FHI 059, Version 13		Issued by: FHI		Date of is	sue: 12/05/2020
Case No: 2022-0541				Date of visit: 0	8/11/2022
Time spent on site: 5	hours		Main Inspector	r:	
Site No: FS0299 Business No: FB0125	Site Name: Business Name:	Dunstaffnage Scottish Sea Fa	arms Ltd		
Case Types: 1 REP 2	2 DIA 3	4	5	6	
Water Temp (°C): 13.1	Thermometer No:	Site		FHI 045 complet	ed Y
Observations:	Region: ST	Water type	: S	CoGP MA:	M-36
Dead/weak/abnormally behaving Clinical signs of disease observed Gross pathology observed? Diagnostic samples taken?	•	Y If yes, see	additional inform	nation/clinical sco nation/clinical sco nation/clinical sco	re sheet.
UNI/REG only - if unable to carry	out intended visit detai	il reason below:			

FHI 059, Version 13

Additional Case Information:

Mort events 10/10 - 1.2%- Gill health environmental - 7945 fish- scheduled peroxide for AGD treatment Mort events 17/10 - 4.5%- Gill health environmental - 28952 fish- scheduled peroxide for AGD treatment Mort events 24/10 - 6.9%- Gill health environmental - 42345 fish- CGD scheduled peroxide for AGD treatment Mortality attributed to poor gill health - AGD confirmed and the site is reporting high counts for PGD. High levels of Muggiaea atlantica (jellyfish) have been identified during plankton counts. Paramove treatment conducted in week 43, post treatment mortality to the weaker, non feeding population. Mortality has begun to decreased following treatment.

Morts; 31/10 - 8/11/22 -9 Days 6758 fish 1.18%/site

lice levels at last count ; adult female - zero, total 0.33 all stages

wild caught wrasse on site; Skye, Wrasse mortality has been low

Paramove treatment week 43 for gill issues. 5 slice treatments since input, last one 18/9/22

Site thermometer used as error in T146

87000 morts in October from 99235 totals morts since input.

On inspection moribund fish observed in pen margins. Lesions observed on many fish, some single deep lesions and some fish with many lesions all over body surface. Lesions appeared in August prior to mort issues and bloom.

Mortalities generally incinerated on site but with increased mortalities incinerator unable to manage. Morts are been taken whole and stored at the shore base in Loch Spelve as this site is currently not stocked, is the only site in the disease managements area and Dunstaffnage does not have a suitable shore base. Morts been collected by Billy Bowie. Transport doc are at Spelve shore base so could not confirm the final destination of morts.

FHI 059, Version 13			Issu	ed by: FHI			Date of issue	e: 12/05/2020		
Case No:	2022-0541]	Site No:	FS0299						
Date of Visit:		08/11/2022]		Inspector(s):					
Registration/Autho							_			
1. Business/site deta	•	checked by s	ite representa	ative?			Y			
2. Changes made to	details?						Y			
Site Details (includ	e cleaner fis	sh for all sect	ions)							
Total No facilities		10	Facilities sto	cked	10	No facilitie	s inspected	4		
Species	sal	wrasse								
Age group	2022 Q2	mixed								
No Fish	567,016	20,148								
Mean Fish Wt	1061g	25g-200g								
Next Fallow Date (S	· ·	uncertain		Next Input Da	_ ` '	not known				
Recent (last 4 wks)				Y	Any escapes	s (since last	visit)?	N		
If yes, detail:	CGI, AGD,	PGD								
Movement Records	s available fo	or inspection?					0.4/00/00000	Y		
2. Date of last inspe		costly optorod					24/06/2022			
 Are records comp Are movement re 		•						n N		
5. Are records comp								N/A		
6. Are health certific		•		able?				N/A		
Transport Records	•									
1. Are any movement		ut by (or on bel	half) of the bu	isiness (not usi	ing a STB)?					
If yes, is there a sys										
Mortality Records										
1. Mortality records	available for	inspection?						Y		
•	2. How are mortalities disposed of?									
If other detail:		-								
3. Mortality records	complete and	d correctly ente	ered?					Y		
4. Recent mortality (last 4 wks):		see additiona	al info						
5. Evidence of recer	nt increased/a							Y		
If yes, facility nos/no	mortality pe	r facility/no sto	ck per facility	/reason:						
across site- Gill hea	lth									
6. Any other peaks i		• •						Y		
If yes, detail:				ntal gill health i	issues					
7. Have increased (unexplained)		•					Y		
If yes, detail action:		health survei								
8. Have 'mortality ev	ents' been re	eported to FHI	? If no, enter (details on mort	ality events sh	neet.		Y		

