle of fish which is 24 months).

13. Scottish Government has taken considerable steps to protect wild salmonids and continues to do so. The majority of aquaculture production is based in the North West Highlands and Islands. There is a presumption against development of marine finfish farms on the north and east coasts - where Scotland’s largest salmon river catchments drain into the North Sea - as a precautionary measure to safeguard migratory fish species (about 80% of Scotland’s wild caught salmon).

14. The S&TCS formed part of a group of NGOs who took part in the recent special session on aquaculture at the North Atlantic Salmon Conservation Organisation (NASCO) meeting in Germany last week. Concerns were raised during a heated and typically one-sided debate about the regulation of sea lice and the aquaculture industry in Scotland with the final aim being land based, closed containment of salmon aquaculture. The option of land-based production of salmon has been fully explored and is not currently commercially viable.

### **Conclusion / Recommendation**

15. The Cabinet Secretary should note the above background information and attached lines to take in response to the recent press release.

██████████ Marine Scotland; Aquaculture Unit

## **Aquaculture – Hot topic - Sea lice management and impacts on wild fish**

### **Top lines**

- **Scotland has a robust legislative and regulatory framework in place which continues to provide the right balance between growing aquaculture and protecting the environment.**
- **The Scottish Government takes considerable steps to protect wild salmon, including a presumption against development of marine finfish farm developments on the north and east coasts which covers approximately 80 per cent of Scotland's wild caught salmon. There are also a number of Special Areas of Conservation (SAC) where wild salmon are afforded additional protection.**
- **The Scottish Government recognises that sea lice management presents a major challenge which is why we have invested significantly in science, research and innovation to enhance the environmental sustainability of the sector and address the knowledge gap in relation to the scale of any impact of sea lice on wild populations of salmonids in Scotland.**
- **Over the last year The Scottish Government has worked cooperatively with the aquaculture industry to agree a new sea lice management policy, including a redefining of “satisfactory measures” for the prevention, reduction and control of sea lice on farms as required by the Aquaculture and Fisheries (Scotland) Act 2007. This includes agreed reporting levels and increased monitoring and intervention. It also includes a backstop limit at which point enforcement action will be taken. The new policy was introduced at the end of May.**
- **We believe that this new policy will result in improvements to the management of sea lice by the aquaculture industry in Scotland, however this will take time. We are working with industry to address this issue including investing significantly in biological management techniques such as cleaner fish and trialling other new technologies. Work is being supported by the latest research particularly in relation to area management and dispersal modelling.**

### **Background**

- **Sea lice are parasites which are ubiquitous in the marine environment. Numbers of sea lice are elevated on salmon farms due to the increased numbers of hosts in the environment. Sea lice transfer from farmed fish to wild fish and vice versa.**
- **Management of sea lice on farms is the key challenge for the aquaculture industry both in Scotland and in other aquaculture producing nations such as Norway and Canada. If not managed satisfactorily then sea lice could limit the future expansion of the industry.**
- **Definitive evidence of the impacts of sea lice on wild salmon in Scotland is lacking – that is why the Scottish Government is supporting significant 3rd party research on this issue.**
- **Scottish Government is working with Scotland's salmon farming industry and representatives of the wild salmon sector on a strategic programme of research that includes a study to explore any impacts of sea lice from fish farming in Scotland; as well as funding research to develop shelf and sea lice dispersal modelling.**
- **The Scottish Government and industry have also match funded up to £22 million to establish the Scottish Aquaculture Innovation Centre (SAIC) which will help the sector improve its environmental performance and growth potential through the application of high quality research, with sea lice a priority.**

## **Salmon & Trout Conservation Scotland (S&TCS) Campaign**

- **Aware the Salmon & Trout Conservation Scotland recently lodged a complaint with the EU relating to a perceived failure of the Scottish Government to comply with the Marine Strategy Framework Directive in respect of sea-lice control on fish farms – we do not believe that this complaint has merit but we await a response from the Commission.**

### **Background**

- S&TCS focus on the conservation of wild salmon and trout and have consistently campaigned on the negative impacts of aquaculture on wild salmonids. Their primary focus is on negative impacts of sea lice from salmon farms on wild salmonids - blaming this for (they suggest) a larger decline in wild salmonids on the west coast compared to east coast rivers.
- The S&TCS lodged a public petition (PE01598) at the Scottish Parliament in February 2016 in relation to Protecting wild salmonids from sea lice from Scottish salmon farms. They have also recently lodged a complaint with the EU relating to a perceived failure of the Scottish Government to comply with the Marine Strategy Framework Directive in respect of sea-lice control on fish farms.
- The S&TCS formed part of a group of NGOs who took part in the recent special session on aquaculture at the North Atlantic Salmon Conservation Organisation (NASCO) meeting in Germany recently, following which a press release was issued drawing negative comparisons between legislative controls in Scotland when compared to other aquaculture producing countries.
- The S&TCS ultimate goal is land based, full closed containment of salmon aquaculture. The option of land-based production of salmon has been fully explored and is not currently commercially viable.

### **Calls for Site Level Reporting of Sea Lice**

- **The SG recently reviewed the public reporting of sea lice data (currently reported for 30 regions across Scotland) and concluded that it was fit for purpose and at an appropriate level for public awareness. This was publicly reported to the RACCE committee.**

### **Background**

- The Conservative manifesto included “We also support a safe expansion of aquaculture but with a significantly more robust, open data, site-level reporting of sea lice levels”. The S&TCS have also called for this.
- It is important to distinguish between the public reporting of sea lice levels and the use of site-level data to inform compliance regimes. The aquaculture industry have strong concerns relating to commercial confidentiality and operational sensitivities.
- There is a minor but vocal anti aquaculture lobby in Scotland. If site-level reporting of sea lice levels is made public, there would be increased focus on the performance of individual sites and potential targeting of anti-fish farming lobby activities. The information could be used in order to call for the removal of sites which report high sea lice levels, putting pressure on local authorities and other regulators, and possible loss of production in the short term.

**From:** [REDACTED]  
**Sent:** 25 November 2016 14:24  
**To:** [REDACTED]  
**Subject:** FW: submission - sea lice public reporting

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**From:** [REDACTED]  
**Sent:** 04 March 2016 15:27  
**To:** Minister for Environment, Climate Change and Land Reform  
**Cc:** Cabinet Secretary for Rural Affairs, Food and Environment; Permanent Secretary; DG Enterprise, Environment & Innovation; Director of Marine Scotland Mailbox; Cowan WJ (Willie); Moffat C (Colin) (MARLAB); Mitchell A (Alastair); [REDACTED]; Gibbons J (Jeff); Raynard R (Rob) (MARLAB); Allan C (Charles) (MARLAB); [REDACTED]; [REDACTED] Communications Greener; [REDACTED]  
**Subject:** submission - sea lice public reporting



Sea Lice Reporting 2016-2017: Letter PWS  
Sea Lice Reporting 2016-2017: Letter PWS  
Sea Lice Reporting 2016-2017: Annex A  
Sea Lice Reporting 2016-2017: Annex B

Please find attached a submission and annexes detailing the public reporting of sea lice figures, and a commitment to review whether the system is operating as expected, during this parliamentary term.

Happy to discuss further if required.

Best Regards,  
[REDACTED]

[REDACTED]  
Head of Aquaculture Health and Welfare  
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Aquaculture Europe - Edinburgh  
Food For Thought  
20-23 September 2016  
<http://www.gov.scot/Resource/0043/00433571.pdf>

04 March 2016

Minister for Environment, Climate Change and Land Reform

## **PUBLIC REPORTING OF SEA LICE FIGURES**

### **Purpose**

To offer the Minister advice in relation to a commitment made during the passage of the now Aquaculture and Fisheries Act 2013 to keep the public reporting system for sea lice data, managed by the Scottish Salmon Producers Organisation on behalf of the salmon farming sector, under review during this Parliamentary session.

### **Priority**

Routine

### **Background**

The industry fish health management reports began quarterly publication (in arrears) at the beginning of 2013, providing information for 30 regions in the aquaculture-producing zone. These regions broadly mirror those for wild fishery catch data and represent a considerable enhancement in granularity from the previous 6 reporting areas model. This followed intense negotiations in the margins of the Aquaculture and Fisheries Bill. Over and above average sea lice counts, the reports also include information on Farm Management Areas, stocking, fallowing, and strategic treatments.

During the passage of the Aquaculture and Fisheries Act 2013, the RACCE committee questioned why the new sea lice public reporting regime did not go further – to farm-level on a weekly basis.

The then Minister for the Environment, Paul Wheelhouse wrote to the RACCE committee (Annex A) to reassure them that the proposed sea lice reporting system was proportionate and fit for purpose, mindful of and balanced against commercial considerations for the farmers. He did, though, commit to keeping the new arrangements under review during this parliamentary term:

“As I said at Committee I am committed to keep the new publication arrangements under review, in the current session of Parliament, and retain powers to legislate on data release if these voluntary arrangements are not operating as expected.”

## **Current Situation**

**It is important to distinguish between the compliance function relating to sea lice carried out by Marine Scotland's Fish Health Inspectorate and the public reporting arrangements which Mr Wheelhouse committed to keep under review.** The question here is whether the agreed publication arrangements continue to operate as expected.

There have been 12 quarterly reports published, and Marine Scotland receive an embargoed copy of the fish health management report during the few days prior to the publication. This allows Marine Scotland Science to analyse the complete sea lice data set and combine it with previous figures to produce trends and provide summary. This information is also submitted to the Minister prior to wider publication to prepare for any media interest.

**For the wider public,** the report provides access to comprehensive sea lice data, as well as other fish health management information, in a user-friendly format. The publication of the fish health management reports have been widely welcomed. Environmental NGOs and representatives of the wild salmon sector are interested in the sea lice levels on fish farms because of the potential impacts on migrating salmon and populations of sea trout. Interest in the reports varies but tends to be led where particular focus is drawn to local issues where, for example, high levels of sea lice have been identified to which their attention has been drawn.

Since the new reporting arrangements began, only the Salmon and Trout Conservation Society (S&TCS) - previously the Salmon & Trout Association - have called for the reports to be further disaggregated to an individual farm level. This is part of a concerted campaign against salmon farming in areas of interaction with wild salmon. Most recently, their call for greater granularity has been backed by the Trout & Salmon magazine but hasn't registered in the wider media or with other environmental NGOs.

**Similarly, for many key stakeholders, the reports offer a supplement to existing or planned interaction at a local level.** Many fish farm operators maintain a very good working relationship with wild fish interests in their area, informing them of any particular fish health issues often related to sea lice information. However, there are a number of areas where this relationship is difficult and the wild fish interests may rely on the public reporting system for their analysis of the sea lice situation. We believe the solution here is to promote improved joint working and we, alongside Crown Estate, are driving improved local relations through our interaction working group pilots.

## **Broader considerations**

**For FHI compliance, the quarterly reports add to the existing range of data available for the management of sea lice on farms.** Proposed improvements to

our sea lice policy and compliance regimes, as highlighted in the recent submission of 16<sup>th</sup> November, will result in better and more proactive use of sea lice information to ensure effective compliance with legislation. This will include an agreed reporting level to FHI for sea lice similar to the mortality and escapes reporting which have previously been agreed with industry and have proven extremely useful in highlighting to inspectors cases which require intervention and/ or further investigation. This will sit alongside an anticipated proposal from industry which is expected to include best practice changes to industry's Code of Good Practice and Integrated Sea Lice Management (ISLM) strategy as well as increased reporting to Marine Scotland.

### **Media Handling/ Risk**

Industry, NGOs and wild fish interests are aware of the commitment to keep under review the sea lice reporting publication arrangements. The S&TCS may accuse Ministers of ignoring demands for more granular public reporting of sea lice. The Minister is also aware of the public petition which was launched recently by the S&TCS in relation to the impacts of salmon farming on wild fish.

We do not anticipate a requirement for any press release. Appropriate lines will be provided to Greener Comms for any media handling.

### **Conclusion**

The publication arrangements are operating well and as expected. They have been generally welcomed, there is little public demand for further granularity, and the publication of the reports has proven to be a useful tool in highlighting the sea lice position around our aquaculture coast, identifying any areas of concern, and driving positive behaviours to improve performance. As such, there is no convincing case for change at this time.

### **Recommendation**

**That the Minister maintains the status quo and writes in those terms to the RACCE committee. A draft letter is attached at Annex B.**

  
Aquaculture Health and Welfare Team  
Marine Scotland

04<sup>th</sup> March 2016

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constit Interest	General Awareness
Cabinet Secretary for Rural Affairs, Food and the Environment			X		

DG Enterprise, Environment and Innovation  
 Linda Rosborough, Director, Marine Scotland  
 Willie Cowan, MS: Head of Performance and Aquaculture  
 Colin Moffat, Director Marine Scotland Science  
 Alastair Mitchell, MS: Aquaculture Unit  
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 [REDACTED]  
 [REDACTED]  
 Jeff Gibbons, MS: Salmon and Recreational Fisheries  
 Rob Raynard, MSS: Head of AAAH  
 Charles Allan, MSS: Head of Fish Health Inspectorate  
 [REDACTED]  
 [REDACTED]

Minister for Environment, Climate Change and Land Reform

Aileen McLeod MSP

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The Scottish  
Government  
Riaghaltas na h-Alba

Rob Gibson

Convener

Rural Affairs, Climate Change and Environment Committee

The Scottish Parliament

Edinburgh

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LEGACY 2014  
XX COMMONWEALTH GAMES  
SCOTLAND

E-mail: [racce.committee@scottish.parliament.uk](mailto:racce.committee@scottish.parliament.uk)

Our ref:

xx March 2016

Dear Rob,

Following the introduction of the Aquaculture and Fisheries (Scotland) Act 2013, the then Minister for Environment and Climate Change, Paul Wheelhouse wrote to the RACCE committee concerning sea lice issues raised during consideration of the Act by Parliament.

Mr Wheelhouse committed to keep the new voluntary publication arrangements for sea lice data under review during the current Parliamentary session, noting powers to legislate for data release could be used if the voluntary arrangements agreed with the salmon farming sector were not operating as expected.

There have now been 3 years of quarterly reports published by the Scottish Salmon Producers Organisation (SSPO), beginning in March 2013. The reports provide the public with access to comprehensive sea lice data for 30 areas, as well as other fish health management information, in a user-friendly format.

The publication of the fish health management reports has been generally welcomed as proportionate and helpful, providing an appropriate level of granularity for public consumption. There have been no calls for any change to this system with the exception of the Salmon and Trout Conservation Scotland (S&TCS) who recently called again for the reports to be further disaggregated to an individual farm level. I have considered their view but concluded that publication of these reports is operating as anticipated, as a public tool to highlight the sea lice position around our aquaculture coast, identifying any areas of concern, and helping to drive positive behaviours to improve performance. When also seen in terms of the 2 year marine production cycle of farmed salmon, the system is still in its relatively early stages. As such, I believe there is no convincing case for change at this time and the voluntary sea lice reporting system should continue as currently.





Ministear airson na h-Àrainneachd agus Atharrachadh Aimsir  
Minister for Environment and Climate Change  
Paul Wheelhouse BPA/MSP

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Rob Gibson MSP  
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17 December 2013

Dear Rob

Thank you for your letter of 27 November 2013 seeking an update on sea lice issues.

As you rightly point out the issue of reporting sea lice data was discussed at length during the progress of the Aquaculture and Fisheries (Scotland) Act 2013 through Scottish Parliament.

The Scottish Government received a commitment from the Scottish Salmon Producers' Organisation (SSPO) for enhanced voluntary reporting of sea lice data for 30 areas based on recognised wild fish catchments. There have now been three quarterly reports published by the SSPO. Scottish Government supports these voluntary Management Reports and regards them as balanced, proportionate and helpful as regards public transparency. In addition, the SSPO agreed that they would provide Marine Scotland Science with access to sea lice information at farm management area level to support defined research projects.

The voluntary sea lice public reporting approach should be seen as part of an overall package that allows us to ensure the environmental sustainability of fish farms. It is not the means by which compliance is judged, rather, there is a robust regulatory system - which the Aquaculture and Fisheries (Scotland) Act 2013 enhances - overseen by the fish health inspectorate, SEPA and others. The requirement for all operators to enter into Farm Management Agreements or Statements set out arrangements for managing fish health and parasites. In addition, fish health inspectors may access farm-level data and inspect fish cages during their inspections. Over time the voluntary reporting will begin to indicate trends and will provide a mechanism that facilitates improved performance where report outputs can be fed into the process of reviewing farm management agreements and statements.

Scotland's aquaculture stocks are internationally recognised as having a high health status, maintained by a regular inspection programme that includes the evaluation of mortality and sea lice numbers by Marine Scotland's Fish Health Inspectorate. The Inspectorate maintains a programme of basic and enhanced inspections with respect to sea lice. Where it is considered that the health of the farmed fish and/or their welfare has been compromised

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appropriate action will be taken, that may include the requirement to withdraw the stocks affected.

Where elevated sea lice levels have been reported operators have been working towards enhancing their on-farm sea lice management in several ways, including: the revision of stocking strategies to synchronise production and fallowing periods; the use of larger pens facilitating increased synchronicity of on-farm treatment; the use of cleanerfish to act as biological controls for sea lice, and independent veterinarian assessment of measures in place to effectively manage sea lice on-farm.

