

Case No: 2024-0152 Date of visit: 20/05/2024

Time spent on site: 5.5hrs Main Inspector: [REDACTED]

Site No: FS1042 Site Name: Seaforth

Business No: FB0119 Business Name: Mowi Scotland Ltd

Case Types: 1 DIA 2 REP 3 4 5 6

Water Temp (°C): 10.1 Thermometer No: T152 FHI 045 completed N/A

Observations: Region: WI Water type: S CoGP MA: W-6

Dead/weak/abnormally behaving fish present? Y If yes, see additional information/clinical score sheet.

Clinical signs of disease observed? Y If yes, see additional information/clinical score sheet.

Gross pathology observed? Y If yes, see additional information/clinical score sheet.

Diagnostic samples taken? Y

UNI/REG only - if unable to carry out intended visit detail reason below:

**Additional Case Information:**

Site visited following notification of the presence of BKD from a third party.

Site has had positive results for Pasteurella, Moritella and Tenacibaculum. CMS has also been confirmed.

Site currently has permission to do livehaul and deadhaul harvests. Livehaul harvest was completed on the morning of the day of inspection. Fish are taken to Mallaig station then loaded into tankers before being transported to Blar Mhor in Fort William for processing. Deadhaul harvests are taken to Ullapool before being loaded into tankers and taken to Blar Mhor.

Mortalities from the site are preferentially ensiled on the barge before being uplifted by Fergusons and taken to either Pelagia in Shetland or ScanBio. Last collection of ensiled material was on 30/10/23.

Only tricaine used since the last inspection for sealice counts. FW and FLS was on site March 9th and good clearance (>95%) was reported. A thermolicer was on site during the inspection.

Farmed lumpfish were stocked at 5% and are being removed from harvest cages and transferred into stocked pens. 33.25% mortality since last inspection.

Site is stocked with a mix of Stofinfiskers and Aquagens. The fish came on from Inchmore and Lochailort hatcheries via Loch Arkaig (Stofinfiskers) and Loch Lochy (Aquagens).

PGD scores have been increasing over the last couple of weeks but remain below 1. The gills of the fish sampled were pale with zoning.

Morts since last inspection:

Wk16: 0.36%, Wk15: 0.22%, Wk14: 0.22%, Wk13: 0.38%

Site plan is to fallow by September 24, however, this may be accelerated.

Several fish that were dark in colour were observed in every pen. The fish that were moribund and displaying clinical signs of disease were removed for diagnostic sampling. There were several lethargic fish also observed across the site but could not be caught with a hand net and so were not sampled. Fish sitting deeper in the water, although slightly lethargic, appeared in good physical health. The moribund fish/lethargic fish sitting at the surface had higher than average lice loads.

Sites covered by movement restrictions are automatically scored as high risk for surveillance frequency.

Case No: **2024-0152** Site No: **FS1042**

Date of Visit: **20/05/2024** Inspector(s): **[REDACTED]**

**Registration/Authorisation Details**

- 1. Business/site details summary checked by site representative?  Y
- 2. Changes made to details?  N

**Site Details (include cleaner fish for all sections)**

Total No facilities	<b>10</b>	Facilities stocked	<b>6</b>	No facilities inspected	<b>10</b>
Species	<b>SAL LUM</b>				
Age group	<b>2023 Q2 2023 Q1</b>				
No Fish	<b>504, 269</b>	<b>77,793</b>			
Mean Fish Wt	<b>4.3kg</b>	<b>60g</b>			
Next Fallow Date (Site)	<b>Sep 24</b>		Next Input Date (Site)	<b>Jan/Feb 25</b>	
Recent (last 4 wks) disease problems?			<b>Y</b>	Any escapes (since last visit)?	<b>N</b>
If yes, detail:	<b>BKD</b>				

**Movement Records**

- 1. Movement records available for inspection?  Y
- 2. Date of last inspection: **27/03/2024**
- 3. Are records complete and correctly entered?  Y
- 4. Are movement records available for dead fish and waste?  Y
- 5. Are records complete and correctly entered?  Y
- 6. Are health certificates for introductions (outwith GB) available?  N/A

**Transport Records**

- 1. Are any movements carried out by (or on behalf) of the business (not using a STB)?
- If yes, is there a system in place for maintenance of transportation records?

