Case No: 2021-0324 Date of visit: 21/09/2021

Time spent on site: 3 hours Main Inspector: [redacted]

Site No: FS0269 Site Name: Kames Hatchery
Business No: FB0134 Business Name: Kames Fish Farming Ltd

Case Types: 1 ECI 2 CNI 3 DIA 4 5 6

Water Temp (°C): 12.6 Thermometer No: T172 FHI 045 completed

Observations: Region: ST Water type: F CoGP MA

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:

Remote inspection conducted by [redacted], observed by [redacted] (for training purposes) and [redacted] (for the purpose of auditing [redacted]) on 15/09/2021. Physical inspection carried out on 21/09/2021 by [redacted] (observed by [redacted] and [redacted]). Diagnostic sampling carried out by [redacted].

First batch of fish moving out in Autumn 2021 and another in spring 2022 all going to Loch Craignish

Import of ova from AquaSearch in March 2019. Observed health certificate during physical inspection

Waste collected at a shared disposal point at Kames pier

Increased mortality events:

2019 wk 18, 4,500 deformed alvins removed

2020 wk 2, 3,500 unviable eggs (referred to as "glass eggs" by the site contact) removed: 3.38% mortality over the site

2020 wk 17, unviable eggs removed: 6.99% mortality. Not reported to FHI. Mortality sheet updated and site representative reminded of requirement to notify FHI of mortality in ova over 6% per week.

2021 wk 6: ~11,500 fish dead due to RTFS (10.25%). Florocol used as a treatment and is was successful. Mortality soon returned to background levels in the following week.

2021 wk 15: unviable eggs removed, 3,808 eggs (2.96%)

July 13th fish vaccinated with Alphaject 22 (just larger fish vaccinated). The rest of the fish will be vaccinated in Oct or Nov 2021

No more eggs from from Aquasearch in Denmark. All future eggs will come from Northern Trout in England.

Case No: 2021-0324 Site No: FS0269

Date of Visit: 21/09/2021 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		15	Facilities stocked		8	No facilities inspected		15
Species	RTR	RTR						
Age group	2021	2021						
No Fish	50,886	35,738						
Mean Fish Wt	42g	130g						
Next Fallow Date (Site)		No plans	Next Input Date (Site)			December 2021		
Recent (last 4 wks) disease problems?			Y	Any escapes (since last visit)?				N
If yes, detail:	RTFS, see mortality section below for further details							

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	26/02/2019
3. Are records complete and correctly entered?	Y
4. Are movement records available for dead fish and waste?	Y
5. Are records complete and correctly entered?	Y
6. Are health certificates for introductions (outwith GB) available?	Y

Transport Records

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

Mortality Records

1. Mortality records available for inspection?	Y
2. How are mortalities disposed of?	Other (detail)
If other detail:	All mortality taken to shared ensiler at pier.
3. Mortality records complete and correctly entered?	Y
4. Recent mortality (last 4 wks):	RTFS diagnosed on site. Only specific tanks affected: tanks 11 and 12. Diagnosed by company vet. Fish vet group prescribed treatment of florocol. Third party vet taken samples from 4 fish and has diagnosed RTFS based on histology observed on 07/09/2021. RTFS confirmed using agar plates by company vet. wk 37: 0.11% (96 fish), wk 36: 0.46% (401 fish) , wk 35: 0.69% (610 fish), wk 34: 0.99% (889 fish).
5. Evidence of recent increased/atypical mortalities?	Y

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

See additional information

6. Any other peaks in mortality during period checked?	Y
If yes, detail:	See additional information
7. Have increased (unexplained) mortalities been reported to vet or FHI?	N/A
If yes, detail action:	No unexplained mortality
8. Have 'mortality events' been reported to FHI? If no, enter details on mortality events sheet.	N

Treatments and Medicines Records

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

Biosecurity Records

1. Biosecurity records available for inspection?	Y
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	Y
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?	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 *how* and *when* that will be notified to Scottish Ministers?	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)?	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.)?	Y
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	Y
8. Have the biosecurity procedures been adequately implemented on site?	Y
If no, detail:	

