

**Annex 2**  
**List of directly auditable indicators (subset of Annex1)**

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## 1.0 Introduction

A recent paper by Amundsen & Osmundsen (2018) generated a database of sustainability indicators for salmon aquaculture (<https://sustainfish.wixsite.com/sustainfishproject/>).

Indicators were selected from eight major certification schemes, mainly in use within Norway, Chile and Scotland. For this report we selected five of the certification schemes which had fish welfare categories:-

Aquaculture Stewardship Council (ASC)

Global Aquaculture Alliance (GAA)/Best Aquaculture Practices (BAP)

Global GAP

Royal Society for the Prevention of Cruelty to Animals (RSPCA)- Farmed Atlantic Salmon

Scottish Salmon Producers Organisation (SSPO)

The data was extracted and categorised from certification scheme audit documents for salmon aquaculture. Amundsen & Osmundsen (2018) discussed with various stakeholders to identify four main categories (domains) as being important and these were further divided into sub-domains to give a total of 28 categories, see Table A.1.

**Table A.1** List of categories used in database, split between Domains and sub-Domains

Domains	Economics	Environment	Governance	Culture
Sub-Domains	<ul style="list-style-type: none"> <li>-Labour &amp; Employment</li> <li>-Wealth &amp; Distribution</li> <li>-Financial Performance</li> <li>-Production Costs</li> <li>-Indirect effects on economic activity</li> <li>- Investments in technology &amp; innovation</li> <li>-License and permit conditions</li> </ul>	<ul style="list-style-type: none"> <li>-Abiotic effects</li> <li>-Biotic effects</li> <li>-Emission &amp; Waste</li> <li>-Feed</li> <li>-Energy consumption &amp; GHG emissions</li> <li>-Fish Health &amp; Welfare</li> <li>-Mitigation Methods</li> </ul>	<ul style="list-style-type: none"> <li>-Representations &amp; Negotiation</li> <li>-Coordination of interests &amp; activities</li> <li>-Siting</li> <li>-Transparency &amp; Traceability</li> <li>-Accountability &amp; Enforcement</li> <li>-Social Assurance</li> <li>-Food Safety</li> </ul>	<ul style="list-style-type: none"> <li>-Enquiry &amp; Learning</li> <li>-Respect for native culture</li> <li>-Employee interests &amp; Well being</li> <li>-Social capital for local communities</li> <li>-Equity</li> <li>-Community Integration</li> <li>-Community Contributions</li> </ul>

For this report the database was searched for indicators primarily related to fish welfare, using search terms previously identified as being important to fish welfare in the Overview document, Table 5. These terms are as listed in the Table of Contents in this document. The indicators were categorised as Direct (D), Indirect (InD) and Regulatory (R) welfare indicators. Direct (D) indicators are those that are measured on the fish themselves (i.e.

mortalities , injuries, handling events). Indirect (InD) indicators are measures that indirectly affect the fish and are mainly associated with environmental parameters or husbandry procedures (i.e. stocking density, water flow) whereas regulatory (R) covers training of staff, documented processes to ensure welfare etc.

A total of 309 indicators were identified from all 5 certification schemes. These were further categorised as being directly auditable if the standard included an associated measurement quantity, and are listed below.

This annex lists all the indicators found to be directly auditable and divided by subject (searched terms). The layout of the information for each of the indicators follows that from the database and is shown below:

<p><u>X</u> Indicator # <u>X.X.X</u>                                                                            <i>Indicator reference number from certification scheme</i>  <i>Reference number given to each indicator for the purposes of this report (matches numbering in Annex 1)</i></p> <p>Indicator Description .....</p> <p>.....</p> <p><b>Certification Scheme</b> <i>Certification scheme where this indicator will be found</i></p> <p><b>Domain</b> <i>from database, Table A.1</i></p> <p><b>Topic/SubDomain</b> <i>from database Table A.1</i></p> <p><b>OWI Category</b> <i>A category given for this report where indicators are further broken down as Regulatory (R), direct (D) or indirect (InD) welfare indicators. Where an indicator is listed as R (D) and R (InD) or R (D, InD) that means the topics the regulation covers is related to both direct and indirect indicators but that indicator would be listed as Regulatory in the summary tables.</i></p>
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Red =ASC  
Green=GAA  
Blue= Global GAP  
Orange=RSPCA  
Light blue = SSPO

## 2.0 Stocking Density

### 5 Indicator # 9.9

The applicant shall apply stocking density criteria based on local conditions, which shall normally be at or below an average 25 kilograms per cubic meter, but may rise higher than this for 5 percent of the production cycle if the fish show other good welfare indicators, and water quality is good.

