



AQUATIC LIFE
—INSTITUTE—

Aquaculture Certification Schemes Benchmark: Aquatic Animal Welfare

Edition 2

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Aquaculture Certification Schemes Benchmark: Aquatic Animal Welfare (2nd Edition)

Summary

[Aquatic Life Institute \(ALI\)](#) has launched the second edition of a welfare-based [aquaculture certification benchmark](#) tool that analyzes current welfare requirements within the primary farming standards of 7 global seafood certification schemes. The assessment areas include water quality, stocking density and space requirements, environmental enrichment, feed composition, stunning and slaughter, neglected species prohibitions, and additional considerations.

Global Animal Partnership (GAP), RSPCA Assured, Naturland, Friend of the Sea, GLOBALGAP, Best Aquaculture Practices (BAP), and Aquaculture Stewardship Council (ASC) were evaluated and scored based on 5 main criteria (water quality, stocking density/space requirements, environmental enrichment, feed composition, stunning/slaughter) each comprised of 4 subcriteria points. We have now also included a species prohibition criteria topic where restrictions related to the farming of 3 different species (octopus/cephalopods, insects, and eyestalk ablated shrimp) are taken into account. The scoring process concludes with an “additional considerations” verification that indicates the presence or absence of enforcement and compliance, adequate employee training, and environmental impact regulations.

This tool identifies sufficient animal welfare considerations in current aquaculture certification standards but also highlights the areas of opportunity for substantial improvements in the near future. We’d like to thank each certifier that was evaluated for participating in this process and commend their efforts to incorporate positive animal welfare into their aquaculture standards.

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Table Summary of Results

| Certifier | | 2023 Score | 2022 Score |
|---|---------------------------------------|------------|------------|
|  | Aquaculture Stewardship Council (ASC) | 9.5* | NA |
|  | Global Animal Partnership (G.A.P.) | 9 | 8.33 |
|  | RSPCA Assured | 8.5 | 6.5 |
|  | Naturland | 8 | 6.34 |
|  | Friend of the Sea | 7.5 | 4.48 |
|  | GLOBALG.A.P. | 7 | 3.88 |
|  | Best Aquaculture Practices (BAP) | 3.5 | 3.18 |

* Aquaculture Stewardship Council (ASC) scores were based on draft language/documentation that was directly shared with Aquatic Life Institute at the time of evaluation. Requirements will be listed in ASC's upcoming Farm Standard and/or the supplementary Interpretation Manual. The Farm Standard consists of principles, criteria, rationale, intent, and indicators related to animal welfare, while the Interpretation Manual is a non-normative document that supports the implementation of the ASC Farm Standard requirements by farmers and provides guidance to auditors to ensure consistency in the interpretation, application, and the auditing of the ASC Farm Standard requirements. As a result, all scores are subject to change based on what is or is not included in final standard documents shared with the public. The Farm Standard will be released for final public consultation in March 2024 and it will become effective in the fall of 2025. The Interpretation Manual will likely go out for public consultation in March 2024 as well.

Introduction & Purpose

Between 51 and 167 billion farmed fish are produced annually from global aquaculture operations¹. However, depending on their harvest age, the number of farmed fish *living* in aquaculture facilities at any time could be much higher than that estimate. Aquatic animals are farmed in larger numbers than any other animal worldwide, yet they have historically been granted limited welfare considerations. Animal welfare advocates often refer to aquaculture facilities as underwater factory farms. Poor rearing conditions affect their health and well-being, increase stress levels, and leave them more susceptible to various diseases. Higher welfare not only translates to increased quality of life for billions of farmed aquatic animals but leads to improved productivity, a healthier society with elevated food safety standards, and ensures the preservation of ecosystems².

Although there is strong scientific evidence on practices that best promote good welfare, the concept of what officially constitutes “humane fish” or a “high welfare seafood product” is still largely undefined worldwide by the public, industry, animal welfare organizations, and most governments. For terrestrially farmed animals, there are many different labeling schemes and standards, such as “cage-free” and “humanely raised.” Even though this is a major step in the right direction for animal welfare, it has also caused confusion for consumers. Disjointed labeling regimes have consequences for both the animals being raised and slaughtered for food and the conscious consumers trying to navigate sustainable and healthy purchasing decisions.

As institutions certifying aquatic animal products begin incorporating positive welfare standards into their seafood labeling programs, they must diligently define ‘high welfare’ products based on the best available scientific evidence rather than relying on subpar industry norms. “Humanely-raised” aquaculture standards must include more than just stunning before slaughter; they should consider welfare conditions throughout the stages of their lives in production. Standards must also account for additional aquatic animals not directly used for human consumption, such as animals reduced to fishmeal and fish oil, cleaner fish, and broodstock.

Consumers turn to seafood labeling schemes for guidance to avoid purchasing products that conflict with sustainable and humane aquaculture practices. More than 100 certifications and ratings programs of one type or another are currently in use by the seafood industry. This shift now means that 56% of all farmed seafood

¹ “Numbers of Farmed Fish Slaughtered Each Year | Fishcount.org.uk.” Fishcount.org.uk, fishcount.org.uk/fish-count-estimates-2/numbers-of-farmed-fish-slaughtered-each-year

² “Why Fish Welfare? | Fish Welfare Initiative.” FWI, www.fishwelfareinitiative.org/why-fish-welfare

(including seaweed) is rated or certified³, and volumes of certified farmed fish and shellfish constitute about 8% of global aquaculture production⁴. The amount of certified aquatic animal products is only expected to increase. There is no evidence that certification will be phased out anytime in the near future, given consumers' increasing demand for sustainable seafood and the absence of a better alternative⁵. However, many of these labels lack explicit considerations for animal welfare or fail to provide adequate protection. In this Welfare Benchmark, and through Aquatic Life Institute's Certifier Campaign, we aim to hold seafood certifier standards accountable and highlight the certification schemes that provide the most robust animal protections.

Given the wide variety of aquatic animals and systems, the potential scope for a complete evaluation of all certification schemes covering all of these animals and the conditions in which they live is vast. Greater specificity would be ideal for a more in-depth comparison of different schemes for a particular species.

This benchmark was created based on publicly available information that was either provided by each certifier or found on their website at the time of writing. As certification standards are updated, this document will be modified annually to reflect both improvements and impairments. We encourage certification schemes to increase transparency and regularly share knowledge with NGOs and the public. If certification companies would like to share drafts of upcoming standards, ALI will consider evaluating those documents for future iterations of the benchmark.

Scoring Rationale

- A total possible score of (2) for each of the 5 main criteria points. Certifiers were scored using a (0.5) point scoring system to facilitate a more transparent and objective evaluation process.
 - Total main score of 10.
 - Example: a score of 1.2 for water quality is not possible.
 - 0 = Animal welfare standards are “nonexistent.”
 - 0.5 = “Beginning” the development of animal welfare standards.
 - 1 = “Developing” animal welfare standards.
 - 1.5 = Adequately “applying” the animal welfare standards.
 - 2 = Animal welfare standards are “exceeding” expectations.

³ "Sustainable Seafood: A Global Benchmark - Certification & Ratings" <https://certificationandratings.org/data-tool-2022/>

⁴Jonell, Malin, et al. 7 Certifying Farmed Seafood a Drop in the Ocean or a “Stepping- Stone” towards Increased Sustainability?

⁵FAO. The State of World Fisheries and Aquaculture 2020. FAO, 2020.

Example: if the sum of points in the water quality criteria is 1, then we would consider that to be a “developing” standard for that certification in water quality, meaning it can be improved.

- The “Neglected Species Prohibitions” were added as a “bonus point” category. A total of (3) points were possible here; (1) point being awarded to certifiers who stated each of the following in their aquaculture standards, representative quotations, or other public communications:
 - Prohibits the certification of any form of octopus/cephalopod farming (1).
 - Prohibits the use of insects in aquafeed (1).
 - Prohibits the certification of shrimp originating from eyestalk ablated broodstock (1).
 - There is a secondary table of “Additional Considerations” that includes:
 - Enforcement/Compliance
 - Adequate Employee Training
 - Environmental Impacts
 - The secondary table of “Additional Considerations” is not scored using the (2) point system and does not contribute to a certifier’s overall score. A “checkmark” system is utilized instead to note that policies regarding each topic are indeed present in the certification standards. These additional considerations were added due to the importance of monitoring and executing standard procedures. For example, provisions for enrichment are counter-productive if negative environmental impacts result from implementation.
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Main Welfare Criteria (10 points possible)

Water Quality (2 points possible):

- Regulations for addressing water quality are explicitly stated within a section/subsection of the farmed standards. (0.5 point)
- Ranges that enable *optimal* welfare conditions (and not merely tolerable conditions) are explicitly listed for at least: (0.5 point)
 - Dissolved oxygen
 - pH
 - Ammonia
- The ranges provided must be species-specific, lifestage specific, rearing system-specific (RAS, sea cage, flow-through, etc.), and based on the best available scientific evidence. (0.5 point)
- Site-specific water quality management plans must be in place and include effective monitoring practices and contingency plans in the event of an emergency (system failures, algal blooms, natural disasters, etc.). (0.5 point)

Stocking Density and Space Requirements (2 points possible):

- Regulations for addressing stocking density/space requirements are explicitly stated within a section/subsection of the farmed standards. (0.5 point)
- Stocking density ranges and limits should be based on the best scientific evidence available for the species and lifestage being farmed, in addition to the type of rearing system being used (RAS, sea cage, flow-through, pond, etc.). (0.5 point)
- Numerical limits should be suggested for each species certified, adjusted when appropriate. They must consider additional, interrelated farming parameters (disease, stress, water quality, maintenance/operations, welfare indicators, environmental complexity, etc.). (0.5 point)
- Stocking densities should not be set according to maximum production possible, but instead allow ample space where animals can engage in/express innate behaviors and interact with their conspecifics appropriately. (0.5 point)

Environmental Enrichment (2 points possible):

- Regulations for addressing environmental enrichments are explicitly stated within a section/subsection of the farmed standards. (0.5 point)
- The scheme should commit to updating its enrichment standards as new research on fish's behavioral motivations and needs emerge. (0.5 point)
- Animals are provided with at least 1 physical stimulation. This can include but is not limited to: (0.5 point)
 - Interactive, submerged materials (ropes, artificial plants, debris) placed strategically throughout the animals' surroundings.
 - Arrangements, such as overhanging covers, that allow animals to hide from conspecifics or seek refuge from unfavorable conditions.
 - Water complexifications that could be achieved through dynamic flow rates, oscillating current directions, bubble curtains, etc.
- Animals are provided with at least 1 psychological stimulation. This can include but is not limited to: (0.5 point)
 - Stimulus using natural or artificial illumination patterns at suitable intensities and colors strategically placed to provide a variety of visual appearances within the holding facility.
 - Nutritional delivery that prevents adverse behavior (aggression, food monopolization, etc.) while providing some level of cognitive choice via submerged dispensing machines or in combination with substrate to promote foraging behavior (for some species/life stages).

Feed Composition (2 points possible):

- Regulations for addressing aquafeed composition are explicitly stated within a section/subsection of the farmed standards. (0.5 point)
- Provides a numerical limit for the amount of fishmeal and fish oil (FMFO) allowed in aquafeed according to the species/life-stage nutritional tolerance. *The formula used for this calculation should be explicitly described* (e.g., FIFO). (0.5 point)
- Recommends that aquafeed contain plant-based alternative content according to species/life-stage nutritional tolerance. (0.5 point)
- Where FMFO is deemed necessary, it should be sourced from traceable offcuts and byproducts of human consumption and verified sustainable wild fisheries. (0.5 point)

Stunning and Slaughter (2 points possible):

- Regulations for addressing stunning and slaughter are explicitly stated within a section/subsection of the farmed standards. (0.5 point)
 - Effective stunning must render an animal immediately and fully unconscious (i.e., within one second by a scientifically validated method) in a manner that sustains unconsciousness until death. The use of ice slurry, CO₂, ammonia bath, salt, and other inhumane methods of stunning/slaughter must be explicitly prohibited. (0.5 point)
 - Fish should be regularly assessed for signs of consciousness after stunning (e.g., opercular eye movement) by *adequately trained personnel*. There should be a backup slaughter method to stun and humanely kill any fish that are alive and conscious after the initial stunning or slaughter method. (0.5 point)
 - Time between stunning and slaughter should be minimized to reduce the risk of consciousness being recovered; time spent in crowding/pre-slaughter practices should be minimized where possible; time spent in transportation from the rearing facility to the slaughter facility should be minimized. (0.5 point)
-

Neglected Species Prohibitions (3 points possible)

- ❖ Prohibits the certification of any form of octopus/cephalopod farming (1 point).
 - ❖ Prohibits the use of insects in aquafeed (1 point).
 - ❖ Prohibits the certification of shrimp originating from eyestalk ablated broodstock (1 point).
-

Additional Considerations (Yes /No)

Enforcement/Compliance:

- List the language used within the standard documents.

