

Case No: 2023-0424 Date of visit: 07/09/2023

Time spent on site: 6 hours Main Inspector:

Site No: FS0413 Site Name: Camas Glas
Business No: FB0119 Business Name: Mowi Scotland Ltd

Case Types: 1 REP 2 DIA 3 4 5 6

Water Temp (°C): 14.1 Thermometer No: T172 FHI 045 completed

Observations: Region: HI Water type: S CoGP MA: M-34

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:

Inspection taking place following several mortality notifications since mid-July being over the reporting criteria. First mortality event reported for wk 28 at 1.01% (10,597 fish) and peaked at wk 33 at 5.24% (49,691 fish).

Recently mortality has reportedly been falling since wk 33. The mortality notification for wk 34 was down to 3.69% (33,209 fish).

Mortality has been attributed to multifactorial causes as PD, SAV, AGD, PGD, *Pasturella skyensis* and *Rickettsia* have all been identified on site. *Caligus* levels are reported to be rising at wk 30. *Rickettsia* being treated with florfenicol and is reported to be effective. A freshwater treatment has been carried out on 28/05 - 09/06 to deal with AGD and *caligus*. Another freshwater treatment was due to take place on the week of the inspection but has been postponed to reduce potential for physical damage following a successful antibiotic treatment

Pasteurella skyensis test positive from 07/08/2023. Fish vaccinated against this.

Antibiotics (florfenicol in-feed) used on site, finished on 22/08/2023 after a week long treatment.

Cage 2 mortality highest this summer (from Loch Ness). Loch Ness fish went to cages 2 and 6. Mortality in cage 6 is in line with other cages

Fish reportedly feeding well on week of inspection. Feeding has increased substantially since antibiotic treatment

At least one of the biologist team on site each week.

Fish from Loch Lochy and Loch Ness (both hatched in Loch Ailort)

Cages are 100m plastic circles

Background mortality is dealt with by ensiling. Due to increased mortality skips are being used currently. Two companies are used to dispose of increased mortality. One (J.A. MacDonald) takes mortality to Whiteshore Cockles and Dundas and the other (Billy Bowie) disposes of fish at Barkip and Dundas.

Peroxide treatment ended early on 11/08/23 as fish in cage 2 did not respond well to treatment and mortality increased. Water temperature at the time was about 15 degrees C.

Thermolicer treatment from 19/06 - 22/06 and 10/07 - 13/07 to deal with lice levels

Peroxide used on 17/7/23 and 11/07/23 both to treat for AGD

Alphamax treatment from 27/07 - 30/07 and 30/08/23 - 06/09/23 to treat rising *Caligus* levels

All lice treatments are reported to be successful.

Feed supply issues (caused by excessive heat where the feed was stored at the feed mill) meant that the fish ate less feed than planned for the 8 weeks before the inspection.

Farmed and wild wrasse on site.

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="SAL"/>	<input type="text" value="WRS"/>			
Age group	<input type="text" value="Q4 23"/>	<input type="text" value="Varied"/>			
No Fish	<input type="text" value="840,346"/>	<input type="text" value="83,097"/>			
Mean Fish Wt	<input type="text" value="1.6kg"/>	<input type="text" value="Varied"/>			
Next Fallow Date (Site)	<input type="text" value="Spring 2024"/>		Next Input Date (Site)	<input type="text" value="Summer 2024"/>	
Recent (last 4 wks) disease problems?			<input type="text" value="Y"/>	Any escapes (since last visit)?	<input type="text" value="N"/>
If yes, detail:	<input type="text" value="See additional info"/>				

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:

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: Florfenicol (in-feed) antibiotic treatment to treat bacterial issues diagnosed by Patogen		
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"/>	Y
5. If yes, what treatment(s)?	Florfenicol	
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 comments		

Records checked between:	22/02/2023 - 07/09/2023
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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	1.8000	1.6000	1.5000	1.8000	2.1000							
Sex	N/A	N/A	N/A	N/A	N/A							
Water Type	SW	SW	SW	SW	SW							
Stock Details		Loch Ness	Loch Ness	Loch Ness	Loch Lochy	Loch Lochy						
	Stock Origin											
Facility No	2	2	2	12	12							

09/2023 Additional Sample Information:

Dispatched with a percussive blow to the head

5 Total Tests assigned 5

Case no: 2023-0424

Site No: FS0413

Method of killing:

Date of visit: 07/09/2023

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)		1 hour	1 hour	1 hour	1 hour	1 hour				
External Signs										
Behaviour	Moribund	S	S	S	S	S				
	Lethargic	S	S	S	S	S				
	Hanging vertical	S			S					
	Spiralling									
	Flashing									
	Loss of equilibrium									
Body	Dark				W					
	Distended abdomen									
	Anorexic		M	S		W				
	Scale Oedema									
Opercula	Shortened									
	Flared									
Haemorrhaging	Throat									
	Ventrum									
	Base of fins									
	Elsewhere									
Eyes	Exophthalmic									
	Enophthalmic (sunken)									
	Cataract									
	Haemorrhagic					M				
Gills	Pale	M	M	M	M	S				
	Zoned									
	Necrotic									
Lesions	Flank			S						
	Elsewhere									
Vent	Inflamed	W	W	W						
	Trailing faeces									
Lice Load	Estimate numbers		0	0	0	0	0			
Internal Signs										
Ascites	Clear	M								
	Bloody									
Oedema	In tissues									
Heart	Pale/anaemic									
	Granulomas									
	Deformed									
Liver	Petechial haem									
	Gross haem									
	Tissue breakdown									
	Enlarged									
	Colour number(s)		4	4	4	4	4			
	Granulomas									
	Lesions									
Pyloric caeca	Petechial haem									
	Tubules mauve									
	Lack of fat	W	W	S	W	W				
Spleen	Enlarged	W								
	Granulomas									
Gut	No food present	S	S	S	S	S				
	Yellow pseudo-faeces	S	S	S	S	S				
	External haem									
	Internal haem									
Body wall	Haemorrhaging									
Swim bladder	Haemorrhaging									
	Fluid filled									
Kidney	Swollen									
	Grey									
	Granular									
	Liquefied									
General	Parasites present									
	Anaemia									

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Date of visit: 07/09/2023

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	Liquefied																			
General	Parasites present																			
	Anaemia																			

Additional comments:

F4 had a slightly swollen heart

Case No:	2023-0424	Date of visit:	07/09/2023
Site No:	FS0413	Inspector:	

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2 nd Insp
MG_AGDQ	5/5	13/09/2023		13/09/2023		10/10/2023		
MG_IHNQ	0/5	13/09/2023		13/09/2023		10/10/2023		
MG_IPN	0/5	13/09/2023		13/09/2023		10/10/2023		
MG_ISA	0/5	13/09/2023		13/09/2023		10/10/2023		
MG_PARA_THER_Q	5/5	13/09/2023		13/09/2023		10/10/2023		
MG_PMCV	0/5	13/09/2023		13/09/2023		10/10/2023		
MG_SAL_POX	4/5	13/09/2023		13/09/2023		10/10/2023		
MG_SAV	3/5	13/09/2023		13/09/2023		10/10/2023		
MG_VHS	0/5	13/09/2023		13/09/2023		10/10/2023		
VSPE (A)	4/5	18/09/2023		20/09/2023		10/10/2023		
VSPE (B)	4/5	18/09/2023		20/09/2023		10/10/2023		
PSFL	5/5	18/09/2023		20/09/2023		10/10/2023		
PMCH	5/5	19/09/2023		20/09/2023		10/10/2023		
GPAT	2/5	19/09/2023		20/09/2023		10/10/2023		
AMGD	1/5	19/09/2023		20/09/2023		10/10/2023		
SKIN	1/5	19/09/2023		20/09/2023		10/10/2023		
SPAT	1/5	19/09/2023		20/09/2023		10/10/2023		
HPAT	4/5	19/09/2023		20/09/2023		10/10/2023		
MPAT	1/5	19/09/2023		20/09/2023		10/10/2023		
PRVP	1/1	20/09/2023		20/09/2023		10/10/2023		

Report Summary			
Case Type	Date	Insp	2 nd Insp
DIA	10/10/2023		

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No	FB0119	DATE OF VISIT	07/09/2023
SITE No	FS0413	SITE NAME	Camas Glas
CASE No	20230424	INSPECTOR	██████████

Section 1: Summary

The above site was visited following notification from the business that mortality had occurred on site over the notifiable threshold.

Upon inspection, moribund fish were observed exhibiting behaviour and gross pathology associated with disease. A necropsy was performed and samples taken for laboratory analysis.

Histopathological examination revealed that amoebic gill disease (AGD) was present (confirmed by qPCR). Fish also displayed evidence of salmon pancreatic diseases. One fish also displayed ulcerative dermatitis with the presence of Gram-negative rod-shaped bacteria which may impact on the osmotic balance. Chronic, multifocal splenitis was also observed (potentially associated with bacterial infection). Some round structures resembling bacteria (likely *Piscirickettsia* sp.) were also observed in one fish.

The following were also identified using real-time PCR (qPCR):

- Salmon gill poxvirus (SGPV)
- Salmonid alphavirus (SAV)
- Piscine reovirus (PRV)
- *Neoparamoeba perurans* (AGD)
- *Paranucleospora theridion*

Pseudomonas fluorescens was identified on plates taken from gill material of 5/5 fish and lesion material of 1/1 fish. The level of growth could not be determined due to condensation run, however the prevalence would indicate a potential risk to a stressed fish population.

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

The above site was visited following notification from the business that mortality had occurred on site over the notifiable threshold. The first notification of the cycle was from week 28 (10/07/23 – 16/07/23) at 1.01% and peaked during week 33 (14/08/23 – 20/08/23) at 5.24%. This mortality had fallen to 1.6% the week prior to the inspection (week 35).

Piscirickettsia was diagnosed by the biologist for the business before the inspection. A week long in-feed treatment using the antibiotic florfenicol was first administered on 16/08/2023.