Treatments and Med	dicines Records		
1. Recent treatments	(see comment)?		Y
If yes, detail:	Paramove		
If other, detail:			
	available for inspection?		Y
	ete and correctly entered?		Y
4. Are fish in a withdra	•		N
5. If yes, what treatme	ent(s)?		
If other, detail:			
6. Are medicines store	ed appropriately?		Y
Biosecurity Records			
	s available for inspection?		
		ding and safe disposal been considered?	
		cottish Ministers or veterinary professional of any	
	ned) mortality at the site been included?		
		ence or suspicion of the presence of a listed disease	
	uded and how and when that will be no		
		ed on the farm site been covered (equal or higher	
health status, certifica	ation if required)?		
6 Hove the husbandr	ry and hispacurity massures implement	ed between each epidemiological unit to minimise	
		isitors, equipment, live or dead fish etc.)?	
		ce to maintain the physical containment of	
aquaculture animals h			
	ity procedures been adequately implem	ented on site?	
If no, detail:			
L			
Results of Surveillar	nce		
	alth surveillance been carried out by, or	on behalf of, the business?	Y
•	available for inspection?		Y
3. Any significant resu	•		Y
	etailed under recent disease problems).	AGD	
Re	ecords checked between:	24/6/22- 7/11/22	

FHI 059, Version 13				Issued by: FHI	
Case no:	2022-0541	Site No:	FS0299	Date of visit Sampling:	/ 08/11/2022 08/
Priority samples:	VI	BA	PA	MG	н
Time sampling starts/ends:	12:00:00	13:00:00	Inspector:		VMD No. 0
Environmental conditions:	1 Indoors	2	3	4	5
Summary samples	HISTY	BA Y	MG Y	VI	PA Total Samples

Add Fish/Pools - click

	Pool/Fish No	F1	F2	F3	F4	F5	P1			
	Fish nos	1	2	3		5	1-5			
	Pool Group	P1	P1	P1	P1	P1				
	Species	SAL	SAL	SAL	SAL	SAL				
	Average weight	900g	900g	900g	900g	900g	900g			
	Sex									
	Water Type	SW	SW	SW	SW	SW	SW			
tock Details	Stock Origin Facility No	Barcaldine Smolt Unit								
Ś	Facility NO	6	6	6	6	10	10			

11/2022	1/2022 Additional Sample Information:												
6	1	Total To	ests ass	igned	4	1							