Adequate Employee Training:

- List the language used within the standard documents.

Environmental Impacts:

- List the language used within the standard documents.
-

Results

Note: Language directly from certification standards is written in blue.

Aquaculture Stewardship Council (ASC) → Total Score = 9.5

Water Quality = 2

- Regulations for addressing water quality are explicitly stated within a section/subsection of the farmed standards. (0.5 point)
- Ranges that enable optimal welfare conditions (and not merely tolerable conditions) are explicitly listed for at least: (0.5 point)
 - Dissolved oxygen
 - pH
 - Ammonia
 - *Specific values for dissolved oxygen, ammonia, nitrite, nitrate, temperature, and salinity are listed in the interpretation manual that will accompany Farm Standards.*
- The ranges provided must be species-specific, lifestage specific, rearing system-specific (RAS, sea cage, flow-through, etc.), and based on the best available scientific evidence. (0.5 point)
 - *Reference tables for water parameters are listed in the interpretation manual and a production system table is incorporated in the Farm Standard.*
- Site-specific water quality management plans must be in place and include effective monitoring practices and contingency plans in the event of an emergency (system failures, algal blooms, natural disasters, etc.). (0.5 point)
 - *Indicator 2.14a.16 The UoC shall assess site-specific characteristics and develop, implement, and monitor effectiveness of a Fish Health and Welfare Management System*

(FHWMS), with the objective of preventing disease outbreaks and ensuring good health and welfare of farmed animals. The FHWMS shall include at least the following:

- f) a process for monitoring water quality, including at least the following:
 - Monitoring frequency (Table 1)
 - Monitoring parameters (Table 1 and interpretation manual)
 - Species-specific limits and monitoring requirements for water quality parameters (Appendix 1 and interpretation manual).
- j) a traffic light system for water quality, morphological scoring, behavioral scoring, and mortality, identifying ranges of acceptable levels (green), warning levels (amber), and unacceptable levels (red) of health or welfare.
- k) increased monitoring in the event that indicators move into the amber and red ranges for water quality, morphological scoring, behavioral scoring or mortality.
- m) corrective measures in the event that water quality, morphological scoring, behavioral scoring and mortality indicators move into the amber or red ranges.

Stocking Density and Space Requirements = 2

- Regulations for addressing stocking density/space requirements are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
 - 2.14a.19 The UoC shall report to ASC the ranges of stocking densities during production, according to Appendix 2 and using the template provided on the ASC website.
- Stocking density ranges and limits should be based on the best scientific evidence available for the species and lifestage being farmed, in addition to the type of rearing system being used (RAS, sea cage, flow-through, pond, etc.). ✓ (0.5 point)
 - Reference table is listed in the interpretation manual.
- Numerical limits should be suggested for each species certified, adjusted when appropriate, and must consider additional, interrelated farming parameters (disease, stress, water quality, maintenance/operations, welfare indicators, environmental complexity etc.). ✓ (0.5 point)
 - In this Farm Standard, ASC requires the assessment of stocking density through various operational welfare indicators (OWIs) (morphological scoring, behavioral scoring, water quality and mortality) that can be used as proxies. If a downward trend is

observed on these indicators, then the farm should be assessing its farming operations, including stocking density, and modifying them accordingly. This approach is more suitable than setting a metric limit as accurate and reliable density figures are hard to obtain in aquaculture, and they vary between species, life stage and farming systems. ASC will provide suggested stocking density ranges for species where data is available, but each farm will have to also comply with the proposed system and its considerations.

- Stocking densities should not be set according to maximum production possible, but instead allow ample space where animals can engage in/express innate behaviors, and interact with their conspecifics appropriately. ✓ (0.5 point)
 - *Based on a draft version of ASC's Farm Standards, a detailed "traffic light" system will be put in place in order to ensure all operational welfare indicators, including behavioral observations, must be appropriately considered and documented to stay "green". Farmers will have a limited amount of time to make any necessary adjustments which could include lowering their stocking density.*

Environmental Enrichment = 1

- Regulations for addressing environmental enrichments are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
 - *Environmental enrichments are explicitly mentioned within the interpretation manual that will accompany the Farm Standards.*
- The scheme should commit to updating their standards for enrichment as new research on the behavioral motivations and needs of fish emerge. ✓ (0.5 point)
 - *Based on a draft version of ASC's Interpretation Manual that will accompany the Farm Standards, this criteria point has been adequately addressed.*
- Animals are provided with at least 1 physical stimulation. This can include but is not limited to: ✗ (0.5 point)
 - Interactive, submerged materials (ropes, artificial plants, debris) placed strategically throughout the animals' surroundings.
 - Arrangements, such as overhanging covers, that allow animals to hide from conspecifics or seek refuge from unfavorable conditions.
 - Water complexifications that could be achieved through dynamic flow rates, oscillating current directions, bubble curtains, etc.

- Animals are provided with at least 1 psychological stimulation. This can include but is not limited to: ✘ (0.5 point)
 - Stimulus using natural or artificial illumination patterns, at suitable intensities and colors, strategically placed to provide a variety of visual appearances within the holding facility.
 - Nutritional delivery that prevents adverse behavior (aggression, food monopolization, etc.) while providing some level of cognitive choice via submerged dispensing machines or in combination with substrate to promote foraging behavior (for some species/life stages).

Feed Composition = 1.5

- Regulations for addressing aquafeed composition are explicitly stated within a section/subsection of the farmed standards. ✔ (0.5 point)
 - *2.13.1 The UoC shall only feed ASC compliant products to ASC certified production, unless feeding seaweed as a direct feed source. The requirement to feed ASC compliant products applies as of September 2024, giving producers two years of transition from the effective date of the ASC Feed Standard.*
 - *(See the ASC Feed Standard for further details)*
- Provides a numerical limit for the amount of fishmeal and fish oil (FMFO) that is allowed in aquafeed according to the species/lifestage nutritional tolerance. *The formula used for this calculation should be explicitly described (e.g. FIFO).* ✔ (0.5 point)
 - *The limits set for Forage Fish Dependency Ratios for fishmeal and fish oil drive efficient use of marine resources, as well as the need for good feed management and feeding regimes at the farm level.*
 - *2.13.3 The UoC shall meet the feed efficiency requirements defined for each culture species, in Annex 1 for ASC certified production.*
 - *2.13.4 The UoC shall calculate the feed efficiency values for each completed production cycle, following the method outlined in Annex 2.*
- Recommends that aquafeed contain plant-based alternative content according to species/lifestage nutritional tolerance. ✘ (0.5 point)
- Where FMFO is deemed necessary, it should be sourced from traceable offcuts and byproducts of human consumption, and verified sustainable wild fisheries. ✔ (0.5 point)
 - *2.13.1 The UoC shall only feed ASC compliant products to ASC certified production, unless feeding seaweed as a direct feed source. The requirement to feed ASC compliant products applies*

as of September 2024, giving producers two years of transition from the effective date of the ASC Feed Standard.

- *(See the ASC Feed Standard for further details).*

Stunning and Slaughter = 2

- Regulations for addressing stunning and slaughter are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
- Effective stunning must be used to render an animal immediately and fully unconscious (i.e. within one second by a scientifically validated method) in a manner that sustains unconsciousness until death. The use of ice slurry, CO₂, ammonia bath, salt, and other inhumane methods of stunning/slaughter must be explicitly prohibited. ✓ (0.5 point)
 - *2.14c.1 The UoC shall ensure all fish are stunned prior to killing, using permitted methods only, as indicated in Table 1: species-specific transition periods for permitted stunning methods*
 - *2.14c.2 The UoC shall ensure fish stunned lose consciousness immediately, and that unconsciousness persists until death sets in, as indicated in the species-specific transition periods (Table 1).*
 - *2.14c.4 The UoC shall not use the following methods to kill fish:*
 - *asphyxia in air,*
 - *CO₂,*
 - *salt baths,*
 - *ammonia baths, or*
 - *evisceration.*
- Fish should be regularly assessed for signs of consciousness after stunning (e.g. opercular eye movement) by *adequately trained personnel*. There should be a backup slaughter method to stun and humanely kill any fish that are alive and conscious after the initial stunning or slaughter method. ✓ (0.5 point)
 - *2.14c.3 The UoC shall ensure that fish are stunned effectively as of the date that the ASC Farm Standard becomes effective (including species-specific transition periods as outlined in Table 1), assessing stunned fish for the absence of all of the following: opercular (gill) movements, eye movements, body movements, reaction to a painful stimulus (e.g., tail-prick or eye corner tap).*
 - *2.14c.6 The UoC shall have immediate mitigation measures in place to respond to ineffective stunning or killing, including the presence of a back-up system such as manual percussive stunning.*
- Time between stunning and slaughter should be minimized in order to reduce the risk of consciousness being recovered; time spent in

crowding/pre-slaughter practices should be minimized where possible; time spent in transportation from the rearing facility to the slaughter facility should be minimized. ✓ (0.5 point)

- *Stunning methods are required to induce immediate or rapid (less than 1 second) unconsciousness. Ice-slurry is not an approved stunning method but can be used as a killing method after immediate or rapid (less than 1 second) unconsciousness (Species-specific welfare aspects of the main systems of stunning and killing of farmed fish, Scientific Opinion of the Panel on Animal Health and Welfare, 2009, EFSA).*
- *2.14b.1 The site shall assess site-specific characteristics and develop a Fish Handling Management System (FHMS). The site shall implement and monitor the FHMS for its effectiveness with the objective of ensuring good health and welfare of farmed animals. The FHMS shall include at least the following:*
 - *g) Crowding shall be carried gradually (partial crowding) encouraging a smooth and quick capture with an appropriate crowding intensity and for a maximum crowding time of 2 hours. This shall not be exceeded unless the veterinary surgeon or health manager demonstrates that this does not negatively impact fish welfare.*
 - *h) Follow species-specific limits on maximum time out of water (Table 1);*
 - *i) Minimum/maximum fasting duration specific to the species being handled, the life stage or size of fish being handled, and the type of handling (Table 1);*

Neglected Species Prohibitions

- ❖ Prohibits the certification of any form of octopus/cephalopod farming.
 - ✗ (1 point)
- ❖ Prohibits the use of insects in aquafeed.
 - ✗ (1 point)
- ❖ Prohibits the certification of shrimp originating from eyestalk ablated broodstock.
 - ✓ (1 point)
 - *Based on feedback from the March-April 2023 consultation, ASC has confirmed that an indicator to prohibit eyestalk ablation will be included on the first version of the Farm Standard.*

Additional Considerations

➤ Enforcement/Compliance:

□ *An ASC audit follows pre-defined process requirements. These requirements are detailed in the Certification and Accreditation Requirements (CAR) and the RUoC. Only ASI-accredited CABs are permitted to conduct certification audits against ASC Standards and issue a certificate. As an independent scheme owner, ASC itself is never involved in the actual audit or certification decision of a UoC. Granted certificates are the property of the CAB. Certificates issued by the CAB, as well as the corresponding audit reports containing audit findings and resolution of any non-conformities, are made publicly available on the ASC website. Where certification was not granted by the CAB, audit findings and the negative certification decision are also made publicly available on the ASC website.*

➤ Adequate Employee Training:

□ *ANNEX X - FISH HEALTH AND WELFARE TRAINING. ASC considers that fish health and welfare can be promoted through staff training. Trained staff understand the benefits and gains of ensuring good health and welfare and are empowered to implement positive changes. Lack or insufficient training of staff, can result in negative impacts that can affect the fish themselves, the environment, and the UoC. Some of the major risks are: Fish are not reared appropriately, Fish are injured or compromised (potentially resulting in death), especially during handling events, Declining fish welfare and health are not identified, Mitigation measures are not appropriate/correct, The surrounding environment is damaged. In order to avoid such risks, the UoC must develop a fish health and welfare training programme for its employees. Such training might be developed either by in-house teams of veterinarians and fish health managers, or externally in conjunction with relevant consultants or academia. In any case, the content of the final training programme must be endorsed by a veterinarian who acknowledges the content as accurate, relevant, and appropriate.*