As I said at Committee I am committed to keep the new publication arrangements under review, in the current session of Parliament, and retain powers to legislate on data release if these voluntary arrangements are not operating as expected.

Scottish Government is working with Scotland's Atlantic salmon farming industry on a strategic programme of research that includes a study to explore any impacts of sea lice from fish farming in Scotland. Marine Scotland also directly carry-out and fund work towards developing a better understanding of the potential impacts of sea lice that includes sweep netting surveys of sea trout, for levels of sea lice, and projects to better evaluate management options as part of its ongoing day-to-day work. Scottish Government consider carefully all research on the impact of sea lice on wild salmon in the wider marine environment and will also continue to consider any evidence of an impact on wild fish stocks from fish farms.

With respect to increased access to aquaculture information Scotland now has an aquaculture database <http://aquaculture.scotland.gov.uk>. This web-based resource provides detailed information on fish farms from datasets held by Marine Scotland, the Food Standards Agency (Scotland), The Crown Estate and SEPA. Also, Marine Scotland's Fish Health Inspectorate has a new Publication Plan which will publish the latest routine FHI fish farm Inspection reports on a quarterly basis. This new and proactive publication approach, particularly when considered alongside the recent launch of the Aquaculture Website, further demonstrates a continued move towards openness and transparency which should be seen as a further positive step forward.

In relation to your comments made on the "tit-for tat" exchanges between the fish farming and wild salmon industries I have established an Interactions Working Group that sits, as one of seven groups, within the Ministerial Group for Sustainable Aquaculture (MGSA). The Interactions group has seen positive engagement between both the farmed and wild fisheries interests.

I hope this clarifies the progress already made and the work being undertaken by the Scottish Government on sea lice issues that were raised during the Aquaculture and Fisheries (Scotland) Act 2013's Parliamentary consideration.

I am happy to discuss further.

Kindest regards

**PAUL WHEELHOUSE**

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[REDACTED]

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**From:** [REDACTED]  
**Sent:** 24 November 2016 16:04  
**To:** [REDACTED]  
**Subject:** FW: line for clearance - Herald - sea lice

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**From:** [REDACTED] **On Behalf Of** Cabinet Secretary for Rural Affairs, Food and Environment  
**Sent:** 11 May 2016 13:58  
**To:** [REDACTED] Cabinet Secretary for Rural Affairs, Food and Environment  
**Cc:** Mitchell A (Alastair); [REDACTED] Cowan WJ (Willie); Gibbons J (Jeff); [REDACTED]  
[REDACTED] Communications Greener; [REDACTED]  
**Subject:** RE: line for clearance - Herald - sea lice

Hi [REDACTED]

Thanks – Mr Lochhead is content to clear.

Thanks,

[REDACTED]  
Deputy Private Secretary to Richard Lochhead MSP | Cabinet Secretary for Rural Affairs, Food & Environment |  
Scottish Government | 2N:08, St Andrew's House, Regent Road, Edinburgh, EH1 3DG | Tel: +44(0)131 244 7327 |  
[REDACTED] | [cabsecrafe@gov.scot](mailto:cabsecrafe@gov.scot)

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**From:** Maguire S (Sheena)  
**Sent:** 11 May 2016 13:48  
**To:** Cabinet Secretary for Rural Affairs, Food and Environment  
**Cc:** Mitchell A (Alastair); [REDACTED] Cowan WJ (Willie); Gibbons J (Jeff); [REDACTED]  
[REDACTED] Communications Greener; [REDACTED]  
**Subject:** line for clearance - Herald - sea lice

[REDACTED]

The Herald has been in touch asking for a comment on the news release below from the Salmon and Trout Conservation stating they plan to make a formal complaint to European Commission on Scottish Government's failure to address the impacts of sea lice parasites produced by Scottish salmon farms threatening west coast wild salmon and sea trout.

Having worked with policy colleagues – we suggest the following response.

Grateful if Mr Lochhead can consider by 3pm to meet the journalists deadline.

Thanks,  
[REDACTED]

Scottish Government spokesperson said:

“The Salmon & Trout Conservation Scotland informed Scottish Government at a meeting earlier this week of their intention to submit a formal complaint to the European Commission about sea lice management in Scotland”

“Scotland has a robust legislative and regulatory framework in place which continues to provide the right balance between growing aquaculture and protecting the environment. The Scottish Government acknowledges that sea lice management presents a challenge for the aquaculture industry which is why we have invested significantly in science, research and innovation to enhance the environmental sustainability of the sector.

“We will continue to work with industry to address this issue, including investing significantly in biological management techniques such as the use of cleaner fish as well as trialling other new technologies. Work is also being supported by research that ensures development is sustainable, particularly with respect to environmental carrying capacity.”

**From:** David Ross [<mailto:david.ross@heraldandtimes.co.uk>]

**Sent:** 11 May 2016 09:05

**To:** Communications Greener

**Subject:** Fw: News release: Complaint submitted to EC on Scottish Government's failure to address the impacts of sea lice parasites from Scottish salmon farms on wild salmon and sea trout

Hi would the Scottish Government like to comment on this?

Best wishes David Ross, Highland Correspondent of the Herald (part-time) 01381 600518

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**From:** Director S&TC Scotland <[director@salmon-troutscotland.org](mailto:director@salmon-troutscotland.org)>

**Sent:** 11 May 2016 08:18

**To:** Director S&TC Scotland

**Subject:** News release: Complaint submitted to EC on Scottish Government's failure to address the impacts of sea lice parasites from Scottish salmon farms on wild salmon and sea trout

<< OLE Object: Picture (Device Independent Bitmap) >>

## **NEWS RELEASE**

**11 May 2016**

**Salmon & Trout Conservation Scotland makes formal complaint to European Commission on Scottish Government's failure to address the impacts of sea lice parasites produced by Scottish salmon farms threatening west coast wild salmon and sea trout**

**Scottish Government called upon to improve dramatically the protection of wild salmon and sea trout from harm caused by poorly-managed marine salmon farms and remedy breach of European law**

Salmon & Trout Conservation Scotland (S&TCS) (Note 1) has today submitted a formal complaint (Note 2) to the European Commission over the failure of the Scottish Government to do enough to control the sea lice parasite issue on Scottish salmon farms, which threatens the survival of key wild salmon and sea trout populations.

Wild fish conservation bodies in Scotland have very long standing and widespread concerns about lack of appropriate measures being put in place by the Scottish Government to control the impact on wild salmon and sea trout through the production and release by salmon farms of billions of juvenile sea lice on the west coast and off the islands of Scotland.

Fisheries scientists are firm in their conclusions that sea lice produced on fish-farms harm wild salmonids, both at an individual and at a population level. However, these threats are not being addressed by effective regulation and control of sea lice numbers on Scottish fish-farms. Statutory regulation is essential to protect wild fish populations that are already significantly reduced (Notes 3 to 7).

Andrew Graham-Stewart, Director of S&TCS, said:

*“The threat to wild salmonids - both Atlantic salmon and sea trout - from sea lice from fish farms on the west coast and in the islands of Scotland is well recognised, but the response of the Scottish Government to these threats has been and remains inadequate. Despite our best efforts over many years, the Scottish Government has not been persuaded of the need to act robustly to deal with the sea lice issue.*

*S&TCS has been left with no choice but to ask the European Commission to intervene.”*

As the graph below - drawn up using data published by the Scottish Salmon Producers Organisation - shows, the problem with sea lice on salmon farms is deteriorating, with a growing proportion of the salmon farming industry failing to keep lice levels down.

<< OLE Object: Picture (Device Independent Bitmap) >>

Thankfully, European law, in the form of the Marine Strategy Framework Directive (MSFD), required the Government to publish, before the end of 2015, a programme of measures necessary to achieve or maintain good environmental status in marine and coastal waters by 2020, and to put those measures into effect by the end of this year (2016).

Importantly the MSFD requires the Scottish Government to put measures in place to protect wild salmonid fish from the threat of sea lice from the fish farms.

However, the published programme of measures is inadequate to address the sea-lice issue and hence achieve the objectives of the Directive.

Mr Graham-Stewart continued:

*“We believe that when the Commission cuts through all the ‘warm words’ and examines the detail of what the Scottish Government claims to have done, it will conclude, as S&TCS has, that the Scottish Government’s actions to date and ‘business as usual’ measures proposed are insufficient and inadequate to comply with European law designed to protect the marine environment.”*

#### **North Atlantic Salmon Conservation Organisation (NASCO) meeting in June**

The complaint is being submitted in the run up to an important international meeting in salmon conservation. The Scottish Government is a party to NASCO, an inter-governmental organization established in 1984 under the Convention for the Conservation of Salmon in the North Atlantic Ocean to conserve, restore, enhance and rationally manage salmon stocks through international cooperation, taking into account the best available scientific information.

The next meeting of the parties is in Bad Neuenahr-Ahrweiler in Germany from 7 to 10 June 2016. The meeting includes a full day Special Session on “Addressing impacts of salmon farming on wild Atlantic salmon”.

Paul Knight, CEO of S&TC UK and Co-Chair of the NASCO NGOs, explained:

*“All nations that host wild populations of Atlantic salmon have agreed to work to conserve those populations, but we believe the Scottish Government is failing to protect these iconic fish from the effects of marine salmon farming, particularly the sea lice produced in their billions on those farms.*

*In the run-up to the NASCO meeting in Germany in June, with its spotlight on salmon farming’s impacts, we call on the Scottish Government to act to protect wild salmonids. Indeed, we can think of no better place or platform for the Scottish Government to announce its intention to remedy the woeful lack of effective legal protection given to wild fish from the harmful effects of poorly run fish farms in Scotland.”*

### **S&TCS aquaculture campaign**

The submission of the formal complaint to Europe is just the next stage in S&TCS’s on-going campaign to secure better protection for wild salmonids from harm caused by the salmon farming industry.

In late 2015, S&TCS published a detailed report into the control of sea lice achieved on fish farms in Scotland over the years 2013-2015, demonstrating the failure to control sea lice on Scottish salmon farms and the need for urgent action from the Scottish Government to protect wild salmon and sea trout populations (Note 8).

This year, S&TCS has also petitioned formally the Scottish Parliament to seek to persuade Scottish Ministers to increase legal protection for wild salmonids from the impact of fish farms (Note 9).

Mr Graham-Stewart added:

*“The Scottish Government consistently denies that wild fish are not sufficiently protected from fish farming activities, particularly from the huge production of sea lice on fish farms, but the facts speak for themselves.*

*We call upon the Scottish Government to stop relying on endless industry promises of improvement in the future – we have heard the same empty promises now for far too many years. The Government must take the bull by the horns and, as soon as possible, amend Scottish law to give marine inspectors a clear and unambiguous duty to protect wild fish from fish farm diseases and parasites”.*

ENDS

Issued by Andrew Graham-Stewart (telephone 01863 766767 or 07812 981531) on behalf of Salmon and Trout Conservation Scotland. For further information contact Andrew Graham-Stewart, Director of S&TCS, on the above numbers or Guy Linley-Adams, Solicitor to the S&TCS Aquaculture Campaign, on 07837 881219 or E: [guy@linley-adams.co.uk](mailto:guy@linley-adams.co.uk)

### **Notes for editors**

1) **Salmon & Trout Conservation UK (S&TC UK)** was established as the Salmon & Trout Association (S&TA) in 1903 to address the damage done to our rivers by the polluting effects of the Industrial Revolution. Since then, S&TC UK has worked to protect fisheries, fish stocks and the wider aquatic environment for the public benefit. S&TC UK has charitable status in both England and Scotland (as S&TCS) and its charitable objectives empower it to address all issues affecting fish and the aquatic environment, supported by robust evidence from its scientific network, and to take the widest possible remit in protecting salmonid fish stocks and the aquatic environment upon which they depend. [www.salmon-trout.org](http://www.salmon-trout.org) [www.salmon-troutscotland.org](http://www.salmon-troutscotland.org)

2) The full text of the complaint is available at

[http://www.salmon-trout.org/pdf/STC\\_complaint\\_to\\_European\\_Commission\\_May\\_2016.pdf](http://www.salmon-trout.org/pdf/STC_complaint_to_European_Commission_May_2016.pdf)

or

[http://www.salmon-troutscotland.org/pdf/STC\\_complaint\\_to\\_European\\_Commission\\_May\\_2016.pdf](http://www.salmon-troutscotland.org/pdf/STC_complaint_to_European_Commission_May_2016.pdf)

### **3) Just what is the problem with sea lice?**

Adult wild salmon are perfectly adapted to coping with a few sea lice. Background levels of these parasites occur naturally in the sea. However the advent of salmon farming, particularly in fjordic sea lochs, has led to a fundamental change in the density and occurrence of sea lice in parts of the coastal waters of the west Highlands and Islands. Even one or two mature female sea lice per fish within a set of cages housing hundreds of thousands of farmed salmon amounts to a rampant breeding reservoir pumping huge numbers of mobile juvenile sea lice out into the local marine environment. The consequences when wild salmon and sea trout smolts, the metamorphosing

fragile skin of which is not adapted to cope with more than the odd louse, migrate from local rivers into this “sea lice soup” can be devastating.

Carrying an unnaturally high burden of sea lice is known to compromise severely the survival of juvenile migratory salmonids. Lice feed by grazing on the surface of the fish and eating the mucous and skin. Large numbers of lice soon cause the loss of fins, severe scarring, secondary infections and, in time, death. Quite literally, the fish are eaten alive. Badly infested salmon smolts disappear out to sea, never to be seen again. In contrast afflicted sea trout smolts remain within the locality and they, together with the impact of the deadly burdens they carry, are more easily monitored through sweep net operations.

4) In 2015, the Scottish Government published its classification of the country’s rivers’ salmon populations. This places all the rivers in the west Highlands and inner Hebrides in the worst-performing category, with wild salmon stocks not reaching their conservation limits, which are a measure of the overall health of the population. No river within salmon farming’s heartland of the west Highlands and inner Hebrides has, according to the Scottish Government’s own scientists, a sufficient stock of wild salmon. [http://www.salmon-trout.org/news\\_item.asp?news\\_id=366](http://www.salmon-trout.org/news_item.asp?news_id=366)

Sea trout populations too are under considerable threat with the number of sea trout returning to Scottish rivers in decline, with the 2013 rod catch being the lowest on record according to Marine Scotland Science. The west Highlands has in recent decades lost all of its formerly prolific loch fisheries for sea trout. The negative impact of sea lice, produced in huge numbers by fish farms, on wild salmonids (salmon and sea trout) is widely accepted by fisheries scientists including the Scottish Government’s own Marine Scotland Science. See Marine Scotland Science (2013) Summary of information relating to impacts of sea lice from fish farms on Scottish sea trout and salmon - 4<sup>th</sup> April 2013 – see Annex 1 of the Complaint.

5) A paper published in 2013 by a group of fisheries experts from Norway, Canada and Scotland re-analyses data from various Irish studies and shows that the impact of sea lice on wild salmon causes a very high loss (34%) of those returning to Irish rivers – see M Krkosek, C W Revie, B Finstad and C D Todd (2013) Comment on Jackson et al. Impact of *Lepeophtheirus salmonis* infestations on migrating Atlantic salmon, *Salmo salar* L., smolts at eight locations in Ireland with an analysis of lice-induced marine mortality - Journal of Fish Diseases.

6) Most importantly, there is clear evidence that both wild salmon and sea trout are in decline in Scotland’s ‘aquaculture zone’, whereas, generally, populations have stabilized on the east and north coasts where there is no fish-farming see <http://www.rafts.org.uk/wp-content/uploads/2011/10/East-v-West-final-RWB.pdf>

7) In 2015, fisheries scientists from Norway, Scotland and Ireland reviewed over 300 scientific publications on the damaging effects of sea lice on sea trout stocks in salmon farming areas, and examined the effect of sea lice on salmon, concluding that sea lice have a potential significant and detrimental effect on marine survival of Atlantic salmon with potentially 12-29% fewer salmon spawning in salmon farming areas. The researchers concluded that: “Salmon lice in intensively farmed areas have negatively impacted wild sea trout populations by reducing growth and increasing marine mortality. Quantification of these impacts remains a challenge, although population-level effects have been quantified in Atlantic salmon by comparing the survival of chemically protected fish with control groups, which are relevant also for sea trout. Mortality attributable to salmon lice can lead to an average of 12–29% fewer salmon spawners. Reduced growth and increased mortality will reduce the benefits of marine migration for sea trout, and may also result in selection against anadromy in areas with high lice levels. Salmon lice-induced effects on sea trout populations may also extend to altered genetic composition and reduced diversity, and possibly to the local loss of sea trout, and establishment of exclusively freshwater resident populations.” See Thorstad , E , Todd , C D , Uglem , I , Bjorn , P A , Gargan , P , Vollset , K , Halttunen , E , Kalas , S , Berg , M & Finstad , B 2015 , ' Effects of salmon lice *Lepeophtheirus salmonis* on wild sea trout *Salmo trutta* – a literature review ' Aquaculture Environment Interactions , vol 7 , no. 2 , pp. 91-113 . (at <https://research-repository.st-andrews.ac.uk/handle/10023/7295>)

8) In December 2015, Salmon & Trout Conservation Scotland (S&TCS) published a detailed report (see [http://www.salmon-troutscotland.org/news\\_item.asp?news\\_id=374](http://www.salmon-troutscotland.org/news_item.asp?news_id=374)) into the control of sea lice on fish farms in Scotland over the last two years, brought into sharp focus the seriousness of the problem with sea lice and the need for urgent action from the Scottish Government to protect wild salmon and sea-trout populations that are already in trouble. The Report highlighted many regions of the Scottish Highlands and Islands where fish farms were collectively above, often very significantly above, the industry’s own ‘good practice’ threshold (based on the number

of adult female lice per farmed fish). At many of the fish-farms, despite repeated chemical treatments against sea lice, including using synthetic pyrethroid and organophosphate chemicals, the regional on-farm sea-lice levels remained stubbornly high. The Report made a number of recommendations for action from the Scottish Government, which the supermarkets are encouraged to support, including

- requiring the immediate publication of farm-specific sea lice data
- tougher regulation and inspection of fish farms;
- a Government-led review of the current voluntary code of practice, replacing it with a statutory code, as provided for in the Aquaculture Act 2007;
- introducing an 'upper-tier' sea lice threshold above which an immediate cull or harvest of farmed fish is required by law;
- amending Scottish legislation to protect wild fish from potential damage caused by fish-farms, with inspectors given a legal duty to control sea lice on fish-farms in order to protect wild fish populations;
- ordering the closure and / or relocation or persistently poorly-performing fish farms;
- signalling that the fish farming industry will be required eventually to move to full closed containment, to ensure a complete 'biological separation' of wild and farmed fish.

