

Case No:	<input type="text" value="2023-0349"/>	Date of visit:	<input type="text" value="31/07/2023"/>			
Time spent on site:	<input type="text" value="5 Hours"/>	Main Inspector:	<input type="text" value=""/>			
Site No:	<input type="text" value="FS0242"/>	Site Name:	<input type="text" value="Gravir"/>			
Business No:	<input type="text" value="FB0169"/>	Business Name:	<input type="text" value="Bakkafrost Scotland"/>			
Case Types:	1 <input type="text" value="DIA"/>	2 <input type="text" value="REP"/>	3 <input type="text" value=""/>	4 <input type="text" value=""/>	5 <input type="text" value=""/>	6 <input type="text" value=""/>
Water Temp (°C):	<input type="text" value="14.9"/>	Thermometer No:	<input type="text" value="T307"/>	FHI 045 completed	<input type="text" value="N/A"/>	
Observations:	Region:	WI	Water type:	S	CoGP MA:	W-4
Dead/weak/abnormally behaving fish present?	<input type="text" value="Y"/>	If yes, see additional information/clinical score sheet.				
Clinical signs of disease observed?	<input type="text" value="Y"/>	If yes, see additional information/clinical score sheet.				
Gross pathology observed?	<input type="text" value="Y"/>	If yes, see additional information/clinical score sheet.				
Diagnostic samples taken?	<input type="text" value="Y"/>					
UNI/REG only - if unable to carry out intended visit detail reason below:						
<input type="text" value="ECI could not be conducted as temperature was over 14 degrees Celsius."/>						

Additional Case Information:

Site inspection stopped early due to an unsafe sea state, only 4 stocked pens inspected.

Site manager not present during the site inspection as he was on annual leave, the remaining paperwork was inspected remotely on 14/08/2023.

At the time of inspection, Gravir was stocked with 567,879 SAL at an average weight of 2.4kg in 12 120 meter pens. Visibility was poor on the date of inspection due to the rough sea state however clinical signs of disease were observed in some of the stocks visually inspected. Pens 1 - 4 were inspected due to mortality onsite at the time being predominant in these pens. Approximately 10 fish were observed as being very lethargic / moribund in these pens. Most fish however were just out of reach to the hand net when attempts were made to capture due to the conditions on site at the time. Two fish from pen 1 and two fish from pen 2 were removed for diagnostic sampling. The stock were observed on camera back at the shorebase following the onsite inspection. Healthy shoaling populations of fish were observed in each pen.

The stock at Gravir were diagnosed with PD in early May of 2023 and have been recording mortality above the reporting threshold since 28/05/23. Mortality attributed to gill health has also occurred since 03/07/23 onsite, believed to be caused by an increase in jellyfish numbers in the area. Two recent reports detailing the results of health surveillance on the stock have shown positive results for AGD and furunculosis, dated 25/07/2023 and 04/08/2023.

Most recent treatments were concluded on 07/07/23 and 28/07/23 which consisted of 6 hour freshwater bath treatments followed by FLS.

Freshwater and FLS treatments have been conducted regularly since December 2023 this production cycle at Gravir, initially the site was treating with freshwater using one hour bath treatments increasing to 3 hour bath treatments around March/April, and more recently to 6 hour bath treatments. The site has sustained a 100% mortality of its cleanerfish stock this production cycle. 353 wild caught ballan wrasse were input on 21/10/2022 and 70,932 Lump fish were input between 02/11/22 and 07/12/2022. From inspection of the cleanerfish mortality records, the last recorded mortality for wrasse onsite was in week 7 of 2023 and for lumpfish week 15 of 2023.

During the visit a member of site staff explained that the majority of the cleanerfish mortality was due to fish being lost during freshwater and FLS treatments. There was some doubt over whether the cleaner fish had been removed prior to these treatments. It was confirmed by the site manager during a remote inspection on 14/08/2023 that they had not been removed prior to treatment. From inspection of the Lumpfish mortality records, approximately 22,000 fish had a recorded cause of mortality from input until week 15 of 2023 as AGD, the remaining stock was unaccounted for within the sites mortality records.

Site is stocked with fish from Geocrab, Applecross and Hebridean smolt.

Mortality removal onsite is usually carried out by whiteshore cockles, who remove whole fish waste from the site mort skip, positioned at the shore base. With the recent increase in mortality, excess mortalities have been removed and ensiled using the Bakkaness vessel.

REG inspection conducted as water temperature was over 14 degrees.