During the inspection several moribund fish were observed on the site. These were all lethargic and fish 1 and 4 were also hanging vertically in the water column. Fish 4 had a darkened abdomen, while fish 2, 3 and 5 were all anorexic. All fish had pale gills, most notably fish 5. The vent of fish 1, 2 and 3 were slightly inflamed. Fish 5 had a haemorrhagic eye and fish 3 had a lesion on the flank.

Internally, the body cavity of fish 1 contained clear ascites and a slightly enlarged spleen. The heart of fish 4 was slightly swollen. All fish exhibited a lack of fat around the pyloric caeca. The hind gut of all fish contained yellow pseudo-faeces and no food.

Samples

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

Fish number	Facility number	Species	Stage	Origin
F1 – F3	2	Atlantic salmon (<i>Salmo salar</i>)	2023 Q4 (~1.6kg)	Loch Ness
F4 and F5	12	Atlantic salmon (<i>Salmo salar</i>)	2023 Q4 (~1.9kg)	Loch Lochy

Results

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

The following bacteria were isolated;

- *Vibrio* sp. (isolates A and B) kidney F1-F4, lesion F3
- *Pseudomonas fluorescens* gill F1-F5, lesion F3

Vibrio sp. was identified on plates taken from kidney material of 4/5 fish and lesion material of 1/1 fish. The level and purity of growth would not suggest this bacterium would be present as a primary source of morbidity overall, however, the level observed on lesion material of fish 3 would suggest it would be the primary source of this lesion.

A second *Vibrio* sp. was identified on plates taken from kidney material of 4/5 fish and lesion material of 1/1 fish. The level and purity of growth would not suggest this bacterium would be present as a primary source of morbidity.

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

Salmon gill poxvirus (SGPV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	19.21	28.43	28.46	28.57	POSITIVE
F2	19.33	26.67	26.82	26.74	POSITIVE
F3	18.58	27.97	27.70	27.98	POSITIVE
F4	19.54	27.51	27.46	27.50	POSITIVE
F5	-	-	-	-	Negative

Salmonid alphavirus (SAV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	17.13	30.20	30.08	30.06	POSITIVE
F2	17.63	24.98	25.20	25.09	POSITIVE
F3	-	-	-	-	Negative
F4	-	-	-	-	Negative
F5	18.60	35.18	35.13	36.90	POSITIVE

Piscine reovirus (PRV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F2	17.30	30.84	31.09	30.95	POSITIVE

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), infectious salmon anaemia virus (ISAV), piscine myocarditis virus (PMCV) and viral hemorrhagic septicemia virus (VHSV).

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

Amoebic gill disease (*Neoparamoeba perurans*) (AGD)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	19.21	29.45	29.28	29.37	POSITIVE
F2	19.33	27.00	26.99	27.03	POSITIVE
F3	18.58	27.78	27.48	27.61	POSITIVE
F4	19.54	28.79	28.89	28.86	POSITIVE
F5	18.79	31.94	32.18	32.71	POSITIVE

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	19.21	29.58	29.71	29.58	POSITIVE
F2	19.33	26.84	26.58	27.03	POSITIVE
F3	18.58	26.79	26.67	26.82	POSITIVE
F4	19.54	30.97	31.24	31.29	POSITIVE
F5	18.79	25.89	25.90	25.89	POSITIVE

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

Histopathological examination revealed the following:

R09

UKAS accredited testing laboratory No. 1964
 Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
 Tel - 0131 244 3498 Fax - 0131 244 0944 Email - ms.fishhealth@gov.scot
 Website - www.gov.scot/Topics/marine/science

Gill: Gill autolysis hindered the reading of all fish. F1 displayed minor lamellar hyperplasia with few amoeboid cells resembling *Neoparamoeba perurans*. Few aneurysmal dilation/telangiectasia observed in F4.

Skin & Muscle: Moderated myositis observed in skeletal red muscle, mainly observed at the area close to the white muscle (F2). Bacterial ulcerative dermatitis (F3).

Heart: Myocarditis, mild, multifocal to diffuse (F1, F2, F3, F4) and mild, multifocal, peritonitis (F1, F2, F3, F4).

Gut and pyloric caeca: Marked, diffuse cell sloughing (potentially associated with post-mortem artefact). Absence of adipose tissues observed in F3 and some peritonitis observed in F3.

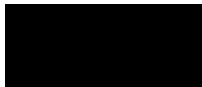
Pancreas: Areas of absence of acinar pancreatic tissue (F2).

Liver: Within the normal range.

Kidney: Interstitial cell (haemopoietic) necrosis, mild, multifocal (F3, F5), increase numbers of melanomacrophage aggregates (F5), hyaline droplets observed in few renal tubules (F3).

Spleen: Granulomatous infiltration, mild, multifocal, observed in F3. F3 also displayed some intracellular round structures resembling bacteria (likely *Piscirickettsia* sp.).

Signed:



Date: 10/10/2023

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 \(www.gov.scot\)](http://www.gov.scot/Topics/marine/science)



Image 1: Fish 1 -5