9) See <http://www.scottish.parliament.uk/GettingInvolved/Petitions/PE01598>

8) For more information, please see [www.salmon-trout.org](http://www.salmon-trout.org)

**From:** [REDACTED]  
**Sent:** 24 November 2016 16:08  
**To:** [REDACTED]  
**Subject:** FW: Submission - 1st quarter 2016 SSPO Fish Health Management Report

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**From:** [REDACTED]  
**Sent:** 12 May 2016 15:07  
**To:** Cabinet Secretary for Rural Affairs, Food and Environment  
**Cc:** Permanent Secretary; DG Enterprise, Environment & Innovation; Director of Marine Scotland Mailbox; Cowan WJ (Willie); Moffat C (Colin) (MARLAB); Mitchell A (Alastair); [REDACTED] Gibbons J (Jeff); Raynard R (Rob) (MARLAB); Murray S (Sandy) (MARLAB); Allan C (Charles) (MARLAB); [REDACTED]  
[REDACTED]  
Communications Greener  
**Subject:** Submission - 1st quarter 2016 SSPO Fish Health Management Report

Please find attached a submission detailing the quarterly fish health management report including sea lice figures, due to be published by the Scottish Salmon Producers' Organisation tomorrow, **13<sup>th</sup> May 2016**. Also attached is an overview of the 1<sup>st</sup> quarter 2016 report (Jan - March 2016).



[REDACTED]  
[REDACTED]

Happy to provide further information if required.

Best Regards,  
[REDACTED]

[REDACTED]  
Head of Aquaculture Health and Welfare  
Marine Scotland – Performance, Aquaculture and Recreational Fisheries

[REDACTED]  
Web: <http://www.scotland.gov.uk/marinescotland>  
Mail: Scottish Government, 1B North, Victoria Quay, Edinburgh EH6 6QQ



Aquaculture Europe - Edinburgh  
Food For Thought  
20-23 September 2016  
<http://www.gov.scot/Resource/0043/00433571.pdf>

## Fish Health Management Report January – March 2016

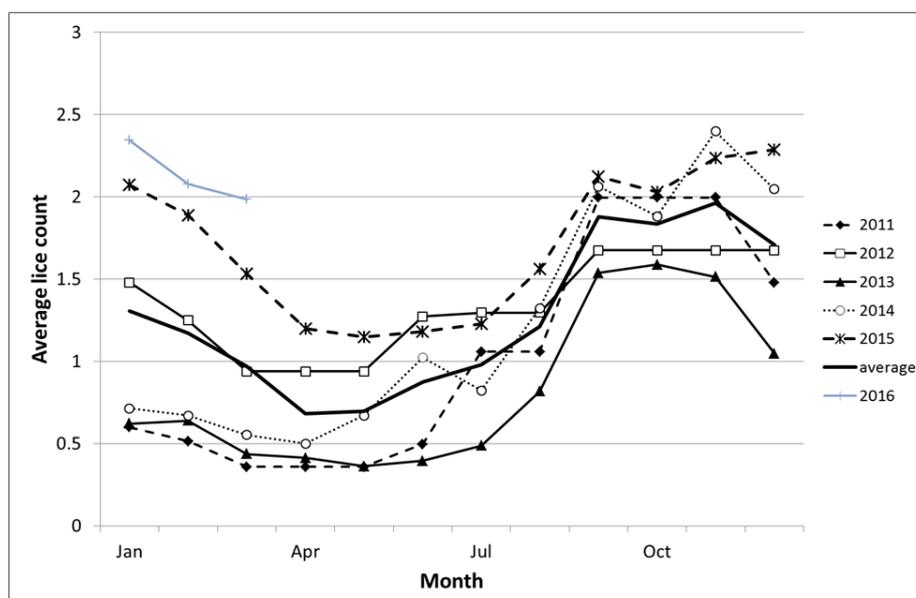
### General Summary and Trends

The fish health management report for the 1<sup>st</sup> quarter (January - March) will be published by the Scottish Salmon Producers Organisation (SSPO) on 13th May 2016.

<http://scottishsalmon.co.uk/category/science-behind-fish-farming/fish-health/>

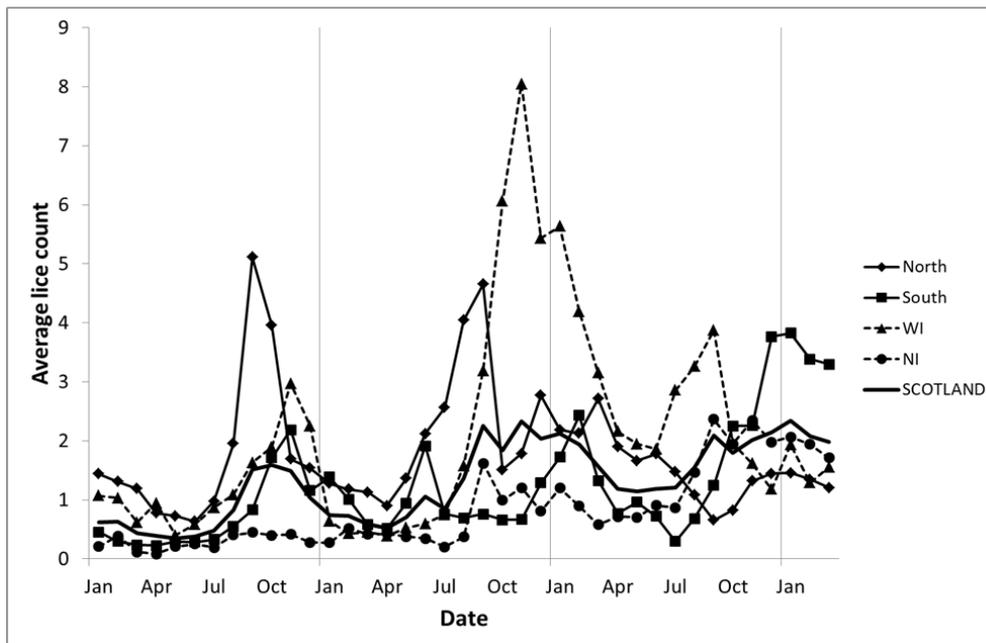
The annual data graph below shows;

- The sea lice counts for the 1<sup>st</sup> quarter 2016 are the highest in the 5 year timeline
- Lice loads appear to be declining more slowly over the quarter than they have in previous years



The area data graph below shows;

- the peak in the Western Isles has now reduced and the northern mainland is still maintaining historic lows.
- increases in both the southern mainland and Northern Isles, both of which are at historic high levels for their regions (although the Northern Isles lice count is still low relative to other regions).



### Areas above the suggested criteria for sea lice treatment

The suggested sea lice treatment thresholds for the months in this quarter report are 1.0 for the month of January and 0.5 for the months of February and March.

15 out of the 28 areas stocked during the reporting period returned average adult female lice numbers greater than 1.0 in January – the number in brackets provides the highest figure reported in the quarter.

- Inchard to Kirkaig North (3.60)
- Kishorn and Carron (1.53)
- Loch Long and Croe (6.33)
- Glenelg and Kilchoan (2.06)
- Skye and Small Isles North (2.42)
- Skye and Small Isles South (1.31)
- Sunart and Aline (1.81)
- Awe and Nell (11.06)
- Add and Ormsary (10.81)
- Island of Mull (9.23)
- Ruel and Drummachloy (9.42)
- Isle of Lewis East (8.01)
- The Uists North (1.72)
- Shetland East (2.51)
- Shetland West (3.10)

15 out of the 27 areas stocked during the reporting period returned average adult female lice numbers greater than 0.5 in February and March

- Inchard to Kirkaig North
- Kishorn and Carron
- Loch Long and Croe
- Glenelg and Kilchoan

- Skye and Small Isles South
- Sunart and Aline
- Awe and Nell
- Add and Ormsary
- Island of Mull
- Islay and Jura (0.88)
- Ruel and Drummachloy
- Isle of Lewis East
- The Uists North
- Shetland East
- Shetland West

Most of the areas noted above held fish of harvest size in the period of the report – this is consistent with the observation that lice numbers increase on farms during the second year of production.

### **Exceptions**

The Awe and Nell area returned a very high sea lice figure of 11.06 average adult female lice in January. The Add and Ormsary area returned a similarly high figure of 10.81 in March. This figure has been unstable or rising throughout the last 2 quarters. sites in this area are holding fish in their second year of production, are currently harvesting out and due to be fallow in Spring 2016.

### **Areas of concern**

The Ruel and Drummachloy area has risen quickly from 2.48 in January to 9.42 and 8.43 in February and March. The fish in this area are entering their 2<sup>nd</sup> year of production. Regular monitoring of this area by the Fish Health Inspectorate is taking place.

Isle of Lewis East continues to have high lice levels and is an area of concern. Freshwater treatments are planned for this area in order to reduce lice levels. Fish Health Inspectors will continue to monitor progress.

Inchard to Kirkaig North has returned increasing sea lice counts from 1.09 through to 3.60. The operator in this area has invested significantly in sea lice management on their sites so it is disappointing to see the numbers in this region increasing. The Fish Health Inspectorate have been in contact with the operator and have reported that lice levels are now dropping following harvesting.

### **Positives**

It is worth highlighting that the Kennart to Gruinard area maintained close to zero lice levels again following significant investment in the use of cleaner fish as a biological control. The sites in this area have required no other form of sea lice treatment in over 12 months. These results, particularly given historic results from this area, are very encouraging.

The Sanda to Creran North and Sanda to Creran South areas are also maintaining sea lice levels at or close to zero. These areas have also managed to keep sea lice levels below 1.0

for 2 years (a full production cycle). Again, this has been as a result of significant investment in cleaner fish as a biological control.

## **Conclusions**

The results this quarter are disappointing generally, particularly when considered alongside the 1<sup>st</sup> quarter results in previous years. However, last quarter 2015 results were also high and so the numbers are not totally unexpected.

This continues to highlight the on-going challenge for industry posed by sea lice. The average sea lice numbers remain above the Code of Good Practice suggested criteria for treatment in most areas. The new regulatory regime including the reinterpretation of “satisfactory measures”, which are required under the Aquaculture and Fisheries (Scotland) Act 2007 in order to manage sea lice, will help to address some of the issues highlighted in this report and will require reduction and control of lice levels beyond 3.0 as well as providing a backstop limit of 8.0 at which point urgent action will be required.

From: [REDACTED]  
Aquaculture Health and Welfare

12 May 2016

Minister for Environment, Climate Change and Land Reform

## **SEA LICE UPDATE AND SSPO FISH HEALTH MANAGEMENT REPORT – JANUARY- MARCH 2016**

### **Purpose**

1. To provide advance notice of the publication of the latest fish health management report by the Scottish Salmon Producers' Organisation (SSPO) on 13<sup>th</sup> May 2016.

### **Priority**

2. **Routine**

### **Background**

3. SSPO's quarterly reports on fish health management provide information for 30 regions of the north-west coast, western and northern isles. They are based on information supplied by farms during the relevant period. The reports include information on Farm Management Areas, stocking, fallowing, strategic treatments and average sea lice counts.

4. The reporting regions broadly mirror those for the wild salmon and sea trout fisheries. The sea lice numbers reported are average adult female lice count per fish for each reporting region.

5. The latest report - for the 1<sup>st</sup> quarter 2016 (Jan - Mar) - will be published on Friday 13<sup>th</sup> May 2016.

6. The fish health management reports are anticipated by wild fish NGO's who are concerned about the potential impacts from sea lice on wild salmon. It is therefore normal for some media interest to be generated.

### **Report summary**

7. An analysis of the latest quarterly report is attached. It provides information on trends in sea lice numbers in the areas as well as highlighting any areas of concern or issues which arise as a result of this quarter's publication.

8. The report shows 13 out of the 27 reporting areas, which were stocked during February returning an adult female lice count lower than the suggested treatment criteria threshold of 0.5. In March this reduced to 12 out of the 27 areas stocked. 13

out of the 28 areas stocked in January returned a lice count of lower than the threshold of 1.0 for that month.

9. The results are disappointing generally, particularly given the time of year when we would normally see sea lice levels dropping. However, when viewed alongside the final quarter of 2015, the figures are not entirely unexpected. The final 3 months of 2015 saw water temperatures remain high with a continued environmental challenge causing gill issues and associated difficulties with effective lice treatments.

10. Areas highlighted from this report are - the Awe and Nell, Add and Ormsary and Ruel and Drummachloy areas. These areas are currently being investigated by the Fish Health Inspectorate and the operators concerned are deploying additional sea lice management techniques in order to reduce sea lice levels.

11. Of the remaining areas suffering from levels above the suggested treatment criteria, those which are increasing will continue to be monitored and sea lice management options will be discussed.

12. Looking to the positives, there continues to be areas where sea lice are being managed extremely well using biological controls (cleaner fish). The Kennert to Gruinard area as well as the Sanda to Creran North area are maintaining levels at zero or close to zero. This is the result of significant investment in the effective deployment of cleaner fish. This best practice is being shared and adopted across the industry.

13. Industry are also working on other alternative solutions. Freshwater treatments and the use of thermolicers have produced results in some areas which have experienced problems with sea lice management. This notably occurred in the Loch Long and Croe area where lice numbers have fallen from a peak of 6.78 to 2.22. Again industry are committed to sharing such resource.

## **Next Steps**

14. This latest quarterly report from SSPO serves again to highlight the on-going challenge faced by industry in managing sea lice. We have taken steps to address this.

15. As previously agreed, following the submission of 29<sup>th</sup> February 2016, we have drawn up a proposal to strengthen the policy which enforces the Aquaculture and Fisheries Act 2007. The requirement for operators to have "satisfactory measures" in place for the reduction and control of sea lice has now been defined and strengthened.

16. The new definition includes a requirement to report sea lice levels above 3.0 average female adult lice to Marine Scotland's Fish Health Inspectorate. This will initiate a site specific action plan and will require satisfactory control measures to be implemented. There will also be an upper backstop limit of 8.0 lice which will initiate enforcement action in cases where lice numbers cannot be reduced and controlled

effectively. This has been agreed with industry and will be communicated to them officially next week.

17. Separately, industry have revised their own sea lice management policy and we expect to receive an industry proposal around the same time as the official communication, which is reflective of the improved regime. This in turn will lead to updates to the industry Code of Good Practice.

18. We also intend, in partnership with industry, to review the current farm management areas with sea lice control as a priority. Recent science including dispersal and connectivity models will be used to optimise the area management in relation to sea lice.

### **Broader Considerations**

19. The Salmon and Trout Conservation Scotland (S&TCS) launched a public petition recently in relation to the impacts of salmon farming on wild fish. They also submitted an official complaint to the European Commission this week again in relation to Scottish Government's perceived failure to protect wild salmon from the impacts of sea lice.

20. Scottish Government will be participating in the theme-based Special session on aquaculture at the North Atlantic Salmon Conservation Organisation (NASCO) next month.

### **Communications**

21. Media interest has been relatively quiet following recent publications of the fish health management reports, however given the broader considerations outlined above, we might reasonably expect that the two stories may be reported together.