**Certification Scheme** Global Aquaculture Alliance (**GAA**)

Standard Best Aquaculture Practices (BAP) - Salmon Farm Standards

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

### 8 Indicator # T 5.5

After the required stocking density has been reached, tanks must be filled to the top with good quality water (see FW 1.6 as a reference) from a known source.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**\*\*9 Indicator** Removed 18<sup>th</sup> December 2019

### 11 Indicator # SW 1.5

If calculating stocking density between 15 and 17 metres depth, the stockperson must be able to demonstrate that monitoring is taking place in order to ensure that all fish are feeding.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

### 12 Indicator # T 7.5

Maximum stocking densities must:

a) be within 40–50kg/m<sup>3</sup> (depending on water quality and size of smolts)

b) be set so that water quality can be maintained over the length of the journey.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**14 Indicator # FW 1.5**

The following maximum stocking densities must not be exceeded:

Hatchery - 15,000 per California basket/tray

Multi-level - 20,000 eggs per tray

First feeding tank - 10,000/m<sup>2</sup>

Freshwater production tank:

Liveweight (mean) - Stocking density (kg/m<sup>3</sup>)

Up to 1gm - 10

>1-5gm - 20

>5-30 - 30

>30 - 50

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**16 Indicator # T 6.17**

The maximum stocking density in the bucket must be no greater than 400kg/m<sup>3</sup>.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**17 Indicator # T 9.11**

The maximum stocking density in the well must be based on the live weight of the fish (+/-) 10%.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**18 Indicator # HP 5.12**

The maximum stocking density in the well must be based on the live weight of the fish as follows:

Live weight of fish (kg) - Maximum stocking density (kg/m<sup>3</sup>)

5.0 - 125

4.0 - 110

3.5 - 100

3.0 - 90

2.0 - 75

1.0 - 60

0.1 - 45

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**19 Indicator # T 5.6**

The maximum stocking density must be set so that water quality (see FW 1.6 as a reference) can be maintained for the duration of the journey.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**20 Indicator # T 7.7**

The number of fish to be loaded must be known in order to be able to verify compliance with the stocking density.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**22 Indicator # FW 7.4**

The stocking density in freshwater enclosures must not exceed 8 kg/m<sup>3</sup>.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**23 Indicator # SW 1.4**

With enclosures of 24 x 24 metres or bigger, or the circular equivalent, the maximum depth to which stocking density can be calculated must not exceed 17 metres.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**24 Indicator # 3.91**

FMSs and FMAgs should take into account relevant aspects of the undernoted guidance:

- i. Definition of the area to which the document relates including, where appropriate, local hydrodynamic conditions.
- ii. General aspects of fish health
  - a. Vaccines and vaccination regimes; Dead fish removal and disposal;

- b. Health status of the FMA inc. any official control(s) in place;
  - c. Health status of fish to be stocked into the FMA;
  - d. Physical condition of fish to be introduced;
  - e. Veterinary input inc. VHPs and BPs;
  - f. Following plans and protocols.
  - iii. Sea lice control strategy:
    - a. Treatment plans inc. synchronisation of treatments;
    - b. Treatment medicines;
    - c. Sensitivity testing;
    - d. Data collection and exchange.
  - iv. Adherence to agreed stocking densities.
  - v. Movement of live fish.
  - vi. Harvesting protocols.
  - vii. Escapes.
  - viii. Exclusion and control of predators.
  - ix. Stock inspection and independent oversight of the operation of the FMAg.
  - x. Information exchange and communication between FMAg partners.
  - xi. Review of the agreement or statement at least every 2 years
- Certification Scheme** Scottish Salmon Producers Organisation ([SSPO](#))  
 Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs  
**Domain** Environment  
**Topic/SubDomain** Fish Health & Welfare  
**OWI category** R (D, InD),

### 3.0 Water Quality

#### 2 Indicator # 2.2.1

Indicator Weekly average percent saturation of dissolved oxygen (DO) on farm, calculated following methodology in Appendix I-4 (twice daily measurement 6am and 3pm but can vary depending on regional and operational practices.)

