SCOTTISH SALMON WATCH

DISEASES

Cabinet Secretary for Environment, Climate Change and Land Reform
Cabinet Secretary for Rural Economy & Connectivity
The Scottish Government
St. Andrew's House
Regent Road
Edinburgh
EH1 3DG

31 May 2018

Dear Cabinet Secretaries,

Ban Imported Salmon Eggs (Ova) from Norway Due to Disease & Genetic Risks

Why is the Scottish Government allowing salmon eggs (ova) from Norway (and Iceland) to flood the Scottish salmon farming industry when the Norwegian Ministry of Climate & Environment has banned the import of ova from Scotland citing unacceptable disease and genetic risks under Norway's Nature Diversity Act?

Documents disclosed via Freedom of Information by the Scottish Government (24 May 2018) expose the "complete mockery of the brand 'Scottish Salmon". In a stinging attack the head of Scotland's largest salmon egg producer (owned by Dutch multinational Hendrix Genetics) accused the Scottish Government of taking a "massive risk" by allowing salmon eggs from Norway and Iceland to flood 'Scottish' salmon farms citing the danger of "transfer of ISA from infected countries such as Norway". Read more via Press Release: "Complete Mockery of the Brand 'Scottish Salmon'".

In a letter to Fergus Ewing (12 February 2018), Neil Manchester of Hendrix Genetics wrote:

> This means that the Scottish salmon industry is now 100% reliant on imported eggs- both a massive risk in the event of borders closing for disease issues (and also the transfer of ISA from infected countries such as Norway), but also making a complete mockery of the brand ?Scottish Salmon?.
>
> This also means that the extensive R&D projects conducted between Landcatch and the Universities of Glasgow, Stirling, and Edinburgh, once lauded as great examples of Smart Successful Scotland, will now require the involvement of Norwegian breeding companies operating in Norway. Phrases other than smart and successful come to mind.

Scottish Salmon Watch urges the Scottish Government to ban imports of salmon eggs from Norway as a matter of urgency to safeguard what's left of the genetic integrity of Scottish salmon. It speaks volumes that the Norwegian Government is fighting to protect biodiversity and values wild salmon highly whilst the Scottish Government is happy to sell wild salmon down the river.

In February 2018, Norway's Ministry of Climate & Environment banned the import of Scottish salmon eggs citing risks of disease and genetic impacts of escapes under the Norwegian Nature Diversity Act.

"Farmed salmon with partial Scottish origin increases the likelihood of a negative impact on Norwegian wild populations above negative effects with Norwegian farmed strains," stated the 22-page letter of refusal. "There is a high probability that genetic mixing between Norwegian wild salmon and farmed salmon of partly Scottish origin will increase the loss of genetic diversity."

"This speaks for the Ministry's view that concern for biodiversity and wild salmon should be given significant weight in the case," continued Norway's Ministry of Climate & Environment. "The Ministry also refers to the value of Norwegian wild salmon as an ecosystem service, or a natural good."

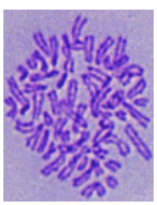
Norway's Deputy Director General at the Ministry of Climate & Environment (Torbjørn Lange) cited a 2017 report by the Norwegian Institute of Nature Research (NINA). "Risk assessment of imports of partly Scottish salmon from Scotland to aquaculture in Norway" - authored by NINA scientists Sten Karlsson and Kjetil Hindar - concluded: "Based on proven genetic distances and that Scottish wild salmon is a separate genetic group different from that found in Norway, fished salmon with partly Scottish origin is considered to have an increased negative effect on wild salmon stocks in Norway."