One issue was raised regarding the sites movement records : Movement of fish offsite to Portree (FS0708) in March 2023 was not recorded in the sites movement book. Issue raised with site manager and the record has since been updated. No further action required.

Case sheet and report amended on 25/01/2024. REG inspection not required as ECI is not due until 2024. Case is a REP/DIA. Report amended and re issued due to an error in case detail.

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"/>				
Age group	<input type="text" value="2022 S0"/>				
No Fish	<input type="text" value="528,531"/>				
Mean Fish Wt	<input type="text" value="2.45"/>				
Next Fallow Date (Site)	<input type="text" value="02/24"/>	Next Input Date (Site)	<input type="text" value="08/24"/>		
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="PD, AGD, furunculosis"/>				

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: <input type="text" value="Optomease"/>		
If other, detail: <input type="text"/>		
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)?	<input type="text" value="Optomease"/>	
If other, detail: <input type="text"/>		
6. Are medicines stored appropriately?	<input type="checkbox"/>	Y

Biosecurity Records

1. Biosecurity records available for inspection?	<input type="checkbox"/>	Y
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	<input type="checkbox"/>	Y
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"/>	Y
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"/>	Y
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"/>	Y
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"/>	Y
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	<input type="checkbox"/>	Y
8. Have the biosecurity procedures been adequately implemented on site?	<input type="checkbox"/>	Y
If no, detail: <input type="text"/>		

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). <input type="text" value="See additional info."/>		

Records checked between:	<input type="text" value="23/06/2021 - 31/07/2023"/>
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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								
Fish nos	1	2	3	4								
Pool Group	P1	P1	P1	P1								
Species	SAL	SAL	SAL	SAL								
Average weight	2.4kg	2.4kg	2.4kg	2.4kg								
Sex	N/A	N/A	N/A	N/A								
Water Type	SW	SW	SW	SW								
Stock Details		Applecross (FS0500)	Applecross (FS0500)	Applecross (FS0500)	Applecross (FS0500)							
	Stock Origin											
Facility No	2	2	1	1								

07/2023 Additional Sample Information:

4

Total Tests assigned

5

Case no: **2023-0349** Site No: **FS0242** Method of killing: **Percussive**
 Date of visit: **31/07/2023** Inspector(s): **[REDACTED]** Sheet Relevant: **Y**

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

Fish Number		1	2	3	4				
Time sampled after death (if > 45 minutes)					10				
External Signs									
Behaviour	Moribund	S	S	S	S				
	Lethargic	S	S	S	S				
	Hanging vertical								
	Spiralling								
	Flashing								
	Loss of equilibrium								
Body	Dark								
	Distended abdomen								
	Anorexic								
	Scale Oedema								
Opercula	Shortened								
	Flared								
Haemorrhaging	Throat								
	Ventrum								
	Base of fins								
	Elsewhere								
Eyes	Exophthalmic								
	Enophthalmic (sunken)								
	Cataract								
	Haemorrhagic								
Gills	Pale	M	M	M	M				
	Zoned								
	Necrotic								
Lesions	Flank								
	Elsewhere								
Vent	Inflamed								
	Trailing faeces								
Lice Load	Estimate numbers	0	1	0	2				
Internal Signs									
Ascites	Clear								
	Bloody	W	W	W	W				
Oedema	In tissues								
Heart	Pale/anaemic								
	Granulomas								
	Deformed								
Liver	Petechial haem		W		W				
	Gross haem								
	Tissue breakdown								
	Enlarged								
	Colour number(s)	4	4	4	4				
	Granulomas								
	Lesions								
Pyloric caeca	Petechial haem		M		M				
	Tubules mauve								
	Lack of fat			W					
Spleen	Enlarged								
	Granulomas								
Gut	No food present	M	M	M	M				
	Yellow pseudo-faeces								
	External haem								
	Internal haem								
Body wall	Haemorrhaging	W			W				
Swim bladder	Haemorrhaging	W			W				
	Fluid filled								
Kidney	Swollen								
	Grey								
	Granular								
	Liquefied								
General	Parasites present								
	Anaemia								

Case no: 2023-0349

Date of visit: 31/07/2023

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

Fish Number																				
Time sampled after death (if > 45 minutes)																				
External Signs																				
Behaviour	Moribund																			
	Lethargic																			
	Hanging vertical																			
	Spiralling																			
	Flashing																			
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Body	Dark																			
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	Scale Oedema																			
Opercula	Shortened																			
	Flared																			
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	Tissue breakdown																			
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	Colour number(s)																			
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	Fluid filled																			
Kidney	Swollen																			
	Grey																			
	Granular																			
	Liquefied																			
General	Parasites present																			
	Anaemia																			