Results of Surveillance

1. Has any animal health surveillance been carried out by, or on behalf of, the business?	Y
2. If yes, are results available for inspection?	Y
3. Any significant results?	Y
If yes, detail (if not detailed under recent disease problems).	RTFS diagnosed (see additional information)
Records checked between:	22/06/2019 - 21/09/2021

Case no:	2021-0324	Site No:	FS0269	Date of visit/ Sampling:	21/09/2021	21/(							
Priority samples:	VI		BA		PA		MG		HI				
Time sampling starts/ends:	16:00:00	17:30:00	Inspector:		VMD No.	0							
Environmental conditions:	1	Indoors	2		3		4		5				
Summary samples	HIST	Y	BA	Y	MG	Y	VI		PA	Y	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							
Stock Details	Species	RTR	RTR	RTR	RTR	RTR	RTR						
	Average weight	120g	120g	120g	60g	100g							
	Sex	N/A	N/A	N/A	N/A	N/A							
	Water Type	FW	FW	FW	FW	FW							
	Stock Origin	Brow well	Brow well	Brow well	Brow well	Brow well							
	Facility No	11	11	12	6	7							

09/2021 Additional Sample Information:

6 Total Tests assigned 2

Case no: 2021-0324 Site No: FS0269 Method of killing: Anaesthetic

Date of visit: 21/09/2021 Inspector(s): [redacted] 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)											
External Signs											
Behaviour	Moribund	S	S	S	S	S					
	Lethargic			W							
	Hanging vertical										
	Spiralling										
	Flashing										
	Loss of equilibrium			M							
Body	Dark										
	Distended abdomen			S							
	Anorexic										
	Scale Oedema										
Opercula	Shortened										
	Flared										
Haemorrhaging	Throat										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	Exophthalmic										
	Enophthalmic (sunken)										
	Cataract										
	Haemorrhagic										
Gills	Pale										
	Zoned										
	Necrotic										
Lesions	Flank										
	Elsewhere										
Vent	Inflamed										
	Trailing faeces										
Lice Load	Estimate numbers										
Internal Signs											
Ascites	Clear										
	Bloody										
Oedema	In tissues										
Heart	Pale/anaemic										
	Granulomas										
	Deformed										
Liver	Petechial haem										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)										
	Granulomas										
	Lesions										
Pyloric caeca	Petechial haem										
	Tubules mauve										
	Lack of fat	M	M	M	M	M					
Spleen	Enlarged										
	Granulomas										
Gut	No food present	M	M	M	M	M					
	Yellow pseudo-faeces										
	External haem										
	Internal haem										
Body wall	Haemorrhaging										
Swim bladder	Haemorrhaging										
	Fluid filled										
Kidney	Swollen										
	Grey										
	Granular										
	Liquefied										
General	Parasites present										
	Anaemia										

Case no: 2021-0324

Date of visit: 21/09/2021

S for strong presence: **M** for medium presence: **W** for w

Fish Number											
Time sampled after death (if > 45 minutes)											
External Signs											
Behaviour	**Moribund**										
	Lethargic										
	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**										
	Zoned										
	Necrotic										
Lesions	**Flank**										
	Elsewhere										
Vent	**Inflamed**										
	Trailing faeces										
Lice Load	**Estimate numbers**										
Internal Signs											
Ascites	**Clear**										
	Bloody										
Oedema	**In tissues**										
Heart	**Pale/anaemic**										
	Granulomas										
	Deformed										
Liver	**Petechial haem**										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)										
	Granulomas										
	Lesions										
Pyloric caeca	**Petechial haem**										
	Tubules mauve										
	Lack of fat										
Spleen	**Enlarged**										
	Granulomas										
Gut	**No food present**										
	Yellow pseudo-faeces										
	External haem										
	Internal haem										
Body wall	**Haemorrhaging**										
Swim bladder	**Haemorrhaging**										
	Fluid filled										
Kidney	**Swollen**										
	Grey										
	Granular										
	Liquefied										
General	**Parasites present**										
	Anaemia										

Additional comments:

Tale of fish 1 and 3 deformed. Physical damage on the lower jaw of fish 5. F3 swollen atrium