➤ Environmental Impacts:

□ *The ASC certification programme, by reconciling the need to address, mitigate and prevent negative environmental impacts with third party assurance of best-in-class practices and performances, can help provide the industry with the social license to operate (SLO) it needs if it is to address responsibly the food security challenges of the 21st century and play a major role in supplying food for mankind.*

□ *In developing the Criteria for this Principle 2, reference documents of UN FAO, RAMSAR, IUCN, OIE were used. Relevant documents are referenced in the Rationale section of each Criterion. Through Principle 2, ASC's vision directly contributes to addressing the UN Sustainable Development Goals (SDG) 6 ("Clean water and sanitation"), SDG 12 ("Responsible consumption and production"), SDG 13 ("Climate action"), SDG 14 ("Life below water") and SDG 15 ("Life on land"). The intended outcome of Principle 2 is that ASC-certified facilities operate in an environmentally responsible manner, by ensuring that: I. The farm's siting and operation does not impact wider ecosystem functioning. II. Resource use is optimized. III. Any discharged outputs do not exceed ecosystem absorption rates. IV. The aquatic species cultured do not harm native species and/or ecosystems.*

Global Animal Partnership (G.A.P) Step Level 3 → Total Score = 9

Water Quality = 2

- Regulations for addressing water quality are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Ranges that enable optimal welfare conditions (and not merely tolerable conditions) are explicitly listed for at least: ✓ (0.5 point)
 - Dissolved oxygen
 - pH
 - Ammonia
 - *5.2.3 For salmon reared in tanks, water quality must adhere to the following limits:*
 - *Oxygen Saturation: 80-100%*
 - *Temperature: 8-16°C (46-60°F)*
 - *Maximum Free Ammonia: .025 mg/L*
 - *Maximum Carbon dioxide (CO₂): 15 mg/L-1*
 - *pH: 6.2-7.8*
 - *Maximum Nitrate: 100 mg/L-1*
 - *Maximum Nitrite: .1 mg/L-1*
- The ranges provided must be species-specific, lifestage specific, rearing system-specific (RAS, sea cage, flow-through, etc.), and based on the best available scientific evidence. ✓ (0.5 point)
 - *5.2.1 For salmon reared in seawater pens, at a minimum, the following must be monitored on a daily basis in at least half of the occupied pens on-site:*
 - *Temperature*

- Salinity
- Oxygen Saturation
- 5.2.3 For salmon reared in tanks, water quality must adhere to the following limits:
 - Oxygen Saturation: 80-100%
 - Temperature: 8-16°C (46-60°F)
 - Maximum Free Ammonia: .025 mg/L
 - Maximum Carbon dioxide (CO₂): 15 mg/L-1
 - pH: 6.2-7.8
 - Maximum Nitrate: 100 mg/L-1
 - Maximum Nitrite: .1 mg/L-1
- Site-specific water quality management plans must be in place and include effective monitoring practices and contingency plans in the event of an emergency (system failures, algal blooms, natural disasters, etc.). ✓ (0.5 point)
 - 5.2.4 If water quality (when controlled) is outside the levels in Standard 5.2.3, a written intervention plan, as detailed in Appendix II, designed to improve water quality must be implemented within 6 hours.
 - 5.2.5 If oxygen saturation drops below 80%, supplemental oxygen must be provided immediately until oxygen saturation returns to 80% or above.

Stocking Density & Space Requirements = 1.5

- Regulations for addressing stocking density/space requirements are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Stocking density ranges and limits should be based on the best scientific evidence available for the species and lifestage being farmed, in addition to the type of rearing system being used (RAS, sea cage, flow-through, pond, etc.). ✓ (0.5 point)
 - 5.1 Stocking density is calculated by taking the current biomass of the tank or pen (based on current average weight of all salmon in the tank or pen, excluding any cleaner fish) plus a maximum 3% variation, divided by the estimated volume of the net or tank (from manufacturer's information). For example, if a seawater pen is stocked with 300,000 salmon at an average of 3 kg, the current biomass of the pen would be 900,000 kg. A net pen that has a 50 m diameter and is 30 m deep would have a volume of approximately 58,904 m³ (based on the calculation of the volume of a cylinder). To calculate the stocking density, divide 900,000 kg by 58,904 m³
 - G.A.P. expects the stocking density values listed to be maintained for the entire life of the salmon.

- *Seawater stocking density numbers include salmon raised in seawater RAS systems.*
- Numerical limits should be suggested for each species certified, adjusted when appropriate, and must consider additional, interrelated farming parameters (disease, stress, water quality, maintenance/operations, welfare indicators, environmental complexity etc.). ✓ (0.5 point)
 - *5.1.1 Salmon stocking density for freshwater production (in either tanks or in open-water pens) must not exceed 45 kg/m³ per pen or tank at any given time.*
 - *5.1.2 Salmon stocking density in seawater must not exceed 17 kg/m³ per pen or tank at any given time.*
- Stocking densities should not be set according to maximum production possible, but instead allow ample space where animals can engage in/express innate behaviors, and interact with their conspecifics appropriately. ✗ (0.5 point)

Environmental Enrichment = 2

- Regulations for addressing environmental enrichments are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
- The scheme should commit to updating their standards for enrichment as new research on the behavioral motivations and needs of fish emerge. ✓ (0.5 point)
 - *5.4 Environmental enrichments are materials that are provided to salmon to add complexity to their environment, encourage the expression of natural behaviors and decrease the expression of abnormal and deleterious behaviors such as fin nipping and cannibalism.*
 - *G.A.P. understands that enrichments are a developing field in salmon aquaculture and is open to novel innovations and ideas from all sectors to determine which enrichments can best enhance salmon welfare.*
 - *5.4.8 Enrichments must be accessible by all salmon in the pen or tank.*
 - *5.4.9 Enrichments must be cleaned and maintained to ensure good water quality.*
 - *5.4.10 Salmon must have continuous access to enrichments.*
- Animals are provided with at least 1 physical stimulation. This can include but is not limited to: ✓ (0.5 point)
 - Interactive, submerged materials (ropes, artificial plants, debris) placed strategically throughout the animals' surroundings.

- Arrangements, such as overhanging covers, that allow animals to hide from conspecifics or seek refuge from unfavorable conditions.
- Water complexifications that could be achieved through dynamic flow rates, oscillating current directions, bubble curtains, etc.
 - *5.4.3 Fry and parr must be provided with at least 1 Type A and 1 Type B enrichment (See Appendix VII) per pen/tank.*
 - *5.4.7 Adult salmon must be provided with 2 types of enrichments (See Appendix VII) per pen/tank.*
 - *Type A includes Substrate, Submerged hides (only for freshwater production), Visual Barrier, Hanging curtain and Moving Light Array*
- Animals are provided with at least 1 psychological stimulation. This can include but is not limited to: (0.5 point)
 - Stimulus using natural or artificial illumination patterns, at suitable intensities and colors, strategically placed to provide a variety of visual appearances within the holding facility.
 - Nutritional delivery that prevents adverse behavior (aggression, food monopolization, etc.) while providing some level of cognitive choice via submerged dispensing machines or in combination with substrate to promote foraging behavior (for some species/life stages).
 - *5.4.3 Fry and parr must be provided with at least 1 Type A and 1 Type B enrichment (See Appendix VII) per pen/tank.*
 - *5.4.7 Adult salmon must be provided with 2 types of enrichments (See Appendix VII) per pen/tank.*
 - *Type B includes Overhanging or over tank/pen cover, Alternating water current velocity (only for freshwater production), Bubble Curtain, Simultaneous feed distributed at different depths (only for marine production).*

Feed Composition = 1

- Regulations for addressing aquafeed composition are explicitly stated within a section/subsection of the farmed standards. (0.5 point)
- Provides a numerical limit for the amount of fishmeal and fish oil (FMFO) that is allowed in aquafeed according to the species/lifestage nutritional tolerance. *The formula used for this calculation should be explicitly described (e.g. FIFO).* (0.5 point)
 - *7.4 The fish in/fish out (FIFO) ratio measures the amount of fishmeal and fish oil that is used to produce one weight equivalent of farmed fish back to wild fish weight equivalents.*
 - *FIFO ratios are only calculated for operations which carry out seawater production.*

- *The equation that operations must use to calculate the FIFO ratio is provided.*
 - *7.4.3 The average annual FIFO ratio must not exceed 1:1 per class.*
- Recommends that aquafeed contain plant-based alternative content according to species/lifestage nutritional tolerance. ✘ (0.5 point)
- Where FMFO is deemed necessary, it should be sourced from traceable offcuts and byproducts of human consumption, and verified sustainable wild fisheries. ✘ (0.5 point)

Stunning and Slaughter = 1.5

- Regulations for addressing stunning and slaughter are explicitly stated within a section/subsection of the farmed standards. ✔ (0.5 point)
- Effective stunning must render an animal immediately and fully unconscious (i.e. within one second by a scientifically validated method) in a manner that sustains unconsciousness until death. The use of ice slurry, CO₂, ammonia bath, salt, and other inhumane methods of stunning/slaughter must be explicitly prohibited. ✔ (0.5 point)
 - *1.1.2 The slaughter facility must use a G.A.P. approved method of stunning and slaughter (Appendix II).*
 - *1.1.5 Salmon must be stunned and rendered insensible prior to exsanguination.*
- Fish should be regularly assessed for signs of consciousness after stunning (e.g. opercular eye movement) by *adequately trained personnel*. There should be a backup slaughter method to stun and humanely kill any fish that are alive and conscious after the initial stunning or slaughter method. ✔ (0.5 point)
 - *1.1.6 A backup stunning and slaughter method must be available and implemented during the slaughter process if the automated system stops working for any reason.*
 - *2.2 The slaughter facility must provide training to all staff responsible for handling live salmon and/or performing stunning and slaughter that:*
 - *Is written and/or hands on;*
 - *Is provided in all necessary languages;*
 - *Describes all aspects of the individual's responsibilities;*
 - *Describes emergency procedures;*
 - *Is provided prior to the individual's handling of any fish at the facility;*
 - *Describes signs of an ineffective stun or kill (Appendix III);*
 - *Describes the proper use of the stunning and slaughter equipment; and*

- *Is on-going as necessary and, at minimum, when any changes affecting the welfare of salmon are implemented.*
- Time between stunning and slaughter should be minimized in order to reduce the risk of consciousness being recovered; time spent in crowding/pre-slaughter practices should be minimized where possible; time spent in transportation from the rearing facility to the slaughter facility should be minimized. ❌ (0.5 point)

Neglected Species Prohibitions

- ❖ Prohibits the certification of any form of octopus/cephalopod farming.
 - ❌ (1 point)
- ❖ Prohibits the use of insects in aquafeed.
 - ✅ (1 point)
 - *7.3.1 The use of insects in feed is prohibited*
- ❖ Prohibits the certification of shrimp originating from eyestalk ablated broodstock.
 - ❌ (1 point)

Additional Considerations

- Enforcement/Compliance:
 - *Each operation must be audited and certified prior to marketing any product(s) as G.A.P. Certified.*
 - *Each operation must be audited once every certification cycle. A certification cycle is 18 months, which allows for salmon and operations to be assessed at different times (and potentially during different freshwater/marine conditions) and to provide flexibility when scheduling audits around key production practices.*
 - *Alternate certification cycle audits (every 3 years) the certifier will schedule the audit around observing a crowding event on-farm.*
 - *If salmon are not raised on a single operation and different stages of production are conducted by different operations (e.g. salmon are hatched and complete smoltification at hatchery A, and then are transported to location B where from 100g onward they are raised to slaughter weight), each operation must submit a completed G.A.P.'s 5-Step® Animal Welfare Farmed Atlantic Salmon application and be audited and certified prior to product being marketed as G.A.P. Certified.*

- *To facilitate implementation of this standard within the context of on-going business, at initial audit only, any farmed Atlantic salmon on-site that the operation has sourced from other operations are eligible for certification without requiring an audit of the source farm(s) (i.e. the purchased salmon will be grandfathered into the Program at the time of the initial audit). All grandfathered fish from this initial audit must be inventoried at the time of the initial audit so that they are not disqualified at subsequent audits.*
- *At recertification, any salmon (including ova, juveniles, or smolts) sourced by the operation must come from a G.A.P. Certified source farm if they are going to be marketed as Animal Welfare Certified.*
- *Each operation must have salmon (which can be ova, juveniles or smolts) on-site at the time of the on-site audit, but not all pens or tanks at an operation must have salmon in them at the time of the audit.*
- *At the time of on-site audit, the person(s) responsible for managing the operation and/or fish caretaker must be present. A designated representative affiliated with a supplier group may also be present at the time of the on-site audit but cannot be the only person present.*
- *Each operation applying for G.A.P. certification is responsible for ensuring that all required records and documents are available, and that all applicable standards are met, including actions that may be contracted or managed by another entity (e.g. transport, predator control).*
- *All applicable standards, including those that may be controlled or managed by, or contracted to, another (e.g. the genetics company; a transporter; a producer group, co-operative, or marketing entity; slaughter facility), will be assessed for compliance by the certification company and incorporated into its overall assessment of the operation prior to the final Step determination.*
- *G.A.P. supports the use of video or other electronic monitoring records for the review of handling procedures (e.g. crowding, pumping, grading) as well as daily pen or tank monitoring. Use of video technology is not a requirement but can be used in place of certain observations listed in G.A.P.'s Policy Manual. Please refer to G.A.P.'s Policy Manual for additional details about how this must be conducted.*
- *Auditors do not make Step-level determinations nor provide consultative service to producers on meeting standards requirements;*

reviewers of authorized certification companies make Step-level determinations.