22. Greener Communications have been made aware and have been provided with appropriate press lines.

### **Recommendation**

23. The Minister is invited to note this submission and the attached summary.

  
Aquaculture Health and Welfare Team  
Marine Scotland

12 May 2016

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constit Interest	General Awareness

Cabinet Secretary for Rural Affairs, Food and the Environment Permanent Secretary			X		X
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DG Enterprise, Environment and Innovation  
Linda Rosborough, Director, Marine Scotland  
Willie Cowan, MS: Head of Performance and Aquaculture  
Colin Moffat, Director Marine Scotland Science  
Alastair Mitchell, MS: Aquaculture Unit  
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Jeff Gibbons, MS: Salmon and Recreational Fisheries  
Rob Raynard, MSS: Head of AAAH  
Sandy Murray, MSS: Epidemiologist  
Charles Allan, MSS: Head of Fish Health Inspectorate  
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[REDACTED]

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**From:** [REDACTED]  
**Sent:** 24 November 2016 16:08  
**To:** [REDACTED]  
**Subject:** FW: sea lice lines

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**From:** [REDACTED]  
**Sent:** 12 May 2016 15:50  
**To:** [REDACTED]  
**Cc:** Communications Greener; [REDACTED] Mitchell A (Alastair)  
**Subject:** sea lice lines

Hi [REDACTED]

Some press lines should there be any interest in the publication of the SSPO sea lice figures tomorrow.

- Marine Scotland acknowledge the 1<sup>st</sup> quarter 2016 fish health management reports published by the Scottish Salmon Producers Organisation.
- The report highlights the on-going challenge faced by industry in relation to the management of sea lice but also welcomes some improvements, particularly in areas where cleaner fish and other alternative sea lice management techniques have been deployed with positive results.
- The Scottish Government acknowledges that sea lice management presents a challenge for the aquaculture industry. Scottish Government is working with the Scottish aquaculture industry on improving sea lice management including reviewing existing guidance and the requirement for any mitigation actions in cases of persistently high sea lice counts. We are also working closely with industry on environmental sustainability including; changes to industry's management guidance to deliver enhanced use of cleaner fish as a biological solution to sea lice management, investigating and trialling novel techniques for sea lice control, improvements in husbandry more generally and exploring opportunities to improve spatial planning.
- Scottish Government is working alongside Scotland's salmon farming industry and representatives of the wild salmon sector on a strategic programme of further research that includes a study to explore any impacts of sea lice from fish farming in Scotland.

Thanks,

[REDACTED]  
[REDACTED]  
Head of Aquaculture Health and Welfare  
Marine Scotland – Performance, Aquaculture and Recreational Fisheries

[REDACTED]  
[REDACTED]  
Web: <http://www.scotland.gov.uk/marinescotland>  
Mail: Scottish Government, 1B North, Victoria Quay, Edinburgh EH6 6QQ



Aquaculture Europe - Edinburgh

Food For Thought

20-23 September 2016

<http://www.gov.scot/Resource/0043/00433571.pdf>

# SEA LICE MANAGEMENT & CONTROL - A PROPOSAL TO MARINE SCOTLAND

## BACKGROUND

A number of key factors influence the industry's past and future approach to lice management and control. Amongst the most important of these are:

- Sea lice on farmed and wild fish are naturally occurring and will never be eradicated.
- Despite industry's best endeavours to control lice on farmed fish there will always be infection pressure from lice present in the marine environment and from wild fish.
- The use of fully licensed sea lice medicines are seriously constrained by environmental regulation and constraints are likely to increase.
- The range of active components of sea lice medicines with different modes of action will always be limited.
- Significant benefits have been gained through the use of non-therapeutic approaches and this is an important part of the future direction of travel.
- The biological control of lice using cleaner fish is still at a relatively early stage and there are important knowledge gaps that are currently being filled through targeted research.
- Minimising numbers of lice, particularly adult and ovigerous females, is important.
- While lice present on farmed fish may be regarded as a *hazard* for wild salmonids, the *risk* will vary from place to place and time to time; although it is reasonable to try to keep any risk as low as practicably possible.
- It is important that industry is kept aware of sea lice issues relevant to wild fish. Substantial knowledge gaps remain as a consequence of the reluctance on the part of wild fish interests to provide information that may help inform strategies for the management of lice on salmon farms.

This paper sets out the various elements of a new industry proposal on lice management. It is the industry's intention that these elements will also form part of the response to calls for the development of Environmental Management Plans (EMPs) of the sort currently being sought by some Scottish Planning Authorities.

### **1. Counting sea lice to inform improved management and control**

The National Treatment Strategy for the Control of Sea Lice on Scottish Salmon Farms (NTS) and the Code of Good Practice for Scottish Finfish Aquaculture (COGP) both stress the importance of frequent counting of all stages of the salmon louse life cycle to inform management decisions. Furthermore, a requirement to count and record lice numbers is enshrined within the Fish Farming Business (Record Keeping) (Scotland) Order 2008, this requirement being based on the provisions of the CoGP.

The CoGP currently sets out a suggested monitoring protocol based on the scientific advice of Fryer, Revie and Gettinby -

*Each company must count lice numbers on the fish held on its farm(s):*

- i) Pens and fish should be sampled at random.
- ii) Personnel carrying out lice counts should have appropriate training in lice recognition and recording, and demonstrate post-training competence.
- iii) Where there are more than five pens per site, five fish should be sampled from each of five pens to give a total of 25 fish.
- iv) Where a site contains less than five pens all pens should be sampled to give a total of 25 fish. A similar number of fish should be selected from each pen.
- v) Fish should be netted from the cage and put straight into the anaesthetic.
- vi) Each life cycle stage of *Lepeophtheirus salmonis* should be counted in turn, i.e. adult females, mobiles, chalimus. All identifiable stages of *Caligus elongatus* should be grouped together.
- vii) After completing the lice counts on the fish from each pen, the tub containing the anaesthetic should be examined for sea lice which may have been shed from the fish and any lice found should be added to the total.
- viii) The name of the person carrying out the counts, the date, the pen number and the water temperature at a depth appropriate to the depth of the pens used on the site should be recorded.
- ix) Minimum recording requirements during sea lice counts are *L. salmonis* chalimus, mobiles and adult females (with or without egg strings) plus all identifiable stages of *C. elongatus* grouped together.

The Board of SSPO has agreed that the industry's approach to counting lice should now be based on farms as *epidemiological units*, with lice counting being broadened to encompass a greater number of fish from a larger number of pens. Opportunities for more effective management and intervention are created by targeting fish in pens that may be more susceptible to early infestation; fish in pens that may give an early indication of increasing numbers of lice across the farm as a whole, and in sentinel pens which create a temporal reference for the farm.

***Farmers will develop new lice counting protocols for their sites based on the foregoing, and advice on counting will be updated in the CoGP in due course. The number of pens and fish included in new counting protocols will be no less than 5 x 5.***

## **2. Suggested treatment criteria**

The CoGP sets out a broad range of measures in relation to counting, communicating information, treating lice and maximising the effectiveness of treatments. The principle around the existing treatment criteria is that:

*In general, treatments should be guided by **the build up of pre-adults** as indicated by weekly counts, the objective being **to prevent the development of gravid females**.*

within this, and in relation to treatment with approved sea lice medicines are

*Suggested criteria for the treatment of sea lice on individual farm sites:*

- *An average of 0.5 adult female *L. salmonis* per fish during the period 1st February to 30th June inclusive.*
- *An average of 1.0 adult female *L. salmonis* per fish during the period 1st July to 31st January inclusive.*

It is important to note these are *suggested treatment criteria* not inflexible cut off points which imply that exceedence is in some way detrimental to the health of farmed or wild fish.

*Within the broad range of different aspects of lice control, these suggested treatment criteria will remain as an important element of industry good practice.*

### **3. Using cleaner fish as a 'treatment' (vs. deploying them in all pens) is a realistic option.**

Experience gained from the use of wrasse has revealed that, once they have become accustomed to the salmon pen environment, it can be relatively straightforward to recapture a proportion of them using creels and transfer them from one pen to another. In this way, and while availability is still relatively limited, it is possible to extend the benefit of their use by rotating them between the pens on individual sites. The rotation of cleaner fish will apply within individual sites and management areas, and not between management areas.

*Note:* there is growing evidence from companies deploying cleaner fish, especially wrasse, that they will tend to select egg strings/gravid female lice in preference to adult lice, then adult lice, then other smaller stages. This makes sense in terms of the nutritional value of different lice stages vs. the energy expended in capturing lice. Cleaner fish preference for those stages that contribute most to the risks of lice transmission from fish to fish / pen to pen / site to site, etc. has potentially significant implications when one considers the general direction of travel on keeping numbers low irrespective of the resources required to do so. Observations from industry are strongly supported by recently published (and unpublished) experimental evidence e.g. "Delousing efficiency of farmed ballan wrasse (*Labrus bergylta*) against *Lepeophtheirus salmonis* infecting Atlantic salmon (*Salmo salar*) post-smolts": Leclercq, Davie and Migaud *Pest Manag Sci* 2014; 70: 1274–1282.

*This approach will be developed as experience and knowledge is shared between sites and companies, with the provisions of the Code being extended to accommodate this.*

### **4. The principle of sharing cleaner fish in areas where lice management and control has been difficult.**

The sharing of cleaner fish within the industry has already happened in a small number of cases where other control measures have had limited success. The SSPO Board has expressed continued support for the sharing of cleaner fish where numbers permit and the likelihood of successful deployment is high. While there are still a number of unknowns on cleaner fish health, welfare and nutrition, the commercial production of significant numbers of cultivated wrasse and lumpfish will become a reality in the next two to three years, and sharing know-how and the results of R&D work across the industry will play an important role in achieving a surplus in cleaner fish stocks.

*The principle of sharing stocks of cleaner fish will continue to be supported by industry.*

### **5. The principle of sharing equipment and other resources.**

While biological control through the use of cleaner fish offers the greatest promise, a significant number of potentially valuable non-therapeutant and engineering solutions to sea lice control are also currently being evaluated across the Scottish industry and elsewhere. These include physical barriers, including skirts; technology designed to physically dislodge

or remove lice, including fish wash, thermal disruption and laser systems. Despite the high capital cost of lice removal and disruption technology, tens of millions of pounds are currently being invested in such equipment for use in Scotland. Where possible existing and new technology and equipment designed to exclude, dislodge and remove lice will be shared within Farm Management Areas and more widely across the industry.

*Information on experience gained through evaluation of novel engineering-based approaches to lice control will be shared across the industry. Equipment and other resources will also be shared where this is possible.*

#### **6. The option of farms within single operator FMAs proposing their own lice control strategy.**

The SSPO Board agreed that all companies in all areas should be required to continue to meet the requirements of the CoGP and that the foregoing proposals be adopted by all.

#### **7. Establishing principles to underpin decisions to depopulate sites where there is no prospect of increasing lice numbers being halted or reversed.**

This is clearly a very complex issue. Decisions taken by companies so far have been based around information on fish age, size, lice population structure, availability of medicines, CAR licence constraints on use, sensitivity to licensed lice medicines, etc. Such decisions go well beyond the simplistic concept of lice numbers alone triggering the removal of fish from the water. This having been said, the industry acknowledges that, in certain circumstances, phased depopulation may be the best way to deal with intractable lice challenges.

### **RESPONDING TO SIGNIFICANT LICE CHALLENGES**

The Board of SSPO has agreed that members will

#### **1. Retain existing *suggested treatment criteria* and related elements of the CoGP.**

The application of *suggested treatment criteria* is only one of the many different elements of sea lice management and control. The term originated within the National Treatment Strategy at the time when only bath treatments were available, so its meaning has changed with time; nonetheless *suggested treatment criteria* can provide useful guidance. When the Code of Good Practice for Scottish Finfish Aquaculture was originally drafted, the *suggested treatment criteria* currently included within the Code were proposed by the then leader of Marine Scotland's Fish Health Inspectorate and were supported by ASFB. It must be noted that exceeding either of the two *suggested treatment criteria* has no particular meaning in terms of the success or otherwise of a treatment, or impact on the health and wellbeing of farmed salmon or wild salmonids .

#### **2. Define a *normal range* for lice numbers on farmed salmon on individual sites.**

Recent discussions with Marine Scotland have stressed the need for industry to focus specifically on the potential for lice to impact on the health and welfare of farmed fish. For this reason, the *normal range* for lice numbers will take into account specific circumstances

on individual sites within FMAs and lice reporting regions, and will be influenced by a number of factors, importantly

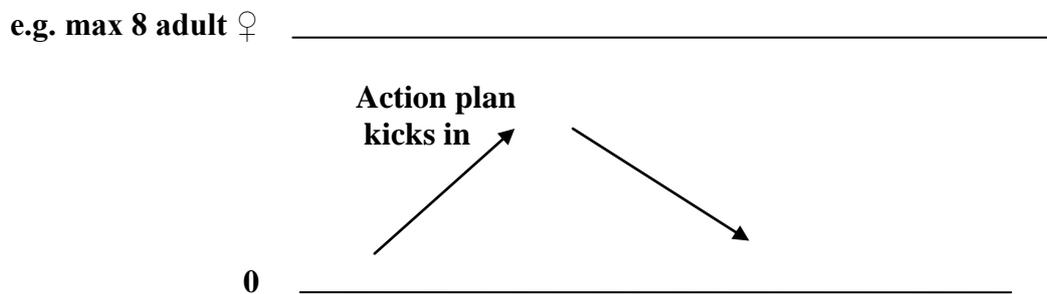
- the age and size of the fish;
- the health status of the fish (e.g. the condition of their gills);
- the potential for the passage of sea lice from the site to adjacent sites. This would be informed by proximity, dispersal modelling, etc;
- the potential for sea lice to impact substantially on local wild migratory salmonid populations. This would be informed by data supplied by local angling clubs, local proprietors, the local fishery trust, the District Fishery Board, etc. Such information would parallel the comprehensive quarterly industry sea lice information that is collated, analysed and published on behalf of industry by SSPO.

SSPO has been publishing information for almost five years now and, during this time, has extended an open invitation to wild salmonid fishery representative bodies to provide parallel region-specific information, but no such information has been supplied.

### 3. Take action to maintain lice numbers within the normal range.

Where there are indications that lice numbers are escalating in such a way that they may create significant risks for farmed fish health and welfare, action will be taken to return numbers to within the normal range within a defined period through the implementation of *site-specific action plans*. These plans will set out the means by which any rate of increase in lice numbers will be determined, decisions taken, actions implemented, and how success will be measured and recorded. The generalised approach is illustrated in fig 1.

Figure 1



### 4. Communication on responses to significant lice challenges

SSPO member companies routinely communicate information on lice management and control to SSPO via the industry health system. This approach will be further strengthened to include additional information on the implementation of action plans that will be supplied at monthly intervals to SSPO. This will allow more effective analysis of information and communication with MSS Aberdeen on trends and responses to lice challenges across the industry.

Marine Scotland has encouraged industry to communicate information to MSS based on the approach illustrated in fig 2.

Figure 2

<p><b>Upper Zone</b> Lice numbers are too high - require urgent attention. [Marine Scotland suggest reporting that the site is in the upper zone when site average <math>\geq</math> 8 adult ♀]</p>
<p><b>Middle Zone</b> Lice numbers are escalating on the site and there is a realistic possibility of numbers entering the upper zone, so the action plan is triggered before this happens. [Marine Scotland suggest reporting to them when site average <math>\geq</math> 3 adult ♀]</p>
<p><b>Lower Zone</b> Lice are present on farmed fish within the site at low levels and, if numbers remain stable, there is no requirement to implement an action plan. [Marine Scotland suggest numbers within this zone of <math>&lt;</math> 3 adult ♀]</p>



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16 May 2016

Dear Farm Correspondent

**Changes in Interpretation of The Aquaculture and Fisheries (Scotland) Act 2007 With Regards to the Satisfactory Measures in Place For The Prevention, Control and Reduction of Parasites.**

In 2007 the Scottish Parliament made provisions in relation to regulation of fish farms and more specifically with regard to the control of parasites, namely sea lice. These were amended by the Aquaculture and Fisheries (Scotland) Act 2013. In particular, powers of inspection to assess the measures in place for the prevention, control and reduction were introduced. This was the first legislation in Scotland to address concerns regarding sea lice controls on fish farms. At the time of implementation in 2007, the Code of Good Practice for Scottish Finfish Production offered a guide to what could be considered satisfactory measures for the prevention, control and reduction of parasites.

Since 2007, there have been significant changes in the Scottish aquaculture industry, with increased production, an increase in the number of active sites and a reduction in the number of companies producing Atlantic salmon. In parallel, the challenges facing farmers have changed, with reduced efficacy of sea lice treatments, the emergence of amoebic gill disease and increased challenges associated with sea lice control, all contributing to increased sea lice numbers across the Scottish salmon farming industry. These, in combination, have contributed to significant issues which require to be addressed.

In collaboration with industry, research and policy colleagues, Marine Scotland have reassessed the measures considered to be satisfactory for the prevention, control and reduction of sea lice on aquaculture sites in Scotland, leading to changes in expectation when these measures are examined by Fish Health Inspectors. In future inspectors will expect to find evidence demonstrating that the following measures are in place:

- All farm sites have access to all licenced sea lice medications, as well as access to suitable biological and/or mechanical control measures, and these can be deployed in a reasonable period of time.
- An improved harvesting strategy for each site, where fewer populations or part populations are held without treatment for sea lice.
- Redefined management areas to reflect current knowledge and understanding of the movement of sea lice in the marine environment. Ensuring that all redefined management

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areas are stocked with a single year class of fish. [Evidence shows that management of sea lice at the farm level is better achieved where all farms in an area are in production synchrony, removing the crossover of infection between year classes].