Scientific research in Scotland has already shown that Norwegian genetic material is threatening the integrity of wild Scottish salmon. The Salmon & Trout Association reported in 2017:

> A study by Scotland's Fisheries Trusts, funded by the Scottish Government, looked for Norwegian genes in wild salmonid populations in the "aquaculture zone" of the west coast of Scotland. Across all sites, 369 out of 1472 (25.1%) individuals were identified as hybrids; this is significantly higher than that seen for the east coast "wild" baseline, where there is no marine aquaculture. The data – which was reviewed by Marine Scotland Science, the Scottish Government's fisheries scientists – showed that over one quarter of west coast wild salmon are in fact Norwegian hybrids. (*See RAFTS (2013) Report on Genetic Tool Development for Distinguishing Farmed vs. Wild Fish in Scotland, February 2013*)

The University of the Highlands & Islands is continuing this work via the research project - "Domestication Genes in Atlantic Salmon: Identification of Markers":

Projects



Domestication Genes in Atlantic Salmon: Identification of Markers

Identification of genetic and epigenetic genomic markers of domestication in Atlantic salmon for use in assessing introgression of farm genes into wild populations. Led by the Rivers and Lochs Institute in collaboration with partners in UK, Norway, Ireland, and Canada, jointly funded by the BBSRC and NERC.

In May 2018, a PhD studentship was advertised by the University of Highlands & Islands to study "Salmon farming in Scotland: quantifying the actual levels of interbreeding and gene introgression of farm escapes with wild populations".

Scientific research published in 2017 reported that introgression of farmed salmon in wild populations in Norway could be as high as 47% (read more via "Half a century of genetic interaction between farmed and wild Atlantic salmon: Status of knowledge and unanswered questions").

In 2013, The Sunday Times reported that one in four wild Atlantic salmon from Scotland was genetically "tainted" by Norwegian fish following scientific research by Rivers & Fisheries Trusts Scotland. In 2013, The Sunday Times reported that "Scots fish are 'Vikings with kilts on'". Read more via "Scottish Salmon's Great Escape".

Wester Ross Fisheries Trust reported in 2013:

'Norwegian' genes found in wild salmon populations in Wester Ross

Posted: Monday 4 March, 2013 @ 16:03:52

[Please also see link to quiz at end of this news item . . .]

The results of a study to learn more about the occurrence of genes with a Norwegian signature in wild salmon populations in the West of Scotland have just been published.

The study, 'Genetic Tool Development for Distinguishing Farmed vs. Wild fish in Scotland' was led by Mark Coulson as part of the RAFTS Managing Interactions with Aquaculture Project [MIAP] and supported by WRFT and other fishery trusts. The report can be downloaded by clicking here or via the link at the end of this item.

The results of this study demonstrate the ability to distinguish between Norwegian and Scottish fish as well as identify individuals of mixed ancestry with high accuracy.

For samples collected in the West of Scotland, the presence of Norwegian genetic signatures was identified from most sites. Several cases of putative direct aquaculture escapees were genetically consistent with field-based identification, including samples from the River Balgy (2006 and 2007) and the Tullich burn near Lochcarron (2011). It was also possible to distinguish individuals of mixed ancestry versus those of either pure Scottish or Norwegian origin. For rivers sampled in Wester Ross, juvenile salmon of mixed ancestry represented the following % of the samples from respective rivers (where n = number of fish in the sample): Gruinard 2005, 15% (n=20); Kerry 2011, 27% (n=33); Torridon 2007, 26% (n=44); Kishorn 2011, 30% (n=27); and Carron [River Lair] 2011, 34% (n=32).

Scottish Salmon Watch filed a Freedom of Information request following a news snippet - "Norway keeps ban on import of Scottish roe" - published in February by Salmon Business which itself triggered a Parliamentary Question from Peter Chapman MSP and a Parliamentary Reply from the Cabinet Secretary for Rural Economy & Connectivity in late February 2018.

"We understand the Norwegian Government are reviewing the decision to ban the import of salmon eggs from Scotland," stated Fergus Ewing on 27 February 2018. "We are in dialogue with the Norwegian Authorities in order to understand the outcome of this review and I will raise the issue at a scheduled meeting with Per Sandberg, Norwegian Minister of Fisheries." This was in reply to a Parliamentary Question filed by Peter Chapman MSP on 19 February 2018: "To ask the Scottish Government what its response is to the Norwegian Government's reported decision to ban the import of salmon eggs from Scotland."