- *Each Step level—Step 1 through Step 5+—has its own requirements that must be met to be certified to that level. If an operation, for example, meets some but not all Step 3 requirements, but 100% of the requirements for Step 1, then the operation is able to achieve Step 1 certification.*
- *If in a particular situation or circumstance, a standard as written might compromise the welfare of the salmon in the producer's care, the producer should contact their accredited certifier to discuss applying to G.A.P. for a deviation.*
- **Adequate Employee Training:**
 - *12.6 Each operation must provide training to all staff and/or managers who are responsible for salmon and cleaner fish (whether full-time, part-time, seasonal or contractual) that: is written and/or hands-on; is presented in all necessary languages; includes instruction on recognizing signs of normal and abnormal salmon and cleaner fish appearance and behavior; describes all aspects of the individual's responsibilities; describes emergency procedures; describes biosecurity protocols; reviews a copy of the Written Farm and Fish Health Plan (Standard 12.2.1); is provided prior to the individual's handling of any fish on the operation; covers all requirements of this version of G.A.P.'s Animal Welfare Certified™ Standards for Farmed Atlantic Salmon; and is on-going as necessary and, at a minimum, when any changes affecting the care and management of salmon are implemented.*
- **Environmental Impacts:**
 - *G.A.P. recognizes that both farm animal welfare and sustainability are linked. While our standard focuses on animal welfare, we want to support partner efforts that also take environmental sustainability into account.*
 - *The operation must have a written plan in place which addresses one or more of the following: Effluent and waste reduction; Reduction of single-use plastics; Increased use of renewable energy sources (e.g. solar, wind); Increased use of feeds that source fish meal and fish oil from certified sustainable fisheries; Increased use of feeds that source soy from certified non-deforested regions. This standard can be met through a written policy, a third-party sustainability certification, or developed by an external consultant.*

RSPCA Assured → Total Score = 8.5

Water Quality = 2

- Regulations for addressing water quality are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Ranges that enable optimal welfare conditions (and not merely tolerable conditions) are explicitly listed for at least: ✓ (0.5 point)
 - Dissolved oxygen
 - pH
 - Ammonia
 - *FW 1.6 The following water quality parameters must be complied with:*
 - *Oxygen (O₂) mg/l 7.0 7.0 7.0 7.0.*
 - *Oxygen (O₂) saturation % in exit water >90.0 >90.0 >70.0 >70.0*
 - *Free ammonia (NH₃) mg/l N/A <0.025 <0.025 <0.025*
 - *Carbon dioxide (CO₂) mg/l <10.0 <10.0 <10.0 <10.0*
 - *Max temp °C 10.0 10.0 12.0 16.0*
 - *Min temp °C 1.0 1.0 1.0 1.0*
 - *pH in inlet water 7.0 to 8.0 7.0 to 8.0 7.0 to 8.0 7.0 to 8.0*
 - *Non-spate suspended solids (turbidity) mg/l <25.0 <25.0 <25.0 <25.0*
 - *Nitrite mg/l <0.2 <0.2 <0.2 <0.2*
 - *Nitrate mg/l N/A N/A <50.0 <50.0*
- The ranges provided must be species-specific, lifestage specific, rearing system-specific (RAS, sea cage, flow-through, etc.), and based on the best available scientific evidence. ✓ (0.5 point)
 - *EVQ 1.1 Water quality composition must be monitored sufficiently frequently, if necessary daily, depending on the system, time of year and lifecycle stage of stock.*
- Site-specific water quality management plans must be in place and include effective monitoring practices and contingency plans in the event of an emergency (system failures, algal blooms, natural disasters, etc.). ✓ (0.5 point)
 - *EVQ 1.2 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.*
 - *EVQ 1.3 The Emergency Action Plan must contain provisions to account for potentially catastrophic events that may adversely affect water quality, such as algal or jellyfish blooms.*

Stocking Density & Space Requirements = 2

- Regulations for addressing stocking density/space requirements are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Stocking density ranges and limits should be based on the best scientific evidence available for the species and lifestage being farmed, in addition to the type of rearing system being used (RAS, sea cage, flow-through, pond, etc.). ✓ (0.5 point)
 - *SW 1.2 The maximum stocking density must be calculated on the weight of fish/m³ of water volume.*
 - *SW 1.3 Whichever net design is being used, the proportion of the cone which is included in stocking density calculations must permit a minimum of a 5m diameter swim circle.*
- Numerical limits should be suggested for each species certified, adjusted when appropriate, and must consider additional, interrelated farming parameters (disease, stress, water quality, maintenance/operations, welfare indicators, environmental complexity etc.). ✓ (0.5 point)
 - *Freshwater production tank:*
 - *Liveweight (mean) up to 1 gm → 10 kg/m³*
 - *>1-5gm → 20 kg/m³*
 - *>5-30 → 30 kg/m³*
 - *>30-50 → 50 kg/m³*
 - *>50 → it may be acceptable to stock them to a density of 60 kg/m³. We are interested in examining this in more detail with a view to amending the standard in future publications.*
 - *Seawater stocking density:*
 - *Seawater enclosure → 17 kg/m³*
 - *Seawater enclosure site maximum → 15 kg/m³*
- Stocking densities should not be set according to maximum production possible, but instead allow ample space where animals can engage in/express innate behaviors, and interact with their conspecifics appropriately. ✓ (0.5 point)
 - *The site stocking plan must demonstrate that the facilities can maintain and service the requirements of the stocking densities in FW 1.5.*
 - *If this cannot be demonstrated at assessment, then a lower stocking density will have to be adhered to.*

Environmental Enrichment = 0.5

- Regulations for addressing environmental enrichments are explicitly stated within a section/subsection of the farmed standards. ✗ (0.5 point)

- *Sea pen environment/enrichment: lumpfish*
 - *CF 14.0 Pens must have suitable structures and substrates to provide the lumpfish with adequate refuges and places to rest.*
 - *CF 14.1 The refuges and substrates must be easy to clean and manage hygienically when in place.*
 - *CF 14.2 Refuges must be placed where they encourage lumpfish to graze on the sea lice (rather than the nets).*
- The scheme should commit to updating their standards for enrichment as new research on the behavioral motivations and needs of fish emerge. ✓ (0.5 point)
 - *The RSPCA are aware of trials examining the introduction of environmental enrichment to tanks to reduce fin damage. The results from such trials would be greatly appreciated by the RSPCA Farm Animals Department in order to inform future standards.*
- Animals are provided with at least 1 physical stimulation. This can include but is not limited to: ✗ (0.5 point)
 - Interactive, submerged materials (ropes, artificial plants, debris) placed strategically throughout the animals' surroundings.
 - Arrangements, such as overhanging covers, that allow animals to hide from conspecifics or seek refuge from unfavorable conditions.
 - Water complexifications that could be achieved through dynamic flow rates, oscillating current directions, bubble curtains, etc.
- Animals are provided with at least 1 psychological stimulation. This can include but is not limited to: ✗ (0.5 point)
 - Stimulus using natural or artificial illumination patterns, at suitable intensities and colors, strategically placed to provide a variety of visual appearances within the holding facility.
 - Nutritional delivery that prevents adverse behavior (aggression, food monopolization, etc.) while providing some level of cognitive choice via submerged dispensing machines or in combination with substrate to promote foraging behavior (for some species/life stages).

Feed Composition = 0.5

- Regulations for addressing aquafeed composition are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
 - *All feed must be manufactured from constituents that are free from active parasites and known fish pathogens and contamination.*

- *All feeds must be produced in accordance with all relevant UK and EU legislation.*
 - *No feedstuffs containing growth regulators or hormones are permitted.*
 - *The use of veterinary medicinal products in food is prohibited except for essential therapeutic use (a disease outbreak or where welfare will otherwise be compromised as advised by a veterinary surgeon).*
- Provides a numerical limit for the amount of fishmeal and fish oil (FMFO) that is allowed in aquafeed according to the species/lifestage nutritional tolerance. *The formula used for this calculation should be explicitly described (e.g. FIFO).* ✘ (0.5 point)
- Recommends that aquafeed contain plant-based alternative content according to species/lifestage nutritional tolerance. ✘ (0.5 point)
- Where FMFO is deemed necessary, it should be sourced from traceable offcuts and byproducts of human consumption, and verified sustainable wild fisheries. ✘ (0.5 point)

Stunning and Slaughter = 1.5

- Regulations for addressing stunning and slaughter are explicitly stated within a section/subsection of the farmed standards. ✔ (0.5 point)
 - *The system must ensure sufficient current is passed through the body of the fish for a sufficient duration to render the fish immediately insensible until death supervenes.*
 - *All fish must be humanely stunned/killed.*
- Effective stunning must render an animal immediately and fully unconscious (i.e. within one second by a scientifically validated method) in a manner that sustains unconsciousness until death. The use of ice slurry, CO₂, ammonia bath, salt, and other inhumane methods of stunning/slaughter must be explicitly prohibited. ✘ (0.5 point)
 - *Permitted stunning/killing methods for marine sourced trout are: a) an effectively applied percussive blow b) electronarcosis followed by bleeding or, c) electrocution.*
- Fish should be regularly assessed for signs of consciousness after stunning (e.g. opercular eye movement) by *adequately trained personnel*. There should be a backup slaughter method to stun and humanely kill any fish that are alive and conscious after the initial stunning or slaughter method. ✔ (0.5 point)
 - *S 2.5 The following welfare outcomes relating to assessing the effectiveness of the stun must be carried out at the end of the*

- process and recorded: a) no eye movement b) no rhythmic opercular movement c) only mild short-term involuntary muscular twitches d) fish turn over and remain upside down e) no sign of fish attempting to swim.*
- *All staff involved with the stunning/killing process must have received full training to ensure they have the knowledge and skill to perform their task humanely and efficiently.*
 - *There must be a named person responsible for fish welfare throughout the killing process who has attended a recognised training course in humane killing of fish and who has the authority to stop the harvest if poor welfare for whatever reason is suspected.*
 - *A priest or secondary stunner must be available throughout the killing process to allow a percussive blow to be administered immediately in the event of a fish not being effectively stunned.*
- Time between stunning and slaughter should be minimized in order to reduce the risk of consciousness being recovered; time spent in crowding/pre-slaughter practices should be minimized where possible; time spent in transportation from the rearing facility to the slaughter facility should be minimized. ✓ (0.5 point)
 - *Crowding and handling prior to killing must be kept to an absolute minimum.*
 - *Feed withdrawal, when required for any situation, must not exceed a maximum of 54 degree days.*
 - *Whatever electrical process is used (batch, continuous flow etc.) it must be ensured that: a) insensibility of the fish is achieved immediately b) there are no pre-stun shocks c) the stun is maintained until the fish dies, or is insensible to percussive stunning.*
 - *Bleeding must follow within 10 seconds.*

Neglected Species Prohibitions

- ❖ Prohibits the certification of any form of octopus/cephalopod farming.
 - ✓ (1 point)
<https://www.rspca.org.uk/-/news-rspca-calls-for-halt-to-first-octopus-farm>
 - *“Octopus are highly advanced, complex and intelligent marine animals that tend to be solitary creatures. Their suitability to be farmed is highly questionable and there is also a significant gap in knowledge on how to properly care for these animals and meet their needs in a commercial setting. In addition, we are not aware of any humane*

slaughter methods for octopus that could be carried out on a commercial scale.”