- Each fish farming site has a specific written procedure for lice management, with waypoints describing set actions to deal with recognised scenarios during the escalation of a sea lice infestation.

Identifying that the measures listed above are satisfactory for the control of sea lice, requires that they can be demonstrated to be so. Therefore a monitoring scheme requires to be implemented. Following extensive discussion, the following reporting measures have been agreed;

- A reporting limit, where an average of **three** adult female sea lice per fish on any fish farming site would be required to be reported to Marine Scotland Science. Where the reporting level is reached, increased monitoring would be implemented and continued until either; the average adult female count is reduced to below the reporting threshold of three, or the intervention limit of an average of **eight** adult female sea lice per fish on any fish farming site is reached - the exceeding of this limit would be deemed unacceptable and an enforcement notice would be served. Reporting would be to the Fish Health Inspectorate Duty Inspector by telephone (01224 295568) or by e-mail ([MS.FishHealth@gov.scot](mailto:MS.FishHealth@gov.scot))

May I also take this opportunity to remind you of the reporting thresholds for mortalities, which were introduced in the autumn of 2013. Mortality events should be reported which fall out with normally expected parameters for farmed fish production in seawater, and would take four forms, namely:

- The initial reporting of an event, such that a decision can be made for investigation by the Fish Health Inspectorate. (The form of this investigation is not specified, but will not necessarily result in an on-site investigation in all cases.)
- A subsequent weekly site mortality out with specified maximum detailed below.
- A rolling 5 week site mortality out with a specified maximum detailed below.
- Notification if any notifiable disease is suspected. (Note that this is currently a statutory requirement.)

Average Weight of Fish on Site	Weekly Mortality Maxima	5 Weekly Rolling Mortality Maxima
Under 750g	1.5%	6%
750g+	1.0%	4%

In the cases of both lice efficacy and event mortality reporting, the reporting route is through the Fish Health Inspectorate duty inspector either by telephone on 01224 295525 or by e-mail to [MS.FishHealth@gov.scot](mailto:MS.FishHealth@gov.scot)

Yours sincerely

C E T Allan  
Fish Health Inspectorate Group Leader

**From:** [REDACTED]  
**Sent:** 04 July 2016 10:43  
**To:** [REDACTED]  
**Subject:** FW: As discussed

**From:** Allan C (Charles) (MARLAB)  
**Sent:** 08 June 2016 17:39  
**To:** Sinclair, Douglas  
**Subject:** RE: As discussed

Many thanks for that Douglas – obviously I had it sense checked in-house, and was expecting some quiet grumbles, but not the SSPO reaction that I got.

With regards your questions:

- The deployment statement refers to all of the methods of control, not just the biological / mechanical, but they are included.
- The requirement in the EN will be to execute such works, or take other steps to demonstrate that they have the ability to control and reduce parasite burdens; preferably to zero or near zero levels, hopefully below the 3 adults or ovigerous reporting level, but definitely below the 8 adult or ovigerous action level. Failure to reduce levels below eight, would, I would argue, be a failure to demonstrate control or reduction and therefore the farmer would be deemed to have contravened the enforcement notice (if there is no reasonable excuse) and an offence has been committed.

Hopefully the above answers your queries.

Happy to discuss further if needed.

Many thanks and with best regards

Charles

**From:** Sinclair, Douglas [<mailto:douglas.sinclair@sepa.org.uk>]  
**Sent:** 08 June 2016 16:54  
**To:** Allan C (Charles) (MARLAB)  
**Subject:** RE: As discussed

Hi Charles

Nothing in there that causes me any distress at all!

It seems an entirely reasonable position to adopt wrt louse control, I think it will also be helpful to local authorities in terms of the planning process.

Two questions:

In the first bullet point you say:

- All farm sites have access to all licenced sea lice medications, as well as access to suitable biological and/or mechanical control measures, and these can be deployed in a reasonable period of time.

Does the "...and these can be deployed in a reasonable period of time" bit refer only to biological and mechanical control or to medicinal approaches too? I'm guessing only to the biological/mechanical but I thought perhaps you were meaning that, for example in using baths, the whole site needed to be treatable within 3-4 days? Probably your use of commas should tell me, but grammar was never my strong point!

Secondly, when the 8 adult louse threshold is breached and you serve an EN, would this include a requirement to treat or some other measure to bring back control?

Apart from that I think it is clear and unambiguous and an entirely reasonable thing for you to be saying.....

All the best and thanks for sight of that.

D

**Douglas Sinclair**  
Specialist I (Aquaculture)  
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Norlantic House  
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E-mail: [douglas.sinclair@sepa.org.uk](mailto:douglas.sinclair@sepa.org.uk)

I no longer work on Mondays, normally available Tuesday - Friday.  
During absences from the office, my e-mails may be read and you may receive a response from Anne Mitchell, Senior Admin Officer in the SEPA Orkney Office.

 **Consider the environment. Please don't print this e-mail unless you really need to.**

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**From:** [Charles.Allan@gov.scot](mailto:Charles.Allan@gov.scot) [<mailto:Charles.Allan@gov.scot>]  
**Sent:** 08 June 2016 09:37  
**To:** Sinclair, Douglas  
**Subject:** As discussed

[REDACTED]

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**From:** [REDACTED]  
**Sent:** 09 December 2016 17:23  
**To:** [REDACTED]  
**Subject:** FW: Submission - sea lice management - stakeholder views

[REDACTED]  
Marine Scotland – Science  
Scottish Government | Marine Laboratory, PO Box 101| 375, Victoria Road | Aberdeen AB11 9DB

[REDACTED]  
Fax: +44 (0)1224 295620

[REDACTED]  
w: <http://www.scotland.gov.uk/marinescotland>

---

**From:** [REDACTED]  
**Sent:** 01 July 2016 14:35  
**To:** Cabinet Secretary for the Rural Economy and Connectivity  
**Cc:** Cabinet Secretary for the Environment, Climate Change and Land Reform; DG Economy; Director of Marine Scotland Mailbox; Cowan WJ (Willie); Moffat C (Colin) (MARLAB); Mitchell A (Alastair); [REDACTED]; Gibbons J (Jeff); Raynard R (Rob) (MARLAB); Murray S (Sandy) (MARLAB); Allan C (Charles) (MARLAB); [REDACTED]; [REDACTED] Communications Rural Economy & Environment; [REDACTED]  
**Subject:** Submission - sea lice management - stakeholder views

PS/ Cabinet Secretary

Please find attached a submission detailing stakeholder views in relation to sea lice management as requested following my earlier submission of 12<sup>th</sup> May (publication of 1st quarter 2016 SSPO Fish Health Management Report).



[REDACTED]  
Sea Lice  
[REDACTED]

Best Regards,  
[REDACTED]

[REDACTED]  
Head of Aquaculture Health and Welfare  
Marine Scotland – Performance, Aquaculture and Recreational Fisheries

[REDACTED]  
Web: <http://www.scotland.gov.uk/marinescotland>

Mail: Scottish Government, 1B North, Victoria Quay, Edinburgh EH6 6QQ



Aquaculture Europe - Edinburgh

Food For Thought

20-23 September 2016

<http://www.gov.scot/Resource/0043/00433571.pdf>

PS/ Cabinet Secretary

## **Sea Lice Management and Impacts on Wild Salmonids**

### **Purpose**

1. The Cabinet Secretary requested background on stakeholder views in relation to sea lice management following the publication of the 1<sup>st</sup> quarter 2016 industry fish health management report.

### **Background**

2. Sea lice are parasites which are ubiquitous in the marine environment and use both salmon and sea trout as hosts. Numbers of sea lice are elevated on salmon farms due to the increased numbers of hosts in the environment. Sea lice transfer from farmed fish to wild fish and vice versa.

3. The majority of aquaculture production is based in the North West Highlands and Islands. There is a presumption against development of marine finfish farms on the north and east coasts – where Scotland's largest salmon farming river catchments drain into the North Sea – as a precautionary measure to safeguard migratory fish species (about 80% of Scotland's wild salmon). There are also a number of Special Areas of Conservation (SAC) where wild salmon are afforded additional protection.

4. No evidence yet exists on the scale of any impacts of lice on wild populations of salmon for Scotland. However, studies carried out in Norway and Ireland suggest increased returns of wild salmon and sea trout which have been treated with anti-sea lice medicines, so by implication wild salmon that have not been treated are negatively impacted by increased sea lice loads in the marine environment.

5. Marine Scotland Science has recently commenced a long term project to address this data gap for Scotland. It will complement another project currently being undertaken by the Scottish Aquaculture Research Forum (SARF), looking at any sea lice impact on the wild salmon population returning to spawn.

### **Sea Lice Management**

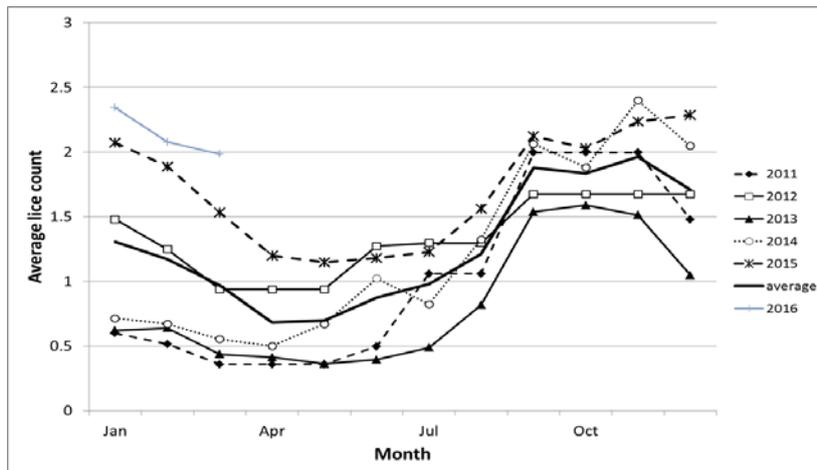
6. All new and modified fish farm developments are assessed by the relevant Local Authorities. Advice is sought from statutory consultees including District Salmon Fishery Boards and all farms are required to comply with stringent Environmental Impact Assessment legislation.

7. Sea lice management in aquaculture is regulated by the Aquaculture and Fisheries (Scotland) Act 2007 and the Aquaculture and Fisheries (Scotland) Act 2013. Marine Scotland's fish health inspectorate operate a risk ranked enhanced sea lice inspection regime, and fully investigate sea lice control practices against legislation on all registered fish farms. This legislation relates to farmed fish and does not consider directly any impacts on wild fish.

8. In addition to the regulatory regime, the majority of the industry are signed up to the voluntary Code of Good Practice for Scottish Finfish Aquaculture (CoGP) which represents a standard against which farms are independently audited. The CoGP includes a National Treatment Strategy for sea lice and Integrated Sea Lice Management plans which are also currently being reviewed and updated.

9. Sea lice figures are published by the Scottish Salmon Producers Organisation on a quarterly basis by region. They provide information for 30 regions of the north-west coast, western and northern isles. The reporting regions broadly mirror those for the wild salmon and sea trout fisheries. The sea lice numbers reported are average adult female lice count per fish for each reporting region. This came about as a result of debate in the passage of the now Aquaculture and Fisheries (Scotland) Act 2013 where there was pressure to move to weekly farm level sea lice data. This was not supported by the industry and a non-legislative compromise was reached. Scotland is arguably out of kilter with the other major salmon producing countries in terms of sea lice publication and the industry's inability to manage sea lice infestation better makes it challenging to hold this line.

10. The graph below shows that sea lice counts for 1<sup>st</sup> quarter 2016 are the highest in the last 5 years.



11. Control of sea lice levels is achieved through the use of licensed veterinary medicines and cleaner fish, such as wrasse which co-habit with the salmon or trout in the cages and feed on the sea lice. Other measures include the coordination of fallowing and stocking within agreed management areas. More innovative techniques are also now being considered with industry making considerable investment in new technologies such as the use of freshwater and heated water to remove the parasites as well as physical removal techniques. Vaccination has been proposed as a means of controlling salmon lice, although there seems little prospect of a licensed vaccine in the near future.

## Stakeholder Views

### Environmental NGO views

12. One of the key issues surrounding the management of sea lice by the aquaculture industry – and therefore its inherent sustainability - is the potential impact of sea lice on wild fish. Environmental NGO's and anti-fish farming campaigners, led by the Salmon and Trout Conservation Scotland (S&TCS) focus on the conservation of wild salmon and trout and have consistently campaigned on the negative impacts of aquaculture on wild salmonids. They blame aquaculture for (they suggest) a larger decline in wild salmonids on the west coast compared to east coast rivers. Their arguments are mostly one-sided and there is often a lack of rational debate on the subject. Full closed containment salmon farming (on-land) is the main goal for them, but this is not currently economically viable and even if it were the risk is that production would be carried out closer to markets, rather than in the Highlands and islands as now.

13. The S&TCS lodged a public petition (PE01598) at the Scottish Parliament in February 2016 in relation to protecting wild salmonids from sea lice from Scottish salmon farms and have recently lodged a complaint with the EU relating to a perceived failure of the Scottish Government to comply with the Marine Strategy Framework Directive in respect of sea-lice control on fish farms – we do not believe that this complaint has merit but we await a response from the Commission.

14. The S&TCS formed part of a group of NGOs who took part in the recent special session on aquaculture at the North Atlantic Salmon Conservation Organisation (NASCO) meeting in Germany. Concerns were raised during a heated debate about the regulation of sea lice and the aquaculture industry in Scotland. They compared the Scottish regulatory system in relation to sea lice control unfavourably with other aquaculture producing countries.

15. Other more balanced wild fish interests, as well as some key decision makers such as local authorities, would prefer there to be better interactions between wild and farmed sectors, including full sharing of data. There have been many attempts at brokering such interaction including a “Chatham House Rules” facilitated discussion with expert mediators and through the existing Ministerial Group on Sustainable Aquaculture Interactions Working Group, but fair to say there hasn’t been significant developments in this area, although in some locations there are good working relationships and sharing of data.

#### Aquaculture Industry views

16. Management of sea lice on farms is the key challenge for the aquaculture industry both in Scotland and in other aquaculture producing nations such as Norway and Canada. If not managed satisfactorily then sea lice could limit the future expansion of the industry. The cost of sea lice to the Scottish aquaculture industry was estimated to be £30 million in 2008. This figure will have increased substantially over the last 8 years .

17. It is in the industry’s best interests to maintain sea lice levels at the lowest possible level given that they are farming in a shared marine environment – and managing sea lice is expensive. They have publically declared that sea lice is their key challenge and that it is currently restricting production growth. Industry are engaged in improving sea lice management but remain resistant to increased legislative controls citing lack of evidence of impacts and significant commercial risks associated with offences or Enforcement Notices.

#### **Improved Management Policy**

18. Scottish Government have over the last year worked with the aquaculture industry to agree a new sea lice management policy, including a redefining of “satisfactory measures” for the prevention, reduction and control of sea lice on farms as required by the Aquaculture and Fisheries (Scotland) Act 2007. This includes agreed reporting levels and increased monitoring and intervention. It also includes a backstop limit at which point enforcement action will be taken. The new policy is currently being implemented but even now the industry is voicing concerns over potential commercial impact of Enforcement Notices if they breach the backstop limit.

19. We believe that this new policy will result in improvements to the management of sea lice by the aquaculture industry in Scotland - earlier intervention by operators, site specific action plans and increased intervention by the fish health inspectorate - however this will take time. We are working with industry to address this issue including investing significantly in biological management techniques, such as the use and production of cleaner fish, through our investment in the Scottish Aquaculture Innovation Centre. Industry are also

trailing other new technologies. Work is being supported by the latest research particularly in relation to area management and dispersal modelling.

20. There is the option to regulate further and potentially introduce legislative sea lice limits. We may need to consider this option seriously if the industry performance in managing sea lice does not improve as a result of the revised measures we are implementing.

21. A review of the current farm management areas, to ensure these are optimal for sea lice management, has been agreed with industry. This will use the latest science from developing dispersal modelling to redraw the boundaries most effectively for the control of sea lice.

**Next Steps**

22. A farmed finfish summit is being arranged for October 2016. Sea lice management, as a key challenge for the industry and one which potentially hinders economic growth, will form an important part of this agenda.

**Conclusion / Recommendation**

23. That the Cabinet Secretary notes the above information as background to stakeholder views in relation to the key issue of sea lice management.

