Case No: 2019-0628 Date of visit: 22/10/2019

Time spent on site: 2 hours Main Inspector: [redacted]

Site No: SS0917 Site Name: John Muir Building
Business No: SB0544 Business Name: Heriot Watt University

Case Types: 1 STS 2 3 4 5 6

Water Temp (°C): 12 Thermometer No: Site FHI 045 completed N/A

Observations: Region: LO Water type: S CoGP MA

Dead/weak/abnormally behaving fish present?	N	If yes, see additional information/clinical score sheet.
Clinical signs of disease observed?	N	If yes, see additional information/clinical score sheet.
Gross pathology observed?	N	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:

Prior to receipt of stocks, staff check the consignment at the site for invasive non-native species. 1% of each consignment is also collected and sent for disease testing when consignment is moved to the University. Shells are cleaned of majority of epifauna prior to transfer by road in sealed polystyrene boxes. On arrival at JMB any remaining epifauna is cleaned off and collected for disposal as clinical waste. The cleaned shells are then immersed in 4% formaldehyde solution for 2 minutes before rinsing off with clean freshwater. Chemical solution is disposed as hazardous chemical waste, freshwater is discharged to main sewer, along with drainage from reception area. Reception area is disinfected using 1% virkon solution
Shells are transferred to holding facility (controlled temperature room G36) in leakproof containers, which are then disinfected with virkon solution. Holding facility is locked and staff access is controlled. Staff have dedicated PPE and pass through a virkon disinfection mat. Shells are then stocked in a depuration tank system (~1 cubic metre tanks) in artificial seawater made up from Peacock salt Seamix. Water is on a recirculation system with UV treatment. Shells are held for around 1 week whilst disease testing results are sought, with shells being transferred to a clean batch of water after 4 days. Usually following a negative test result the shells are transferred off site.

Dirty SW is disinfected with 4.7% sodium hypochlorite solution before discharging to the domestic drainage. The tanks and equipment are then cleaned and disinfected using sodium hypochlorite and then virkon prior to re-use. The Loch Nell stocks had been held in tanks 1 and 2 but were removed from the tanks on the afternoon of the 21/10/19. They had been stored in polystyrene boxes awaiting sampling and then disposal. The Loch Ryan stocks were held in tank 3 awaiting test results but were going to be disposed of due to being held on site with stocks that had tested positive by QPCR for Bonamia.
Facility is housed in the same building as the research aquarium but has a separate water supply, drainage, access and staff/PPE.

Case No:	2019-0628	Site No:	SS0917
Date of Visit:	22/10/2019	Inspector(s):	[redacted]

Registration/Authorisation Details

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

Site Details

Total No facilities		6	Facilities stocked		1	No facilities inspected	6
Species	OED	OED					
Age group	JUV	JUV					
No Fish	~4000	~980					
Mean Fish Wt	14g	125g					
Next Fallow Date (Site)		End October 2019	Next Input Date (Site)			12th November 2019	

Recent (last 4 wks) disease problems?	Y	Any escapes (since last visit)?	N/A
If yes, detail:	Shells have tested positive by QPCR for Bonamia		

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	26/02/2018
3. Are records complete and correctly entered?	Y
4. Are movement records available for dead fish and waste?	N
5. Are records complete and correctly entered?	N/A
6. Are health certificates for introductions (outwith GB) available?	N/A

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:	Clinical waste incineration
3. Mortality records complete and correctly entered?	Y
4. Recent mortality (last 4 wks):	see attached sheet
5. Evidence of recent increased/atypical mortalities?	N
If yes, facility nos/no mortality per facility/no stock per facility/reason:	
6. Any other peaks in mortality during period checked?	N
If yes, detail:	
7. Have increased (unexplained) mortalities been reported to vet or FHI?	N/A
If yes, detail action:	
8. Have 'mortality events' been reported to FHI? If no, add MRT case and enter on mortality events sheet.	N/A

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

Biosecurity Records

1. Biosecurity records available for inspection?	N
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?	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).	QPCR positive for Bonamia

Records checked between: 26/02/18 - 22/10/19

Case no:	2019-0628	Site No:	SS0917	Date of visit/ Sampling:	22/10/2019	23/					
Priority samples:	VI		BA		PA		MG	x	HI	x	
Time sampling starts/ends:				Inspector:			VMD No.	0			
Environmental conditions:	1	Indoors	2		3		4		5		
Summary samples	HIST		BA		MG	Y	VI		PA		Total Samples

Add Fish/Pools - click

	Pool/Fish No	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
	Fish nos	1	2	3	4	5	6	7	8	9	10	11	12
	Pool Group												
Stock Details	Species	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED
	Average weight	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
	Sex												
	Water Type	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
	Stock Origin	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan
	Facility No	3	3	3	3	3	3	3	3	3	3	3	3

10/2019	Additional Sample Information:
	Sampling completed by Diagnostic staff during the morning of 23 October 2019. Sheet HI001 not supplied by sampling staff.