- ❖ Prohibits the use of insects in aquafeed.
 - ❌ (1 point)
- ❖ Prohibits the certification of shrimp originating from eyestalk ablated broodstock.
 - ✅ (1 point)
 - During direct communications between Aquatic Life Institute and the RSPCA - developers of the higher welfare farm animal standards used by RSPCA Assured - Sean Black, their Senior Scientific Officer for Aquaculture, stated, "Whilst the RSPCA does not have any welfare standards for farmed shrimp, and therefore RSPCA Assured does not certify farmed shrimp in any capacity, the RSPCA is opposed to the mutilation of farm animals, including those used in aquaculture and, as such, is opposed to the practice of eyestalk ablation in shrimp farming." They allow us to utilize this quotation to satisfy the neglected species prohibition criteria requirement.

Additional Considerations

- Enforcement/Compliance:
 - *RSPCA Assured is the RSPCA's farm assurance and food labeling scheme. RSPCA Assured assesses and approves farms, hauliers and abattoirs that meet all of the applicable RSPCA welfare standards. (Please note that RSPCA Assured does not approve equipment).*
 - *Products from animals reared, transported and slaughtered under the RSPCA Assured scheme can be labeled with the scheme's food label: 'RSPCA Assured'. Use of the RSPCA Assured name and mark are strictly subject to RSPCA Assured membership, traceability, license fee and artwork approval.*
 - *Membership of the scheme is subject to an annual fee and successful assessment. Risk-based monitoring is also undertaken by RSPCA Assured assessors. RSPCA Assured is a charity in its own right and not for profit.*
- Adequate Employee Training:
 - *Examples of recognised courses include, the North Atlantic Fisheries College (NAFC) Fish Welfare Training Course and the Fish Vet Group (FVG) Fish Welfare Training Course, and the Benchmark Health and Welfare of Atlantic Salmon Course.*
 - *An adequate number of experienced staff must be available to deal sufficiently quickly with any problems that arise.*

- *Stock-keepers must be able to demonstrate their proficiency in procedures that have the potential to cause pain or distress including netting or other handling, crowding and euthanasia.*
 - *Stock-keepers must be able to recognise indicators of poor welfare in fish including abnormal behavior, physical injury and symptoms of disease.*
 - **Environmental Impacts:**
 - *The stock-keeper is responsible for providing the life support system for farmed fish and needs to maintain the highest environmental quality at all times.*
 - *The farm needs to be operated with respect for the natural environment and employees need to recognise their duty to care for the wider environment. All reasonable steps need to be taken to minimize the ecological impact of the farming system. Producers need to draw up an Environmental Impact Plan within two years of joining the scheme.*
 - *These standards are primarily aimed at the welfare of farmed fish. However, the potential for aquaculture to have wider environmental effects must also be considered. In addition to fully complying with all relevant legislation and recommendations, the farmer should demonstrably and positively review environmental protection policies as developments in research and technology allow. It is the responsibility of the management to ensure that all employees recognise their duty to care for the natural environment and monitor possible impacts on it.*
-

Naturland → Total Score = 8

Water Quality = 1

- Regulations for addressing water quality are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Ranges that enable optimal welfare conditions (and not merely tolerable conditions) are explicitly listed for at least: ✗ (0.5 point)
 - Dissolved oxygen
 - pH
 - Ammonia

- The ranges provided must be species-specific, lifestage specific, rearing system-specific (RAS, sea cage, flow-through, etc.), and based on the best available scientific evidence. ✓ (0.5 point)
 - *The water quality (e.g. temperature, pH, salinity, oxygen, ammonium and nitrate concentrations) must conform to the natural requirements of the species in question.*
- Site-specific water quality management plans must be in place and include effective monitoring practices and contingency plans in the event of an emergency (system failures, algal blooms, natural disasters, etc.). ✗ (0.5 point)

Stocking Density & Space Requirements = 2

- Regulations for addressing stocking density/space requirements are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Stocking density ranges and limits should be based on the best scientific evidence available for the species and lifestage being farmed, in addition to the type of rearing system being used (RAS, sea cage, flow-through, pond, etc.). ✓ (0.5 point)
- Numerical limits should be suggested for each species certified, adjusted when appropriate, and must consider additional, interrelated farming parameters (disease, stress, water quality, maintenance/operations, welfare indicators, environmental complexity etc.). ✓ (0.5 point)
 - *Carp (Cyprinus carpio among others) in ponds:*
 - *3.1 The stocking density shall not exceed the state that at least a 50% of fish yield is obtained via the natural feed availability. Only in the case that protein-rich feed (e.g. peas and beans) is administered, the maximum yield permitted is 1,200 kg carp per hectare of pond area per year.*
 - *3.2 Where carp and other species (e. g. pike, pike-perch, tench) are reared in polyculture, the total maximum yield of 1,500 kg per hectare per year applies.*
 - *Salmonidae:*
 - *3 Stocking density of salmon (Salmo salar) shall not exceed 10 kg fish/m³. The maximum stocking density of brook trout (Salvelinus fontinalis) and whitefish (Coregonus) is 15 kg/m³. The maximum stocking density of trout (Oncorhynchus, Trutta) and arctic charr (Salvelinus alpinus) is 20 kg/m³. Where salmonids are kept in net cages, the maximum stocking density is 10 kg/m³. In no case shall the animals display any injuries (e.g. to their fins) indicating too high stocking densities.*

- *Crustaceans:*
 - 5.3 A provisional maximum for stocking density of decapods (*Decapoda*)⁴⁵ shall be set 15 post larvae/m². The biomass in the ponds shall not exceed 1600 kg/ha.
 - 5.4 The following maximum stocking densities apply to the cultivation of noble crayfish (*Astacus astacus*): a. small crayfish (< 20 mm): 100/m² b. medium-sized crayfish (20 - 50 mm): 30/m² c. adult crayfish (> 50 mm): 5/m²
- *Tropical freshwater fishes (e.g. milkfish *Chanos chanos*, tilapia *Oreochromis sp.*, Siamese catfish *Pangasius sp.*) in ponds, flow-through systems and net cages:*
 - The stocking density may not exceed 10 kg/m³, this being the upper limit. The only exception to this rule is in the cultivation of tilapia (*Oreochromis sp.*) where a stocking density of 20 kg/m³ is permissible. In no case may the fish show evidence of injuries (e.g. to their fins) which would indicate excessive stocking density.
- *Perciformes (perch-like), Carangiformes (jacklike) and Gadiformes (cod-like) fish species in marine net cages:*
 - In the case of members of the species *Perciformes*, *Carangiformes* and *Gadiformes*, the stocking density shall not exceed 10 kg fish/m³. In no case shall the animals display any injuries (e.g. of the fins) indicating too high stocking densities.
- Stocking densities should not be set according to maximum production possible, but instead allow ample space where animals can engage in/express innate behaviors, and interact with their conspecifics appropriately. ✓ (0.5 point)
 - *The husbandry conditions must enable the animal to behave in a way natural to the species; this refers, in particular, to behavioral needs regarding movement, resting and feeding as well as social and reproduction habits. The husbandry systems shall be designed keeping all this in view*

Environmental Enrichment = 1

- Regulations for addressing environmental enrichments are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
- The scheme should commit to updating their standards for enrichment as new research on the behavioral motivations and needs of fish emerge. ✓ (0.5 point)

- *The farm should furthermore regularly check to see whether further positive effects with regard to animal welfare can be achieved by introducing structural elements (known as environmental enrichments) to enhance the existing husbandry systems (e. g. protective shelters, type of flooring, shade etc.).*
- Animals are provided with at least 1 physical stimulation. This can include but is not limited to: ✘ (0.5 point)
 - Interactive, submerged materials (ropes, artificial plants, debris) placed strategically throughout the animals' surroundings.
 - Arrangements, such as overhanging covers, that allow animals to hide from conspecifics or seek refuge from unfavorable conditions.
 - Water complexifications that could be achieved through dynamic flow rates, oscillating current directions, bubble curtains, etc.
- Animals are provided with at least 1 psychological stimulation. This can include but is not limited to: ✘ (0.5 point)
 - Stimulus using natural or artificial illumination patterns, at suitable intensities and colors, strategically placed to provide a variety of visual appearances within the holding facility.
 - Nutritional delivery that prevents adverse behavior (aggression, food monopolization, etc.) while providing some level of cognitive choice via submerged dispensing machines or in combination with substrate to promote foraging behavior (for some species/life stages).

Feed Composition = 2

- Regulations for addressing aquafeed composition are explicitly stated within a section/subsection of the farmed standards. ✔ (0.5 point)
- Provides a numerical limit for the amount of fishmeal and fish oil (FMFO) that is allowed in aquafeed according to the species/lifestage nutritional tolerance. *The formula used for this calculation should be explicitly described (e.g. FIFO).* ✔ (0.5 point)
 - *Maximum values for the use of fish meal/oil may be determined for specific species (ref. B. Supplementary Regulations for specific farming systems and animal species).*
 - *Carp:*
 - *Fish meal and fish oil is not permitted in the feed.*
 - *Crustaceans:*
 - *Efforts shall be made towards reducing the total doses of external feed, respectively, towards increasing the importance of natural feed production (phyto-, zooplankton) in the ponds. Therefore, careful documentation shall be kept by*

the farm operator, allowing to calculate the eFCR₄₆. Additionally, the fishmeal content as well as the total protein content of compound feed shall be reduced as far as possible in the case of decapods (Decapoda)⁴⁷. As provisional maximum levels shall be set: 20% for fishmeal/-oil content and 30% for total protein.

- *Tropical freshwater fishes:*
 - *The upper limit for the fish meal resp. fish oil content in feed has been determined at 10% for Pangasius.*
 - *It is not permissible to include fish meal or fish oil in the feed of Oreochromis.*
 - *The economic feed conversion ratio (eFCR) must be calculated and recorded in writing every year for every harvest cycle terminating within a calendar year. Naturland must be informed when any extraordinary deviations in the feed conversion ratios (critical value: 25% variance from the figure for the previous year) occur.*
- *Recommends that aquafeed contain plant-based alternative content according to species/lifestage nutritional tolerance. ✓ (0.5 point)*
 - *The proportion of animal feed components is to be replaced by vegetable products wherever nutritionally justifiable.*
- *Where FMFO is deemed necessary, it should be sourced from traceable offcuts and byproducts of human consumption, and verified sustainable wild fisheries. ✓ (0.5 point)*
 - *Special requirements are made as to the origin of fish meal/oil (ref. Appendix 1).*
 - *All feed originating from wild marine fauna has to be harvested in compliance with internationally established sustainability standards. Wherever possible, this shall be confirmed by producing proof of independent certification. The following sources are permitted:*
 - *Products from organic aquaculture*
 - *Fishmeal/-oil from trimmings of wild fish processed for human consumption*
 - *Fishmeal/-oil from by-catches of captures for human consumption.*
 - *The use of fishmeal/-oil from other sources may be applied for the sole purposes of safeguarding quality. Compliance with these special demands, as well as other requirements which are in general*

valid for feeds admitted by Naturland, will be confirmed by Naturland by a separate inspection and certification procedure.

Stunning and Slaughter = 1

- Regulations for addressing stunning and slaughter are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
 - *Slaughtering of fishes shall be carried out by means of incision of gills or immediate evisceration. Prior to this, fishes have to be stunned (by means of concussion, electrocution and, if need be, by natural plant anesthetics, tropical and subtropical fish and invertebrates also by using ice, provided that it is not otherwise specified for certain species in the Special Part).*
 - *Carp:*
 - *It is recommended that carp be stunned using a combination of electrical stunning followed by a blow to the head.*
- Effective stunning must render an animal immediately and fully unconscious (i.e. within one second by a scientifically validated method) in a manner that sustains unconsciousness until death. The use of ice slurry, CO₂, ammonia bath, salt, and other inhumane methods of stunning/slaughter must be explicitly prohibited. ✗ (0.5 point)
- Fish should be regularly assessed for signs of consciousness after stunning (e.g. opercular eye movement) by *adequately trained personnel*. There should be a backup slaughter method to stun and humanely kill any fish that are alive and conscious after the initial stunning or slaughter method. ✗ (0.5 point)
- Time between stunning and slaughter should be minimized in order to reduce the risk of consciousness being recovered; time spent in crowding/pre-slaughter practices should be minimized where possible; time spent in transportation from the rearing facility to the slaughter facility should be minimized. ✓ (0.5 point)
 - *Part B; I. 10. Transport, slaughtering and processing: “Catching, transport and slaughtering must be done quickly and humanely in order to spare the animals unnecessary suffering.”*
 - *Moreover, every producer has to fill out a slaughtering protocol that needs to be approved by our department. As part of this protocol, the producer has to describe the most important working steps including “, ... transport to caging facilities in tanks with or without water, transport to slaughtering facilities ... and*

duration of the individual steps” as well as details about the “number of fish that are stunned within one process” and the “period between stunning and killing”.