Kate Smith, Ext 46162 Marine Scotland; Aquaculture Unit

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constit Interest	General Awareness
Cabinet Secretary for the Rural Economy and Connectivity			X		
Cabinet Secretary for the Environment, Climate Change and Land Reform			X		

DG Enterprise, Environment and Innovation  
 Linda Rosborough, Director, Marine Scotland  
 Willie Cowan, MS: Head of Performance and Aquaculture  
 Colin Moffat, Director Marine Scotland Science  
 Alastair Mitchell, MS: Aquaculture Unit  
 [Redacted]  
 Jeff Gibbons, MS: Salmon and Recreational Fisheries  
 [Redacted]  
 Rob Raynard, MSS: Head of AAAH  
 Sandy Murray, MSS: Epidemiologist  
 Charles Allan, MSS: Head of Fish Health Inspectorate  
 [Redacted]  
 Communications Rural



## **Briefing for Paul Wheelhouse – 26 July 2016 – Aqua Pharma visit**

### **Aquaculture**

**The Scottish Government supports the sustainable growth of the Scottish aquaculture industry, with due regard to the marine environment:**

- To 2020 by supporting achievement of industry growth targets to increase sustainable production of marine finfish to 210,000 tonnes and shellfish to 13,000 tonnes
- The Scottish aquaculture industry is currently estimated to be worth £1.86 billion annually and supports over 8,300 jobs
- As the 3<sup>rd</sup> largest global producer, Scottish farmed salmon is our top food export worth £495 million in 2014
- We are well on target to deliver both targets – potentially worth over £2 billion in revenues annually and supporting 10,000 jobs.

**We are now working with the aquaculture sector to focus on opportunities out to 2030, within a framework that addresses environmental sustainability challenges.**

- Alongside the economic and social value that delivery of the growth targets will bring, we must take due regard of environmental challenges such as sea lice, disease and escapes from finfish farms.
- We want to encourage the aquaculture industry, through policy promotion, research and innovation to achieve further sustainable growth, using higher energy locations, potentially open-sea, which would help to address husbandry, spatial capacity and wild fish interaction constraints.

### **Sea Lice**

**The Scottish aquaculture industry have publically declared that sea lice management is their key challenge and this is also recognised by the Scottish Government.**

- Management of sea lice on farms is the key challenge for the industry both in Scotland and in other aquaculture producing nations such as Norway and Canada. If not managed satisfactorily then sea lice will limit the future expansion of the industry.
- The Scottish Government and industry have match funded up to £22 million to establish the Scottish Aquaculture Innovation Centre (SAIC) which is helping the sector improve its environmental performance and growth potential through the application of high quality research, with sea lice as a priority, and has contributed to projects totalling over £5 million on the cultivation and use of cleaner fish for biological control of sea lice.

### **New Sea Lice Management Policy**

- Over the last year The Scottish Government has worked cooperatively with the aquaculture industry to agree a new sea lice management policy, including a redefining of “satisfactory measures” for the prevention, reduction and control of sea lice on farms as required by the Aquaculture and Fisheries (Scotland) Act 2007.

- This includes agreed reporting levels and increased monitoring and intervention. It also includes a backstop limit at which point enforcement action will be taken. The new policy is currently being implemented
- We believe that this new policy will result in improvements to the management of sea lice by the aquaculture industry in Scotland, however this will take time.
- A review of the current farm management areas, to ensure these are optimal for sea lice management, has been agreed with industry. This will use the latest science from developing dispersal modelling to redraw the boundaries most effectively for the control of sea lice.
- The new policy is in addition to the voluntary Code of Good Practice for Scottish Finfish Aquaculture (CoGP) which represents a standard against which farms are independently audited. The CoGP includes a National Treatment Strategy for sea lice and Integrated Sea Lice Management plans which are also currently being reviewed and updated.
- A farmed finfish summit is being arranged for October 2016. Sea lice management, as a key challenge for the industry and potential inhibitor, will form an important part of this agenda.

### **Aqua Pharma Hydrogen Peroxide Sea Lice Treatment**

- Resistance to available sea lice treatments is increasing in all salmon producing nations. Paramove® is a sea lice medicine manufactured by Solvay, and sold globally in collaboration with Aqua Pharma, containing hydrogen peroxide as it's active ingredient. There have been no reports of resistance in Scotland to date.
- Hydrogen peroxide treatments 'knock' lice from fish and can reduce their reproductive capacity or kill them. Some lice are able to recover and reinfect the farm or others in the area.
- Paramove® is now frequently used on Scottish fish farms, especially towards the end of a production cycle, as it has no withdrawal period, and often in conjunction with other products in order to reach good lice clearance across site.
- Peroxide treatments are regarded as environmentally friendly, releasing water and oxygen as breakdown products only, enabling farms are able to carry out multiple treatments.
- Hydrogen peroxide treatments are also an effective treatment for several gill conditions, including amoebic gill disease.

**Aqua Pharma allocate a proportion of all profit to fund scientific research. Mr Wheelhouse may wish to enquire about current research aimed at addressing the challenge of sea lice, given the magnitude of the problem facing industry and the eagerness of the industry to improve sea lice management on Scottish fish farms.**

**From:** [REDACTED]  
**Sent:** 25 November 2016 13:05  
**To:** [REDACTED]  
**Subject:** FW: Submission - 2nd quarter 2016 fish health management report

---

**From:** [REDACTED]  
**Sent:** 12 August 2016 16:18  
**To:** Cabinet Secretary for the Rural Economy and Connectivity  
**Cc:** Cabinet Secretary for the Environment, Climate Change and Land Reform; DG Economy; Director of Marine Scotland Mailbox; Cowan WJ (Willie); Moffat C (Colin) (MARLAB); Mitchell A (Alastair); [REDACTED] Gibbons J (Jeff); [REDACTED] Raynard R (Rob) (MARLAB); Murray S (Sandy) (MARLAB); Allan C (Charles) (MARLAB); [REDACTED]  
**Subject:** Submission - 2nd quarter 2016 fish health management report

Please find attached a submission detailing the quarterly fish health management report including sea lice figures, due to be published by the Scottish Salmon Producers' Organisation on Monday, **15th August 2016**. Also attached is an overview of the 2nd quarter 2016 report (April-June).



[REDACTED]  
[REDACTED]

Regards,  
[REDACTED]

[REDACTED]  
Aquaculture Health and Welfare  
Marine Scotland – Performance, Aquaculture and Recreational Fisheries  
[REDACTED]  
Web: <http://www.scotland.gov.uk/marinescotland>  
Mail: Scottish Government, 1B North, Victoria Quay, Edinburgh EH6 6QQ



Aquaculture Europe - Edinburgh  
Food For Thought  
20-23 September 2016  
<http://www.gov.scot/Resource/0043/00433571.pdf>

From: [REDACTED]  
Aquaculture Health and Welfare

12 August 2016

Cabinet Secretary for Rural Economy and Connectivity

## **SEA LICE UPDATE AND SSPO FISH HEALTH MANAGEMENT REPORT – APRIL - JUNE 2016**

### **Purpose**

1. To provide advance notice of the publication of the latest fish health management report by the Scottish Salmon Producers' Organisation (SSPO) on 15<sup>th</sup> August 2016.

### **Priority**

2. **Routine**

### **Background**

3. SSPO's quarterly reports on fish health management provide information for 30 regions of the north-west coast, western and northern isles. They are based on information supplied by farms during the relevant period. The reports include information on Farm Management Areas, stocking, fallowing, strategic treatments and average sea lice counts.

4. The reporting regions broadly mirror those for the wild salmon and sea trout fisheries. The sea lice numbers reported are average adult female lice count per fish for each reporting region.

5. The latest report - for the 2<sup>nd</sup> quarter 2016 (Apr - Jun) - will be published on Monday 15<sup>th</sup> August 2016.

6. The fish health management reports are anticipated by wild fish NGO's who are concerned about the potential impacts from sea lice on wild salmon.

### **Report summary**

7. An analysis of the latest quarterly report is attached. It provides information on trends in sea lice numbers in the areas as well as highlighting any areas of concern or issues which arise as a result of this quarter's publication.

8. The report shows 15 out of the 29 reporting areas, which were stocked during the quarter returning an adult female lice count higher than the suggested treatment criteria threshold for the months of February to June of 0.5. This reduced treatment threshold takes account of any potential impacts on migratory salmon.

9. The results are disappointing generally, given that this alongside last quarter's results provides the highest sea lice figures for the first half of the year in the 5 year dataset. However, when viewed alongside the final quarter of 2015 and the 1<sup>st</sup> quarter of 2016, the figures are not unexpected.

10. Areas highlighted from this report are - the Awe and Nell, Add and Ormsary and Ruel and Drummachloy areas. These areas are having difficulty reducing sea lice levels on larger fish which are in their second year of production. The Fish Health Inspectorate are regularly monitoring sites in this area.

11. Of the remaining areas suffering from levels above the suggested treatment criteria, those which are increasing will continue to be monitored by the Fish Health Inspectorate and sea lice management options will be discussed.

12. As with the 1<sup>st</sup> quarter 2016, there continues to be positive results from areas where sea lice are being managed extremely well using biological controls (cleaner fish). The Kennert to Gruinard area as well as the Sanda to Creran North area are maintaining levels at zero or close to zero. This is the result of significant investment in the effective deployment of cleaner fish. This best practice is being shared and implemented in other areas across the industry.

13. Industry continue to work on other alternative solutions. Freshwater treatments and the use of thermolicers are being made available, particularly in areas where chemical treatments aren't producing the results expected. Again industry are committed to sharing such resource.

### **Stakeholder Views**

14. As noted in the submission of 1 July, management of sea lice on farms is the key challenge for the aquaculture industry both in Scotland and in other aquaculture producing nations such as Norway and Canada. If not managed satisfactorily then sea lice could limit the future expansion of the industry. Recent analysis suggests that parasites account for an annual loss of up to 16.5% of the value of UK aquaculture production. The vast majority of this relates to the treatment of sea lice.

15. It is in the industry's best interests to maintain sea lice levels at the lowest possible level given that they are farming in a shared marine environment – and managing sea lice is expensive. They have publically declared that sea lice is their key challenge and that it is currently restricting production growth. Industry are engaged in improving sea lice management but remain resistant to increased legislative controls citing lack of evidence of impacts and significant commercial risks associated with offences or Enforcement Notices.

### **Next Steps**

16. This latest quarterly report from SSPO serves again to highlight the on-going challenge faced by industry in managing sea lice. We have taken steps to address this.

17. We have drawn up a proposal, following extensive consultation with industry, to strengthen the policy which enforces the Aquaculture and Fisheries Act 2007. The requirement for operators to have “satisfactory measures” in place for the reduction and control of sea lice has now been redefined and strengthened.

18. The new definition includes a requirement to report sea lice levels above 3.0 average female adult lice to Marine Scotland’s Fish Health Inspectorate. This will initiate a site specific action plan and will require satisfactory control measures to be implemented. There will also be an upper backstop limit of 8.0 lice which will initiate enforcement action in cases where lice numbers cannot be reduced and controlled effectively. The reporting aspect of the policy is proposed to begin on 1<sup>st</sup> September 2016 with a start date of 1<sup>st</sup> January 2017 proposed for the enforcement aspect. This allows industry time to implement new management strategies and appropriate resource as required.

19. In parallel, industry have revised their own sea lice management policy and we expect to receive an industry proposal which is reflective of the improved regime, in turn leading to updates to the industry Code of Good Practice. The industry are also pursuing a meeting with the Cabinet Secretary for the Environment, Climate Change and Land Reform to discuss future sea lice treatment regime and overriding sea lice management policy showing commitment to achieve environmental sustainability and addressing the issue of sea lice.

20. We also intend, in partnership with industry, to review the current farm management areas with sea lice control as a priority. Recent science including dispersal and connectivity models will be used to optimise the area management in relation to sea lice.

## **Broader Considerations**

21. The Salmon and Trout Conservation Scotland (S&TCS) launched a public petition recently in relation to the impacts of salmon farming on wild fish which is currently being considered by the Petitions Committee. Marine Scotland have submitted a response to this. They also submitted an official complaint to the European Commission in May, again in relation to Scottish Government’s perceived failure to protect wild salmon from the impacts of sea lice.

## **Communications**

22. Media interest has been relatively quiet following recent publications of the fish health management reports, however given the broader considerations outlined above, and the importance of this reporting quarter in relation to any impacts on migrating smolts, we might expect there to be some interest.

23. Greener Communications have been made aware and have been provided with appropriate press lines.

## Recommendation

24. The Minister is invited to note this submission and the attached summary.

  
 Aquaculture Health and Welfare Team  
 Marine Scotland

12 August 2016

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constit Interest	General Awareness
Cabinet Secretary for the Environment, Climate Change and Land Reform Permanent Secretary			X		X

DG Economy  
 Linda Rosborough, Director, Marine Scotland  
 Willie Cowan, MS: Head of Performance and Aquaculture  
 Colin Moffat, Director Marine Scotland Science  
 Alastair Mitchell, MS: Aquaculture Unit  
  
 Jeff Gibbons, MS: Salmon and Recreational Fisheries  
  
  
 Rob Raynard, MSS: Head of AAAH  
 Sandy Murray, MSS: Epidemiologist  
 Charles Allan, MSS: Head of Fish Health Inspectorate  
  
  
  
  
  


## Fish Health Management Report April – June 2016

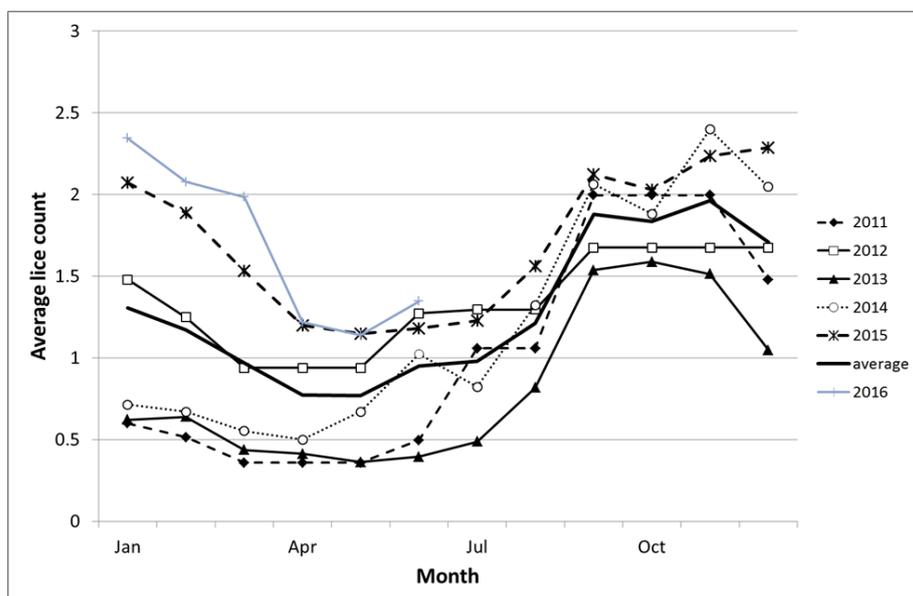
### General Summary and Trends

The fish health management report for the 2<sup>nd</sup> quarter (April- June) will be published by the Scottish Salmon Producers Organisation (SSPO) on 15th August 2016.

<http://scottishsalmon.co.uk/farming/>

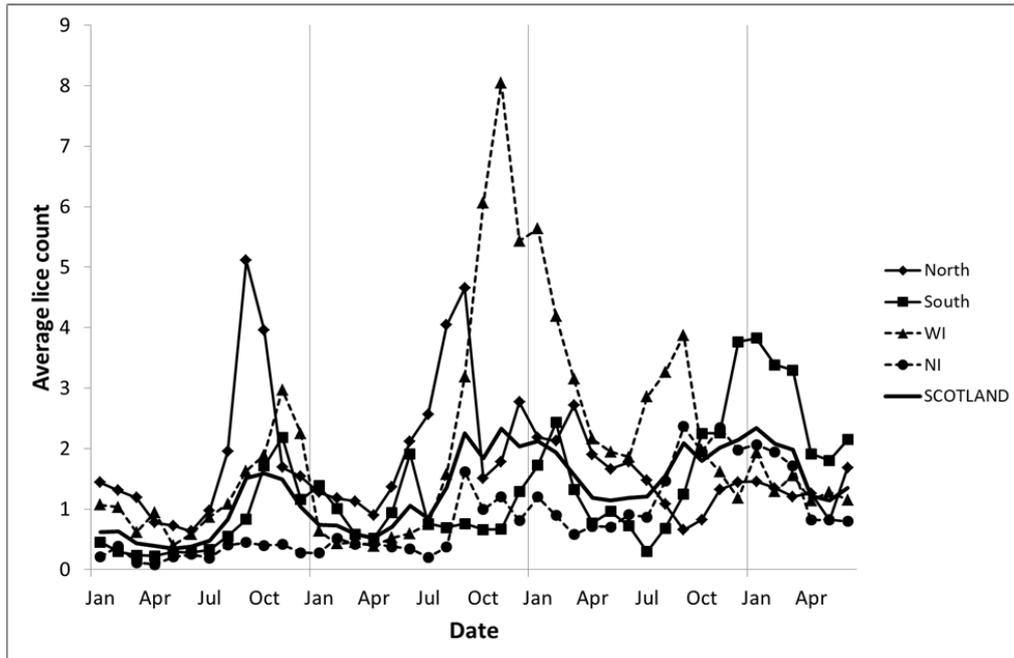
The annual data graph below shows;

- The sea lice counts for the 2<sup>nd</sup> quarter 2016 are as high as those from 2015, which produced the highest figures in the 5 year timeline
- Lice loads have reduced over the quarter in line with 2<sup>nd</sup> quarter trends from previous years



The area data graph below shows;

- the peak in the Western Isles has now reduced and the northern mainland is still maintaining historic lows.
- the relatively high combined lice count appears to be due to high values from the south mainland region



### Areas above the suggested criteria for sea lice treatment

The suggested sea lice treatment threshold for the months in this quarter report is 0.5.