As background, the FOI disclosure by the Scottish Government on 24 May 2018 includes the following timeline:

March 2016: The Scottish Government (Alastair Mitchell) wrote to the Norwegian Government (Yngve Torgersen):

"I've been advised that a recent planned export of Landcatch eggs from Scotland to Norway was stopped by Norway's Environment Directorate on grounds that those eggs are non-Norwegian and are, therefore, an alien species under your regulations (they further allege other imports since June 2015 may have been illegal)."

May 2016: Neil Manchester, Managing Director of Hendrix Genetics (owners of Landcatch) wrote to the Scottish Government (Willie Cowan) asking that the Scottish Government "act in a reciprocal fashion regarding all imports of live salmon eggs and smolts from Norway". In other words, ban imports of salmon eggs and smolts from Norway.

June 2016: Neil Manchester, Managing Director of Hendrix Genetics (owners of Landcatch) wrote to the Scottish Government (Willie Cowan): "We have just received confirmation from the Fisheries Department in the Norwegian Government that they have rejected our appeal, and are upholding their decision to prevent the movement of salmon eggs from Scotland into Norway as they believe that mixing phylogeographic strains of salmon will have a serious impact on wild fish stocks."

Hendrix Genetics requested an assurance from the Scottish Government "that exactly the same challenges will be put to any application for the movement of live salmon eggs or smolts from Norway into Scotland, and that movements should only be permitted if it can be proven that the strain matches native Scottish strains of salmon."

June 2016: Michael Russell (now the Scottish Government's Minister for UK Negotiations on Scotland's Place in Europe) wrote to Neil Manchester of Hendrix Genetics and Fergus Ewing (Cabinet Secretary for Rural Economy & Connectivity): "I had been alerted to the potential for this problem to arise and it is certainly now very pressing. I hope Fergus can find a way forward, perhaps by direct contact with the Norwegian Government but I am happy to raise it in the Parliament in the new session (we are now about to go into recess) if a solution has not been found by then."

July 2016: The Scottish Government wrote to Hendrix Genetics: "Scottish Government are going to follow this up as a matter of urgency with the Norwegian Government....In relation to the trade of imported Atlantic ova from Norway, Scottish Government do not consider Atlantic salmon ova of Norwegian origin to be an alien or locally absent species according to the definitions provided in the EU Regulation. We would therefore not consider any reciprocal action in this regard."

February 2018: Neil Manchester of Hendrix Genetics wrote to Fergus Ewing (email copied to Michael Russell): "In the press today it was reported that the Norwegian Environment Ministry issued a communique saying it will not allow the import of farmed salmon from Scotland for aquaculture in Norway, citing fears that escapees could 'further weaken' the country's wild salmon population. This coincides with Hendrix Genetics being issued with a 22 page letter explaining why Scottish genetics are seen as a threat to the Norwegian wild

stocks and why their decision to ban our import of eggs from Scotland into Norway is final and not open to appeal."

"Thus, thanks in part to a spectacular lack of support from parties who should have shown an interest, our case is lost," continued the Managing Director of Hendrix Genetics. "The Landcatch breeding programme, established in 1980 by Sir William Lithgow, heavily funded during the 1990s through Scottish Enterprise, and the only independent Scottish salmon egg producer in existence, will now be terminated. This means that the Scottish salmon industry is now 100% reliant on imported eggs - both a massive risk in the event of borders closing for disease issues (and also the transfer of ISA from infected countries such as Norway), but also making a complete mockery of the brand 'Scottish Salmon'. This also means that the extensive R&D projects conducted between Landcatch and the Universities of Glasgow, Stirling and Edinburgh, once lauded as great examples of Smart Successful Scotland, will now require the involvement of Norwegian breeding companies operating in Norway. Phrases other than smart and successful come to mind."

