

Case No: 2024-0396 Date of visit: 10/10/2024

Time spent on site: 6 hours Main Inspector:

Site No: FS0091 Site Name: Meall Mhor Loch Fyne
Business No: FB0169 Business Name: Bakkatfrost Scotland

Case Types: 1 REP 2 DIA 3 4 5 6

Water Temp (°C): 12.32 Thermometer No: T308 FHI 045 completed N/A

Observations: Region: ST Water type: S CoGP MA: M-42

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:

Last inspection - 7 Feb 2024

Recent mortality - lost around 6.17% (15,126 fish) over past month for the site (10/09 to 10/10). Mortality higher in cages 9, 10, 11 and 12 losing 11%, 8%, 10% and 10% respectively over past month.

Recent diagnosis of CMS and tenacibaculum.

Last gill treatment 3 weeks ago - 20/9/2024 - FW and FLS, whole site. Treatments roughly every 7-8 weeks. Last SLICE - whole site April 2024.

Stock from Migdale and Geocrab

Looking to ensile waste in future - developments in place / started

5 lethargic fish removed from across the site and sampled for diagnostic purposes. No moribund fish seen but several apparently lethargic fish observed. One runty fish from cage fish removed and observed but not sampled.

Results of surveillance 11/09 - Furunculosis (typical and atypical); CMS, AGD, SGPV, PRV-1, PMCV, Tenacibaculum; 24/09 - PMCV and AGD.

Case No: Site No:

Date of Visit: Inspector(s):

Registration/Authorisation Details

1. Business/site details summary checked by site representative?

2. Changes made to details?

Site Details (include cleaner fish for all sections)

Total No facilities	<input type="text" value="12"/>	Facilities stocked	<input type="text" value="12"/>	No facilities inspected	<input type="text" value="12"/>
Species	<input type="text" value="A salmon"/>				
Age group	<input type="text" value="2023 Q3"/>				
No Fish	<input type="text" value="232,129"/>				
Mean Fish Wt	<input type="text" value="4.3kg"/>				
Next Fallow Date (Site)	<input type="text" value="April / May 2025"/>	Next Input Date (Site)	<input type="text" value="2025 Q3"/>		
Recent (last 4 wks) disease problems?			Y	Any escapes (since last visit)?	<input type="text" value="N"/>
If yes, detail:	<input type="text" value="CMS in last month"/>				

Movement Records

1. Movement records available for inspection?

2. Date of last inspection:

3. Are records complete and correctly entered?

4. Are movement records available for dead fish and waste?

5. Are records complete and correctly entered?

6. Are health certificates for introductions (outwith GB) available?

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?

2. How are mortalities disposed of?

If other detail:

3. Mortality records complete and correctly entered?

4. Recent mortality (last 4 wks):

5. Evidence of recent increased/atypical mortalities?

If yes, facility nos/no mortality per facility/no stock per facility/reason:

Recent mortality attributed to CMS and gill health related conditions.

6. Any other peaks in mortality during period checked?

If yes, detail:

7. Have increased (unexplained) mortalities been reported to vet or FHI?

If yes, detail action:

8. Have 'mortality events' been reported to FHI? If no, enter details on mortality events sheet.

Treatments and Medicines Records

1. Recent treatments (see comment)?	<input type="checkbox"/>	Y
If yes, detail:	Optomease for lice counts and gill scores. Freshwater & FLS	
If other, detail:		
2. Medicines records available for inspection?	<input type="checkbox"/>	Y
3. Are records complete and correctly entered?	<input type="checkbox"/>	Y
4. Are fish in a withdrawal period?	<input type="checkbox"/>	N
5. If yes, what treatment(s)?		
If other, detail:		
6. Are medicines stored appropriately?	<input type="checkbox"/>	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"/>	Y
2. If yes, are results available for inspection?	<input type="checkbox"/>	Y
3. Any significant results?	<input type="checkbox"/>	Y
If yes, detail (if not detailed under recent disease problems).	See additional information	

Records checked between:	01/02/2024 to inspection date
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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	Male	N/A	Female								
Water Type	SW	SW	SW	SW	SW								
Stock Details													
	Stock Origin	Migdale Loch Damp	Migdale Loch Damp	Migdale Loch Damp	Geocrab Hatchery	Migdale Loch Damp							
Facility No	1	2	2	3	7								

Case no: 2024-0396

Site No: FS0091

Method of killing: Percussive

Date of visit: 10/10/2024

Inspector(s):