Case Number:	2021-0324		Site No:	FS0269	Insp:	
Date of Visit	21/09/2021		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	5
	Frequency of movements on from equivalent zone or compartment including third country	0	9	18	26	
	Number of suppliers	0	5	10	14	5
Movements off	Frequency of movements off	0	3	6	10	6
	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	1
	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			
	Common processes with other farms	3			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	2
	Sites sharing staff and equipment	0	1	2	2
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	27
Rank	HIGH

Case No: 2021-0324 Site No: FS0269

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) fallowed 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?	N
2. Are measures in place to mitigate against the predation experienced on site? (Detail below)	Y

If other, detail below:

Site inside, contract with pest control company, traps available for use if required (not required at the time of the inspection)

3. Have escape incidents or events been experienced on or in the vicinity of the site since the last FHI inspection?	N
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)	Y

Site No: FS0269

Case No: 2021-0324

Nature of non-compliance:

Action taken (FHI):

Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology

Case No: 2021-0324 Site No: FS0269 Date of visit: 21/09/2021

Start date:	End date: (if applicable)	Size of fish:	Average weight of affected population:	Species:	Yearclass (SW SAL only):	Timescale	Mortality rate recorded(%):	Explained/ unexplained:	If explained, select reason(s):
20/04/20	26/04/2020	Eggs to 1st feed	0.1g	RTR		Weekly	6.99	Explained	Transport

If unexplained, select observations:	Total mortality during event (if available):	Additional information (e.g. action taken by company):	Action taken by FHI (include case no where applicable):	Yearclass Year
		Eggs removed from consignment, recorded and disposed of.	FHI aware during an inspection on 21/09/2021 (case number: 2021-0324). Site representative reminded to contact FHI when mortality in ova exceeds 6% per week.	2020

Case No: 2021-0324 Date of visit: 21/09/2021

Site No: FS0269 Inspector:

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp
MG IHN	0/1	06/10/2021		24/09/2021		27/10/2021		
MG IPN	1/1	06/10/2021		24/09/2021		27/10/2021		
MG SAV	0/1	06/10/2021		24/09/2021		27/10/2021		
MG VHS	0/1	06/10/2021		24/09/2021		27/10/2021		
GPAT	5/5	06/10/2021		0610/2021		27/10/2021		
GPAR	5/5	06/10/2021		0610/2021		27/10/2021		
G.salaris	0/5	06/10/2021		0610/2021		27/10/2021		
FPSY	4/5	27/10/2021		27/10/2021		27/10/2021		

Report Summary			
Case Type	Date	Insp	2nd Insp
ECI, CNI	06/10/2021		
DIA	27/10/2021		

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0134	**DATE OF VISIT**	21/09/2021
SITE NO	FS0269	**SITE NAME**	Kames Hatchery
CASE NO	20210324	**INSPECTORS**	[redacted]

Inspection under the Aquatic Animal Health (Scotland) Regulations 2009

The above site was inspected, in accordance with the Aquatic Animal Health (Scotland) Regulations 2009.

All epidemiological units were inspected.

Samples were taken for diagnostic purposes. A separate report will be issued detailing the results of these tests.

Records

The surveillance frequency category of the site was assessed as high. An inspection under the Aquatic Animal Health (Scotland) Regulations 2009 will be conducted annually. The category of the site will be reassessed on a routine basis and updated as required.

The information required for the public record of aquaculture production businesses regarding this site was verified and where necessary updated. The following records were also inspected to ensure that the conditions of authorisation for your Aquaculture Production Business (APB) are being met:

Aquaculture animal and aquaculture animal product movement records were inspected and appeared to be adequately maintained.

Records in relation to aquaculture animals transported by the business were inspected and found to be adequately maintained.

Mortality records were inspected and found to be adequately maintained.

Mortality levels had exceeded the reporting criteria since the last inspection and had not been reported to the Fish Health Inspectorate. I would like to remind you of the industry agreement in relation to mortality reporting as detailed in A Code of Good Practice for Scottish Finfish Aquaculture.

Reports detailing the results of animal health surveillance carried out by or on behalf of the business and/or Marine Scotland were available for inspection.

Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Email – ms.fishhealth@gov.scot
Website - https://www.gov.scot/policies/fish-health-inspectorate/

The biosecurity measures plan for the site was inspected and found to be adequately maintained and implemented.

Inspection under the Aquaculture and Fisheries (Scotland) Act 2007

The site was also inspected in accordance with the Aquaculture and Fisheries (Scotland) Act 2007 with respect to section 5 regarding containment and escapes.

On this occasion the site was found to be satisfactory.

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

Signed: [redacted] Date: 06/10/2021

Fish Health Inspector

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/

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FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0134	**DATE OF VISIT**	21/09/2021
SITE NO	FS0269	**SITE NAME**	Kames Hatchery
CASE NO	20210324	**INSPECTOR**	[redacted]

Section 1: Summary

During a routine inspection, moribund fish were observed. Five fish were removed from the water for diagnostic purposes.

Histopathology examination revealed mild multifactorial proliferative branchitis. Several amoebic cells were present and one fish also displayed bacteria among gill filaments (potentially associated with Rainbow Trout Fry Syndrome [RTFS] observed on site).

Flavobacterium psychrophilum was identified on plates taken from kidney material of 4 / 5 Fish. Because of the fastidious nature of this bacterium the low level of growth observed does not reflect the actual level present in the fish and in this case the treatment with antibiotics will have reduced the number of viable bacteria. *F. psychrophilum* is a primary fish pathogen and a risk to fish health.

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 as part of a risk based surveillance schedule. The inspection conducted was a routine inspection. Before the physical inspection on site it was noted that RTFS had been confirmed on site by the company biologist and a third party vet. The fish had been treated for this disease using florfenicol and mortality rates had reportedly reduced due to this treatment. It was thought that only fish in tanks 11 and 12 were affected by the disease. Some fish on site had been vaccinated using Alphaject 22.

During the physical inspection of the site, 5 fish were removed after moribund fish were observed. All fish removed were moribund and fish 3 was also lethargic, had a loss of equilibrium, a distended abdomen and a deformed tail. Fish 1 also had a deformed tail and fish 5 had physical damage on the lower jaw. During the internal examination, it was noted that all fish had a lack of fat associated with the pyloric caeca and no food present in the gut. Fish 3 also had a swollen atrium.

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

Samples

Samples were collected from 5 fish according to the table below:

Fish number	Pool number	Facility number	Species	Stage	Origin
1 + 2	1	11	Rainbow trout (*Oncorhynchus mykiss*)	~120g	Brow Well Fisheries
3	1	12	Rainbow trout (*Oncorhynchus mykiss*)	~120g	Brow Well Fisheries
4	1	6	Rainbow trout (*Oncorhynchus mykiss*)	~60g	Brow Well Fisheries
5	1	7	Rainbow trout (*Oncorhynchus mykiss*)	~100g	Brow Well Fisheries

Results

Bacteriology: Kidney and spleen material from fish 1- 5 were inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated from fish 1,2,4 and 5.
Flavobacterium sp. (kidney)

Flavobacterium psychrophilum was identified by QPCR.

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

Tissue samples were tested for the presence of infectious pancreatic necrosis virus (IPNV), by QPCR

Pool Number	**Endogenous control Cp value**	**Cp Values**			**Reported Result (PCR)**
P1	15.79	31.86	32.03	32.38	POSITIVE

The samples tested negative for **infectious haematopoietic necrosis virus** (IHNV), salmonid alphavirus (SAV) and viral haemorrhagic septicemia virus (VHSV).

Parasitology: Fins were collected to determine the presence of *Gyrodactylus salaris* using light microscopy and molecular techniques (PCR).

No *G. salaris* parasites were detected in the samples examined.

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from fish 1 – 5. The tissue samples were fixed in 10% neutral buffered formalin.