**Mortality Records**

- 1. Mortality records available for inspection?  Y
- 2. How are mortalities disposed of? **Other (detail)**  
 If other detail: **Whole fish transferred in sealed mort bins direct to Whiteshore cockles for incineration. However an ensiler is available on site for smaller fish.**
- 3. Mortality records complete and correctly entered?  Y
- 4. Recent mortality (last 4 wks): **Wk20: 4,876 (0.82%), Wk19: 7,709 (1.13%) , Wk18: 6,155 (0.8%) , Wk17: 4,346 (0.55%)**
- 5. Evidence of recent increased/atypical mortalities?  Y  
 If yes, facility nos/no mortality per facility/no stock per facility/reason:  
**Multiple bacterial infections have been confirmed on site. BKD has also been confirmed and is now being attributed to the primary cause of mortality.**
- 6. Any other peaks in mortality during period checked?  N  
 If yes, detail:
- 7. Have increased (unexplained) mortalities been reported to vet or FHI?  Y  
 If yes, detail action: **After mortalities began to increase in wk19, company biologist visited the site. This was followed by samples being taken by Pharmaq and notification of the presence of BKD.**
- 8. Have 'mortality events' been reported to FHI? If no, enter details on mortality events sheet.  Y

**Treatments and Medicines Records**

1. Recent treatments (see comment)?	Y
If yes, detail:	TMS
If other, detail:	
2. Medicines records available for inspection?	Y
3. Are records complete and correctly entered?	Y
4. Are fish in a withdrawal period?	Y
5. If yes, what treatment(s)?	TMS
If other, detail:	
6. Are medicines stored appropriately?	Y

**Biosecurity Records**

1. Biosecurity records available for inspection?	<input type="checkbox"/>
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	<input type="checkbox"/>
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any <i>increased (unexplained)</i> mortality at the site been included?	<input type="checkbox"/>
4. Has the action that will be taken in the event that the presence or suspicion of the presence of a listed disease is detected been included and <i>how</i> and <i>when</i> that will be notified to Scottish Ministers?	<input type="checkbox"/>
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?	<input type="checkbox"/>
6. Have the husbandry and biosecurity measures implemented between each epidemiological unit to minimise transmission of disease been covered (movement of staff, visitors, equipment, live or dead fish etc.)?	<input type="checkbox"/>
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	<input type="checkbox"/>
8. Have the biosecurity procedures been adequately implemented on site?	<input type="checkbox"/>
If no, detail:	

**Results of Surveillance**

1. Has any animal health surveillance been carried out by, or on behalf of, the business?	<input type="checkbox"/>
2. If yes, are results available for inspection?	<input type="checkbox"/>
3. Any significant results?	<input type="checkbox"/>
If yes, detail (if not detailed under recent disease problems).	

Records checked between:	27/03/24 - 20/05/24
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Case no:  Site No:  Date of visit/  
 Sampling:

Priority samples: VI  BA  PA  MG  HI

Time sampling starts/ends:   Inspector:  VMD No.

Environmental conditions: 1  2  3  4  5

Summary samples HIST  BA  MG  VI  PA  Total Samples

**Add Fish/Pools - click**

Pool/Fish No	F1	F2	F3	F4	F5							
Fish nos	1	2	3	4	5							
Pool Group												
Species	SAL	SAL	SAL	SAL	SAL							
Average weight	4.3kg	4.3kg	4.3kg	4.3kg	4.3kg							
Sex	N/A	N/A	N/A	N/A	N/A							
Water Type	SW	SW	SW	SW	SW							
Stock Details		Loch Arkaig FS0649	Loch Lochy FS0150	Loch Lochy FS0150	Loch Arkaig FS0649	Loch Arkaig FS0649						
	Stock Origin											
Facility No	2	8	10	9	9							

05/2024 Additional Sample Information:

Dry tube - additional kidney samples taken for dry swabs.  
 Blood agar plates were swabbed with kidney material for *Pastuerella skyensis*.  
 F1-4 were moribund and removed from the cages. F5 was removed from the mort basket. Was humanely dispatched and sampled.

Total Tests assigned


Case no: 2024-0152

Site No: FS1042

Method of killing: Percussive

Date of visit: 20/05/2024

Inspector(s):