**Certification Scheme** Aquaculture Stewardship Council ([ASC](#))

Standard Salmon Standard

**Domain** Environment

**Topic/Subdomain** Fish Health & Welfare

**OWI Category** InD,

#### 3 Indicator # 2.2.2

Indicator Maximum percentage of weekly samples from 2.2.1 that fall under 2 mg/litre DO

**Certification Scheme** Aquaculture Stewardship Council ([ASC](#))

Standard Salmon Standard

**Domain** Environment

**Topic/Subdomain** Abiotic Effects

**OWI Category** InD,

**10 Indicator # 9.4**

**Indicator** Where weather conditions allow, trained staff shall make at least daily inspections and reports on the culture facility, water quality, and behavior and condition of fish.

**Certification Scheme** Global Aquaculture Alliance (**GAA**)

Standard Best Aquaculture Practices (BAP) - Salmon Farm Standards

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD

**13 Indicator # 9.9**

**Indicator** The applicant shall apply stocking density criteria based on local conditions, which shall normally be at or below an average 25 kilograms per cubic meter, but may rise higher than this for 5 percent of the production cycle if the fish show other good welfare

**Indicators**, and water quality is good.

**Certification Scheme** Global Aquaculture Alliance (**GAA**)

Standard Best Aquaculture Practices (BAP) - Salmon Farm Standards

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**25 Indicator # EVQ 1.2**

**Indicator** If water quality departs from the acceptable range, steps must be taken immediately to identify the source of the problems and rectify the situation as quickly as possible.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**26 Indicator # FW 9.34**

**Indicator** Site staff must ensure that the depth and flow of water is closely monitored to ensure that returning fish are not returned to water that is either too shallow, or at an incorrect flow rate, depth or quality.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**27 Indicator # M 3.11**

**Indicator** Stock-keepers must be able to recognise:

a) visual **Indicators** of poor water



b) behavioural **Indicators** of poor water quality.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD

### **28 Indicator # FW 1.4**

**Indicator** Supply water must:

a) be of high quality (see FW 1.6)

b) if necessary, be filtered or treated with ultra violet radiation.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

### **30 Indicator # FW 1.6**

**Indicator** The following water quality parameters must be complied with when water quality is managed.

Parameter - Ova - Alevins - Fry - Parr/Smolt

Oxygen (O<sub>2</sub>) mg/l - 7.0 - 7.0 - 7.0 - 7.0

Oxygen (O<sub>2</sub>) - >90.0 - >70.0 - >70.0 - >70.0

saturation % in exit

water

Free ammonia - <0.025 - <0.025 - <0.025 - <0.025

(NH<sub>3</sub>) mg/l (N/A for

Green eggs)

Carbon dioxide - <10.0 - <6.0 - <6.0 - <10.0

(CO<sub>2</sub>) mg/l

Max temp °C - 8.0 - 10.0 to 12.0 - 12.0 to 14.0 - 16.0

Min temp °C - 1.0 - 1.0 - 1.0 - 1.0

pH in inlet water - 5.5 to 8.0 - 5.5 to 8.0 - 5.5 to 8.0 - 5.5 to 8.0

Non-spate - <25.0 - <25.0 - <25.0 - <25.0

suspended solids

(turbidity) mg/l

Nitrite mg/l - <0.2 - <0.2 - <0.2 - <0.2

Nitrate mg/l - N/A - <50.0 - <50.0 - <50.0

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**32 Indicator # FW 5.8**

**Indicator** The water depth must be appropriate to the tank being used in order to be able to maintain optimum water quality levels.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**34 Indicator # EVQ 1.1**

**Indicator** Water quality composition must be monitored sufficiently frequently, if necessary daily, depending on the system, time of year and lifecycle stage of stock (as specified in the VHWP – see H 1.1).

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**39 Indicator # 5.62**

**Indicator** Farmers should ensure that enclosure nets are kept clean in order to avoid water quality problems during crowding.

**Certification Scheme** Scottish Salmon Producers Organisation (**SSPO**)  
Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**40 Indicator # 5.72**

**Indicator** Stocking density should be monitored in relation to fish health, fish behaviour and water quality to ensure that fish welfare is not compromised.