FHI 059, Versio	on 13		Issued by: FHI						Date of issue: 12/05/20			
Case no:	2022-0541		Site N	lo:	FS029	99	N	lethod o	f killing:	Anaesth	netic	
Date of visit:	08/11/20)22	Inspe	ctor(s):				5	Sheet Re	elevant:	Y	
	aas M far madium processos W i	for wook proc										
Fish Number	nce: M for medium presence: W	tor weak pres		2 3	3 4	1 5	1					
	er death (if > 45 minutes)	•		-	1.5h	1.5h						
External Signs												
Behaviour	Moribund	S	S	S	S	S						
	Lethargic	S	S	S	S	S						
	Hanging vertical			_								
	Spiralling											
	Flashing Loss of equilibrium				-		-					
Body	Dark				_							
Douy	Distended abdomen											
	Anorexic											
	Scale Oedema											
Opercula	Shortened											
	Flared											
Haemorrhaging	Throat											
	Ventrum Base of fins											
	Elsewhere											
Eyes	Exophthalmic											
	Enophthalmic (sunken)											
	Cataract											
	Haemorrhagic											
Gills	Pale	S	S	S	S	S	S					
	Zoned											
Leciene	Necrotic	W S	W S	W S	W S	W S	W S					
Lesions	Flank Elsewhere	3	3	3	3	3	3					
Vent	Inflamed			_								
Volit	Trailing faeces											
Lice Load	Estimate numbers	0	(0 0	0 0	1					
Internal Signs												
Ascites	Clear			_								
Oadama	Bloody	_			_		_					
Oedema Heart	In tissues Pale/anaemic			_			-					
neart	Granulomas				_							
	Deformed											
Liver	Petechial haem			S								
	Gross haem											
	Tissue breakdown											
	Enlarged											
	Colour number(s)	2		2 2	2 2	2 6	2					
	Granulomas				_		_					
Pyloric caeca	Lesions Petechial haem											
. ,	Tubules mauve											
	Lack of fat				S							
Spleen	Enlarged	М	М									
	Granulomas											
Gut	No food present	S		S		S						
	Yellow pseudo-faeces		S		S							
	External haem				S							
Body wall	Internal haem Haemorrhaging				3							
Swim bladder	Haemorrhaging											
	Fluid filled											
Kidney	Swollen											
	Grey											
	Granular											
	Liquefied											
General	Parasites present											
	Anaemia											

FHI 059, Version 13

Case no:	2022-0541

Г

Date of visit:

08/11/2022

 ${\bf S}$ for strong presence: ${\bf M}$ for medium presence: ${\bf W}$ for w

	ice: M for medium presence: W for	N				 	
Fish Number							
	er 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:

F1 - deep lesion, F2 deep lesion fluid filled gut, F3- surface lesion, choc chip liver, enlarged gall bladder, F4 spotted lesions all over flanks, inflamed hind gut, haemorrhaging on gills, F5 spot lesions over flanks, haemorrhaging on gills.

FHI 059, Version 13

Case No:	2022-0541]		Date of visit:	08/11/2022			
Site No:	FS0299]		Inspector:		I		
Results Summary	Freq.			Da	te of Notifica	tion		
		Database	Insp	Phone	Insp	Writing	Insp	2 nd Insp
MG Parather	5/5	15/11/2022		15/11/2022		18/01/2022		
MG Pisci	5/5	15/11/2022		15/11/2022		18/01/2022		
MG AGD	5/5	15/11/2022		15/11/2022		18/01/2022		
MG sal Pox	5/5	15/11/2022		15/11/2022		18/01/2022		
MG IPN	0/3	22/11/2022				18/01/2022		
MG ISA	0/3	22/11/2022				18/01/2022		
MG PMCV	0/3	22/11/2022				18/01/2022		
MG SAV	0/3	22/11/2022				18/01/2022		
MG VHS	0/3	22/11/2022				18/01/2022		
MG IHN	0/3	22/11/2022				18/01/2022		
VVIS	1/5	25/11/2022				18/01/2022		
VSPE	5/5	28/11/2022				18/01/2022		
GPAT	5/5	01/12/2022				18/01/2022		
EPIT	4/5	01/12/2022				18/01/2022		
SPAT	5/5	01/12/2022				18/01/2022		
SKIN	5/5	01/12/2022				18/01/2022		
PISH	2/5	01/12/2022				18/01/2022		
LPAT	4/5	01/12/2022				18/01/2022		
KPAT	4/5	01/12/2022				18/01/2022		
AMGD	5/5	01/12/2022				18/01/2022		
CGDH	5/5	01/12/2022				18/01/2022		
HPAT	4/5	01/12/2022				18/01/2022		
	170	01,12,2022						
VI IPN, ISA, SAV, VHS, IHN	0/2	18/01/2022				18/01/2022		
Report Summary				1				
Case Type	Date	Insp	2 nd Insp					
Diag	18/01/2022							
	l							
	l							
	l							
	1							





FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

 BUSINESS No
 FB0125

 SITE No
 FS0299

 CASE No
 20220541

DATE OF VISIT08/11/2022SITE NAMEDunstaffnageINSPECTORInspector

Section 1: Summary

Dunstaffnage was inspected following reports of increased mortality by the farm operator. During the inspection moribund fish were observed and five fish were removed for diagnostic sampling.