Sheet Relevant: Y

S for strong presence: M for medium presence: W for weak presence

Fish Number		F1	F2	F3	F4	F5				
Time sampled after death (if > 45 minutes)										
External Signs										
Behaviour	Moribund	S	S	S	S	S				
	Lethargic									
	Hanging vertical									
	Spiralling									
	Flashing									
Loss of equilibrium										
Body	Dark	S	S	S	S	M				
	Distended abdomen		W	W		M				
	Anorexic				M					
	Scale Oedema									
Opercula	Shortened	W				W				
	Flared									
Haemorrhaging	Throat		W	W						
	Ventrum		W							
	Base of fins									
Eyes	Elsewhere		W		M					
	Exophthalmic									
Gills	Enophthalmic (sunken)									
	Cataract									
	Haemorrhagic	W								
	Pale	M	M	M	W	S				
Lesions	Zoned	W	W		M	S				
	Necrotic									
	Flank									
Vent	Elsewhere									
	Inflamed					M				
Lice Load	Trailing faeces									
	Estimate numbers		3	42	40	54	9			
Internal Signs										
Ascites	Clear									
	Bloody	W	W			W				
Oedema	In tissues									
Heart	Pale/anaemic	M	M	S	S	S				
	Granulomas	W		M	W					
	Deformed				W	W				
Liver	Petechial haem					W				
	Gross haem									
	Tissue breakdown									
	Enlarged			W		M				
Pyloric caeca	Colour number(s)		3	3	3	3	3			
	Granulomas	S		W	W	W				
	Lesions									
Spleen	Petechial haem					M				
	Tubules mauve									
	Lack of fat									
Gut	Enlarged		S	W	S	S				
	Granulomas		S	W	S	S				
Body wall	No food present					W				
	Yellow pseudo-faeces	M	S	W	M					
	External haem	W	W			M				
Swim bladder	Internal haem									
	Haemorrhaging	W				W				
Kidney	Haemorrhaging	W		W						
	Fluid filled									
	Swollen	W	S	M	M	S				
	Grey	M	S	W	M	S				
General	Granular	M	S	M	M	S				
	Liquefied		M		W	M				
	Parasites present									
	Anaemia									

Case no: 2024-0152

Date of visit: 20/05/2024

S for strong presence: M for medium presence: W for weak presence

<b>Fish Number</b>										
<b>Time sampled after death (if &gt; 45 minutes)</b>										
<b>External Signs</b>										
<b>Behaviour</b>	<b>Moribund</b>									
	<b>Lethargic</b>									
	<b>Hanging vertical</b>									
	<b>Spiralling</b>									
	<b>Flashing</b>									
<b>Body</b>	<b>Loss of equilibrium</b>									
	<b>Dark</b>									
	<b>Distended abdomen</b>									
	<b>Anorexic</b>									
<b>Opercula</b>	<b>Scale Oedema</b>									
	<b>Shortened</b>									
	<b>Flared</b>									
<b>Haemorrhaging</b>	<b>Throat</b>									
	<b>Ventrum</b>									
	<b>Base of fins</b>									
<b>Eyes</b>	<b>Elsewhere</b>									
	<b>Exophthalmic</b>									
	<b>Enophthalmic (sunken)</b>									
<b>Gills</b>	<b>Cataract</b>									
	<b>Haemorrhagic</b>									
	<b>Pale</b>									
<b>Lesions</b>	<b>Zoned</b>									
	<b>Necrotic</b>									
	<b>Flank</b>									
<b>Vent</b>	<b>Elsewhere</b>									
	<b>Inflamed</b>									
	<b>Trailing faeces</b>									
<b>Lice Load</b>	<b>Estimate numbers</b>									
<b>Internal Signs</b>										
<b>Ascites</b>	<b>Clear</b>									
	<b>Bloody</b>									
<b>Oedema</b>	<b>In tissues</b>									
<b>Heart</b>	<b>Pale/anaemic</b>									
	<b>Granulomas</b>									
	<b>Deformed</b>									
<b>Liver</b>	<b>Petechial haem</b>									
	<b>Gross haem</b>									
	<b>Tissue breakdown</b>									
	<b>Enlarged</b>									
	<b>Colour number(s)</b>									
<b>Pyloric caeca</b>	<b>Granulomas</b>									
	<b>Lesions</b>									
	<b>Petechial haem</b>									
<b>Spleen</b>	<b>Tubules mauve</b>									
	<b>Lack of fat</b>									
	<b>Enlarged</b>									
<b>Gut</b>	<b>Granulomas</b>									
	<b>No food present</b>									
	<b>Yellow pseudo-faeces</b>									
	<b>External haem</b>									
	<b>Internal haem</b>									
<b>Body wall</b>	<b>Haemorrhaging</b>									
<b>Swim bladder</b>	<b>Haemorrhaging</b>									
	<b>Fluid filled</b>									
	<b>Swollen</b>									
<b>Kidney</b>	<b>Grey</b>									
	<b>Granular</b>									
	<b>Liquefied</b>									
	<b>Parasites present</b>									
<b>General</b>	<b>Anaemia</b>									



Additional comments:

F4 - left eye had burst.