**Certification Scheme** Scottish Salmon Producers Organisation (**SSPO**)  
Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD

**4.0 Flow Rate****2 Indicator # FW 1.7**

**Indicator** Flow rates must be such that fish can comfortably maintain their position in the

water column.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

## 5.0 Mortality

### 1 Indicator # 5.1.5

**Indicator** Maximum viral disease-related mortality on farm during the most recent production cycle

**Certification Scheme** Aquaculture Stewardship Council (ASC)  
Standard Salmon Standard

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

### 2 Indicator # 5.1.6

**Indicator** Maximum unexplained mortality rate from each of the previous two production cycles, for farms with total mortality > 6%

**Certification Scheme** Aquaculture Stewardship Council (ASC)  
Standard Salmon Standard

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

### 14 Indicator # H 1.8

**Indicator** If the mortality level is above 0.5% a week (excluding pre-swim up fry) the designated vet or trained and competent fish biologist/fish health manager must be notified and an investigation made as appropriate.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

### 16 Indicator # FW 3.5

**Indicator** Producers must be able to demonstrate that mortality was below 5% for the previous year, if intending to stock above 15,000.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category D,**

## 5.0 Grading

### **8 Indicator # FW 10.2**

**Indicator** An assessment of fish condition must be made before the grading process begins, to ensure that they are robust enough to endure the grading procedure, where machines simultaneously grade fish at vaccination.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category D,**

### **9 Indicator # HP 5.9**

**Indicator** Any fish that are placed in the hold after grading must be subjected to an additional welfare risk assessment. Any additional fasting period must be authorised by the veterinary surgeon or health manager.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category D,**

### **10 Indicator # FW 6.2**

**Indicator** Feed withdrawal prior to grading must not exceed 48 hours.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category D,**

### **12 Indicator # FW 6.4**

**Indicator** Grading must only start when the majority of fish weigh in excess of 1.3 grams.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category D,**

### **13 Indicator # HP 2.22**

**Indicator** Grading operations must not take place if adverse weather conditions are likely to compromise fish welfare.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**20 Indicator #** HP 2.6

**Indicator** The grading plan must include:

- a) the reason for the need to grade
- b) a pre-grade risk assessment
- c) the number of fish to be graded per day
- d) the location of fish populations both pre- and post- grade
- e) the pre-grade fasting period
- f) the health status of the fish
- g) the equipment to be used, including the type of grader
- h) expected timetable for completion of the grade
- i) the required number of staff and duties to be performed
- j) the physical characteristics of the site such as water temperature, tides and weather conditions
- k) the training records of the grading team
- l) the requirement for a post grading health check
- m) post grading mortality records
- n) any relevant contingency plans
- o) the agreement and signatures of the site manager and the person in charge of the grading equipment.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** R(D, InD),

**24 Indicator #** FW 9.9

**Indicator** Vaccination Team Leaders and Vaccinators must be able to demonstrate their proficiency in procedures that have the potential to cause pain or distress, including the vaccination technique, hand grading of fish to be culled and their humane euthanasia.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

## 7.0 Handling

**2 Indicator #** 9.7

**Indicator** The applicant shall exercise care in handling fish and manage them within specified limits for crowding and time out of water, and limit other sources of outside disturbances.

**Certification Scheme** Global Aquaculture Alliance (**GAA**)

Standard Best Aquaculture Practices (BAP) - Salmon Farm Standards

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**7 Indicator # T 1.7**

**Indicator** Any handling of fish prior to transport must: a) be kept to a minimum b) be conducted in such a way as to prevent any unnecessary distress to the fish c) not result in fish being out of water for more than 15 seconds (unless anaesthetised).

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**8 Indicator # S 1.2**

**Indicator** Crowding and handling prior to killing must be kept to an absolute minimum.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**9 Indicator # H 1.5**

**Indicator** Fish condition must be continuously monitored for signs of disease or problems with the environment or handling practices.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**10 Indicator # HP 1.1**

**Indicator** Removal from water and handling must only be carried out when absolutely necessary.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**15 Indicator # 5.64**

**Indicator** Fish should be inspected daily and dead or moribund fish should be removed,

minimising handling to avoid stress to the live fish within the enclosure.