March 2018: Neil Manchester of Hendrix Genetics emailed the Cabinet Secretary for Rural Economy & Connectivity (Fergus Ewing): "The point here is that if the Minister accepts this decision, and thereby the reasoning behind it, he must answer why he is unwilling to afford the same level of protection to wild salmon. Alternatively, since our independent salmon breeding and egg production business in Argyll has been destroyed by this decision and the time it has taken to reach it, I would hope that Scottish government would recognize this and act/react accordingly."

The Global Alliance Against Industrial Aquaculture (GAAIA) pointed out in a press release (16 April 2017) that:

- In 2016, 53% (22.6 million) of imported eggs were sourced from Norway via Aquagen (a company genetically fingered by a peer-reviewed scientific paper as the source of ISA outbreak in Chile)

- In 2016, Norwegian-owned Marine Harvest imported 14.5 million eggs - all from Norway - accounting for 34% of all egg imports

- In 2016, the Scottish Salmon Company imported 12.4 million eggs - again all from Norway - accounting for 30% of eggs imports

- No data for Scottish Sea Farms is available because "disclosure of this particular information would, or would be likely to, prejudice substantially the confidentiality of commercial information provided by Scottish Sea Farms and thus cause substantial harm to their commercial interests"

Download the FOI data from the Scottish Government as an Excel spreadsheet online here

Date	Site of destination	Operator	Consignee on certificate (if different from operator)	Species	Stage	Number	Source Country	Source Company
14/01/2016	Mill Burn	Kintail Hatchery	Marine Harvest (Scotland)	Salmon	Ova	2,000,000	Norway	Aquagen AS
05/01/2016	Quoys Hatchery	Cooke Aquaculture Scotland Ltd		Salmon	Ova	550,000	Norway	Aquagen AS
14/01/2016	Tullich Hatchery	The Scottish Salmon Company		Salmon	Ova	1,200,000	Iceland	Stofnfiskur
20/01/2016	Howietoun Hatchery	Howietoun Fishery	The Scottish Salmon Company	Salmon	Ova	400,000	Norway	Aquagen AS
20/01/2016	Barvas Hatchery	The Scottish Salmon Company		Salmon	Ova	1,908,540	Norway	Aquagen AS
21/01/2016	Lochailort Recirculation Unit	Marine Harvest (Scotland)		Salmon	Ova	3,000,000	Norway	Marine Harvest (Norway)
04/02/2016	Knock Hatchery	Scottish Sea Farms Ltd		Salmon	Ova			
04/02/2016	Wester Fearn	Highland Salmon Company Ltd		Salmon	Ova	350,000	Rep of Ireland	Marine Harvest (Ireland)
10/02/2016	Lochailort Recirculation Unit	Marine Harvest (Scotland)		Salmon	Ova	200,000	Norway	Marine Harvest (Norway)
10/02/2016	Couldoran Incubation Unit	Scottish Sea Farms Ltd		Salmon	Ova			
10/02/2016	Ardtaraig Hatchery	Cooke Aquaculture (Freshwater) Ltd		Salmon	Ova	400,000	Norway	Aquagen AS
17/02/2016	Girlsta Hatchery	Grieg Seafood Shetland Ltd (Hatchery)		Salmon	Ova	1,545,000	Norway	Salmobreed
18/02/2016			Scottish Sea Farms Ltd	Salmon	Ova			
24/02/2016	Geocrab Hatchery	The Scottish Salmon Company		Salmon	Ova	461,160	Norway	Aquagen AS
24/02/2016	Mingarry Hatchery	Hebridean Smolts Ltd	The Scottish Salmon Company	Salmon	Ova	564,375	Norway	Aquagen AS
24/02/2016	Allt Mor Hatchery	JS Salmon Ltd	Kames Fish Farming Ltd	Salmon	Ova	500,000	Norway	Aquagen AS
24/02/2016	Quoys Hatchery	Cooke Aquaculture Scotland Ltd		Salmon	Ova	250,000	Rep of Ireland	Marine Harvest (Ireland)
02/03/2016	Kinlochmoidart Hatchery	Sunbeam Aquaculture	The Scottish Salmon Company	Salmon	Ova	575,000	Norway	Aquagen AS
02/03/2016	Amhuinnsuidhe Hatchery	The Scottish Salmon Company		Salmon	Ova	275,000	Norway	Aquagen AS
02/03/2016	Quoys Hatchery	Cooke Aquaculture Scotland Ltd		Salmon	Ova	70,000	Norway	Aquagen AS
02/03/2016	Inverpolly	Finfish Ltd		Salmon	Ova	1,300,000	Norway	Marine Harvest (Norway)
03/03/2016			Scottish Sea Farms Ltd	Salmon	Ova			
10/03/2016	Lochailort Recirculation Unit	Marine Harvest (Scotland)		Salmon	Ova	1,300,000	Norway	Marine Harvest (Norway)
17/03/2016	Furnace (FW)	Cooke Aquaculture (Freshwater) Ltd		Salmon	Ova	650,000	Norway	Aquagen AS
25/05/2016	Girlsta Hatchery	Grieg Seafood Shetland Ltd (Hatchery)		Salmon	Ova	1,545,000	Norway	Erfjord Stamfisk