F5 - white membrane was noted covering some of the internal organs.

Site No: FS1042
Case No: 2024-0152
Nature of non-compliance:
Action taken (FHI):
Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology





# FISH HEALTH INSPECTORATE VISIT REPORT

## SUMMARY FOR INFORMATION OF SITE OPERATOR

<b>BUSINESS No</b>	FB0119	<b>DATE OF VISIT</b>	20/05/2024
<b>SITE No</b>	FS1042	<b>SITE NAME</b>	Seaforth
<b>CASE No</b>	20240152	<b>INSPECTOR</b>	██████████

### Section 1: Summary

The site was inspected following notification from a third party of the suspected presence of bacterial kidney disease (BKD). Five fish were selected for diagnostic sampling.

Histopathology examination revealed marked granulomatous inflammation consistent with BKD, confirmed by qPCR. Two fish also displayed features consistent with cardiomyopathy syndrome (CMS), also confirmed by qPCR, and mild hyperplastic proliferative gill pathology.

Infectious pancreatic necrosis (IPN), *Neoparamoeba perurans* (AGD), *Paranucleospora theridion* and salmon gill poxvirus (SGPV) and were all detected by qPCR.

Following the positive PCR result *Renibacterium salmoninarium* and the observed clinical signs of BKD the initial designation notice covering the site has been replaced with a confirmed designation notice.

Please contact myself or the duty inspector should you require any further information, have any queries regarding this report or if any problems develop.

### Section 2: Case Detail

#### Observations

Seaforth was inspected following notification from a third party of the suspected presence of bacterial kidney disease (BKD) on the site. At the time of inspection, the site was stocked with 504,269 (2023 Q2) Atlantic salmon at an average weight of 4.3kg, originating from Loch Arkaig (FS0649) and Loch Lochy (FS0150). Since the last inspection, three mortality events have occurred at the site. Two events occurred in May 2024 and the third at the beginning of June 2024, whereby a total of 19,001 fish were lost. All cages were inspected, and moribund fish were observed across the site displaying clinical signs of disease. The general population of fish also appeared lethargic. Five moribund fish were removed from cages 2, 8, 9 and 10 for diagnostic sampling.

Externally, all five fish were moribund and were dark in colour. F2 and F3 had distended abdomens and F4 was anorexic. The opercula of F1 and F5 were shortened. Haemorrhaging was noted on the throat of F2 and F3 and along the ventral surface of F2 and F4. Haemorrhaging was also observed in the eyes of F1 and the left eye of F4 had burst. The gills were pale in all five fish and were also zoned in F1-2 and F4-5. The vent of F5 was inflamed. Lice loads on the fish ranged between 3-54, mainly consisting of *Lepeophtheirus salmonis* at all stages of development.

Internally, bloody ascites was observed in the body cavity of F1-2 and F5. The hearts of all five fish were pale/anaemic and were also deformed in F4-5. Petechial haemorrhaging was noted in the pyloric caeca and the liver of F5. The livers of F3 and F5 were also enlarged. All livers were pale in colour and granulomas were present in all fish, except F2.

The spleens were also enlarged and had granulomas in all fish, except F1. Pseudo-faeces were present in the guts of F1-4 and external haemorrhaging of the gut was noted in F1-2 and F5.

R09

Haemorrhaging was also present in the body walls of F1 and F5 and on the swim bladder of F1 and F3. The kidneys were swollen, grey in colour and granular in texture in all five fish. The kidneys of F2 and F4-5 were also slightly liquefied.

### Samples

Samples were collected from five fish according to the table below:

Fish number	Facility number	Species	Stage	Origin
F1	2	Atlantic salmon	2023 Q2	Loch Arkaig FS0649
F2	8	Atlantic salmon	2023 Q2	Loch Lochy FS0150
F3	10	Atlantic salmon	2023 Q2	Loch Lochy FS0150
F4	9	Atlantic salmon	2023 Q2	Loch Arkaig FS0649
F5	9	Atlantic salmon	2023 Q2	Loch Arkaig FS0649

### Results

**Bacteriology:** Kidney and gill material from F1-F5 were inoculated onto appropriate media for the isolation of bacteria. No significant bacteria were isolated.

