

Case No:	2022-0368	Date of visit:	31/08/2022			
Time spent on site:	3.5 hours	Main Inspector:				
Site No:	FS0065	Site Name:	Loch Laxford			
Business No:	FB0398	Business Name:	Loch Duart Ltd			
Case Types:	1 DIA	2 REP	3	4	5	6
Water Temp (°C):	13.9	Thermometer No:	T173	FHI 045 completed		
Observations:	Region:	HI	Water type:	S	CoGP MA:	M-3
Dead/weak/abnormally behaving fish present?	<input type="checkbox"/>	If yes, see additional information/clinical score sheet.				
Clinical signs of disease observed?	<input type="checkbox"/>	If yes, see additional information/clinical score sheet.				
Gross pathology observed?	<input type="checkbox"/>	If yes, see additional information/clinical score sheet.				
Diagnostic samples taken?	<input type="checkbox"/>					
UNI/REG only - if unable to carry out intended visit detail reason below:						

Additional Case Information:

AGD was primarily the cause of mortality peaks at beginning of last cycle - Wks 40, 41, 43 and 44 in 2020, mortality of 1.59% (5,951 fish), 1.59% (5,845 fish), 1.24% (4,427 fish) and 1.82% (6,394 fish).

This year - April started to see changes in bloodwork to see PD. No noticeable changes to stock apart from when this water quality issue has arose recently - gills affected. Diet changed when diagnosed, functional feed - more digestible, less oil etc.

Report by the company due to increasing mortality on site (sample date 27/07/2022) stated that histology samples have shown harmful plankton insult was the primary cause of mortality.

Site has had 2 rounds of freshwater treatment between 14th-25th July. Increased mortality was not observed until after the first freshwater treatment. To try and reduce mortalities the site is routinely cleaning nets, feeding in the morning only, reduced feeding, low stock, swabbing every week for AGD (in case of needing further treatments). Aeration is also on site should it be required.

Salmosan and SLICE were given earlier in the year. SLICE 2nd -8th FEB 2022. Salmosan 18th-22nd April 2022.

Fish only in withdrawal for TMS (tricane) at the moment.

No concerns with wrasse, no increased mortality.

Remote inspection carried out 25/08/2022 by [REDACTED], supervised by [REDACTED]. Diagnostic inspection and sampling carried out 31/08/2022 by [REDACTED], supervised by [REDACTED].

Case No: **2022-0368** Site No: **FS0065**
 Date of Visit: **31/08/2022** Inspector(s): **[REDACTED]**

Registration/Authorisation Details

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

Site Details (include cleaner fish for all sections)

Total No facilities	24	Facilities stocked	15	No facilities inspected	
Species	SAL	WRS			
Age group	S0 2021	Wild and			
No Fish	253,000	9,461			
Mean Fish Wt	1.1kg	60-70g			
Next Fallow Date (Site)	Spring 2023		Next Input Date (Site)	Autumn 2023	
Recent (last 4 wks) disease problems?			Y	Any escapes (since last visit)?	
If yes, detail:	PD confirmed on site along with severe gill pathology suggestive of an acute environmental c				

Movement Records

1. Movement records available for inspection?
 2. Date of last inspection: **23/09/2020**
 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? **Other (detail)**
 If other detail: **Taken away to be incinerated or used for biogas**
 3. Mortality records complete and correctly entered?
 4. Recent mortality (last 4 wks): **SAL: Wk 30 - 4.94% (17,473), WK31 - 4.03% (13,574), Wk32 - 11 (37,974), Wk33 - 4.6% (13,108). WRS: 756 in last 4 weeks.**
 5. Evidence of recent increased/atypical mortalities?
 If yes, facility nos/no mortality per facility/no stock per facility/reason:
Across whole site. Attributed to severe gill pathology suggestive of an acute environmental challenge. PD also con site.
 6. Any other peaks in mortality during period checked?
 If yes, detail: **See additional info**
 7. Have increased (unexplained) mortalities been reported to vet or FHI?
 If yes, detail action: **Reported to company vet and samples taken 27/07/22 - see additional informati**
 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)?

If yes, detail:

T.M.S.

If other, detail:

2. Medicines records available for inspection?

3. Are records complete and correctly entered?

4. Are fish in a withdrawal period?

5. If yes, what treatment(s)?

T.M.S

If other, detail:

6. Are medicines stored appropriately?

Biosecurity Records

1. Biosecurity records available for inspection?

2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?

3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any *increased (unexplained)* mortality at the site been included?

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 *how* and *when* that will be notified to Scottish Ministers?

5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?

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.)?

7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?

8. Have the biosecurity procedures been adequately implemented on site?

If no, detail:

Results of Surveillance

1. Has any animal health surveillance been carried out by, or on behalf of, the business?

2. If yes, are results available for inspection?

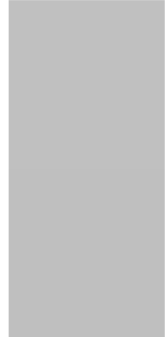
3. Any significant results?