Read more via: [Press Release: "Viking Invasion Taints 'Scottish' Salmon"]

The [latest data published by the Scottish Government in September 2017] reveals that 91% of 'Scottish' salmon is sourced via imported eggs from overseas (predominantly from Norway and Iceland).

Ova Production

Table 17: Number (000s) of salmon ova produced during 2009-2016

Year	2009	2010	2011	2012	2013	2014	2015	2016
No. of ova	91,964	91,655	78,208	57,489	56,904	33,450	11,605	13,689

In 2016, 13.7 million ova were stripped, an increase of 18% from the number of ova produced in 2015.

Table 18: Source, number (000s) and previous year's estimate of ova laid down to hatch during 2005-2017

Year	In-house broodstock	Out-sourced GB broodstock	GB wild broodstock	Foreign ova	Total	Previous year's estimate
2005	43,261	22,465	71	9,896	75,693	65,741
2006	19,063	17,768	63	27,157	64,051	58,385
2007	18,837	14,366	78	42,022	75,303	68,032
2008	19,831	14,261	171	26,409	60,672	75,302
2009	17,148	20,158	65	30,200	67,571	64,693
2010	13,744	26,220	0	29,657	69,621	61,011
2011	15,664	14,630	0	34,322	64,616	54,526
2012	18,556	9,981	0	34,700	63,237	55,723
2013	16,996	8,263	0	41,315	66,573	49,249
2014	14,418	2,725	10	53,684	70,837	48,149
2015	6,479	223	10	61,463	68,175	65,284
2016	5,884	4	0	58,458	64,346	59,604
2017						60,673

Table 22b: Destination and number (000s) of salmon ova, parr and smolts exported during 2005-2016 derived from health certificates

Export year	Farmed origin ova				Total	Parr and Smolts
	Chile	EU	Norway	Others		
2005	8,560	3,130	0	1,566	13,256	1,362
2006	26,930	4,312	0	0	31,242	998
2007	32,150	164	0	0	32,314	2,169
2008	62,185	130	0	15	62,330	551
2009	7,181	317	0	0	7,498	89
2010	0	189	600	0	789	130
2011	0	0	0	820	820	183
2012	0	0	0	0	0	55
2013	0	650	0	0	650	404
2014	0	0	0	0	0	259
2015	0	93	0	2	95	8
2016	0	335	0	23	361	173

In 2016, 361,000 ova were exported. Parr and smolt exports increased by 165,000 fish on the 2015 figure.