Tissue samples from F1-F5 were tested for segments of nucleic acid indicative of the presence of the pathogens specified below:

#### *Renibacterium salmonarum* (BKD)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	20.56	16.02	16.03	16.02	POSITIVE
F2	20.54	25.08	25.22	25.33	POSITIVE
F3	-	-	-	-	Negative
F4	20.69	31.23	31.56	31.25	POSITIVE
F5	20.25	22.56	22.48	22.71	POSITIVE

The samples tested negative for *Pasteurella skyensis*.

**Virology:** Tissue samples were tested for segments of nucleic acid indicative of the presence of the pathogens specified below using real-time PCR (qPCR):

#### Salmon gill poxvirus (SGPV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	-	-	-	-	Negative
F3	22.13	36.22	37.20	37.17	POSITIVE
F4	-	-	-	-	Negative
F5	-	-	-	-	Negative

R09

Piscine myocarditis virus (CMS)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	15.41	18.83	18.80	18.89	POSITIVE
F2	-	-	-	-	Negative
F3	-	-	-	-	Negative
F4	15.17	15.93	15.81	15.94	POSITIVE
F5	15.11	14.09	14.18	13.83	POSITIVE

Infectious pancreatic necrosis (IPN)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	14.08	35.17	35.26	36.13	POSITIVE
F3	-	-	-	-	Negative
F4	-	-	-	-	Negative
F5	-	-	-	-	Negative

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious salmon anaemia virus (ISAV), salmonid alphavirus (SAV) and viral haemorrhagic septicaemia virus (VHSV).

**Parasitology:** Tissue samples were tested for segments of nucleic acid indicative of the presence of the parasites specified below using real-time PCR (qPCR).

*Neoparamoeba perurans* (AGD)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	-	-	-	-	Negative
F3	22.13	31.54	31.60	31.52	POSITIVE
F4	-	-	-	-	Negative
F5	-	-	-	-	Negative

*Paranucleospora theridion*

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.90	35.98	35.84	36.06	POSITIVE
F2	22.25	32.44	32.31	32.27	POSITIVE
F3	22.13	39.60	37.87	38.33	POSITIVE
F4	-	-	-	-	Negative
F5	22.39	35.69	36.02	35.46	POSITIVE

**Histology:** Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Lamellar hyperplasia and fusion, mild, multifocal (F1, F2, F3, F4, F5) with foci of necrosis (F2, F3). One plankton-like structure among gill filaments (F1). Some aneurysmal dilation/telangiectasia (F3) and free blood among gill filaments (F4).

Skin & Muscle: Within the normal range.

Heart: Small foci of muscular necrosis with presence of Gram-positive bacteria (F1). Myocarditis multifocal, mild (F2). F3 displayed some nest of basophilic nuclei. Endomyocarditis, multifocal (F4, F5). F5 also displayed some granulomatous inflammation. Epicarditis, mild (F1, F2, F5) and F1 exhibited Gram-positive bacteria.

Gut and pyloric caeca: Peritonitis (F1, F2) with foci of necrosis (F1), mild. F5 displayed congested hindgut folds.

Pancreas: Within the normal range.

Liver: Moderate, multifocal, granulomatous inflammation with necrosis (F1, F4, F5) and F1 exhibited Gram-positive bacteria. Capsulitis (F1). Hepatocellular necrosis, mild, multifocal (F3). Some cuffing (F1). Hepatocellular vacuolation (macrovesicles), mild, diffuse (F3).

Kidney: Interstitial granulomatous inflammation with necrosis, ranging from moderate to marked, multifocal (F1, F2, F4, F5) and F1 exhibited Gram-positive bacteria.

Spleen: Granulomatous inflammation, ranging from mild to marked, multifocal with necrosis (F1, F2, F4, F5) and F1 exhibited Gram-positive bacteria. Mild capsulitis (F2).

Please contact myself or the duty inspector should you require any further information or have any queries regarding this report.

Signed:



Date: 17/06/2024

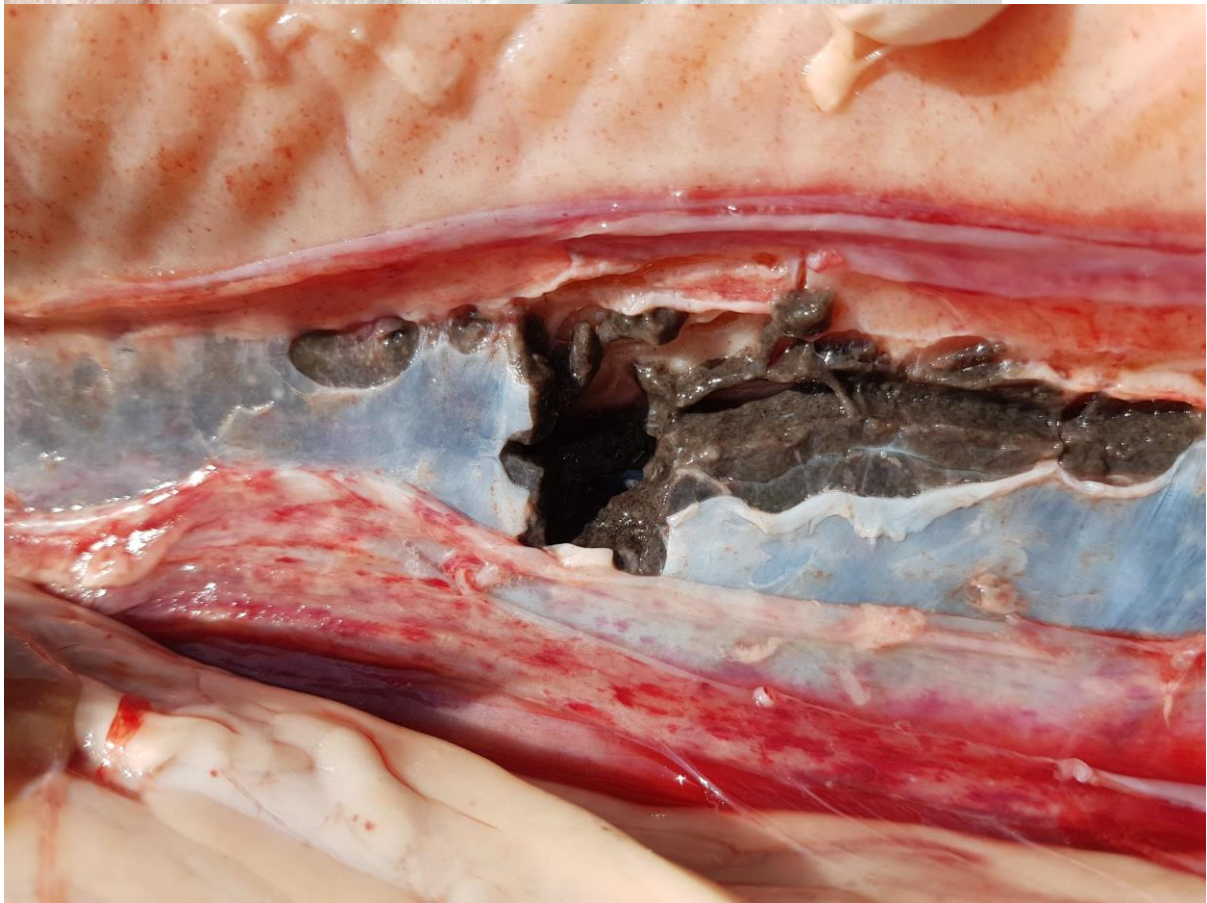
Fish Health Inspector

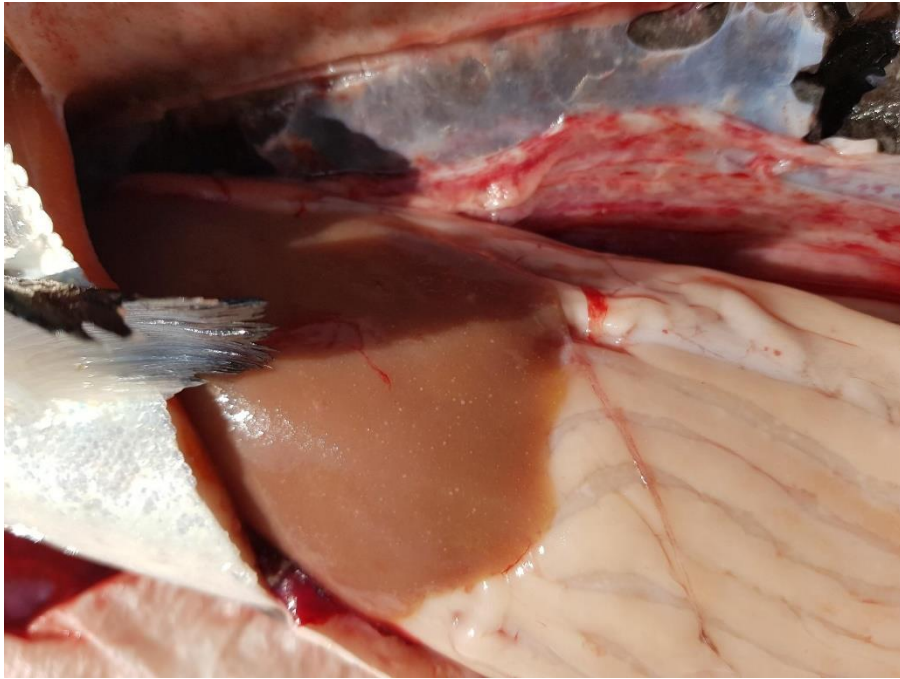
The Fish Health Inspectorate Service Charter detailing standards of service is available on the Scottish Government website at [Fish Health Inspectorate Service Charter - gov.scot](http://www.gov.scot/policies/fish-health-inspectorate/) ([www.gov.scot](http://www.gov.scot))