Histopathology examination revealed mixed and complex pathology. There was pathology consistent with salmonid rickettsial septicaemia (SRS). This was confirmed by qPCR in all five fish tested. Gills displayed multifocal, mild, hyperplasic branchitis associated with complex gill issues. Lesions could also be associated with environmental factors. Epitheliocystis (likely Brachiomonas sp.) and amoebic gill disease were also observed. All fish were confirmed positive by qPCR for *Neoparamoeba perurans* (amoebic gill disease), *Paranucleospora theridion* and salmon poxvirus. Liver and kidney of F3 displayed mild zonal haemorrhagic hepatocellular necrosis and glomerular necrosis, potentially associated with systemic Moritella systemic infection/toxemia.

Moritella viscosa and two *Vibrio* spp were identified. The level and purity would not suggest they would be implicated in current morbidity.

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

Observation

The site had been experiencing increased mortalities, peaking at 6.9% for the week starting 24/10/22 and attributed to environmental and gill health issues. On inspection moribund fish were observed at the pen margins. Lesions were observed on many fish, some single deep lesions and some fish with many smaller circular lesions all over their flanks. Five moribund fish were removed for diagnostic examination.

All the fish sampled had pale necrotic gills, with gill haemorrhaging in fish F4 and F5. Fish 1 had a large deep lesion above the anal fin. Fish 2 had two large lesions on the flank between the anal and pelvic fin. Fish 3 had a smaller lesion above the pelvic fin which appeared to be healing. Fish F4 and F5 had about seven small round lesions, described as cigarette burn type lesions, on both flanks. They also all had pale livers with petechial haemorrhages observed on the liver of F3. F1 and F2 had enlarged spleens. F1, F3 and F5 had no food in their gut with F2 and F3 having yellow pseudo faeces. F4 exhibited internal haemorrhaging of the gut.

Samples

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

Fish number	Pool number	Facility number	Species	Stage	Origin
1-4	1	6	Atlantic salmon	2022 Q2, 900g	Barcaldine smolt unit
5	1	10	Atlantic salmon	2022 Q2, 900g	Barcaldine smolt unit

<u>Results</u>

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

The following bacteria were isolated;

Vibrio sp. (isolate a): kidney (1/5), lesion (5/5) *Vibrio* sp. (isolate b): kidney (3/5), lesion (3/5) *Moritella viscosa*: lesion (1/5)

The level and purity of the *Vibrio* sp. would not suggest they would be implicated in morbidity. *Moritella viscosa* was identified on plates taken from lesion material of 1/5 fish. Although *Moritella viscosa* is a primary fish pathogen, the level and purity observed would not suggest it would be linked to current fish morbidity.

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

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	18.09	23.75	23.62	23.71	POSITIVE
F2	19.19	23.02	22.85	23.29	POSITIVE
F3	18.78	31.31	30.82	31.12	POSITIVE
F4	18.17	35.92	36.24	35.72	POSITIVE
F5	19.32	26.14	25.92	26.14	POSITIVE

Pisciriskettsia salmonis

DNA sequence analysis was performed on kidney samples. The results confirmed the QPCR positive amplification of *Pisciriskettsia salmonis*.

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

Salmon gill poxvirus

	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	19.84	25.5	25.44	25.41	POSITIVE
F2	19.02	24.74	24.46	24.53	POSITIVE

R09

F3	19.61	27.79	27.46	27.69	POSITIVE
F4	19.18	31.9	32.09	31.81	POSITIVE
F5	19.54	22.42	22.16	22.19	POSITIVE

From the samples tested by qPCR, F2, F3 and F4 tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), infectious salmon anaemia virus (ISAV), salmonid alphavirus (SAV), viral haemorrhagic septicemia virus (VHSV) and piscine myocarditis virus (PMCV). The other two fish were also tested but have been reported as "no result".