15 out of the 29 areas stocked during the reporting period returned average adult female lice numbers greater than 0.5 during the reporting period – the number in brackets provides the highest figure reported in the quarter.

- Inchard to Kirkaig North (3.77)
- Kishorn and Carron (0.74)
- Loch Long and Croe (6.07)
- Skye and Small Isles South (2.96)
- Sunart and Aline (1.20)
- Awe and Nell (5.87)
- Add and Ormsary (7.23)
- Islay and Jura (2.28)
- Fyne (1.54)
- Ruel and Drummachloy (6.64)
- Isle of Lewis East (4.28)
- Isle of Lewis West (2.02)
- Harris (0.90)
- The Uists North (1.71)
- Shetland East (1.77)

Most of the areas noted above held fish of harvest size in the period of the report – this is consistent with the observation that lice numbers increase on farms during the second year of production.

## **Exceptions**

The Awe and Nell and Loch Long and Croe areas returned high sea lice figures of around 6 average adult female lice in the reporting period. The Add and Ormsary area returned a similarly high figure of 7.23 in June. This figure has been unstable or rising throughout the last 3 quarters, at a time when we would expect to see sea lice numbers dropping. Sites in this area are experiencing difficulties treating sea lice. They are holding fish in their second year of production, are currently harvesting out and due to be fallow later in the year.

## **Areas of concern**

The Ruel and Drummachloy area has dropped following last quarter, however has remained high throughout the quarter at around 6 adult female lice per fish, rising quickly from 2.48 in January to 9.42 and 8.43 in February and March. The fish in this area are early in their 2<sup>nd</sup> year of production and so concerns remain about sea lice management. Regular monitoring of this area by the Fish Health Inspectorate is taking place.

## **Positives**

It is worth noting that there continues to be areas which are managing to keep sea lice levels close to zero and below the suggested treatment criteria of 0.5. The Kennart to Gruinard area maintained close to zero lice levels again as a result of very successful deployment of cleaner fish as a biological control. The sites in this area have required no other form of sea lice treatment in over 12 months. These results, particularly given historic results from this area, continue to be very encouraging and are being shared across industry as an example of best practice

The Sanda to Creran North and Sanda to Creran South areas are also maintaining sea lice levels at or close to zero. These areas have also managed to keep sea lice levels below 1.0 for 2 years (a full production cycle). Again, this has been as a result of significant investment in cleaner fish as a biological control.

## **Conclusions**

The results this quarter, although showing a drop from the 1<sup>st</sup> quarter of the year, are disappointing generally, particularly when considered alongside the 2<sup>nd</sup> quarter results from previous years.

This continues to highlight the on-going challenge for industry posed by sea lice. The average sea lice numbers remain above the Code of Good Practice suggested criteria for treatment in most areas. The new sea lice management policy and regulatory regime including the reinterpretation of “satisfactory measures”, which are required under the Aquaculture and Fisheries (Scotland) Act 2007 in order to manage sea lice, will help to address some of the issues highlighted in this report and will require reduction and control of lice levels beyond the reporting level of 3.0 as well as providing a backstop limit of 8.0 at which point urgent action will be required. This will ensure that satisfactory measures are being deployed at individual site level to ensure that sea lice are being appropriately managed.

Alongside the new policy, industry continue to invest significantly in new methods for sea lice management, however this remains their biggest challenge and will require improvements in the management of sea lice at both site and area level in order to deliver positive results across the industry.

[REDACTED]

---

**From:** [REDACTED]  
**Sent:** 09 December 2016 17:26  
**To:** [REDACTED]  
**Subject:** FW: Submission - 2nd quarter 2016 fish health management report

[REDACTED]  
Marine Scotland – Science  
Scottish Government | Marine Laboratory, PO Box 101| 375, Victoria Road | Aberdeen AB11 9DB

[REDACTED]  
Fax: +44 (0)1224 295620

[REDACTED]  
w: <http://www.scotland.gov.uk/marinescotland>

---

**From:** [REDACTED]  
**Sent:** 12 August 2016 16:32  
**To:** [REDACTED] Cabinet Secretary for the Rural Economy and Connectivity  
**Cc:** Cabinet Secretary for the Environment, Climate Change and Land Reform; DG Economy; Director of Marine Scotland Mailbox; Cowan WJ (Willie); Moffat C (Colin) (MARLAB); Mitchell A (Alastair); Gibbons J (Jeff); [REDACTED]  
[REDACTED] Raynard R (Rob) (MARLAB); Murray S (Sandy) (MARLAB); Allan C (Charles) (MARLAB); [REDACTED]  
**Subject:** RE: Submission - 2nd quarter 2016 fish health management report

Hi [REDACTED]

The below press lines have just been provided to Comms;

- Marine Scotland acknowledge the 2<sup>nd</sup> quarter 2016 fish health management reports published by the Scottish Salmon Producers Organisation.
- The report highlights the on-going challenge faced by industry in relation to the management of sea lice but also notes maintained improvement in some areas, particularly where cleaner fish and other alternative sea lice management techniques have been deployed with positive results.
- Scottish Government acknowledges that sea lice management presents the key challenge for the aquaculture industry. Over the last year The Scottish Government has worked cooperatively with the aquaculture industry to agree a new sea lice management policy, including a redefining of “satisfactory measures” for the prevention, reduction and control of sea lice on farms as required by the Aquaculture and Fisheries (Scotland) Act 2007. This includes agreed reporting levels and increased monitoring and intervention. It also includes a backstop limit at which point enforcement action will be taken. We believe that this new policy will result in improvements to the management of sea lice by the aquaculture industry in Scotland.
- We are also working closely with industry on environmental sustainability including; changes to industry’s management guidance to deliver enhanced use of cleaner fish as a biological solution to sea lice management, investigating and trialling novel techniques for sea lice control, improvements in husbandry more generally and exploring opportunities to improve spatial planning.

- Scottish Government is working alongside Scotland's salmon farming industry and representatives of the wild salmon sector on a strategic programme of further research that includes a study to explore any impacts of sea lice from fish farming in Scotland.

Thanks,



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**From:** [REDACTED]  
**Sent:** 12 August 2016 16:29  
**To:** [REDACTED] Cabinet Secretary for the Rural Economy and Connectivity  
**Cc:** Cabinet Secretary for the Environment, Climate Change and Land Reform; DG Economy; Director of Marine Scotland Mailbox; Cowan WJ (Willie); Moffat C (Colin) (MARLAB); Mitchell A (Alastair); [REDACTED] Gibbons J (Jeff); [REDACTED] Raynard R (Rob) (MARLAB); Murray S (Sandy) (MARLAB); Allan C (Charles) (MARLAB); [REDACTED]  
**Subject:** Re: Submission - 2nd quarter 2016 fish health management report

Hi the press lines might have come in while I was on leave but haven't seen these? Could these be sent alt is usual too for across now pls? these to go to cab sec in the submission I think as well

---

**From:** [REDACTED]  
**Sent:** Friday, August 12, 2016 04:17 PM  
**To:** Cabinet Secretary for the Rural Economy and Connectivity  
**Cc:** Cabinet Secretary for the Environment, Climate Change and Land Reform; DG Economy; Director of Marine Scotland Mailbox; Cowan WJ (Willie); Moffat C (Colin) (MARLAB); Mitchell A (Alastair); [REDACTED] Gibbons J (Jeff); [REDACTED] Raynard R (Rob) (MARLAB); Murray S (Sandy) (MARLAB); Allan C (Charles) (MARLAB); [REDACTED]  
**Subject:** Submission - 2nd quarter 2016 fish health management report

Please find attached a submission detailing the quarterly fish health management report including sea lice figures, due to be published by the Scottish Salmon Producers' Organisation on Monday, **15th August 2016**.

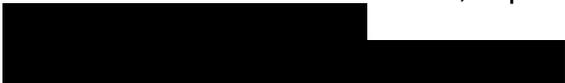
Also attached is an overview of the 2nd quarter 2016 report (April-June).

<<SUBMISSION - sea lice quarter 2 2016.docx>> <<FHM Report 2nd quarter 2016.docx>>

Regards,



Aquaculture Health and Welfare  
Marine Scotland – Performance, Aquaculture and Recreational Fisheries



Web: <http://www.scotland.gov.uk/marinescotland>

Mail: Scottish Government, 1B North, Victoria Quay, Edinburgh EH6 6QQ



Aquaculture Europe - Edinburgh

Food For Thought

20-23 September 2016

<http://www.gov.scot/Resource/0043/00433571.pdf>

[REDACTED]

---

**From:** [REDACTED]  
**Sent:** 12 December 2016 11:43  
**To:** [REDACTED]  
**Subject:** FW: Loch Greshornish FS0015

[REDACTED]  
Marine Scotland – Science  
Scottish Government | Marine Laboratory, PO Box 101| 375, Victoria Road | Aberdeen AB11 9DB

[REDACTED]  
Fax: +44 (0)1224 295620

[REDACTED]  
w: <http://www.scotland.gov.uk/marinescotland>

---

**From:** [REDACTED]  
**Sent:** 07 September 2016 16:41  
**To:** [REDACTED]  
**Cc:** [REDACTED] Allan C (Charles) (MARLAB); [REDACTED]  
**Subject:** Loch Greshornish FS0015

Hi [REDACTED]

[REDACTED] called, he has heard some reports that Greshornish has had to fallow early due to algal bloom and sea lice damage.

Would you be able to conduct a PSI?

Thanks

[REDACTED]  
Senior Fish Health Inspector  
Marine Scotland - Science

Scottish Government | Marine Laboratory | 375 Victoria Road | Aberdeen | AB11 9DB

[REDACTED]  
Fax: +44 (0)1224 295620

[REDACTED]  
w: <http://www.gov.scot/topics/marine>



T: +44 (0)1224 876544 «Ext» F: +44 (0)1224 295511 «Fax»  
enquiries@marlab.ac.uk



25<sup>th</sup> October 2016

Dear Farm Correspondent

**Changes in Interpretation of The Aquaculture and Fisheries (Scotland) Act 2007 With Regards to the Satisfactory Measures in Place For The Prevention, Control and Reduction of Parasites.**

I wrote to you in May of this year regarding the change in interpretation of The Aquaculture and Fisheries (Scotland) Act 2007. Following my letter, clarification was sought on some aspects of the controls. Discussions have been ongoing with industry and policy colleagues which has led to an updated text and annex attached.

In 2007 the Scottish Parliament made provisions in relation to regulation of fish farms and more specifically with regard to the control of parasites, namely sea lice. These were amended by the Aquaculture and Fisheries (Scotland) Act 2013. In particular, powers of inspection to assess the measures in place for the prevention, control and reduction were introduced. This was the first legislation in Scotland to address concerns regarding sea lice controls on fish farms. At the time of implementation in 2007, the Code of Good Practice for Scottish Finfish Production offered a guide to what could be considered satisfactory measures for the prevention, control and reduction of parasites.

Since 2007, there have been significant changes in the Scottish aquaculture industry, with increased production, an increase in the number of active sites and a reduction in the number of companies producing Atlantic salmon. In parallel, the challenges facing farmers have changed, with reduced efficacy of sea lice treatments, the emergence of amoebic gill disease and increased challenges associated with sea lice control, all contributing to increased sea lice numbers across the Scottish salmon farming industry. These, in combination, have contributed to significant issues which require to be addressed.

In collaboration with industry, research and policy colleagues, Marine Scotland have reassessed the measures considered to be satisfactory for the prevention, control and reduction of sea lice on aquaculture sites in Scotland, leading to changes in expectation when these measures are examined by Fish Health Inspectors. Identifying that measures are satisfactory for the control of sea lice, requires that they can be demonstrated to be so. Therefore a monitoring scheme requires to be implemented.

This will include a reporting level, where an average of 3 adult female sea lice per fish on any fish farming site would be required to be reported to the Fish Health Inspectorate. Where the reporting level is reached, increased monitoring by the Fish Health Inspectorate would be implemented and

Marine Laboratory, PO Box 101, 375 Victoria Road,  
Aberdeen AB11 9DB  
[www.scotland.gov.uk/marinescotland](http://www.scotland.gov.uk/marinescotland)



continued until either; the average adult female count is reduced to below the reporting level of 3, or the intervention limit of an average of 8 adult female sea lice per fish on any fish farming site is reached.

Reaching the intervention limit requires the implementation of an explicit action plan, agreed with the Fish Health Inspectorate, which will reduce and maintain the average number of adult female sea lice per fish at the site below the reporting level of 3. If satisfactory measures cannot be demonstrated then enforcement action will be taken (a more detailed explanation of this policy is attached).

Alongside the new reporting and intervention limits the following measures will also be expected to be in place:

- All farm sites have access to a range of licenced in-feed and bath sea lice medications (including deltamethrin, azamethiphos and emamectin benzoate) as well as access to suitable biological and/or mechanical control measures, and these can be deployed in a reasonable period of time.
- An improved harvesting strategy for each site, where fewer populations or part populations are held without treatment for sea lice.
- Each fish farming site has a specific written procedure for lice management, with waypoints describing set actions to deal with recognised scenarios during the escalation of a sea lice infestation.

It is acknowledged that the sea lice management policy as outlined above is designed to improve sea lice management across the industry. As part of that wider objective of improving lice control in Scotland, it has been agreed with industry that a review of the current Integrated Sea Lice Management (ISLM) strategy will take place. This will include the defining of management areas to reflect the current knowledge and understanding of the movement of sea lice in the marine environment.

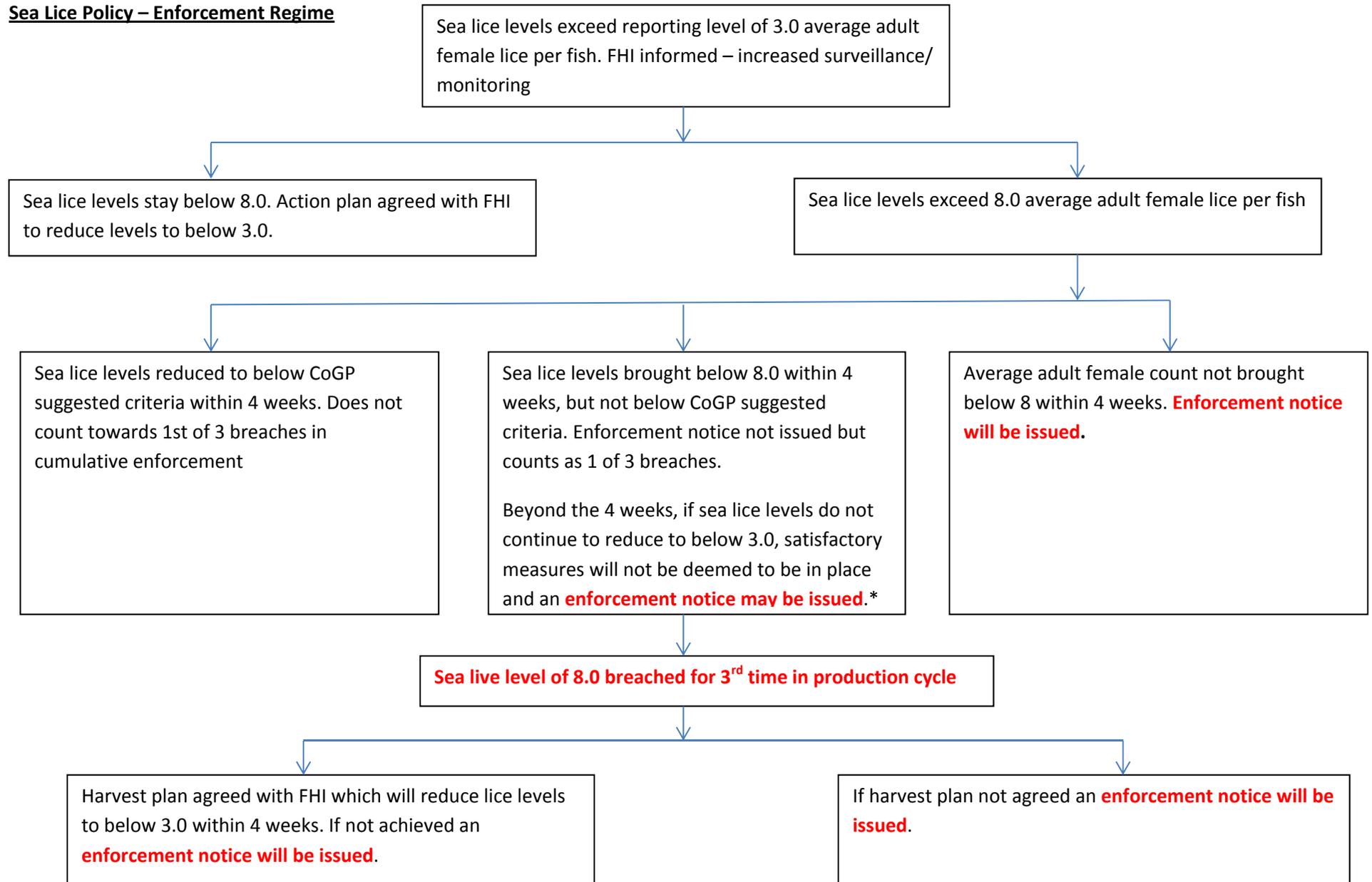
The reporting regime as noted above is effective from the date of this letter. Please report to the Duty Fish Health Inspector on 01224 295525 or MS.FishHealth@gov.scot. In order for industry to implement the required procedures, the enforcement regime will take effect from 1st April 2017. It is intended that this policy will be subject to review in 2019.