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Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

Histopathological examination revealed the following:

Tissues from 5 Atlantic salmon were examined by light microscopy. The following histopathological changes were observed:

Gill: Very mild to mild multifocal interlamellar hyperplasia (F1-F5) and lamellar fusion (F5). F5 displayed occasional spaces (lacunae) on the hyperplasic plaques, some of the lacunae filled with cell debris and amoebic cells, (F5). All fish exhibited several amoebic cells free among gill filaments and lamellae. F5 also displayed cluster of filamentous and rod-shaped Gram-negative bacteria associated with debris among gill filaments. F5 exhibited inflammatory cell infiltration, mainly polymorphonuclear neutrophils, observed at the gill filaments centre. One third of proximal area of one gill filament dispalyed cell necrosis associated. One several aneurysmal dilation (F3).

Skin & Muscle: Within normal range.

Heart: Mild pericarditis (F2).

Gut and pyloric caeca: Some cell sloughing (F5) (potentially associated with post-mortem artefacts).

Pancreas: Within normal range. F1 displayed artefacts which hindered the reading.

Liver: Mild diffuse hepatocyte vacuolation (F1, F3).

Kidney: Renal tubes displayed hyaline droplets on the lining epithelium (F1, F2 & F5), heamatopoiteic tissue slightly congested.

Spleen: Slightly congested (F2, F5).

Brain: Not sampled

Eye: Not sampled.

Signed: [redacted] Date: 12/11/2021

Fish Health Inspector

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/

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Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