The two samples which presented no results by qPCR were run by cell culture for infectious haematopoietic necrosis virus (IHNV), infectious salmon anaemia virus (ISAV), and viral haemorrhagic septicemia virus (VHSV), Infectious pancreatic necrosis virus (IPNV) and Salmonid alphavirus (SAV). The results of these tests were negative.

Parasitology:

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

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	19.84	27.19	27.49	27.58	POSITIVE
F2	19.02	26.53	26.38	26.26	POSITIVE
F3	19.61	27.04	27.06	26.82	POSITIVE
F4	19.18	26.33	26.24	26.19	POSITIVE
F5	19.54	25.28	26.19	25.99	POSITIVE

Neoparamoeba perurans (AGD)

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	19.84	22.01	22.09	21.77	POSITIVE
F2	19.02	21.79	21.42	21.57	POSITIVE
F3	19.61	21.45	21.54	21.39	POSITIVE
F4	19.18	23.7	23.69	23.32	POSITIVE
F5	19.54	20.64	20.9	20.83	POSITIVE

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

Histopathological examination revealed the following:

<u>Gill</u>: Filament hyperplasia and lamellar fusion mild, multifocal (F1-F5), filament necrosis, focal, mild (F1-F5), presence of few amoeboid cells resembling *Neoparamoeba perurans* observed in all fish and few basophilic epithelial inclusions (likely epitheliocystis) (F2-F5), some vascular disturbance also noticed. F2 exhibited a focally extended area with several intracellular round blue structures resembling bacteria (likely *Piscirickettsia* sp.), these bacteria stained Gramnegative and positive to Giemsa stain. F3 also displayed circulating inflammatory cells in the vessels and some haemorrhage, cell debris with rod-shaped bacteria associated.

R09

<u>Skin & Muscle</u>: Partial absence of epidermal layer, musculature necrosis and degeneration, some inflammatory cell infiltration and haemorrhage, presence of few intracellular round blue structures resembling bacteria (likely *Piscirickettsia* sp.) observed in F1 & F2 and other bacteria on the outer layer of the dermis observed in all fish. F4 displayed also congested vessels, haemorrhaged, inflammation and necrosis of skeletal read muscle

<u>Heart</u>: Small foci of cellular degeneration (F2) and inflammatory cells (F3-F5). Mild epicarditis (F2, F4). F2: no atrium.

<u>Gut and pyloric caeca</u>: Peritonitis, mild, multifocal (F2, F4, F5) and some haemorrhage, presence of some bacteria within the intestinal lumen (F1). F3: No Gut and pyloric caeca tissue in section.

Pancreas: Within the normal range. F3: Pancreas tissue not in section.

Liver: Hepatocellular necrosis, mild, multifocal (F2). F3 exhibited random, mild, multifocal hepatocellular cell degeneration and necrosis, multifocal congestion and dilation of the hepatic sinusoids and foci of sinusoidal haemorrhage with several cells exhibiting granules of melanin. A varied number of hepatocytes exhibited cytoplasmic protein-like inclusion roughly spherical of varied size, some being brightly eosinophilic but the majority presented more basophilic properties, potentially linked to erythrocyte degradation. F4 and F5 displayed hepatocellular vacuolation (macrovisicules).

<u>Kidney</u>: F3 displayed several glomeruli displayed shrunken appearance, congested vessels and pink material potentially linked with erythrocyte degradation and some dilation of renal tube lumen. F1 and F2 displayed interstitial cell (haemopoietic) necrosis mild, multifocal and few round blue structures resembling bacteria (likely *Piscirickettsia* sp.) were also observed. F5 exhibited Interstitial cell (haemopoietic) necrosis, multifocal, mild.

<u>Spleen</u>: Necrosis, multifocal, mild (F1, F2, F5). some cuffing (F3, F4, F5), foci of cellular necrosis (F2).



Fish Health Inspector

Date: 18/01/2023

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

