Additional comments:

Case Number:	2023-0349	Site No:	FS0242	Insp:			
Date of Visit	31/07/2023	No of movements/supp./dest.			Score		
Live fish movements		0	1-5	6-10	>10		
Movements on (from out with GB) of susceptible species	Frequency of movements on from equivalent MS	0	5	10	14	0	
	Frequency of movements on from equivalent zone or compartment including third country	0	9	18	26	0	
	Number of suppliers	0	5	10	14	0	
Movements off	Frequency of movements off	0	3	6	10	10	
	Number of destinations	0	3	6	10	3	
Exposure via water		Site contacts			0	1-5	6-10
Water contacts with other farms (holding species susceptible to same diseases)	Farm is protected (secure water supply through disinfection or borehole)	0					
	Farm is on-line or in a coastal zone with category I farms upstream or within 1 tidal excursion	1	2		4	2	
	Farm is on-line or in a coastal zone with category III farms upstream or within 1 tidal excursion	1	3		6		
	Farm is on-line or in a coastal zone with category V farms upstream or within 1 tidal excursion	1	4		8		
Management practices		None	Secure	Unsecure			
Water contacts with processors	Any processing plant discharging into adjacent waters	0	1		2	0	
On farm processing within the rules of the directive	No on farm processing	0				0	
	Processing own fish (re-cycling risk)	1					
	Processing fish from MS of equivalent status	2					
	Processing fish from zone or compartment of equivalent status	4					
	Processing fish from Category III farm	8					
	Processing fish from Category V farm	10					
Disposal of fish and fish by-products	Site's own waste only processed.	0				0	
	Common processes with other farms	3					
	Collection point for waste from other farms	5					
Use of unpasteurised feeds	No feeding of unpasteurised feed	0				0	
	Feeding unpasteurised feed	5					
Biosecurity		Number of sites	1	2 or 3	≥ 4		
Contacts with other sites	Sites operating from single shorebase	0	1		2	0	
	Sites sharing staff and equipment	0	1		2	0	
Disinfection of equipment between sites, use of footbaths etc	Yes	0				0	
	No	1					
CoGP/Regulator							
Practices in accordance with regulator or industry code of practice	Yes	0				0	
	No	3					
Platform access to cages	Yes	0				0	
	No	2					
Total Rank					15		

Case No:

Site No:

Sea Lice Inspection (Seawater Sites Only)

- 1. Has the site experienced sea lice problems in the previous 4 years?
- 2. Is the CoGP Farm Management Area (or equivalent) followed synchronously on a single year class basis?
- 3. Does the site have access to a range of licenced in-feed and bath sea lice medications (including deltamethrin, azamethiphos and emamectin benzoate) as well as access to suitable biological and/or mechanical control measures, and can these be deployed in a reasonable period of time?
- 4. Is there a signed documented farm management agreement or statement relevant to the site and CoGP Farm Management Area (or equivalent)?
- 5. Are sea lice count records available for inspection? (Legal SSI, CoGP Annex 6)
- 6. Do records adequately reflect the required standard specified in the SSI and the CoGP? (Legal SSI, CoGP Annex 6)
- 7. Are sea lice (*L. salmonis*) record levels below the suggested criteria for treatment in the CoGP during the period that records are inspected? (CoGP Annex 6)
- 8. Have average adult female sea lice (*L. salmonis*) numbers per fish been at a level of 3 or above (prior to w/b 10/6/19) or 2 or above (from w/b 10/6/19) during the period that records are inspected?
- If yes, have these been reported to the Fish Health Inspectorate? If no, FHI see comment.
- 9. Is *C. elongatus* infestation at a level which is considered to cause significant welfare problems? (CoGP 4.3.81, 5.3.50)
- 10. Have therapeutic treatments been administered or other actions taken when *L. salmonis* levels have exceeded the suggested criteria for treatment or where *C. elongatus* is considered to have welfare implications? (CoGP 4.3.82, 5.3.51)
- 11. Has any other action been taken (where applicable)?
- 12. Have therapeutic treatments or the actions taken had a significant impact upon the lice levels recorded?
- 13. Are treatments, where conducted, carried out in cooperation between participating farms?
- 14. Is there a harvesting strategy for the site, where fewer populations or part populations are held without treatment for sea lice?
- 15. Is there a site specific written lice management procedure with waypoints describing set actions to deal with recognised scenarios during the escalation of a sea lice infestation?
- 16. Do the sea lice levels observed on stocks reflect sea lice count data? If no please detail reasons.