If yes, detail (if not detailed under recent disease problems).

PD

Records checked between:

23/09/2020 - 31/08/2022



15
N
challenge

Y
Y
Y
Y
N/A

Y
Y
1.76%
Y

firmed on
Y
Y
ion
Y

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	P1						
Fish nos	1	2	3	4	5	1-5						
Pool Group	P1	P1	P1	P1	P1							
Species	SAL	SAL	SAL	SAL	SAL							
Average weight	1.1000	1.1000	1.1000	1.1000	1.1000							
Sex	N/A	N/A	N/A	N/A	N/A							
Water Type	SW	SW	SW	SW	SW							
Stock Details		Ormsary (FS0575)	Ormsary (FS0575)	Ormsary (FS0575)	Ormsary (FS0575)	Ormsary (FS0575)						
	Stock Origin											
Facility No	21	21	21	21	21							

Case no: 2022-0368

Site No: FS0065

Method of killing: Percussive

Date of visit: 31/08/2022

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)		45min	65min	85min	100m	115min								
External Signs														
Behaviour	Moribund													
	Lethargic	S	S	S	S	S								
	Hanging vertical													
	Spiralling													
	Flashing													
	Loss of equilibrium													
Body	Dark													
	Distended abdomen													
	Anorexic			M	S	M								
	Scale Oedema													
Opercula	Shortened													
	Flared													
Haemorrhaging	Throat													
	Ventrum													
	Base of fins													
	Elsewhere													
Eyes	Exophthalmic													
	Enophthalmic (sunken)													
	Cataract													
	Haemorrhagic													
Gills	Pale	W	W	W	W	W								
	Zoned													
	Necrotic	W	W	W	W	W								
Lesions	Flank	S												
	Elsewhere													
Vent	Inflamed													
	Trailing faeces													
Lice Load	Estimate numbers	0	0	0	0	0								
Internal Signs														
Ascites	Clear													
	Bloody													
Oedema	In tissues													
Heart	Pale/anaemic													
	Granulomas													
	Deformed													
Liver	Petechial haem													
	Gross haem													
	Tissue breakdown													
	Enlarged													
	Colour number(s)	3	3	3	2	2								
	Granulomas													
	Lesions													
Pyloric caeca	Petechial haem													
	Tubules mauve													
	Lack of fat			M	S	M								
Spleen	Enlarged													
	Granulomas													
Gut	No food present													
	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													

Additional comments:

Case No: 2022-0368

Date of visit: 31/08/2022

Site No: FS0065

Inspector: [REDACTED]

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2 nd Insp
Salmon Gillpox	5/5	06/09/2022		06/09/2022		11/10/2022		
Paranucleospora theridion	5/5	06/09/2022		06/09/2022		11/10/2022		
MG AGD	5/5	06/09/2022		13/09/2022		11/10/2022		
MG PRV	1/1	09/09/2022		13/09/2022		11/10/2022		
MG IHN	0/4	07/09/2022		13/09/2022		11/10/2022		
MG IPN	0/4	07/09/2022		13/09/2022		11/10/2022		
MG ISA	0/4	07/09/2022		13/09/2022		11/10/2022		
MG SAV	1/4	07/09/2022		13/09/2022		11/10/2022		
MG VHS	0/4	07/09/2022		13/09/2022		11/10/2022		
PRVH	1/5	16/09/2022		30/09/2022		11/10/2022		
GPAT	5/5	22/09/2022		30/09/2022		11/10/2022		
HPAT	4/5	22/09/2022		30/09/2022		11/10/2022		
SKIN	1/5	22/09/2022		30/09/2022		11/10/2022		
MPAT	1/5	22/09/2022		30/09/2022		11/10/2022		
MG_PMCV	0/4	07/09/2022		05/10/2022		11/10/2022		
Moritella Viscosa - VVIS	1/5	16/09/2022		30/09/2022		11/10/2022		

Report Summary			
Case Type	Date	Insp	2 nd Insp
DIA	26/10/2022		

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No	FB0398	DATE OF VISIT	31/08/2022
SITE No	FS0065	SITE NAME	Loch Laxford
CASE No	20220368	INSPECTOR	[REDACTED]

Section 1: Summary

The above site was inspected following reports of increased mortality by the farm operator. During the physical inspection of all pens, five fish were removed for diagnostic sampling.

Histopathology examination revealed hyperplastic branchitis, vascular disturbance and haemorrhage. Bacterial dermatitis in F1. F2 displayed pathology features resembling heart and skeletal inflammation (HSMI), confirmed by a positive QPCR for piscine orthoreovirus.