Sheet Relevant: Y

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

Fish Number	1	2	3	4	5					
Time sampled after death (if > 45 minutes)	01:30	01:30	01:30	01:30	01:30					
External Signs										
Behaviour	Moribund									
	Lethargic	M	M	M	M	M				
	Hanging vertical									
	Spiralling									
	Flashing									
	Loss of equilibrium									
Body	Dark			M						
	Distended abdomen									
	Anorexic					W				
	Scale Oedema									
Opercula	Shortened									
	Flared									
Haemorrhaging	Throat									
	Ventrum				W					
	Base of fins									
	Elsewhere									
Eyes	Exophthalmic									
	Enophthalmic (sunken)									
	Cataract									
	Haemorrhagic	W								
Gills	Pale	S	W	M	W	W				
	Zoned	W								
	Necrotic		W	W						
Lesions	Flank					M				
	Elsewhere									
Vent	Inflamed									
	Trailing faeces									
Lice Load	Estimate numbers									
Internal Signs										
Ascites	Clear				M	M				
	Bloody				M					
Oedema	In tissues									
Heart	Pale/anaemic									
	Granulomas									
	Deformed									
Liver	Petechial haem		W		S	W				
	Gross haem			M	S	M				
	Tissue breakdown									
	Enlarged									
	Colour number(s)	3	3	6	5	6				
	Granulomas									
	Lesions									
Pyloric caeca	Petechial haem	W			M					
	Tubules mauve									
	Lack of fat			M						
Spleen	Enlarged									
	Granulomas									
Gut	No food present			M	M	M				
	Yellow pseudo-faeces	W		M	W					
	External haem									
	Internal haem									
Body wall	Haemorrhaging				M					
Swim bladder	Haemorrhaging									
	Fluid filled									
Kidney	Swollen									
	Grey	W			S	W				
	Granular									
	Liquefied									
General	Parasites present									
	Anaemia	S	M		M					

Case no: 2024-0396

Date of visit: 10/10/2024

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General	Parasites present																		
	Anaemia																		

Additional comments:

F1 and F2 - clumped haemorrhagic gills. F1 general anemic appearance. F3 - dark coloured maturing fish. F4 - fibronous cast over liver, pale coloured spleen. F5 lesion by tail - this was a smaller runtier fish with a missing eye which had healed over, the gut was fluid filled.



AMENDED FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No	FB0169	DATE OF VISIT	10/10/2024
SITE No	FS0091	SITE NAME	Meall Mhor Loch Fyne
CASE No	20240396	INSPECTOR	██████████

This report replaces the fish health report R09 issued on 7 February 2025 by ██████████. The previous report should be discarded. The origin of fish sampled had been entered incorrectly in the original report and has now been updated correctly within this amended report.

Section 1: Summary

The above site was inspected following reports of increased mortality by the farm operator. During the visit, all cages were inspected. Numerous lethargic fish were observed across the site and five were removed for diagnostic sampling.

Histopathological examination revealed features consistent with *Aeromonas salmonicida* (furunculosis) which was isolated on plates. Mild hyperplastic branchitis was also observed. Myocarditis (some could also be related to the presence of piscine myocarditis virus). Coagulative hepatocellular necrosis was also observed. One fish also displayed bacterial ulcerative dermatitis and some features resembling *Piscirickettsia* sp. which was confirmed by PCR.

Aeromonas salmonicida was identified on plates taken from fish 1 and 5. The level and purity of growth would suggest this bacterium is present as a primary pathogen in fish 1 and as a secondary pathogen in fish 5. *Yersinia ruckeri* was identified on plates taken from fish 4 and 5. The level and purity of growth would suggest this bacterium is present as a primary pathogen in fish 4 and as a secondary pathogen in fish 5. *Vibrio* sp. was identified on plates taken from fish 5. The level and purity of growth would suggest this bacterium would be the primary source of this lesion.

Fish were tested for various pathogens by qPCR. All fish sampled tested positive for *Paranucleospora theridion*, four fish were positive for salmon gill poxvirus, three for *Neoparamoeba perurans*, two for piscine myocarditis virus and one for *Piscirickettsia* sp. In addition, one fish tested positive for infectious salmon anaemia virus, the virus strain was confirmed as HPR-0 which is recognised to be non-pathogenic and is not subject to statutory control measures.

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

R09



Section 2: Case Detail

Observations

The site was inspected following reports of increased mortality by the farm operator, with losses of around 6.17% of stock (15,126 fish) in the four weeks leading up to the inspection. Mortality had been attributed to cardiomyopathy syndrome and gill health related conditions. Some peaks in mortality were experienced across the summer months, up to 1.53% for the site per week and were attributed to furunculosis and maturing stock.

Clinical signs and gross pathological observation of the five lethargic fish removed for sampling included:

A dark colouration to the body (F3) and anorexic appearance (F5). Haemorrhaging was observed across the ventrum (F4) and within the eyes (F1). The gills of all five fish appeared pale, zoned (F1) and necrotic (F2, F3). A lesion was present on the flank of F5. Internal observation revealed clear ascites within the body cavity (F4, F5), bloody ascites (F4). Across the surface of the liver petechial haemorrhaging was evident (F2, F4, F5) along with gross haemorrhaging (F3, F4, F5). Petechial haemorrhaging was observed across the pyloric caeca of F1 and F4, and this organ appeared to have a lack of fat within F3. Within the gut, no food was present (F3, F4, F5) along with yellow pseudo-faeces (F1, F3, F4). Haemorrhaging was present across the body wall of F4 and the kidney appeared grey in colour (F1, F4, F5). There was a general anaemic appearance with respect to F1, F2 and F3.