Containment Inspection

- 1. Has the site experienced equipment damage due to predators in the current or previous production cycles?
- 2. Are measures in place to mitigate against the predation experienced on site? (Detail below)
- seal pro nets, seal fences, bird nets.
- If other, detail below:
- 3. Have escape incidents or events been experienced on or in the vicinity of the site since the last FHI inspection?
- If Yes proceed with questions 4 – 9. If No skip to question 10
- 4. Have these been reported to Scottish Ministers?
- 5. Have these been reported to local DSFB forthwith (where they exist)? (CoGP – 4.4.37, 5.4.17)
- 6. Have these been reported to the SSPO and local fisheries trusts forthwith (where they exist)? (CoGP – 4.4.37, 5.4.17)
- 7. Were methods (if any) used to recover escapees? If yes give detail
- 8. If gill nets were deployed was this action agreed with local wild fish interests and was permission given by Scottish Ministers? (Legal, CoGP – 4.4.38, 5.4.18)
- 9. What action was taken to prevent and minimise the risk of further escapes? (Not covered in code but could be considered under satisfactory measures of the Act)
- 10. Is the site inspected as satisfactory with regards to containment? If no, please detail reason(s)

Case No: 2023-0349

Site No: FS0242

Date of Visit: 31/07/2023

Inspector: [REDACTED]

Point of Compliance

1. Is the farm under inspection located within a farm management area?

If N, no further questions require completion.

Points of Compliance for Both Farm Management Agreements and Statements

2. Has a current farm management agreement or statement (FMAg/S) been prepared?

3. Is the current FMAg/S available for inspection?

4. Does the FMAg/S identify the relevant farm management area?

5. Does the FMAg/S identify the fish farm site(s) to which it applies?

6. Does the FMAg/S identify the date of commencement of the agreement or statement?

7. Does the FMAg/S identify the date of review?

Arrangements for Fish Health Management

8. Does the FMAg/S identify the minimum health standards for the stocks to be introduced to the area or farm?

9. Does the FMAg/S identify the vaccination requirements for stocks held in the area or farm?

10. Does the FMAg/S identify the species of fish which may be stocked into the area or farm?

11. Does the FMAg/S identify the maximum stocking density of any pen on any farm in the area or the individual farm?

12. Does the FMAg/S identify the arrangements for the storage and disposal of any dead fish from any fish farm in the area or the individual farm?

Arrangements for The Management of Sea Lice

13. Does the FMAg/S identify arrangements for the sharing of data on sea lice numbers and treatments?

14. Does the FMAg/S identify the availability and the use of medicines on farms covered by the agreement or statement?

15. Does the FMAg/S identify any requirements for the sensitivity testing of available treatments for sea lice on farms in the area or individual farms?

16. Does the FMAg/S identify the circumstances under which biological controls and cleaner fish are to be used on farms in the area or individual farms?

17. Does the FMAg/S identify the arrangements for synchronous treatments on farms within the area?

Live Fish Movements

18. Does the FMAg/S identify the circumstances when live fish may be introduced or removed from the area or farm?

19. Does the FMAg/S identify the arrangements for the movement of live fish on and off sites in the area or individual farms?

Harvesting

20. Does the FMAg/S identify acceptable harvest practices on farms in the area or individual farms?

Fallowing

21. Does the FMAg/S identify the dates by which the area or individual farm will be fallow and the earliest date when a farm or area may be restocked?

22. Does the FMAg/S identify whether one or more year classes may be stocked onto sites covered by the agreement or statement?

23. Does the FMAg/S identify whether broodstock or potential broodstock are to be kept on any site covered by the agreement or statement?

Point of Compliance for Farm Management Agreements Only

24. Does the farm management agreement include arrangements for persons to become, or cease to be, parties to the agreement?