**Certification Scheme** Scottish Salmon Producers Organisation (**SSPO**)

Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

## 8.0 Crowding

### 1 Indicator # 9.7

**Indicator** The applicant shall exercise care in handling fish and manage them within specified limits for crowding and time out of water, and limit other sources of outside disturbances.

**Certification Scheme** Global Aquaculture Alliance (**GAA**)

Standard Best Aquaculture Practices (BAP) - Salmon Farm Standards

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

### 5 Indicator # HP 2.18

**Indicator** Oxygen levels must:

a) be monitored and recorded throughout all crowding operations (e.g. grading, vaccinating and treating)

b) not fall below 7mg/l, with appropriate action taken should this occur.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

### 7 Indicator # HP 2.19

**Indicator** Supplementary oxygen and/or aeration must be available for the duration of the crowding procedure.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

\*\*11 Indicator Removed 18<sup>th</sup> December 2019

**12 Indicator # HP 4.7**

**Indicator** The sweep net/crowding device must:

- a) be of an appropriate size
- b) have sufficient floatation
- c) be constructed of knotless mesh.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

**13 Indicator # 3.106**

**Indicator** Nets should be examined before crowding the fish and at intervals during harvesting operations to ensure the absence of defects likely to give rise to escapes and any defects repaired.

**Certification Scheme** Scottish Salmon Producers Organisation (**SSPO**)  
Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs

**Domain** Environment

**Topic/SubDomain** Biotic Effects

**OWI category** InD,

**19 Indicator # 5.63**

**Indicator** Farmers should monitor oxygen levels during crowding and take corrective action if levels fall below a critical point for that species (the critical point will vary between species and with environmental factors).

**Certification Scheme** Scottish Salmon Producers Organisation (**SSPO**)  
Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

## 9.0 Smolt

**4 Indicator # SW 1.7**

**Indicator** After transfer to sea, smolts must not be handled for at least 120 days, for example not crowded, except for veterinary treatments.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**5 Indicator # T 7.5**

**Indicator** Maximum stocking densities must:

- a) be within 40–50kg/m<sup>3</sup> (depending on water quality and size of smolts)
- b) be set so that water quality can be maintained over the length of the journey.



**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon  
**Domain** Environment  
**Topic/SubDomain** Fish Health & Welfare  
**OWI category** InD,

**9 Indicator # FW 8.3**

**Indicator** The use of hypertonic water (water above 35 parts/1000) for smolt survival testing is prohibited.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon  
**Domain** Environment  
**Topic/SubDomain** Fish Health & Welfare  
**OWI category** D,

10.0 Behaviour

N=0

11.0 Cortisol

N=0

12.0 Positive Welfare

N=0

13.0 Stress

**20 Indicator # 5.49**

**Indicator** Different species have different tolerance to being out of water, but the time out of water should never be so long as to produce signs of distress.

**Certification Scheme** Scottish Salmon Producers Organisation (**SSPO**)  
Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs  
**Domain** Environment  
**Topic/SubDomain** Fish Health & Welfare  
**OWI category** D

14.0 Slaughter

**1 Indicator # 9.12**

**Indicator** Prior to slaughter, fish shall be stunned humanely.

**Certification Scheme** Global Aquaculture Alliance (**GAA**)  
Standard Best Aquaculture Practices (BAP) - Salmon Farm Standards  
**Domain** Environment  
**Topic/SubDomain** Fish Health & Welfare  
**OWI category** D

**5 Indicator # AB. 5.2.20**

Is there feedback relating to animal welfare from slaughter/primary processing to the farm?

**Certification Scheme** Global Good Agriculture Practice ([GLOBALG.A.P.](#))

Standard Integrated Farm Assurance (IFA), Aquaculture Module + Risk-Assessment on Social Practice (GRASP)

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** R(D)

#### **8 Indicator # S 1.4**

**Indicator** The method of killing used must rapidly, and without pain and distress, render the fish insensible, until death supervenes.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals ([RSPCA](#))

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D

### 15.0 Harvest

#### **11 Indicator # S 1.9**

Before the beginning of each harvest:

- a) the stunning system must be tested to ensure it is working properly
- b) the first 10 fish through each stunner must be assessed and demonstrate the following to ensure the system is functioning correctly:
  - i) the checks must include that fish have no eye movement
  - ii) no rhythmic opercular movement
  - iii) only mild short term involuntary muscular twitches
  - iv) no reaction to tail pinch
- c) the results of the checks listed in a) and b), above, must be:
  - i) recorded, and
  - ii) made available on request.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals ([RSPCA](#))

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain**

**Topic/SubDomain**

**OWI category** D

#### **12 Indicator # F 4.1**

For harvest fish, fasting time must:

- a) not exceed 72 hours (unless directed by the designated veterinary surgeon for fish welfare reasons)
- b) be recorded in the VHWP (see H 1.1).