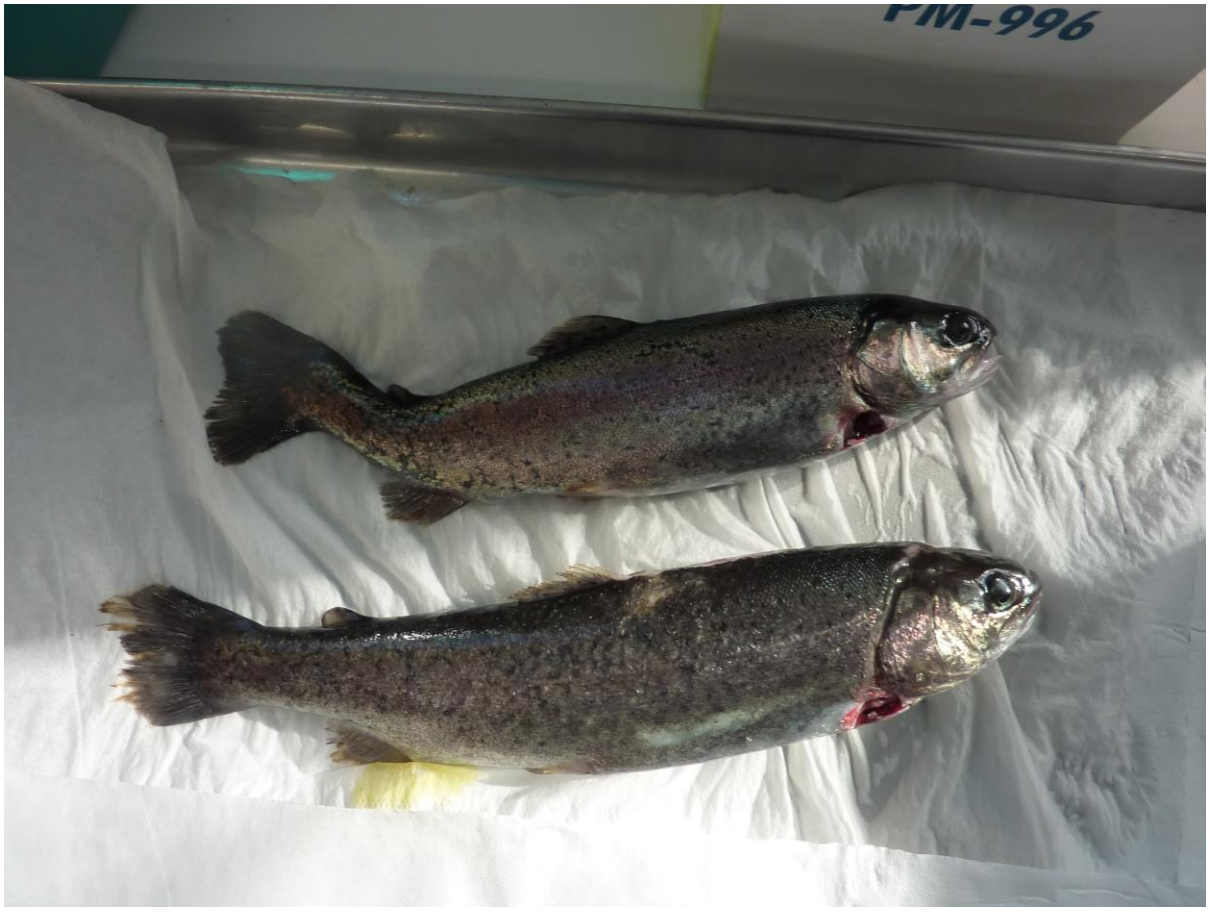

Image 1: Fish 1 and 2

Image 2: Fish 3