Neglected Species Prohibitions

- ❖ Prohibits the certification of any form of octopus/cephalopod farming.
 - ❌ (1 point)
- ❖ Prohibits the use of insects in aquafeed.
 - ❌ (1 point)
- ❖ Prohibits the certification of shrimp originating from eyestalk ablated broodstock.
 - ✅ (1 point)
 - *3.2 The manipulation of eyestalks (ligation, ablation, or similar measures), and the use of larvae which have been produced using this method, are prohibited.*

Additional Considerations

- Enforcement/Compliance:
 - *Standards will only endure and make a lasting impact if they can be clearly monitored and be put into consistent practice. Any decisions involved have to be seen to be made impartially and on neutral, unbiased terms. This is guaranteed by calling on the services of independent and autonomous committees - standards committee, inspection body and certification committee - as well as by the composition of the committees - consisting of diverse interest groups such as scientists, agriculturists and consumers. Independent inspection procedures and the consistent application of Naturland’s standards form the basis of the production of high quality products cultivated in a balance with nature and the environment. This quality is visibly documented by the Naturland logo.*
- Adequate Employee Training:
 - *The operation shall act responsibly towards the livestock, the staff shall be appropriately trained in the handling and care of the animals, and facilities and equipment are inspected at regular intervals.*
- Environmental Impacts:
 - *Organic agriculture is particularly committed to sustainable management. This includes the respectful treatment of nature and the environment, the sustainable use of natural resources, the acceptance of social responsibility and the maintenance of economic performance. The benefits derived from natural ecosystems and their economic*

performance must be maintained. Damage to ecosystems should be kept to a minimum. Biological diversity or biodiversity is to be maintained and fostered on farms to the best of the farmer's ability; this includes diversity of ecosystems, diversity of species and genetic diversity. Sites containing areas of high conservation value (HCV6) are subject to special safeguarding provisions. Water and soil are valuable natural commodities whose protection is of crucial importance and which must therefore be used carefully and sustainably. Energy should be used as efficiently as possible and renewable energy resources should be used for preference. Wherever waste is unavoidable, it should be disposed of in an eco-friendly manner or recycled. Organic residues should be re-used and preferably composted. Preference is to be given to procuring raw materials and goods from suppliers in close proximity.

Friend of the Sea → Total Score = 7.5

Water Quality = 1.5

- Regulations for addressing water quality are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Ranges that enable optimal welfare conditions (and not merely tolerable conditions) are explicitly listed for at least: ✗ (0.5 point)
 - Dissolved oxygen
 - pH
 - Ammonia
 - *Water-quality parameters should at all times be within the acceptable range that sustains normal activity and physiology for a given species.*
 - *These water quality parameters should include temperature, salinity, dissolved oxygen concentration, pH, ammonia and nitrite concentrations, and some index of solids concentration, i.e. transparency, turbidity or total suspended solids concentration, and shall be measured regularly, as determined by culture system type and stocking density.*
- The ranges provided must be species-specific, lifestage specific, rearing system-specific (RAS, sea cage, flow-through, etc.), and based on the best available scientific evidence. ✓ (0.5 point)
 - *Example: Specific requirements for Sparus aurata: Optimum temperature range is between 11 - 30° C.*

- Site-specific water quality management plans must be in place and include effective monitoring practices and contingency plans in the event of an emergency (system failures, algal blooms, natural disasters, etc.). ✓ (0.5 point)
 - *2.1 → A contingency plan must exist to correct water quality parameters when they deviate from reference values. (Important)*
 - *The auditor shall ensure that water quality parameters within production units are routinely measured and fall within the tolerance range. Regular monitoring as part of good husbandry practices should be carried out and a contingency plan should be in place to allow corrective measures i.e. removal and replacement of culture water, addition of oxygen etc. should be taken if levels should fall outside acceptable ranges/reference values.*

Stocking Density and Space Requirements = 1

- Regulations for addressing stocking density/space requirements are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Stocking density ranges and limits should be based on the best scientific evidence available for the species and life stage being farmed, in addition to the type of rearing system being used (RAS, sea cage, flow-through, pond, etc.). ✗ (0.5 point)
- Numerical limits should be suggested for each species certified, adjusted when appropriate, and must consider additional, interrelated farming parameters (disease, stress, water quality, maintenance/operations, welfare indicators, environmental complexity, etc.). ✓ (0.5 point)
 - *1.1 → Production units should provide horizontal and vertical withdrawal space, optimizing fish welfare conditions regarding spatial constraints.*
 - *13.2 → Stocking density should be monitored in relation to fish health and behavior indicators (see Section 12 Welfare Assessment). Limit stocking to 20 kg/m³ max (for *Sparus aurata* specifically). Water quality must be monitored frequently and on demand.*
- Stocking densities should not be set according to maximum production possible, but instead allow ample space where animals can engage in/express innate behaviors and interact with their conspecifics appropriately. ✗ (0.5 point)

Environmental Enrichment = 0.5

- Regulations for addressing environmental enrichments are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
- The scheme should commit to updating its standards for enrichment as new research on the behavioral motivations and needs of fish emerge. ✗ (0.5 point)
- Animals are provided with at least 1 physical stimulation. This can include but is not limited to: ✗ (0.5 point)
 - Interactive, submerged materials (ropes, artificial plants, debris) placed strategically throughout the animals' surroundings.
 - Arrangements, such as overhanging covers, that allow animals to hide from conspecifics or seek refuge from unfavorable conditions.
 - Water complexifications that could be achieved through dynamic flow rates, oscillating current directions, bubble curtains, etc.
- Animals are provided with at least 1 psychological stimulation. This can include but is not limited to: ✗ (0.5 point)
 - Stimulus using natural or artificial illumination patterns at suitable intensities and colors strategically placed to provide a variety of visual appearances within the holding facility.
 - Nutritional delivery that prevents adverse behavior (aggression, food monopolization, etc.) while providing some level of cognitive choice via submerged dispensing machines or in combination with substrate to promote foraging behavior (for some species/life stages).

Feed Composition = 0.5

- Regulations for addressing aquafeed composition are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
- Provides a numerical limit for the amount of fishmeal and fish oil (FMFO) allowed in aquafeed according to the species/life-stage nutritional tolerance. *The formula used for this calculation should be explicitly described (e.g., FIFO).* ✗ (0.5 point)
- Recommends that aquafeed contain plant-based alternative content according to species/life-stage nutritional tolerance. ✗ (0.5 point)
- Where FMFO is deemed necessary, it should be sourced from traceable offcuts and byproducts of human consumption and verified sustainable wild fisheries. ✗ (0.5 point)

Stunning and Slaughter = 2

- Regulations for addressing stunning and slaughter are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)

- Effective stunning must render an animal immediately and fully unconscious (i.e., within one second by a scientifically validated method) in a manner that sustains unconsciousness until death. The use of ice slurry, CO₂, ammonia bath, salt, and other inhumane methods of stunning/slaughter must be explicitly prohibited. ✓ (0.5 point)
 - *The only permitted stunning and subsequent killing methods are: a) an effectively applied percussive blow, b) electronarcosis followed by bleeding, asphyxia or other slaughter method that must be applied while the fish unconscious, c) electrocution (i.e. killing by electrical current).*
- Fish should be regularly assessed for signs of consciousness after stunning (e.g., opercular eye movement) by *adequately trained personnel*. There should be a backup slaughter method to stun and humanely kill any fish that are alive and conscious after the initial stunning or slaughter method. ✓ (0.5 point)
 - *Stunning should be sufficient to render fish unconscious rapidly, as indicated by lack of opercular movement or other indicators. The auditor must verify that only permitted stunning and slaughter methods are used.*
 - *It is important to observe fish immediately after stunning. In a properly stunned fish, a reflex shudder or tail flap will usually occur for a few seconds after stunning.*
 - *14.3 A backup system e.g. 'priest' must be available throughout the killing process.*
 - *14.6 All staff involved with the stunning and killing process must have received full training.*
 - *The auditor must verify that each person involved in killing is aware of the importance of good killing practice, i.e. to rapidly and effectively apply stunning and slaughter in order to minimize stress and that they have received full training.*
 - *14.7 There must be a named person responsible for fish welfare throughout the killing process. This person is responsible for harvest records including stunning and slaughtering efficiency.*
- Time between stunning and slaughter should be minimized to reduce the risk of consciousness being recovered; time spent in crowding/pre-slaughter practices should be minimized where possible; time spent in transportation from the rearing facility to the slaughter facility should be minimized. ✓ (0.5 point)
 - *8.1 Transport must be planned in order to minimize possible adverse effects on fish welfare. Transport on land: max 8h.*
 - *9.2 The period during which fish are deprived of food to achieve gut clearance prior to certain procedures or harvesting must be*

appropriate and as minimal as possible. Unless justified, this must always be < 50-degree days.

- *10.3 The frequency and duration of crowding should be kept to the minimum and clearly justified. The period for fish crowding on any occasion must not exceed 1.5 hours for grading or treatments and 2 hours for harvest.*
- *Chapter 7.3 of the OIE Aquatic Animal Health Code (2019) provides detailed guidance on welfare aspects of stunning and killing of farmed fish for human consumption.*

Neglected Species Prohibitions

- ❖ Prohibits the certification of any form of octopus/cephalopod farming.
 - (1 point)
 - During direct conversations between Aquatic Life Institute and Friend of the Sea, they stated, "Friend of the Sea prohibits the certification of any form of octopus/cephalopod farming." Friend of the Sea allows us to utilize this quotation to satisfy the neglected species prohibition criteria requirement.
- ❖ Prohibits the use of insects in aquafeed.
 - (1 point)
- ❖ Prohibits the certification of shrimp originating from eyestalk-ablated broodstock.
 - (1 point)
 - During direct conversations between Aquatic Life Institute and Friend of the Sea, their team stated, "Friend of the Sea prohibits the certification of shrimp originating from eyestalk ablated broodstock." Friend of the Sea allows us to utilize this quotation to satisfy the neglected species prohibition criteria requirement.

Additional Considerations

- Enforcement/Compliance:
 - *The purpose of this document is to provide guidance on the FOS standards for Certification Bodies (CBs) for auditors, to ensure consistent interpretation and application across countries and CBs, hence improving the efficiency of the assessment process. This Audit Guidance document provides this guidance through: 1- Description of how to interpret the principles and criteria from the FOS standards. 2- Audit instructions to verify compliance through indicators. 3- Information relating to exceptional situations. 4- Objective criteria for critical limits. 5- Instructions to complete the audit report. A brief explanation is given for each*

criterion, together with the description of indicators and list of documentation to collect and attach to the report.