Moritella viscosa was identified on plates taken from lesion material of F1. The level and purity of growth would suggest that although *Moritella viscosa* would be implicated as the primary source of the lesion it would not be implicated as the primary source of morbidity overall.

All five fish tested positive for Salmon gill poxvirus, *Paranucleospora theridion* and *Neoparamoeba perurans* (amoebic gill disease (AGD)). F4 tested positive for salmonid alphavirus (SAV).

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

Following three weeks of increased mortality notifications above the reporting threshold, a site inspection was conducted and diagnostic samples taken for analysis.

All fish sampled were lethargic. F4, F3 and F5 were anorexic in body condition. All fish showed a weak presence of necrotic and pale gills and F1 had a lesion on the flank. No lice were observed on any of the sampled fish.

During internal examination, F3-5 all had a lack of fat on the pyloric caeca and all fish had yellow pseudo-faeces.

Samples

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

R09

Fish number	Facility number	Species	Stage	Origin
1-5	21	Atlantic Salmon	1.1kg 2021 S0	Ormsary (FS0575)

Results

Bacteriology: Kidney and gill material from F1-5 and lesion material from F1 were inoculated onto appropriate media for the isolation of bacteria.

The following bacterium was isolated from fish one:

- *Moritella viscosa* from the lesion on F1

Virology: Tissue samples were tested for segments of nucleic acid indicative of the presence of the pathogens specified below using real-time PCR (qPCR). Due to failure of endogenous control, RNA QPCR tests for F5 were excluded from results. As mentioned in the summary, only F2 was tested for piscine reovirus following histopathology.

Salmon gill poxvirus

Fish Number	Endogenous control Cp value	Cp Values			Reported result
1	21.69	26.57	26.52	26.53	POSITIVE
2	21.84	25.46	25.2	25.37	POSITIVE
3	21.19	33.81	33.76	33.94	POSITIVE
4	21.23	31.76	31.74	31.52	POSITIVE
5	21.79	26.11	25.96	26.01	POSITIVE

Salmonid alphavirus (SAV)

Fish Number	Endogenous control Cp value	Cp Values			Reported result
1	-	-	-	-	NEGATIVE
2	-	-	-	-	NEGATIVE
3	-	-	-	-	NEGATIVE
4	16	31.12	31.78	30.76	POSITIVE
5	-	-	-	-	NO RESULT

Piscine reovirus (PRVP)

Fish Number	Endogenous control CP value	Cp Values			Reported Result
2	19.66	24.18	24.12	24.11	POSITIVE

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

R09

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
1	21.67	29.43	29.3	29.49	POSITIVE
2	21.49	34.13	34.17	34.44	POSITIVE
3	20.96	29.34	29.28	29.66	POSITIVE
4	20.99	30.16	30.24	30.31	POSITIVE
5	21.63	32.62	32.79	32.77	POSITIVE

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported result
1	21.69	28.49	28.39	28.51	POSITIVE
2	21.84	28.57	28.77	28.81	POSITIVE
3	21.19	22.31	22.26	22.17	POSITIVE
4	21.23	22.17	22.02	22.21	POSITIVE
5	21.79	28.05	28.06	28.08	POSITIVE

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1 to F5. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Lamellar hyperplasia and fusion (F1-F5), mild to moderate, multifocal to diffuse. Occasional to several basophilic epithelial inclusions (likely epitheliocystis) observed in F1 and F2. Lamellar epithelial lifting and some exudate observed in all fish. Chloride cell hyperplasia and displacement and increase number of goblet cells observed in all fish. F2 displayed areas of marked filament and lamellar necrosis and haemorrhage. The filament of F2 at the centre exhibited moderate inflammatory cell infiltrate. Some aneurysmal dilation/telangiectasia and lamellar congestion and some vascular disturbances observed in all fish.

Skin & Muscle: Lesion F1: Partial absence of the epidermis, moderate inflammatory cell infiltrate and haemorrhage in the dermal layer reaching the outer layer of the hypodermis and mild oedema. Gram-negative filamentous bacteria observed on the dermis. F2 mild, multifocal, myofibre degeneration and inflammatory cell infiltrate observed in the skeletal red muscle.

Heart: Multifocal, mild, Myocarditis (F1, F2, F5). Epicarditis, mild (F2, F4). F2: No atrium in section.

Gut and pyloric caeca: Within normal range. F3: No pyloric caeca.

Pancreas: Within normal range.

Liver: Small area of hepatocellular necrosis (F4). Some foci hepatocellular vacuolation (macrovisicules) (F1, F4). Some cuffing (F2, F3). F5: Too few tissue and autolyse artefacts.

R09

Kidney: Hyaline droplets observed in few renal tubules of all fish. Some increase on the number of melanomacrophage aggregates (F3, F4).

Spleen: Within normal range.

Signed:



Fish Health Inspector

Date: 11/10/2022

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at <https://www.gov.scot/publications/fish-health-inspectorate-service-charter/>