Management and operation

25. Is the fish farm being managed and operated in accordance with the agreement or statement?

26. What is the version no/date of issue of the FMAg/S?

Site No: FS0242
Case No: 2023-0349
Nature of non-compliance:
Action taken (FHI):
Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology



Case No: **2023-0349** Date of visit: **31/07/2023**
 Site No: **FS0242** Inspector: **[REDACTED]**

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2 nd Insp
MG_AGDQ	1/4	10/08/2023		10/08/2023		25/08/2023		
MG_IHNQ	0/4	10/08/2023		10/08/2023		25/08/2023		
MG_IPN	0/4	10/08/2023		10/08/2023		25/08/2023		
MG_PARA_THER_Q	4/4	10/08/2023		10/08/2023		25/08/2023		
MG_SAL_POX	4/4	10/08/2023		10/08/2023		25/08/2023		
MG_SAV	3/4	10/08/2023		10/08/2023		25/08/2023		
MG_VHS	0/4	10/08/2023		10/08/2023		25/08/2023		
BA_ASAL	4/4	15/08/2023		16/08/2023		25/08/2023		
BA_VSPE	2/4	15/08/2023		16/08/2023		25/08/2023		
GPAT	3/4	16/08/2023		16/08/2023		25/08/2023		
SPAT	3/4	16/08/2023		16/08/2023		25/08/2023		
HPAT	4/4	16/08/2023		16/08/2023		25/08/2023		
KPAT	3/4	16/08/2023		16/08/2023		25/08/2023		
ASSM	3/4	16/08/2023		16/08/2023		25/08/2023		
EPIT	1/4	16/08/2023		16/08/2023		25/08/2023		
MG_ISA	0/4	24/08/2023		16/08/2023		25/08/2023		

Report Summary			
Case Type	Date	Insp	2 nd Insp
DIA, REP	25/08/2023		
DIA (reissued)	25/01/2024		



FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0169	DATE OF VISIT	31/07/2023
SITE NO	FS0242	SITE NAME	Gravir
CASE NO	20230349	INSPECTOR	[REDACTED]

Section 1: Summary

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

Histopathology examination revealed features consistent with *Aeromonas salmonicida* (furunculosis). This was confirmed by the isolation of *Aeromonas salmonicida* ssp. *salmonicida*, and the level and purity of growth would suggest that this is the primary cause of morbidity in this case. Two fish also displayed areas of light HE stain in the compactum stratum. Hepatocellular necrosis and minor hyperplastic branchitis were also observed. Some features on the musculature resembled presence of salmon alphavirus. *Vibrio* sp. was also identified, but the purity of growth would not suggest that it would be implicated in morbidity.

All fish sampled tested positive for *Paranucleospora theridion* and salmon gill poxvirus. One fish tested positive for *Neoparamoeba perurans*. In addition, three fish tested positive for salmonid alphavirus, the causative agent of pancreas disease (PD) in Atlantic salmon.

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 site was inspected following reports of prolonged increased mortality by the farm operator. At the time of visit the site was stocked with 528,531 2022 S0 Atlantic salmon at an average weight of 2.45kg.

The stock at Gravir was diagnosed with PD in early May of 2023, stock have also sustained damage to their gills from a recent environmental insult where plankton counts for jellyfish have been elevated. Gravir have been reporting mortality above the reporting threshold since 28/05/2023.

During the inspection of the site the visit had to be stopped early due to an unsafe sea state, meaning only four stocked pens were inspected. Of the pens inspected, approximately 10 fish in each pen were observed as being lethargic and/or moribund. Two fish from pen one and two fish from pen two were removed for diagnostic sampling.

All fish sampled presented as lethargic and moribund prior to removal for sampling. Externally all four fish appeared relatively healthy, the gills of all four fish were slightly pale and F3 & F4 had shortened opercula.

Internally, all fish sampled had a small amount of bloody ascites present. Petechial haemorrhaging was observed on the liver and pyloric caeca of F2 and F4. Mild haemorrhaging to the swim bladder of F1 and F4 was also observed. No food was present in the gut of all four fish.

Samples

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

Fish number	Facility number	Species	Stage	Origin
F1-F2	2	Atlantic salmon	2022 S0, 2.4kg	Applecross (FS0500)
F3-F4	1	Atlantic salmon	2022 S0, 2.4kg	Applecross (FS0500)

Results

Bacteriology: Kidney and gill material from F1 – F4 was inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- *Aeromonas salmonicida* ssp. *Salmonicida*.: F1 - F4 (Kidney), F2 - F4 (Gill).
- *Vibrio* sp.: F2, F3 (Kidney).

The level and purity of *Aeromonas salmonicida* ssp. *salmonicida* identified from F1 – F4 would suggest that this is the primary cause of morbidity in this case.