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals ([RSPCA](#))

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**16 Indicator # S 1.5.2**

There must be sufficient time after stunning, and safeguards in place, to:

- a) assess the effectiveness of the stun in all fish
- b) ensure all fish that have not been effectively stunned are re-stunned immediately.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain**

**Topic/SubDomain**

**OWI category** D,

**24 Indicator # 5.69**

The period during which fish are deprived of food to achieve gut clearance prior to certain procedures or harvesting should be appropriate to the species and temperature.

**Certification Scheme** Scottish Salmon Producers Organisation (**SSPO**)

Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

16.0 Feeding

**14 Indicator # F 4.2**

After any period of fasting, food must be reintroduced in a way that: a) encourages the fish to resume feeding b) minimises waste c) producers can demonstrate does not compromise fish welfare.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**17 Indicator # FW 5.2**

Feed must be:

- a) available to appetite
- b) spread at regular intervals.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**19 Indicator # FW 8.4**

Feed withdrawal prior to transfer to sea must be no greater than 48 hours.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**22 Indicator # F 3.2**

Fish must be observed at least once a day during feeding.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**36 Indicator # 3.146**

Feeding should be withdrawn from fish to be vaccinated for an appropriate period, in accordance with Data Sheet recommendations and fish welfare guidance.

**Certification Scheme** Scottish Salmon Producers Organisation (SSPO)

Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**37 Indicator # 5.68**

Before transport or harvest, feed should be withheld to reduce metabolic rate and the excretion of waste products, and to eliminate the presence of food and/or faecal material in the gut at harvest, thus minimising the risk of microbiological contamination during processing.

**Certification Scheme** Scottish Salmon Producers Organisation (SSPO)

Standard SSPO Code of Good Practice (CoGP) - Seawater Lochs

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

17.0 Physical Health

17.1 Gill

N=0

17.2 Skin condition

N=0

17.3 Snout, scales and fin damage

N=0

## 17.4 Injury

### 1 Indicator # HP 7.13

If an attack has taken place, the fish must be checked for signs of injury as a result of the attack.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

### 4 Indicator # T 6.5

The fish must be transferred from the tanks/rearing enclosures without causing injury to fish.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

### 6 # T 7.14

Water flow through the wells at discharge must:

- a) be sufficient to facilitate movement of the fish
- b) not be so strong as to cause the fish injury.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (**RSPCA**)  
Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** InD,

## 17.5 Bleed

### 1 Indicator # AB. 13.1.4

Are fish effectively stunned prior to bleeding?

**Certification Scheme** Global Good Agriculture Practice (**GLOBALG.A.P.**)

Standard Integrated Farm Assurance (IFA), Aquaculture Module + Risk-Assessment on Social Practice (GRASP)

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

### 2 Indicator # AB. 13.1.5

When fish are bled, is this done immediately after stunning? Is the bleeding effective with a monitoring procedure in place?

**Certification Scheme** Global Good Agriculture Practice (**GLOBALG.A.P.**)

Standard Integrated Farm Assurance (IFA), Aquaculture Module + Risk-Assessment on Social

Practice (GRASP)

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**3 Indicator # S 1.6**

Bleeding must follow within 10 seconds.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

### 17.6 Sea Lice

**9 Indicator # H 4.7.1**

Any fish with severe physical damage caused by sea lice grazing must be removed and dispatched humanely without delay.

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain** Environment

**Topic/SubDomain** Fish Health & Welfare

**OWI category** D,

**13 Indicator # H 4.6**

Sea lice damage to fish must be recorded during lice counts. This must include:

a) condition of fish – good/thin

b) site of lesions

c) skin condition

d) fish behaviour – lively/moribund. (RSPCA)

**Certification Scheme** Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Standard RSPCA Welfare Standards for Farmed Atlantic Salmon

**Domain**

**Topic/SubDomain**

**OWI category** D,