- Adequate Employee Training:
 - *Welfare assessment can be carried out with the observation of operational welfare indicators that can be measured by farm personnel trained to recognise normal and abnormal behaviors, indicators of physical health, variations in water quality etc.*
- Environmental Impacts:
 - *Friend of the Sea's Sustainable Aquaculture Certification criteria require:*
 - *No impact on critical habitat (mangroves, wetlands, etc.)*
 - *Compliance with water quality parameters*
 - *Reduction of escapes to negligible levels*
 - *No use of harmful antifouling nor growth hormones*
 - *Compliance with social accountability*
 - *Reduction of carbon footprint*

GLOBALG.A.P. → Total Score = 7

Water Quality = 1

- Regulations for addressing water quality are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Ranges that enable optimal welfare conditions (and not merely tolerable conditions) are explicitly listed for at least: ✗ (0.5 point)
 - Dissolved oxygen
 - pH
 - Ammonia
- The ranges provided must be species-specific, lifestage specific, rearing system-specific (RAS, sea cage, flow-through, etc.), and based on the best available scientific evidence. ✗ (0.5 point)
- Site-specific water quality management plans must be in place and include effective monitoring practices and contingency plans in the event of an emergency (system failures, algal blooms, natural disasters, etc.). ✓ (0.5 point)
 - *AQ 20.02.18 The farm/hatchery/transport and holding facilities have a routine water quality monitoring and control program based on a risk assessment and taking into account potential contamination, farmed aquatic species health and welfare, and the production system.*

- *The farm shall have in place a monitoring and control program based on a risk assessment for water quality to ensure that the health and welfare of the farmed aquatic species is not compromised. The risk assessment shall include relevant water quality parameters, fluctuations, and sampling points such as temperature, dissolved oxygen, carbon dioxide, dissolved nitrogen, pH, ammonia, nitrate, nitrite, suspended solids, and microbiological parameters, among others identified in the risk assessment as necessary. Records for each site shall be in place. Frequency shall be related to the aquaculture system used and shall be established by the risk assessment. Major Must.*

Stocking Density and Space Requirements = 1.5

- Regulations for addressing stocking density/space requirements are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Stocking density ranges and limits should be based on the best scientific evidence available for the species and lifestage being farmed, in addition to the type of rearing system being used (RAS, sea cage, flow-through, pond, etc.). ✓ (0.5 point)
 - *AQ 20.02.13 A density shall be established in relation to farmed aquatic species' size, production stage, environment, and production system. The farm shall show that limits are based on scientific evidence or industry best practices regarding health and welfare and food safety. Major Must.*
- Numerical limits should be suggested for each species certified, adjusted when appropriate, and must consider additional, interrelated farming parameters (disease, stress, water quality, maintenance/operations, welfare indicators, environmental complexity, etc.). ✗ (0.5 point)
- Stocking densities should not be set according to maximum production possible, but instead allow ample space where animals can engage in/express innate behaviors and interact with their conspecifics appropriately. ✓ (0.5 point)
 - *AQ 20.02.13 Density limits shall not be set as an average for the system or as production cycle average. Set densities shall not be exceeded. Stocking densities shall be calculated, and records shall be in place. Major Must.*

Environmental Enrichment = 1

- Regulations for addressing environmental enrichments are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)

- *AQ 20.02.15 The producer considers enhancing the rearing conditions to improve performance and animal welfare of the farmed aquatic species. Based on the increased understanding of the husbandry of farmed aquatic species, consideration shall be given to better meeting physiological and behavioral needs, e.g. through environmental enrichments. Efforts shall be made to give farmed aquatic species an environment which is suitable to their needs. For instance, considerations shall be given to social, structural, sensory, and dietary enrichments.*
- The scheme should commit to updating its standards for enrichment as new research on the behavioral motivations and needs of fish emerge. ✓ (0.5 point)
 - *Minor Must (previously Recommended)*
- Animals are provided with at least 1 physical stimulation. This can include but is not limited to: ✗ (0.5 point)
 - Interactive, submerged materials (ropes, artificial plants, debris) placed strategically throughout the animals' surroundings.
 - Arrangements, such as overhanging covers, that allow animals to hide from conspecifics or seek refuge from unfavorable conditions.
 - Water complexifications that could be achieved through dynamic flow rates, oscillating current directions, bubble curtains, etc.
- Animals are provided with at least 1 psychological stimulation. This can include but is not limited to: ✗ (0.5 point)
 - Stimulus using natural or artificial illumination patterns at suitable intensities and colors strategically placed to provide a variety of visual appearances within the holding facility.
 - Nutritional delivery that prevents adverse behavior (aggression, food monopolization, etc.) while providing some level of cognitive choice via submerged dispensing machines or in combination with substrate to promote foraging behavior (for some species/life stages).

Feed Composition = 1.5

- Regulations for addressing aquafeed composition are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
- Provides a numerical limit for the amount of fishmeal and fish oil (FMFO) allowed in aquafeed according to the species/life-stage nutritional tolerance. *The formula used for this calculation should be explicitly described (e.g., FIFO).* ✗ (0.5 point)
- Recommends aquafeed contain plant-based alternative content according to species/life-stage nutritional tolerance. ✓ (0.5 point)

- *While the aquaculture industry is expected to grow in the future, reliance on forage fish use in feed should not. Sustainable sourcing, efficient use of marine ingredients, and the use of alternatives to forage fish are fundamental steps to reducing and eliminating detrimental effects in the marine ecosystem. Refer to the GLOBALG.A.P. Compound Feed Manufacturing Standard.*
- Where FMFO is deemed necessary, it should be sourced from traceable offcuts and byproducts of human consumption and verified sustainable wild fisheries.
 - ✓ (0.5 point)
 - *AQ 22.01.02 Compound feed used on the farm, for both targeted species and cohabitant species, has been manufactured by and obtained from a recognized source. The compound feed manufacturing production locations from which the feed is sourced, shall be certified against at least one of the following:*
 - *GLOBALG.A.P. CFM standard*
 - *A standard that has been successfully benchmarked against the GLOBALG.A.P. standard*
 - *A feed safety scheme accredited to either ISO/IEC Guide 17065 or ISO/IEC 17021*
 - *AQ 22.02.03 Farms obtain from their feed suppliers a declaration that the composition of each feed conforms to the GLOBALG.A.P. requirements on fishmeal and fish oil. Statements specifying conformance shall be in place. The compound feed supplier shall provide information on the fishmeal and fish oil composition upon request, including fishmeal and fish oil percentage and , where possible, origin.*
 - *Farms shall have in place a fish in/fish out ratio (whole fish from wild fish).*
 - *The self assessment/internal audit and certification body audit reports shall have at least two values recorded: average fishmeal and fish oil percentage and the fish in/fish out ratio.*
 - *Major Must*

Stunning and Slaughter = 1

- Regulations for addressing stunning and slaughter are explicitly stated within a section/subsection of the farmed standards. ✓ (0.5 point)
- Effective stunning must render an animal immediately and fully unconscious (i.e., within one second by a scientifically validated method) in a manner that sustains unconsciousness until death. The use of ice slurry, CO₂, ammonia

bath, salt, and other inhumane methods of stunning/slaughter must be explicitly prohibited. ✓ (0.5 point)

- *AQ 26.01.04 Farmed aquatic species are effectively stunned with consideration of farmed aquatic species welfare.*
- *Farmed aquatic species shall be stunned using an effective stunning method and immediately become unconscious. Monitoring procedures shall be in place.*
- *Monitoring procedures shall include manufacturer guidance, where applicable, and effectiveness of the stunner. Refer to “Aquatic animal health code”, section “Stunning and killing methods” of the World Organization for Animal Health (www.woah.org).*
- *If technology is available for a particular species and proven to be effective, the use of ice slurry or asphyxia shall be phased out.*
- Fish should be regularly assessed for signs of consciousness after stunning (e.g., opercular eye movement) by *adequately trained personnel*. There should be a backup slaughter method to stun and humanely kill any fish that are alive and conscious after the initial stunning or slaughter method. ✗ (0.5 point)
- Time between stunning and slaughter should be minimized to reduce the risk of consciousness being recovered; time spent in crowding/pre-slaughter practices should be minimized where possible; time spent in transportation from the rearing facility to the slaughter facility should be minimized. ✗ (0.5 point)

Neglected Species Prohibitions

- ❖ Prohibits the certification of any form of octopus/cephalopod farming.
 - ✗ (1 point)
- ❖ Prohibits the use of insects in aquafeed.
 - ✗ (1 point)
- ❖ Prohibits the certification of shrimp originating from eyestalk-ablated broodstock.
 - ✓ (1 point)
 - *AQ 18.01.05 Specific to shrimp farming: all larvae sourced either internally or externally originate only from shrimp females without eyestalk ablation.*
 - *Evidence in the shrimp supply chain shall identify larval origin with regard to eyestalk ablation. Examples of evidence can be supplier statements or photos, but preferably videos.*

- *A plan shall be in place to source only larvae originating from shrimp females without ablation (or any other type of physically invasive method for inducing breeding) not later than April 2024.*

Additional Considerations

➤ Enforcement/Compliance:

□ *AQ 02: Internal Documentation*

- *Site records demonstrate compliance with the standard for the last three months.*
- *Effective corrective actions are taken to address non-conformances detected during the self-assessments/internal audits.*
- *A continuous improvement plan is documented.*
- *There is evidence that a continuous improvement plan is implemented.*

➤ Adequate Employee Training:

- *AQ 04.02.04 Workers directly responsible for handling farmed aquatic species receive species-specific training in health, welfare, and handling techniques.*

- *Workers shall be able to demonstrate competence at interview.*

Training records and certificates for each worker shall be in place and available for the certification body audit. Workers shall be able to demonstrate appropriate handling techniques and identify indicators of poor welfare, including but not limited to: signs of diseases, parasites, physical damage, behavioral abnormalities, morphological abnormalities, visual indicators of poor water quality, altered production parameters. As a minimum, training shall take place every five years.

➤ Environmental Impacts:

- *Environmental and biodiversity management: This section is intended to ensure good practices with regard to the management and protection of the direct environment and natural resources. Farms shall be built and managed in a way that both responsibly addresses environmental and ecological aspects and conserves biodiversity and existing ecosystem functions while recognizing that other land uses, people, and species depend upon these same ecosystems.*

Best Aquaculture Practices (BAP) → Total Score = 3.5

Water Quality = 1

- Regulations for addressing water quality are explicitly stated within a section/subsection of the farmed standards. (0.5 point) ✓
- Ranges that enable optimal welfare conditions (and not merely tolerable conditions) are explicitly listed for at least: ✗ (0.5 point)
 - Dissolved oxygen
 - pH
 - Ammonia
- The ranges provided must be species-specific, lifestage specific, rearing system-specific (RAS, sea cage, flow-through, etc.), and based on the best available scientific evidence. ✗ (0.5 point)
- Site-specific water quality management plans must be in place and include effective monitoring practices and contingency plans in the event of an emergency (system failures, algal blooms, natural disasters, etc.). ✓ (0.5 point)
 - *Although farms are required to measure the water quality of effluents, regular measurement of water quality to demonstrate that conditions are suitable for good production performance is also required. These are the same water quality variables that are normally measured as part of good husbandry practices. In each production unit, temperature, salinity, dissolved oxygen concentration, pH, ammonia and nitrite concentrations, and some index of solids concentration – transparency, turbidity or total suspended solids concentration – shall be measured regularly, as determined by culture system type and production system intensity (i.e. stocking density). For finfish and crustacean species grown in flowing, tidal or turbulent water, current speed should be measured and not exceed limits defined by species and life stage. Fish should never be forced to the downstream end of the culture unit by water flow during the grow-out period. Farms should have contingency plans and/or alarms in place in the event of system failure, including having staff on-call to respond to water quality emergencies.*

Stocking Density and Space Requirements = 0

- Regulations for addressing stocking density/space requirements are explicitly stated within a section/subsection of the farmed standards. ✗ (0.5 point)

- Stocking density ranges and limits should be based on the best scientific evidence available for the species and lifestage being farmed, in addition to the type of rearing system being used (RAS, sea cage, flow-through, pond, etc.). ✘ (0.5 point)
- Numerical limits should be suggested for each species certified, adjusted when appropriate, and must consider additional, interrelated farming parameters (disease, stress, water quality, maintenance/operations, welfare indicators, environmental complexity, etc.). ✘ (0.5 point)
- Stocking densities should not be set according to maximum production possible, but instead allow ample space where animals can engage in/express innate behaviors and interact with their conspecifics appropriately. ✘ (0.5 point)

Environmental Enrichment = 0

- Regulations for addressing environmental enrichments are explicitly stated within a section/subsection of the farmed standards. ✘ (0.5 point)
- The scheme should commit to updating its standards for enrichment as new research on the behavioral motivations and needs of fish emerge. ✘ (0.5 point)
- Animals are provided with at least 1 physical stimulation. This can include but is not limited to: ✘ (0.5 point)
 - Interactive, submerged materials (ropes, artificial plants, debris) placed strategically throughout the animals' surroundings.
 - Arrangements, such as overhanging covers, that allow animals to hide from conspecifics or seek refuge from unfavorable conditions.
 - Water complexifications that could be achieved through dynamic flow rates, oscillating current directions, bubble curtains, etc.
- Animals are provided with at least 1 psychological stimulation. This can include but is not limited to: ✘ (0.5 point)
 - Stimulus using natural or artificial illumination patterns at suitable intensities and colors strategically placed to provide a variety of visual appearances within the holding facility.
 - Nutritional delivery that prevents adverse behavior (aggression, food monopolization, etc.) while providing some level of cognitive choice via submerged dispensing machines or in combination with substrate to promote foraging behavior (for some species/life stages).