The level and purity of the *Vibrio* sp. identified from F2 and F3 would not suggest that it would be implicated as a primary cause of morbidity.

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

Salmonid alphavirus (SAV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	15.67	36.27	34.49	35.03	POSITIVE
F3	15.04	33.73	34.67	36.13	POSITIVE
F4	15.80	36.24	36.10	35.26	POSITIVE

Salmon gill poxvirus

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	22.13	32.02	31.79	32.01	POSITIVE
F2	23.14	36.97	36.22	36.17	POSITIVE
F3	21.89	27.62	27.59	27.62	POSITIVE
F4	21.66	31.66	31.73	31.97	POSITIVE

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), infectious salmon anaemia virus (ISAV) 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).

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	22.13	28.05	28.10	28.08	POSITIVE
F2	23.14	32.98	32.98	32.98	POSITIVE
F3	21.89	30.19	30.22	30.42	POSITIVE
F4	21.66	30.62	30.62	30.27	POSITIVE

Neoparamoeba perurans (AGD)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	-	-	-	-	Negative
F3	21.89	32.05	32.84	32.47	POSITIVE
F4	-	-	-	-	Negative

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1 – F4. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Mild, multifocal, lamellar hyperplasia (F2, F3, F4), some basophilic epithelial inclusions (likely epitheliocystis) (F3). Several aggregates of Gram-negative bacteria (F2 & F4). Features of autolysis observed on F3, F4.

Skin & Muscle: Myositis, mild, multifocal (F2).

Heart: Several small dense aggregates of Gram-negative bacteria and some fibre necrosis surrounding the bacterial aggregates (F2, F3 & F4), some haemorrhage also observed in compact layer of F4. Few scattered thrombi (ventricle) (F1, F3). Epicarditis (F2). Some light H&E stain observed in the compact layer (F2, F3).

Gut and pyloric caeca: Marked cell sloughing (potentially associated with post-mortem artefact) observed in all fish.

Pancreas: Within the normal range.

Liver: Hepatocellular necrosis, mild, multifocal with Gram-negative rod-shaped bacterial aggregates (F2) and marked with haemorrhage in F4. Hepatocellular necrosis, mild, multifocal (F3) some mild, diffuse hepatocellular vacuolation (macrovesicles) (F1- F2).

Kidney: Foci of interstitial cell (haemopoietic) necrosis (F3) with few to several dense aggregates of Gram-negative rod-shaped bacteria in F2, F3, F4.

Spleen: Necrotising splenitis with Gram-negative rod-shaped bacteria, multifocal, mild (F3), few aggregates of Gram-negative rod-shaped bacteria in F2, F4. Cuffing (F2, F3 & F4).

Signed:



Date: 25/08/2023

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 \(www.gov.scot\)](https://www.gov.scot/resources/information/fish-health-inspectorate-service-charter/)

AMENDED FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No	FB0169	DATE OF VISIT	31/07/2023
SITE No	FS0242	SITE NAME	Gravir
CASE No	20230349	INSPECTOR	██████████

This report replaces the fish health report R09 issued on 25/08/2023 by ██████████. From the photos taken during the sampling process, haemorrhaging to the body wall was observed in F1 and F4 which had not been detailed in the previous report.

Section 1: Summary

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

Histopathology examination revealed features consistent with *Aeromonas salmonicida* (furunculosis). This was confirmed by the isolation of *Aeromonas salmonicida* ssp. *Salmonicida*, and the level and purity of growth would suggest that this is the primary cause of morbidity in this case. Two fish also displayed areas of light HE stain in the compactum stratum. Hepatocellular necrosis and minor hyperplastic branchitis were also observed. Some features on the musculature resembled presence of salmon alphavirus. *Vibrio* sp. was also identified, but the purity of growth would not suggest that it would be implicated in morbidity.

All fish sampled tested positive for *Paranucleospora theridion* and salmon gill poxvirus. One fish tested positive for *Neoparamoeba perurans*. In addition, three fish tested positive for salmonid alphavirus, the causative agent of pancreas disease (PD) in Atlantic salmon.

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 site was inspected following reports of prolonged increased mortality by the farm operator. At the time of visit the site was stocked with 528,531 2022 S0 Atlantic salmon at an average weight of 2.45kg.

The stock at Gravir was diagnosed with PD in early May of 2023, stock have also sustained damage to their gills from a recent environmental insult where plankton counts for jellyfish have been elevated. Gravir have been reporting mortality above the reporting threshold since 28/05/2023.