F1 -



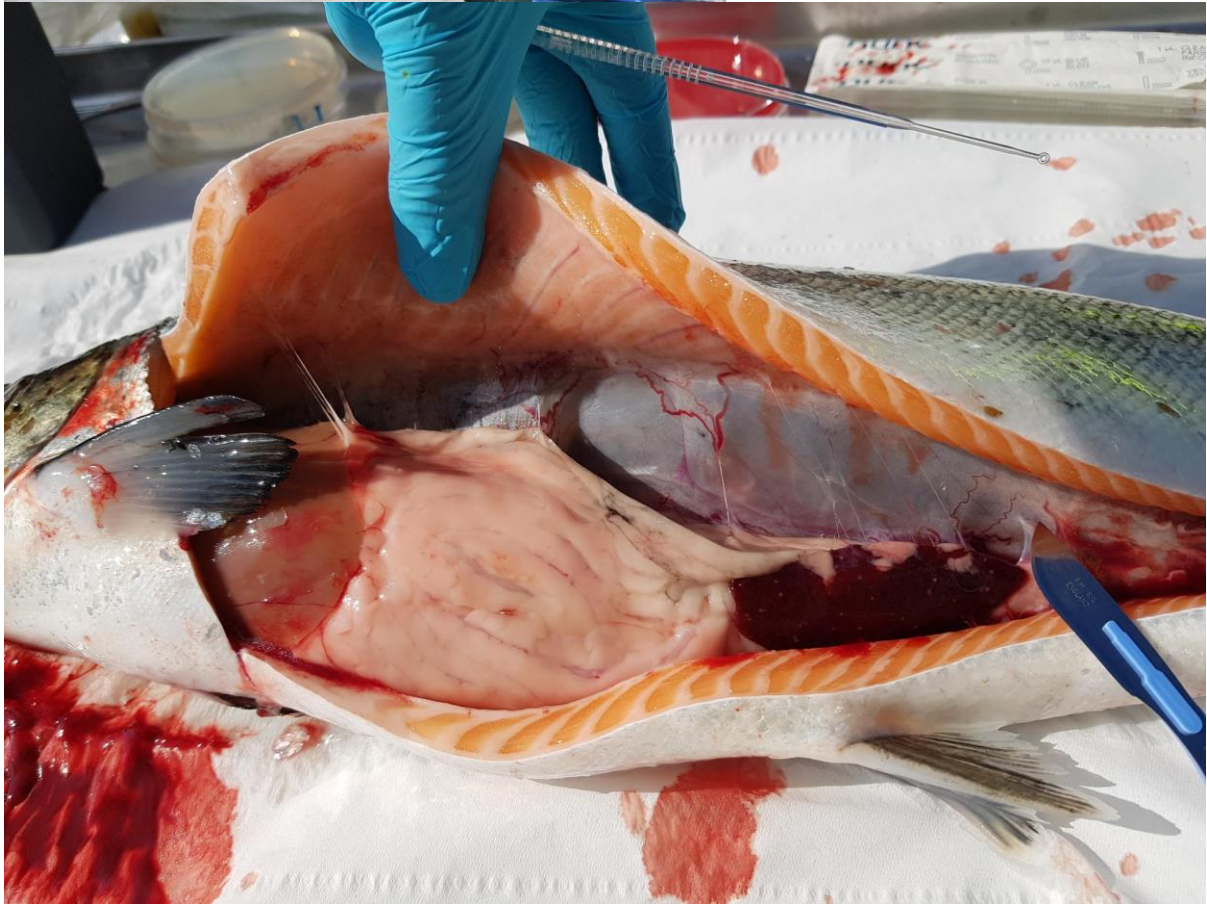


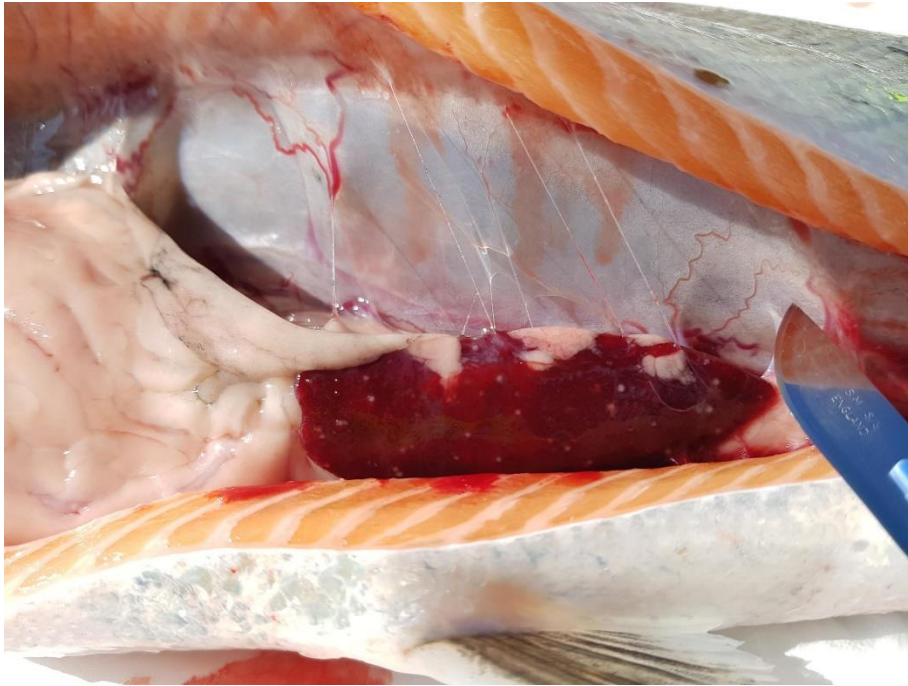