150 Total Tests assigned 2

F13	F14	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24	F25	F26	F27	F28
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
OED	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED	OED
0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan	Loch Ryan
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Case Number:	2019-0628	Site No:	SS0917
Date of Visit	22/10/2019	Inspector:	[redacted]

Number of Susceptible species on site

If no susceptible species present = **LOW** risk

If susceptible species present, score for each pathogen

	No	Yes	
Susceptible to Bonamia ostrea (OED)	0	25	25
Susceptible to Marteilia refringens (OED, MED)	0	3	3
Susceptible to OsHV (CGI)	0	3	0

Sites within a tidal excursion		**1**	**2-5**	**>6**	
Site contacts	Number of sites holding susceptible species within a tidal excursion	0	2	10	0

Live shellfish movements		**0**	**1-2**	**>3**	
Movements on	Frequency of movements on from equivalent MS	0	5	10	0
	Frequency of movements on from equivalent zone or compartment including third country	0	10	20	0
	Number of suppliers	0	5	10	0
Movements off	Frequency of movements off within MSS Management Areas	0	1	2	0
	Frequency of movements off outwith MSS Management Areas	0	3	6	6
	Number of destinations	0	3	6	3

Management practices		**None**	**Secure (effluent treatment)**	**Unsecure (no effluent treatment)**	
Water contacts with depuration facilities	Depuration of stock from own sites within MSS management area	0	1	2	0
	Depuration of stock from other businesses sites within MSS management area	0	2	6	0
	Depuration of stock from sites outwith MSS management area	0	4	8	0

Biosecurity	**Number of sites**	**1**	**2 or 3**	**≥ 4**	
Contacts with other sites	Sites operating from single shorebase	0	1	2	1
	Sites sharing staff and equipment	0	1	5	0
			Yes	**No**	
	Disinfection of equipment between sites, use of footbaths etc		0	2	0

Total	38
Risk	

Case No: 2019-0628 Date of visit: 22/10/2019

Site No: SS0917 Inspector: [redacted]

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp
Bonamia sp. qPCR	33/150	11/12/2019	[redacted]			23/12/2019	[redacted]	
Bonamia sp. PCR	5/5	11/12/2019	[redacted]			23/12/2019	[redacted]	
Bonamia Sequence	1/1	11/12/2019	[redacted]			23/12/2019	[redacted]	
Bonamia Histo	7/40	11/12/2019	[redacted]			23/12/2019	[redacted]	

Report Summary			
Case Type	Date	Insp	2nd Insp
STS	23/12/2019	[redacted]	[redacted]

Note - attachments file must be saved to ARC folder as PDF with correct name format e.g. 2012-0123-attach or 2012-0123-attach2 etc.

Here are the mortality records from our biosecurity facility:
Tank 1 (Loch Nell):
14/10/19 - 0
15/10/19 - 0
16/10/19 - 1
17/10/19 - 0
18/10/19 - 5
19/10/19 - 6
20/10/19 - 6
21/10/19 - 27

Tank 2 (Loch Nell):
14/10/19 - 0
15/10/19 - 0
16/10/19 - 2
17/10/19 - 0
18/10/19 - 3
19/10/19 - 1
20/10/19 - 8
21/10/19 - 37

Tank 3 (Loch Ryan):
14/10/19 - 0
15/10/19 - 0
16/10/19 - 0
17/10/19 - 4
18/10/19 - 4
19/10/19 - 5
20/10/19 - 8
21/10/19 - 8

[redacted]
Heriot Watt University
John Muir Building
Heriot Watt University
Riccarton Campus, Edinburgh
EH14 4AS
[redacted]

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO SB0544
SITE NO SS0917
INSPECTOR [redacted]

DATE OF VISIT 22/10/2019
SITE NAME John Muir Building
CASE NO 20190628

Statutory test

The above site was inspected and 150 samples collected to be screened for the presence of *Bonamia ostreae*. The site was placed under suspicion for the presence of *Bonamia ostreae* as it had received flat oysters (*Ostrea edulis*) from a site which had tested positive for *Bonamia ostreae* by a commercial laboratory service.