During the inspection of the site the visit had to be stopped early due to an unsafe sea state, meaning only four stocked pens were inspected. Of the pens inspected, approximately 10 fish in each pen were observed as being lethargic and/or moribund. Two fish from pen one and two fish from pen two were removed for diagnostic sampling.

All fish sampled presented as lethargic and moribund prior to removal for sampling. Externally all four fish appeared relatively healthy, the gills of all four fish were slightly pale and F3 & F4 had shortened opercula.

R09

Internally, all fish sampled had a small amount of bloody ascites present. Petechial haemorrhaging was observed on the liver and pyloric caeca of F2 and F4. Haemorrhaging was also observed within the body cavity in F1 and F4. Mild haemorrhaging to the swim bladder of F1 and F4 was also present. No food was present in the gut of all four fish.

Samples

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

Fish number	Facility number	Species	Stage	Origin
F1-F2	2	Atlantic salmon	2022 S0, 2.4kg	Applecross (FS0500)
F3-F4	1	Atlantic salmon	2022 S0, 2.4kg	Applecross (FS0500)

Results

Bacteriology: Kidney and gill material from F1 – F4 was inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- *Aeromonas salmonicida* ssp. *Salmonicida*: F1 - F4 (Kidney), F2 - F4 (Gill).
- *Vibrio* sp.: F2, F3 (Kidney).

The level and purity of *Aeromonas salmonicida* ssp. *salmonicida* identified from F1 – F4 would suggest that this is the primary cause of morbidity in this case.

The level and purity of the *Vibrio* sp. identified from F2 and F3 would not suggest that it would be implicated as a primary cause of morbidity.

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

Salmonid alphavirus (SAV)

Fish Number	Endogenous control value	Cp	Cp Values			Reported Result (PCR)
F1	-	-	-	-	-	Negative
F2	15.67	36.27	34.49	35.03		POSITIVE
F3	15.04	33.73	34.67	36.13		POSITIVE
F4	15.80	36.24	36.10	35.26		POSITIVE

Salmon gill poxvirus

Fish Number	Endogenous control value	Cp	Cp Values			Reported Result (PCR)
F1	22.13	32.02	31.79	32.01		POSITIVE
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F3	21.89	27.62	27.59	27.62	POSITIVE
F4	21.66	31.66	31.73	31.97	POSITIVE

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), infectious salmon anaemia virus (ISAV) 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).

Paranucleospora theridion

Fish Number	Endogenous control value	Cp	Cp Values			Reported Result (PCR)
F1	22.13		28.05	28.10	28.08	POSITIVE
F2	23.14		32.98	32.98	32.98	POSITIVE
F3	21.89		30.19	30.22	30.42	POSITIVE
F4	21.66		30.62	30.62	30.27	POSITIVE

Neoparamoeba perurans (AGD)

Fish Number	Endogenous control value	Cp	Cp Values			Reported Result (PCR)
F1	-		-	-	-	Negative
F2	-		-	-	-	Negative
F3	21.89		32.05	32.84	32.47	POSITIVE
F4	-		-	-	-	Negative

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1 – F4. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Mild, multifocal, lamellar hyperplasia (F2, F3, F4), some basophilic epithelial inclusions (likely epitheliocystis) (F3). Several aggregates of Gram-negative bacteria (F2 & F4). Features of autolysis observed on F3, F4.

Skin & Muscle: Myositis, mild, multifocal (F2).

Heart: Several small dense aggregates of Gram-negative bacteria and some fibre necrosis surrounding the bacterial aggregates (F2, F3 & F4), some haemorrhage also observed in compact layer of F4. Few scattered thrombi (ventricle) (F1, F3). Epicarditis (F2). Some light H&E stain observed in the compact layer (F2, F3).

Gut and pyloric caeca: Marked cell sloughing (potentially associated with post-mortem artefact) observed in all fish.

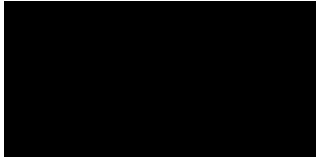
Pancreas: Within the normal range.

Liver: Hepatocellular necrosis, mild, multifocal with Gram-negative rod-shaped bacterial aggregates (F2) and marked with haemorrhage in F4. Hepatocellular necrosis, mild, multifocal (F3) some mild, diffuse hepatocellular vacuolation (macrovesicles) (F1- F2).