F2 -







F3 –



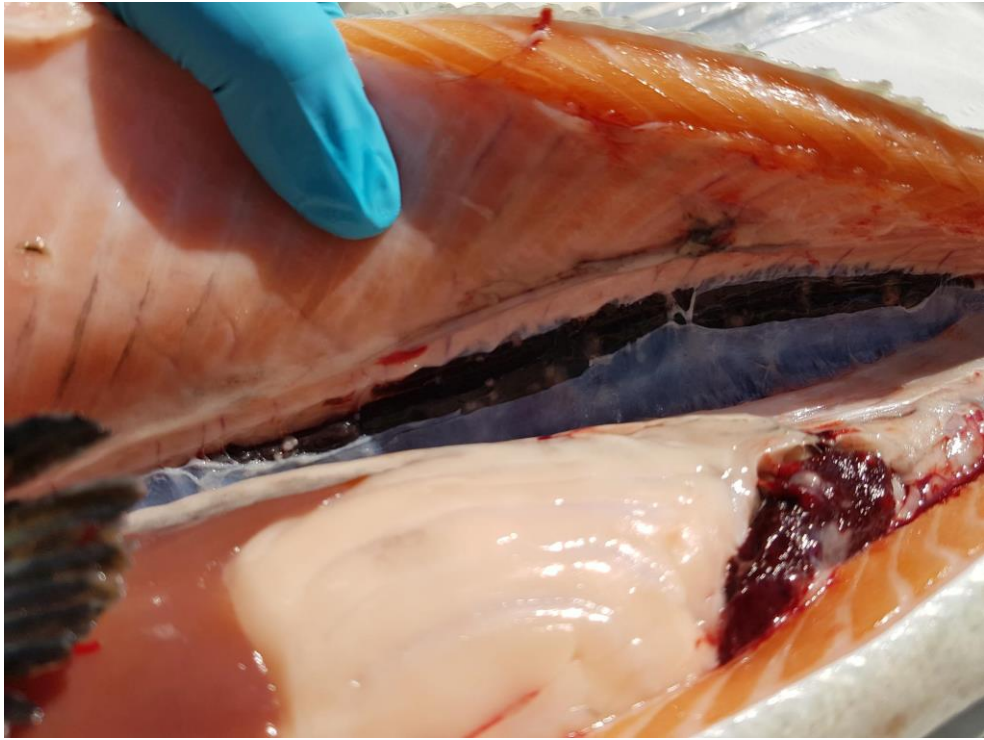
No internal photos.

F4 –









F5 -