The number of ova laid down to hatch was 64.3 million, a decrease of 3.9 million (5.6%) on the 2015 figure. The majority of the ova (90.8%) were derived from foreign sources, this being a decrease of 3.0 million (4.9%) on the 2015 figure. Supplies derived from GB broodstock decreased by 0.8 million, a 12.1% decrease on the 2015 figure. No ova from GB wild broodstock were laid down in 2016, however, in previous years the ova derived from wild stocks were generally held and hatched for wild stock enhancement by the aquaculture industry in cooperation with wild fisheries managers.

International Trade in Ova

Since the introduction of the EU single market on 1st January 1993 and the associated Fish Health Regulations common to all EU member states, a trade in live salmon and ova has been established. In addition, the European Economic Area (EEA) agreement allows trade between the EU and the member states of the European Free Trade Association (EFTA). Trade is based on the same rules as are established within the EU regarding compartments and zones declared free from listed diseases.

Trade with Third Countries has also been established, but only from sites that have met the same health standards as are established within the EU regarding the approval of farms and zones for listed diseases. Exports to countries outside the EU are subject to the health conditions placed by the importing country. Marine Scotland Science advises potential exporters to ascertain with the importing country any specific health testing requirements that may be a condition of import.

Imports and Exports

Table 22a: Source and number (000s) of ova, parr and smolts imported during 2004-2016 derived from health certificates

Import Year	Ova						Parr and Smolts	
	EU Member States	EFTA		Third Countries		Total	EU Member States	EFTA-Norway
		Iceland	Norway	Australia	USA			
2004	4,450	3,475	6,750	1,860	450	16,985	824	0
2005	2,610	570	13,210	0	450	16,840	150	0
2006	11,575	300	15,940	2,400	0	30,215	375	0
2007	10,511	0	33,555	0	0	44,066	420	0
2008	5,600	0	22,703	0	0	28,303	519	0
2009	5,460	0	29,938	0	0	35,398	328	0
2010	2,150	0	26,533	0	0	28,683	452	0
2011	3,400	0	35,851	0	0	39,251	800	0
2012	10,134	0	23,849	0	0	33,983	0	0
2013	10,700	2,719	35,044	0	0	48,463	55	0
2014	5,218	3,813	49,831	0	0	58,862	1,602	1,748
2015	4,815	8,978	45,926	0	0	59,719	2,118	365
2016	5,444	5,324	38,602	0	0	49,370	1,956	0

The numbers of ova imported decreased by 17.3%. The number of parr and smolts imported decreased from that observed in 2015, with only 1.9 million parr and smolts imported from EU member states.

A [paper published in the journal Aquaculture in 2016] revealed how Scottish salmon farming has been flooded by imports of foreign salmon eggs (ova) over the last few decades.