Kidney: Foci of interstitial cell (haemopoietic) necrosis (F3) with few to several dense aggregates of Gram-negative rod-shaped bacteria in F2, F3, F4.

Spleen: Necrotising splenitis with Gram-negative rod-shaped bacteria, multifocal, mild (F3), few aggregates of Gram-negative rod-shaped bacteria in F2, F4. Cuffing (F2, F3 & F4).

Signed:



Fish Health Inspector

Date: 25/01/2024

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F1







F2







F3



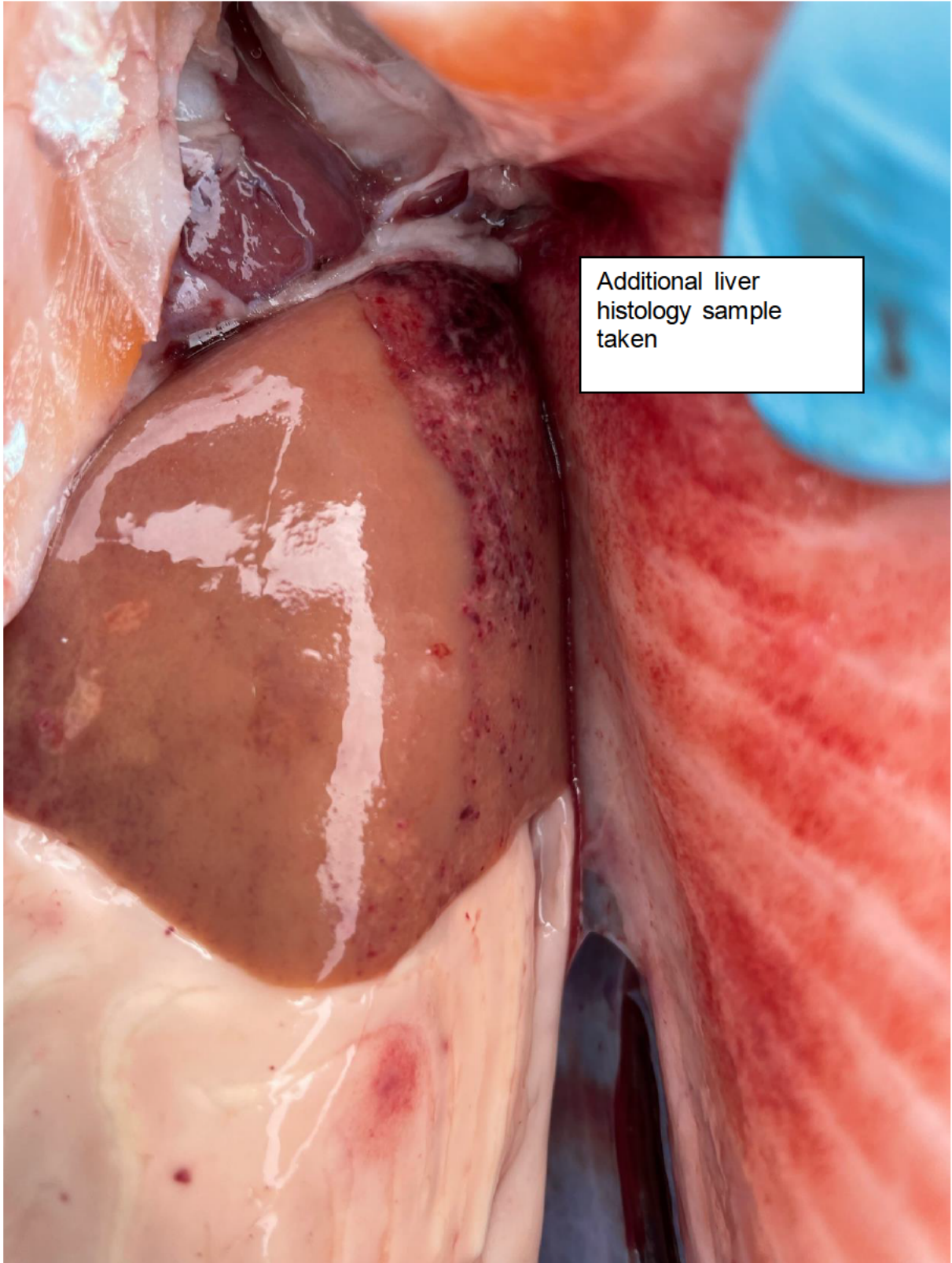




F4







Additional liver
histology sample
taken