Samples

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

Fish number	Facility number	Species	Stage	Origin
1	1	Atlantic salmon	4.3 kg / 2023 Q3	Migdale Loch Damph
2	2	Atlantic salmon	4.3 kg / 2023 Q3	Migdale Loch Damph
3	2	Atlantic salmon	4.3 kg / 2023 Q3	Migdale Loch Damph
4	3	Atlantic salmon	4.3 kg / 2023 Q3	Geocrab Hatchery
5	7	Atlantic salmon	4.3 kg / 2023 Q3	Migdale Loch Damph

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Results

Bacteriology: Kidney and gill material from all five fish and lesion material from F5 was inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated from the samples taken:

- *Aeromonas salmonicida* from kidney and gill material of fish 1 and 5. The level and purity of growth would suggest this bacterium is present as a primary pathogen in fish 1 and as a secondary pathogen in fish 5.
- *Yersinia ruckeri* from kidney material of fish 4 and 5. The level and purity of growth would suggest this bacterium is present as a primary pathogen in fish 4 and as a secondary pathogen in fish 5.
- *Vibrio* sp. from lesion material of fish 5. The level and purity of growth would suggest this bacterium would be the primary source of this lesion.

Following observations in histopathology, tissue samples associated with fish 5 were tested for segments of nucleic acid indicative of the presence of the *Piscirickettsia* using real-time PCR (qPCR). The result from this fish was positive. This was a non-standard test so Cp values are not included.

From the tests conducted, we do not have evidence of resistance to amoxycillin, oxytetracycline, sulphamethoxazole/trimethoprim or florfenicol for both the *Aeromonas salmonicida* and *Yersinia ruckeri* isolates identified.

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

Infectious salmon anaemia virus (ISAV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1		-	-	-	Negative
F2		-	-	-	Negative
F3		-	-	-	Negative
F4		-	-	-	Negative
F5	15.34	31.41	31.75	32.25	POSITIVE

Genetic sequencing was undertaken on the product obtained in association with the ISAV positive result. This confirmed the presence of HPR-0 which is recognised to be a non-pathogenic strain of the virus and is not subject to statutory control measures.

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Salmon gill poxvirus (SGPV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.76	38.22	>40.00	>40.00	POSITIVE
F2		-	-	-	Negative
F3	21.91	37.06	36.48	36.63	POSITIVE
F4	21.74	32.09	31.93	32.10	POSITIVE
F5	22.07	35.71	35.61	35.52	POSITIVE

Piscine myocarditis virus (PMCV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1		-	-	-	Negative
F2		-	-	-	Negative
F3		-	-	-	Negative
F4	15.02	32.68	32.38	32.87	POSITIVE
F5	15.06	21.64	21.69	21.62	POSITIVE

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), salmonid alphavirus (SAV) and viral haemorrhagic septicemia 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	21.76	33.85	33.36	33.40	POSITIVE
F2		-	-	-	Negative
F3	21.91	35.14	35.19	35.57	POSITIVE
F4		-	-	-	Negative
F5	22.07	30.48	30.46	30.64	POSITIVE

Paranucleospora theridion

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Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.76	34.36	35.09	34.96	POSITIVE
F2	21.80	32.72	32.96	32.71	POSITIVE
F3	21.91	35.44	35.02	34.70	POSITIVE
F4	21.74	31.84	31.92	32.05	POSITIVE
F5	22.07	31.88	31.78	32.07	POSITIVE

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from all five fish. Material from the lesion of F5 was also taken. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Some lamellar hyperplasia and fusion, multifocal, (F1, F2, F4, F5). Dense aggregates of Gram-negative rod-shape bacteria (F1), several aneurysmal dilation/telangiectasia (F1, F2, F4). Free blood among gill filaments (F1). Some autolysis artefacts observed in all fish.

Skin & Muscle: Lesion: Marked ulcerative dermatitis with presence of Gram-negative rod-shaped bacteria on the dermal outer layer and presence of few round blue structures resembling bacteria (likely *Piscirickettsia* sp.) (F5), myositis mainly observed on the red skeletal musculature (F5).

Heart: Several, scattered, dense aggregates of Gram-negative rod-shape bacteria and some surrounding by fibre necrosis (F1). Minor, multifocal, myocarditis (F2, F3, F4, F5). F2 displayed a focally extended area of necrosis with thrombi and Gram-negative rod-shape bacteria. Epicarditis (F3, F5).

Gut and pyloric caeca: F5 displayed some peritonitis. All fish displayed cell sloughing (potentially associated with post-mortem artefact), ranging from marked to mild.

Pancreas: Within the normal range.

Liver: Coagulative hepatocellular necrosis, mild, multifocal (F4) and perivascularitis (F4, F5). Hepatocellular vacuolation (macrovesicles), some to moderate, diffuse (F1, F2, F3).

Kidney: Interstitial cell (haemopoietic) necrosis with few small aggregates of Gram-negative rod-shape bacteria (F1, F4, F5). F5 exhibit some hyaline droplet on the epithelium of the renal tubules. F3 displayed a granuloma-like structure walling off some unknown structures.

Spleen: Some cuffing (F1, F5).

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

R09



Signed:



Fish Health Inspector

Date: 21 February 2025

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](https://www.gov.scot/policies/fish-health-inspectorate/) (www.gov.scot)