Yours sincerely

C E T Allan

Fish Health Inspectorate Group Leader

## Sea Lice Policy – Enforcement Regime



\*the expectation is that sea lice levels will continue to decrease to below 3.0. If this does not occur then enforcement action may be taken – this will be judged on a case by case basis

[REDACTED]

---

**From:** [REDACTED]  
**Sent:** 25 November 2016 13:06  
**To:** [REDACTED]  
**Subject:** FW: Submission - 3rd quarter 2016 SSPO Fish Health Management Report

---

**From:** [REDACTED]  
**Sent:** 17 November 2016 11:15  
**To:** Cabinet Secretary for the Rural Economy and Connectivity  
**Cc:** Cabinet Secretary for the Environment, Climate Change and Land Reform; Permanent Secretary; DG Economy; Director of Marine Scotland Mailbox; Moffat C (Colin) (MARLAB); [REDACTED] Mitchell A (Alastair); [REDACTED] Gibbons J (Jeff); Raynard R (Rob) (MARLAB); [REDACTED] Murray S (Sandy) (MARLAB); Allan C (Charles) (MARLAB); [REDACTED]  
**Subject:** Submission - 3rd quarter 2016 SSPO Fish Health Management Report

Please find attached a submission detailing the quarterly fish health management report including sea lice figures, due to be published by the Scottish Salmon Producers' Organisation tomorrow - **18th November 2016**.

Also attached is an overview of the 3rd quarter 2016 report (July - Sept).



Sea Lice: Final Report: Q3  
Submission - 3rd quarter 2016 SSPO...

Regards

[REDACTED]  
Aquaculture Policy Advisor  
Marine Scotland – Performance, Aquaculture and Recreational Fisheries

Web: <http://www.scotland.gov.uk/marinescotland>

Mail: Scottish Government, 1B North, Victoria Quay, Edinburgh EH6 6QQ

## Fish Health Management Report July - Sept 2016

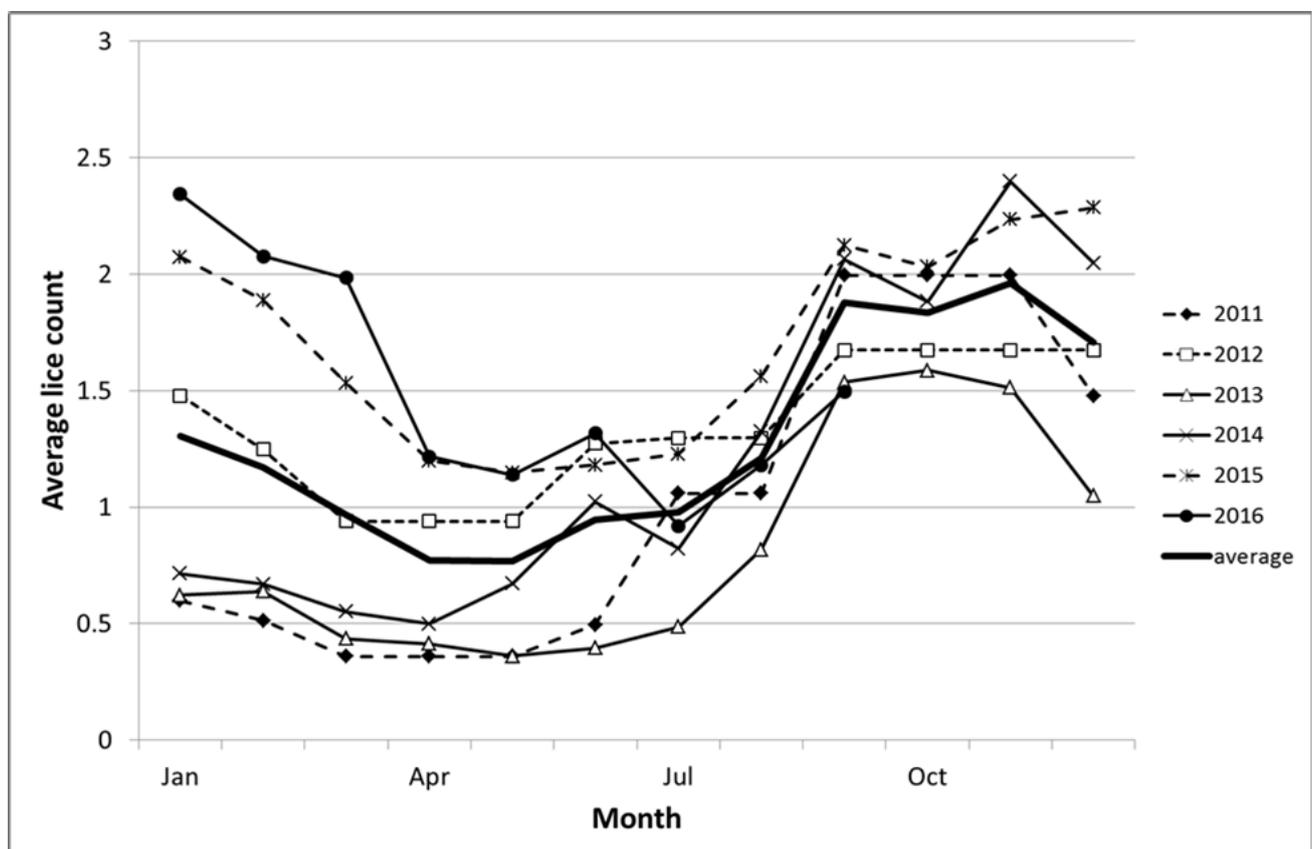
### General Summary and Trends

The fish health management report for the 3rd quarter (July - Sept) will be published by the Scottish Salmon Producers Organisation (SSPO) on 18th November 2016.

<http://scottishsalmon.co.uk/category/media/sspo-publications/>

The annual data graph below shows;

- sea lice numbers appear to be stable at relatively low levels in Q3, having decreased from the highest levels recorded in Q1 of 2016.
- the Scotland average in September 2016 is the lowest since recording started in 2011.



The area graph below shows;

- a sharp rise in the Western Isles region in the last two months and indication of a rise in the Northern Isles.
- a continuing trend of reduction of sea lice levels in the South Scotland area.



## **Exceptions**

The Isle of Lewis West returned a high sea lice figure of 8.46 adult female lice per fish in September, rising from 4.74 in July. The sites in this area are holding fish in their second year of production and started harvest in the reporting period. While harvesting, sites are unable to treat for sea lice using chemotheraputants due to consideration of withdrawal periods. Sites in this area have committed to increased cleaner fish use in the next production cycle.

## **Areas of Concern**

The Loch Long and Croe area returned a peak figure of 6.22 adult female lice per fish. Similarly, this area held harvest sized fish in Q3 and is known to have fallowed in October. High figures in July in the Awe and Nell (3.97) and Add and Ormsary (4.68) areas were also due to fish being held for harvest – both areas are now fallow.

## **Positives**

Sea lice levels tend to increase in the late summer and early autumn. However many areas have maintained low or reduced lice levels over the quarter this year. In Q2 the Ruel and Drummachloy area was considered an area of concern. Lice levels, although still high, have remained close to 4 adult female lice per fish over the quarter, including during harvest. This is a drop from 6 in the second quarter and 9 in the first.

The Kennert to Gruinard area continued to maintain close to zero lice levels and have sustained success with their cleaner fish program. The Inchard to Kirkaig North area has managed to reduce and maintain lice levels from a peak of 4 in Q2 to 0.7 at Q3's end, below the suggest criteria for treatment.

## **Conclusions**

The trend this quarter has not followed that which we would have expected given results from previous years and the sea lice levels recorded in the first two quarters of 2016. Gill issues have affected much of the industry this year and many regions have carried out accelerated or early harvest. This reduction in biomass, particularly of 2<sup>nd</sup> year production fish, has likely reduced the average lice burden in Scotland. Average sea lice numbers remain above the Code of Good Practice suggested criteria for treatment in some areas. We would expect to see sea lice numbers plateau during the next quarter in line with previous annual trends, however gill issues may impact harvest and stocking regimes further into Q4.

From: [REDACTED]  
Aquaculture Health and Welfare

17 November 2016

Cabinet Secretary for Rural Economy and Connectivity

## **SEA LICE UPDATE AND SSPO FISH HEALTH MANAGEMENT REPORT JULY - SEPT 2016**

### **Purpose**

1. To provide advance notice of the publication of the latest fish health management report by the Scottish Salmon Producers' Organisation (SSPO) on 18 November 2016.

### **Priority**

2. **Routine**

### **Background**

3. SSPO's quarterly reports on fish health management provide information for 30 regions of the north-west coast, western and northern isles. They are based on information supplied by farms during the relevant period. The reports include information on Farm Management Areas, stocking, fallowing, strategic treatments and average sea lice counts.

4. The reporting regions broadly mirror those for the wild salmon and sea trout fisheries. The sea lice numbers reported are average adult female lice count per fish for each reporting region.

5. The latest report for the 3<sup>rd</sup> quarter 2016 (July - Sept) will be published on Friday 18<sup>th</sup> November 2016.

### **Report summary**

6. An analysis of the latest quarterly report is attached. It provides information on trends in sea lice numbers in the areas as well as highlighting any areas of concern or issues which arise as a result of this quarter's publication.

7. In general the sea lice levels reported during Q3 are lower than we would have expected and should be welcomed. However, they should be welcomed with caution. We are aware of a large number of mortality events resulting from a combination of both sea lice and on-going gill health issues across parts of Scotland. These have been widely reported by the media recently. Loss of production, in combination with accelerated harvest, has unexpectedly and significantly decreased the stocked biomass in some reporting areas. This will have contributed to a

reduction in the overall average lice burden in Q3 and makes comparing seasonal trends problematic.

8. The report shows 16 out of the 28 reporting areas stocked during the quarter returning an average adult female lice count lower than the suggested treatment criteria threshold of 1.0 for this period. Many of the areas, covering a large proportion of the mainland as well as the Orkney, appear to be managing sea lice well and have maintained or reduced lice levels over the quarter.

9. Sea lice numbers in the Harris, Isle of Lewis East and Shetland East areas, show an increasing trend. In general sea lice levels tend to increase during Q3. Increases in these areas are therefore not unexpected. The majority of areas suffering from levels above the suggested treatment criteria contain sites which are in their second year of production. Sites in their second year of production will hold a higher biomass of larger fish and consequently it is expected that they will harbour more lice per fish.

10. Areas highlighted as returning particularly high numbers from this report are – the Isle of Lewis West and Loch Long and Croe. Some sites within these areas were undergoing harvest in Q3. While harvesting, sites may be unable to treat for sea lice using chemotheraputants due to consideration of withdrawal periods. Both of these areas will be completely fallow in Q4.

## **Next Steps**

11. Industry continue to invest in and trial alternative solutions to sea lice. Freshwater treatments and the use of thermolicers have been made available, particularly in areas where chemical treatments aren't proving effective. It will take time for new management techniques to be deployed successfully as additional tools for sea lice control across the industry. The industry also continue to deploy cleaner fish with notable success in the majority of cases.

12. The combination of issues leading to gill problems is being addressed in discussions with industry and Marine Scotland Science. We have also asked SAIC to treat this as a priority issue and an early workshop is arranged for December.

13. Officials, in cooperation with industry, have strengthened the policy which enforces the Aquaculture and Fisheries (Scotland) Act 2007. The requirement for operators to have 'satisfactory measures' in place for the reduction and control of sea lice has been redefined. The new policy was introduced after Q3 of this year and includes a requirement to report sea lice levels above 3.0 average female adult lice per fish to Marine Scotland's Fish Health Inspectorate. This will initiate a site specific action plan and will require satisfactory control measures to be implemented. As an indication, at a minimum, sites in at least 8 of the reporting areas were over this level at some point in this reported quarter. We will continue to work with industry to improve sea lice management via the implementation and monitoring of the new sea lice policy.

14. In parallel, industry have committed to review their own Integrated Sea Lice Management strategy within their industry Code of Good Practice. The first meeting of the ISLM review group is scheduled for 25<sup>th</sup> November. The industry are also meeting with the Cabinet Secretary for the Environment, Climate Change and Land Reform to discuss future sea lice management and their commitment to environmental sustainability.

### Communications

15. Media interest has been quiet following recent publications of the fish health management reports, however there have been several media articles relating to aquaculture mortality including in relation to the use of a Thermolicer sea lice treatment. We stand ready to respond and Comms have been made aware and provided with appropriate press lines.

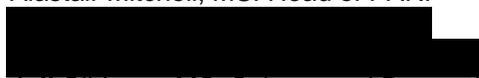
### Recommendation

16. Ministers are invited to note this submission and the attached summary.

  
 Aquaculture Health and Welfare Team  
 Marine Scotland

17 November 2016

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constit Interest	General Awareness
Cabinet Secretary for Rural Economy and Connectivity			X		
Cabinet Secretary for Environment, Climate Change and Land Reform			X		
Permanent Secretary					X

DG Economy  
 Mike Palmer, Director, Marine Scotland  
 Colin Moffat, Director Marine Scotland Science  
 Alastair Mitchell, MS: Head of PARF  
  
 Jeff Gibbons, MS: Salmon and Recreational Fisheries  
  
 Rob Raynard, MSS: Head of AAAH  
 Sandy Murray, MSS: Epidemiologist  
 Charles Allan, MSS: Head of Fish Health Inspectorate  


[REDACTED]

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**From:** [REDACTED]  
**Sent:** 25 November 2016 13:07  
**To:** [REDACTED]  
**Subject:** FW: Sea Lice Press Lines - 18 Nov

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**From:** [REDACTED]  
**Sent:** 17 November 2016 11:19  
**To:** [REDACTED]  
**Cc:** Communications Rural Economy & Environment; [REDACTED] Mitchell A (Alastair)  
**Subject:** Sea Lice Press Lines - 18 Nov

Hi [REDACTED]

As per my submission this morning, press lines below should there be any interest in the publication of the SSPO Q3 sea lice figures tomorrow.

- Marine Scotland acknowledge the 3<sup>rd</sup> quarter 2016 fish health management reports published by SSPO. Marine Scotland are engaged with industry on improving sea lice management and have over the last year worked with the aquaculture industry to agree a new sea lice management policy, including a redefining of “satisfactory measures” for the prevention, reduction and control of sea lice on farms as required by the Aquaculture and Fisheries (Scotland) Act 2007. This includes agreed reporting levels and increased monitoring and intervention.
- Marine Scotland continue to work closely with the Scottish aquaculture industry on environmental sustainability including; changes to industry’s management guidance to deliver enhanced use of cleaner fish as a biological solution to sea lice management, investigating and trialling novel techniques for sea lice control, improvements in husbandry more generally and exploring opportunities to make spatial planning for aquaculture more effective.
- Scottish Government is also working with Scotland’s salmon farming industry and representatives of the wild salmon sector on a strategic programme of further research that includes a study to explore any impacts of sea lice from fish farming in Scotland.

Thanks,

[REDACTED]  
Aquaculture Policy Advisor  
Marine Scotland – Performance, Aquaculture and Recreational Fisheries

[REDACTED]  
Web: <http://www.scotland.gov.uk/marinescotland>

Mail: Scottish Government, 1B North, Victoria Quay, Edinburgh EH6 6QQ

[REDACTED]

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**From:** [REDACTED]  
**Sent:** 18 November 2016 15:58  
**To:** Cabinet Secretary for the Rural Economy and Connectivity  
**Cc:** News Desk; Allan C (Charles) (MARLAB); [REDACTED]  
[REDACTED] Communications Rural Economy & Environment; Palmer MR  
(Mike); Mitchell A (Alastair); [REDACTED]  
**Subject:** Lines to clear - salmon fish farms - Telegraph - due 5pm

Hello [REDACTED]

The Telegraph approached us for comment following the Marine Harvest incident – asking about potential impact on prices for the consumer, animal welfare, and our position on whether the company is doing enough.

With officials, developed the following lines, which have been cleared by Spads.

**A Scottish Government spokesperson said:**

“Marine Scotland evaluates the health and welfare of fish on sites during inspections and investigates all mortality events fully. We remain in close contact with the company, who continue to take the welfare of their fish seriously and acknowledge that recent fish losses have been regrettable.

“We support the development of new approaches which avoid the use of medicines to address challenges such as sea lice, including fresh and warm water treatments. Industry is undertaking research with a number of partners to improve the effectiveness of these innovative treatments and enhance their reliability.”

Please let me know if Cab Sec is content for issue.

Many thanks,

[REDACTED]

[REDACTED]

Communications First Minister and Communications CTEA | [REDACTED]

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