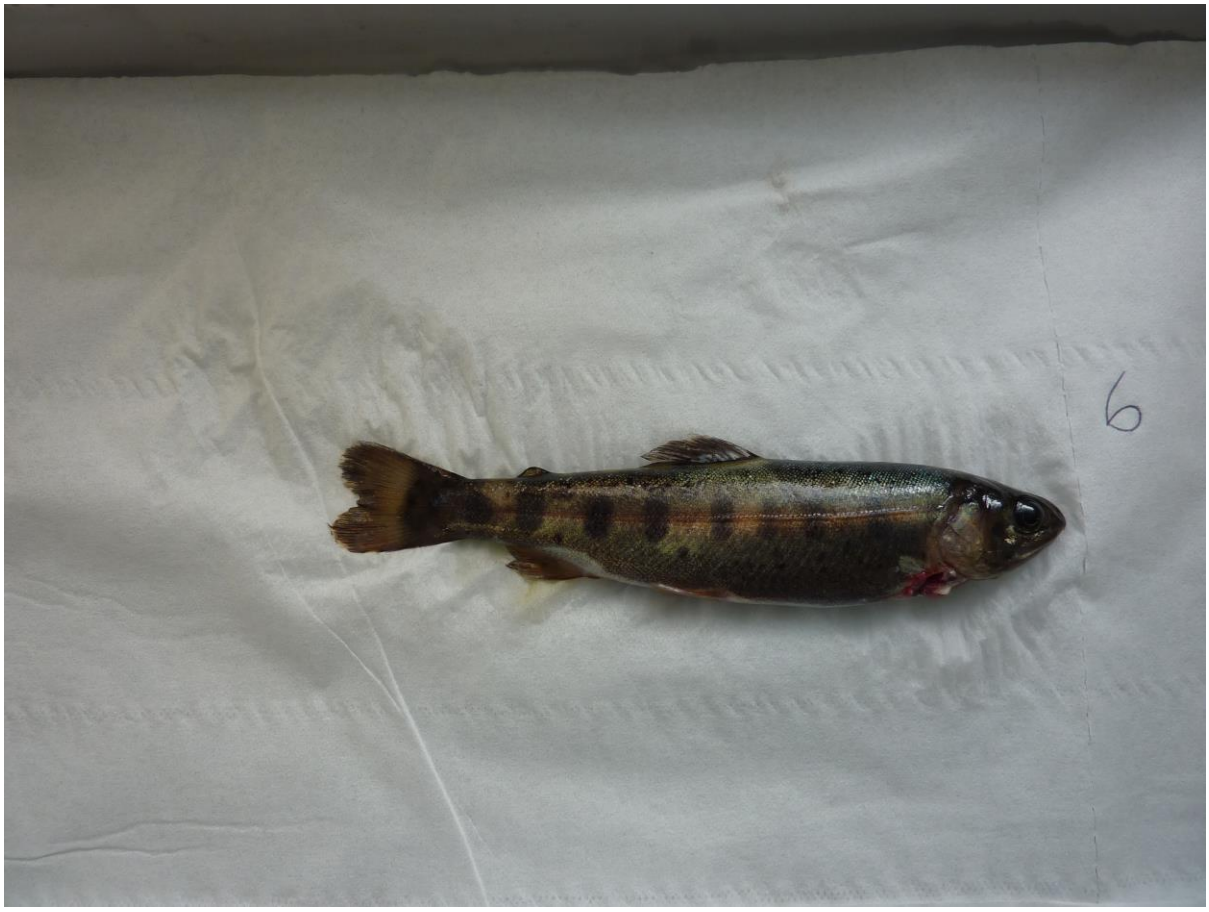

Image 3: Fish 4

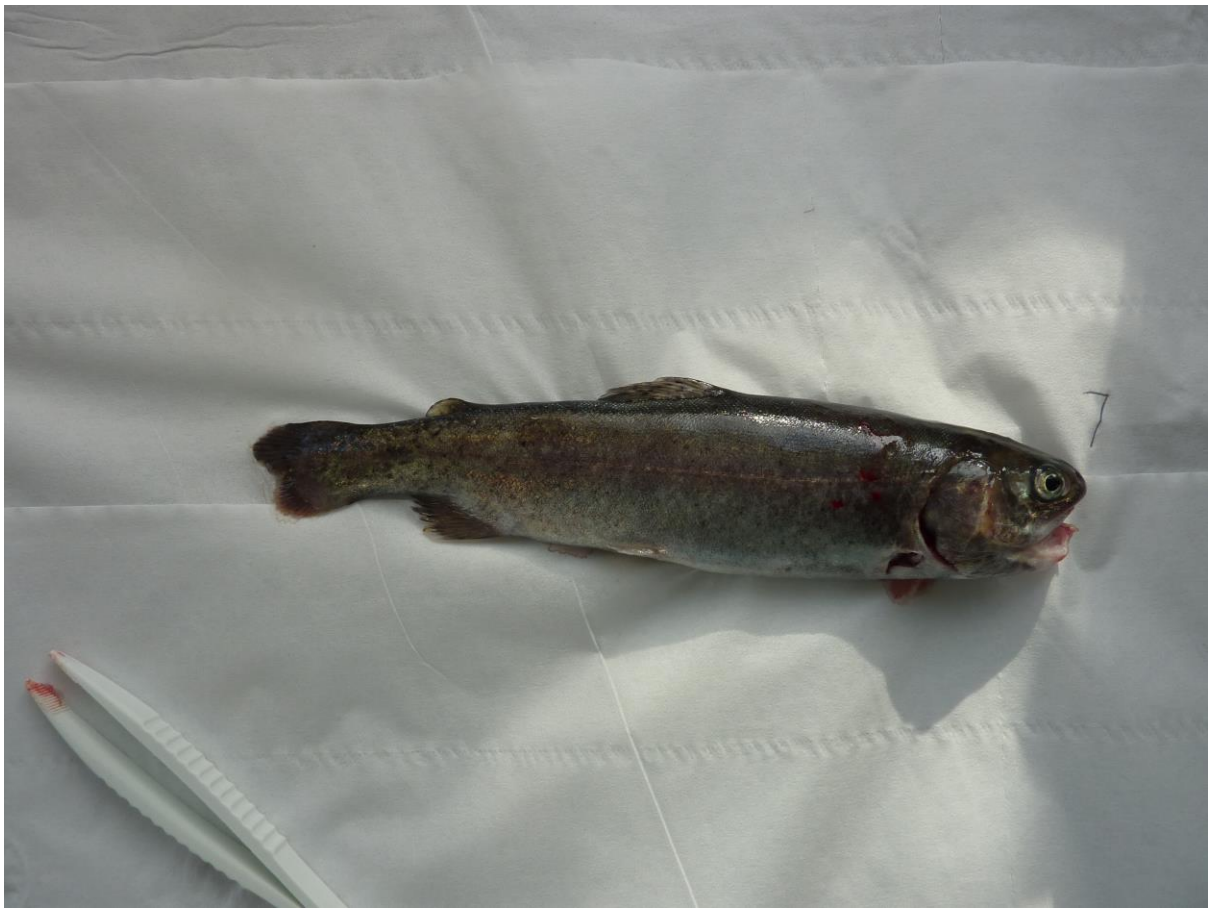

Image 4: Fish 5