All epidemiological units were inspected. No clinical signs associated with *Bonamia ostreae* were observed.

Samples

A total of 150 flat oysters were collected and tested for the presence of *Bonamia ostreae*.

Results

Molecular genetics: Tissue samples were tested for segments of DNA indicative of the presence of *Bonamia* spp. using real-time PCR (QPCR).

Fish Number	Origin	Endogenous control Cp value	Cp Values			Reported Result (QPCR)
F39	Sgeir Liath	12.12	20.63	20.72	20.68	**Positive**
F49	Sgeir Liath	12.39	30.69	30.71	30.31	**Positive**
F50	Sgeir Liath	11.19	25.73	26.10	25.59	**Positive**
F53	Sgeir Liath	12.18	25.13	25.01	25.10	**Positive**
F55	Sgeir Liath	11.34	27.28	27.40	27.28	**Positive**
F56	Sgeir Liath	11.68	19.00	18.88	18.99	**Positive**

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

F59	Sgeir Liath	12.41	19.07	19.23	19.23	**Positive**
F60	Sgeir Liath	11.27	15.82	15.94	15.92	**Positive**
F68	Sgeir Liath	12.20	19.99	19.90	20.15	**Positive**
F70	Sgeir Liath	11.24	17.61	17.59	17.55	**Positive**
F71	Sgeir Liath	13.74	30.04	30.19	30.02	**Positive**
F74	Sgeir Liath	13.49	20.93	20.94	20.99	**Positive**
F76	Sgeir Liath	12.60	28.69	28.48	28.60	**Positive**
F80	Sgeir Liath	13.82	27.03	26.96	27.19	**Positive**
F83	Sgeir Liath	13.08	26.30	26.24	26.22	**Positive**
F84	Sgeir Liath	13.83	20.72	20.55	20.66	**Positive**
F85	Sgeir Liath	12.64	29.75	29.67	29.69	**Positive**
F88	Sgeir Liath	13.26	31.64	31.43	31.78	**Positive**
F94	Sgeir Liath	12.77	22.76	22.70	22.71	**Positive**
F103	Sgeir Liath	12.81	28.10	27.95	28.15	**Positive**
F104	Sgeir Liath	12.68	31.17	30.82	31.13	**Positive**
F108	Sgeir Liath	11.78	27.59	27.36	27.53	**Positive**
F114	Sgeir Liath	13.38	30.21	30.09	30.07	**Positive**
F120	Sgeir Liath	12.65	22.18	22.12	22.18	**Positive**
F121	Sgeir Liath	12.89	27.37	27.25	27.21	**Positive**
F122	Sgeir Liath	13.34	30.74	30.74	30.89	**Positive**
F129	Sgeir Liath	12.93	24.78	24.80	24.62	**Positive**
F137	Sgeir Liath	14.63	17.58	17.62	17.53	**Positive**
F138	Sgeir Liath	13.56	26.86	26.76	26.71	**Positive**
F139	Sgeir Liath	14.87	24.30	24.36	24.45	**Positive**
F140	Sgeir Liath	13.89	25.28	25.26	25.21	**Positive**
F142	Sgeir Liath	14.68	31.05	31.08	30.99	**Positive**
F146	Sgeir Liath	14.50	29.66	29.62	29.68	**Positive**

The results of this test for all other shellfish were negative.

F70 was subsequently sent for sequencing and confirmed to be the notifiable pathogen *Bonamia ostreae*.

Histology: Tissue samples of gill, mantle and digestive gland were taken from F1 - 150. The tissue samples were fixed in Davidson's fixative.

Histopathological examination revealed the following:

F1 - F30, F39, F49 & F55 - No evidence of bonamiosis observed.

F50, F53, F56, F59, F60, F68 & F70 – Presence of microcells consistent with *Bonamia* spp.

F19 displayed moderate multifocal haemolytic infiltration in the vesicular connective tissue surrounding the digestive gland.

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Appraisal

The presence of *Bonamia ostreae* was confirmed at the site.

The movement restrictions placed on the site will remain in force. You must continue to apply for permission to move live or dead shellfish onto or off the site. Please submit applications at least five working days prior to the movement.

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

Signed: [redacted] Date: 23/12/2019

Fish Health Inspector

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at www.gov.scot/Topics/marine/Fish-Shellfish/FHI/charter

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