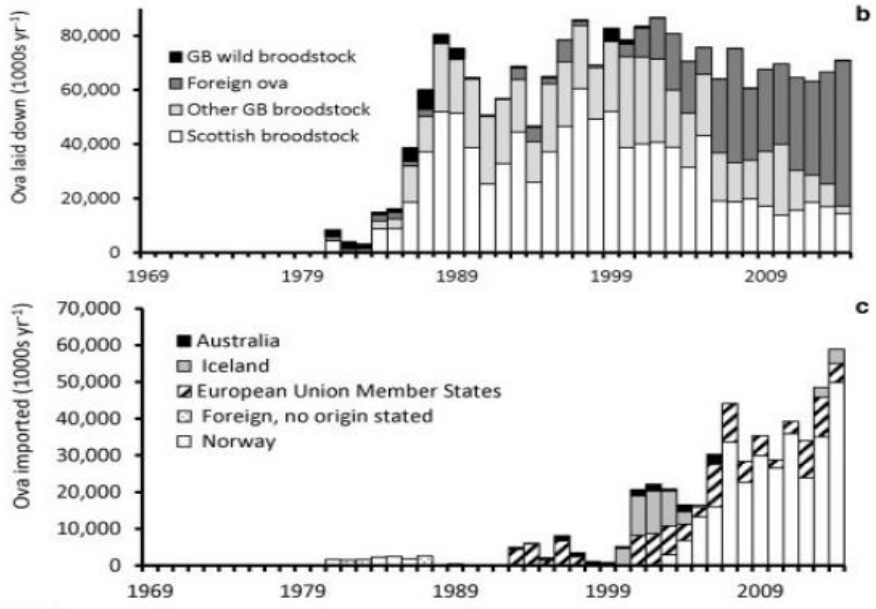


Fig. 2.
Data on salmon ova in Scotland. a: Numbers of ova produced in Scotland, subdivided into laid down in Scotland, exported and not laid or exported. Data available 1984/1994/1995–2014. b: Origins of ova laid down to hatch within Scottish salmon industry. Data available 1981–2014. c: Origins of foreign (imported) ova. Data available 1981–2014.

The Scottish Parliament's salmon farming inquiry briefly touched upon the issue in oral evidence from the predominantly Norwegian-owned salmon farming companies on 2 May:

Stewart Stevenson: I just have a wee point, which is probably for Grant Cummings, based on what he said. I can be corrected on this, but is there not an international trade in smolts, which I believe is two-way? If there is, how does that affect the provenance that we rely on to sell products?

Grant Cumming: It is possible to import and export smolts from areas of equivalent disease status. The majority of those smolts are Scottish, if not all of them. It is possibly more common for eggs to come from abroad, but they can still make a quality Scottish salmon.

Jamie Greene: This might be a question for Marine Harvest. I was surprised to learn that all the eggs come from Norway. How does that add to Scottish provenance?

Ben Hadfield: In farming generally, it is quite typical to move stock types around the world. It is the case in chicken farming, beef farming and pig farming. In salmon production, there is a requirement to take eggs from multisea winter fish brood stock from big rivers. The majority of the worldwide salmon industry uses Norwegian stocks. They have been bred over time and there are some elements of our Scottish stocks within those. They are used in Canada, Norway and Scotland.

Jamie Greene: I am happy to leave that there.

The Convener: I will bring in Craig Anderson, who might have a different story to tell.

Craig Anderson: The Scottish Salmon Company also imports Norwegian eggs. However, we have invested £3 million in a native Hebridean brood stock programme based in Langass on wild stock from the River Uist. It is Scottish eggs and Scottish fish. By 2020, our aim is for 15 per cent of our production to be native Hebridean, and we aim to grow that.

In conclusion, the reputation of the 'Scottish Salmon' brand is cracked beyond repair and is an international joke. When is the Scottish Government going to start protecting native wild salmon rather than protecting predominantly Norwegian companies importing Norwegian salmon eggs into Scotland to pass off to unsuspecting consumers as 'Scottish' salmon?

Do you still concur with the following statement in July by the Scottish Government?

"In relation to the trade of imported Atlantic ova from Norway, Scottish Government do not consider Atlantic salmon ova of Norwegian origin to be an alien or locally absent species according to the definitions provided in the EU Regulation. We would therefore not consider any reciprocal action in this regard"

'Scotland's 10 Year Farmed Fish Health Framework' published earlier this month (23 May 2018) cites ova yet fails to tackle the issue of imports from Norway and Iceland (where infectious diseases carry, to steal the words of Neil Manchester of Hendrix Genetics, a massive risk):

- Identify where support to fish farming companies is necessary and assist industry to prioritise robust ova selected for disease resistance to maintain and enhance Scotland's good health status.

- Revise the recommendations of the Code of Good Practice with regards to ova selection.

Why does the Scottish Government not immediately ban the import of ova from Norway?

Yours sincerely,

Don Staniford

Director, Scottish Salmon Watch

SCOTTISH SALMON WATCH VIRUSES

Cc:
Michael Russell MSP and Minister for UK Negotiations on Scotland's Place in Europe
Peter Chapman MSP
Mark Ruskell MSP