Feed Composition = 1.5

- Regulations for addressing aquafeed composition are explicitly stated within a section/subsection of the farmed standards. ✔ (0.5 point)

- Provides a numerical limit for the amount of fishmeal and fish oil (FMFO) allowed in aquafeed according to the species/life-stage nutritional tolerance. *The formula used for this calculation should be explicitly described (e.g., FIFO).*
 - ✓ (0.5 point)
 - *3.40 The farm shall calculate and record a final Fish-in Fish-out (FIFO) ratio and Forage Fish Dependency Ratio (FFDR) value for all completed crops in a calendar year.*
 - *3.41 Depending on the species farmed, the FIFO shall not exceed the following values:*
 - *Whiteleg shrimp (Litopenaeus vannamei) – 1.0*
 - *Black tiger shrimp (Penaeus monodon) – 1.2*
 - *Tilapia – 0.5*
 - *Pangasius catfish – 0.3*
 - *Channel catfish – 0.3*
 - *Rainbow trout – 1.2 (note: does not include steelhead salmon raised in sea cages).*
 - *Atlantic salmon – 1.4 (note: in recirculating systems only).*
 - *3.42 For species not named in 3.41, the FIFO shall not exceed 4, or 5 if fish processing byproducts are included in the feed.*
 - *FIFO and FFDR Calculation: Aquaculture producers should strive to use marine feed ingredients efficiently, relative to current industry standards, as well as in the global context of livestock feeds and the different species and system intensity combinations. The fish-in fish-out (FIFO) ratio and forage fish dependency ratio (FFDR) are two related indices of the ecological efficiency of fishmeal and fish oil use in an aquaculture system. In short, FIFO considers fishmeal and fish oil together and FFDR considers fishmeal and fish oil separately. Many aquaculture feeds incorporate only small amounts of fishmeal and fish oil and farms that use these feeds can have FIFO and FFDR values less than 1, indicating that they make a net contribution to global fish supplies. Farms shall obtain the percent fishmeal and fish oil in feeds from feed manufacturers or suppliers. The inclusion levels in feeds shall include any meal or oil derived from whole, wild-caught fish, squid, krill, mollusks or any other wild aquatic animals. However, they shall exclude meal or oil derived from by-products such as trimmings, offal and their derivatives such as squid liver powder, aquaculture by-products such as shrimp head meal and ingredients derived from invasive aquatic species. The quantity of each feed type used, along with the fishmeal and fish oil content of each feed shall be recorded in the audit report. For calculation of FIFO and*

FFDR, in the absence of better, specific data from feed suppliers, the industrial processing yields from the reduction of wet, whole, forage fish to fishmeal is assumed to be 22.5% and for forage fish to fish oil is assumed to be 4.8%. However, feed mills should supply farmers with more precise estimates if the default values are not valid in specific cases, with appropriate documentation from suppliers of fishmeal and fish oil. The feed fish inclusion factor (FFIF) estimates the combined fishmeal and fish oil concentration of the feed on a dry weight basis, relative to the wild fish, and is calculated as follows: $\text{Feed fish inclusion factor} = (\text{Percent fishmeal in feed} + \text{Percent fish oil in feed}) / (22.5 + 4.8)$ Using the resulting value for FFIF, farms shall calculate and record a final yearly FIFO ratio as follows: $\text{Fish-in fish-out ratio} = \text{Feed fish inclusion factor} \times \text{Feed Conversion Ratio}$ Calculation of the FFDR separately compares the amount of fishmeal and fish oil provided in feed to the production system with the wet weight amount of fish produced and then uses the greater of these two values as the total FFDR for the system. In cases where aquatic animals are provided with feed of relatively high protein and lipid to meet requirements, fish oil derived from forage fish is more limiting than fishmeal. In that case, the FFDR for fish oil is reported. Farms shall calculate and record a final production cycle FFDR as follows: $\text{FFDR}_{\text{fishmeal}} = (\text{Percent fishmeal in feed} \times \text{Feed Conversion Ratio}) / 22.5$ $\text{FFDR}_{\text{fish oil}} = (\text{Percent fish oil in feed} \times \text{Feed Conversion Ratio}) / 4.8$ $\text{FFDR} = \text{The greater of } \text{FFDR}_{\text{fishmeal}} \text{ or } \text{FFDR}_{\text{fish oil}}$ Metric standards for FIFO for production of some key aquaculture species have been set based on available industry data and used to reward efficient operations within those sectors with certification. For farms producing novel or uncommon species (particularly higher trophic level marine fish species), insufficient or unreliable data limits the potential to set a species-specific standard at this time. However, given the limited availability of marine ingredient resources for aquafeeds, there is a need to set a global maximum limit for “responsible” products in the market. For this reason, an absolute maximum FIFO for BAP certification has been set at four where byproducts are excluded and five if byproducts are included in the FIFO calculation. Auditors must collect data during audits that shall be used in the future to establish metric standards for other species.

- Recommends aquafeed contain plant-based alternative content according to species/life-stage nutritional tolerance. ❌ (0.5 point)
- Where FMFO is deemed necessary, it should be sourced from traceable offcuts and byproducts of human consumption and verified sustainable wild fisheries. ✅ (0.5 point)
 - *3.43 The farm shall obtain feed either from a BAP-certified feed mill or from a feed mill that provides declarations that it complies with BAP Feed Mill standards regarding: · The recording of species and fishery origins of each batch of fishmeal and fish oil, and; · Having a written Plan of Action defining policies for responsibly sourcing fishmeal and fish oil from reduction fisheries and setting clear goals for responsibly sourcing soy ingredients.*

Stunning and Slaughter = 1

- Regulations for addressing stunning and slaughter are explicitly stated within a section/subsection of the farmed standards. ✅ (0.5 point)
- Effective stunning must render an animal immediately and fully unconscious (i.e., within one second by a scientifically validated method) in a manner that sustains unconsciousness until death. The use of ice slurry, CO₂, ammonia bath, salt, and other inhumane methods of stunning/slaughter must be explicitly prohibited. ✅(0.5 point)
 - *Chapter 7.3 of the OIE Aquatic Animal Health Code provides detailed guidance on welfare aspects of stunning and killing of farmed fish for human consumption. If aquatic animals are processed on-farm, the choice of stunning and killing methods should be appropriate for the species and life stage. Stunning should be sufficient to render fish unconscious rapidly, as indicated by lack of opercular movement or other indicators. The following methods are considered humane: percussive or mechanical stunning, including spiking or pithing, and electrical stunning and killing in water. The following methods are not allowed for killing fish: carbon dioxide (CO₂) in holding water, chilling with ice and CO₂ in holding water, salt or ammonia baths, asphyxiation by removal from water (anoxia) and exsanguination without stunning.*
- Fish should be regularly assessed for signs of consciousness after stunning (e.g., opercular eye movement) by *adequately trained personnel*. There should be a backup slaughter method to stun and humanely kill any fish that are alive and conscious after the initial stunning or slaughter method. ❌ (0.5 point)

- Time between stunning and slaughter should be minimized to reduce the risk of consciousness being recovered; time spent in crowding/pre-slaughter practices should be minimized where possible; time spent in transportation from the rearing facility to the slaughter facility should be minimized. ✖ (0.5 point)

Neglected Species Prohibitions

- ❖ Prohibits the certification of any form of octopus/cephalopod farming.
 - ✖ (1 point)
- ❖ Prohibits the use of insects in aquafeed.
 - ✖ (1 point)
- ❖ Prohibits the certification of shrimp originating from eyestalk-ablated broodstock.
 - ✖ (1 point)

Additional Considerations

- Enforcement/Compliance:

- *The auditor shall present his/her findings and review all non-conformities that have been identified during the assessment but shall not make comment on the likely outcome of the assessment. A written summary of the non-conformities discussed at the closing meeting shall be agreed upon and signatures from the farm representative obtained. A copy of the non-conformity report must be left with the farm prior to the auditor departing the farm. The farm shall provide the CB, in accordance with GSA/BAP certification management rules, suitable and adequate objective evidence that corrective action has been implemented to rectify the non-conformity. This evidence shall also address root cause and future prevention. The evidence will be reviewed, and the CB will respond either confirming closure of the non-conformity or requesting further evidence. The farm must submit evidence to the CB to close out all non-conformities within 35 calendar days from the day following the end of the audit. Failure to close out non-conformities in the given timeframe will result in certification not being granted or continued, and facilities will be required to re-apply for a full assessment for certification.*
- *The auditor will provide a full report of the assessment, including the details of any non-conformities issued. The auditor will submit the report to the CB. The report shall include brief statements of objective evidence of both conformity and nonconformity. The report shall follow the format specified by the GSA/BAP. The report shall be issued in*

accordance with the GSA/BAP Report Guidelines. Within the audit report there shall be a record of the duration of the assessment (expressed as hours) and any reason for the lengthening or shortening of the duration from that which is typical.

- The audit report along with the corrective actions submitted by the farm will be evaluated by a Certification Committee of the CB, who will make the final certification decision post closure of all non-conformities. The timelines for audit, closure of non-conformities, technical review and certification decision are as specified in the GSA/BAP CB Requirements Document PI - Policy - BAP CB Requirements Document - Issue 14.8 - 18-September-2020.pdf (bapcertification.org) available on the BAP website. To achieve certification to the BAP Farm Standard, the applicant farm must meet all of the requirements of the Standard.*
- **Adequate Employee Training:**
 - Farm workers shall be trained in their roles and responsibilities in maintaining the welfare of farmed aquatic animals. Farm managers are responsible for providing training to workers about 1) evaluation of welfare indicators, including normal and abnormal behavior, signs of poor welfare and expected diseases, 2) water quality management and aquatic animal husbandry, 3) aquatic animal handling procedures (crowding, disease treatment, transfers, loading for transport), and 4) humane euthanasia methods. Training logs should be maintained by the farm to indicate worker training activities.*
- **Environmental Impacts:**
 - The BAP Environmental Responsibility pillar includes audit clauses that are specific to manage what are identified and considered to be the most important environmental impacts. However, every farm and the environment in which it is embedded is different. Environmental impacts and their management will vary with type of production system (e.g. ponds, net pens, flow-through systems, RAS), production system intensity and, to a lesser extent, species farmed. Thus, management plans should be flexible and responsive to address the impacts identified for a particular farm. Some of the potential issues that may be considered in an Environmental Impact Assessment and Management Plan may include: • Location of farm with respect to wetlands or sensitive habitats • Quality of waters receiving farm wastes • Salinization of local areas near farm • Environmental capacity of water bodies receiving farm wastes • Characteristics of sediments beneath net pens • Use of chemicals and drugs • Disease transmission between wild and farmed fish • Disposal of mortalities • Use of*

non-native species · Escapes from culture systems · Impacts on biodiversity, especially threatened and endangered species · Conflicts with other resource users · Impacts on cultural and recreational resources · Resource use (i.e., water, land, energy, feed ingredients)

Every BAP-certified farm should conduct an assessment that identifies the impacts from construction and operation of the farm to the surrounding environment. The identification and assessment of the type, magnitude and extent of environmental impacts is the first step in developing options for impact management. The Environmental Impact Assessment need not be formal or conducted by an independent third party. Some farms may be required to conduct a formal Environmental Impact Assessment by government regulatory agencies as a condition of permitting. Although aquaculture production has global-scale environmental impacts, the main focus of the Environmental Impact Assessment and Management Plan should be on local- to regional-scale impacts. The emphasis should be on impacts and management during farm operation, although impacts of farm construction should also be considered for new farms. Stakeholder consultation during and communication after the environmental impact assessment process is strongly encouraged. The farm should develop an Environmental Management Plan that describes procedures to monitor and control farm impacts and provide evidence that the plan is operational and effective. The Environmental Management Plan should include the following elements:

- Description of an environmental quality baseline based upon available science that indicates the sensitivity of the environment to the impacts identified.*
- Identification of significant but easily identifiable impacts and environmental issues of concern at the production site with an estimation or prediction of the magnitude, spatial extent, duration and frequency of occurrence of each impact.*
- Impacts to any nearby ecologically sensitive areas (e.g., freshwater and marine wetlands, mangrove forests, seagrass beds, coral reefs, salt marshes, tidal flats) should also be identified. The significance of each impact should be evaluated and assessed. For significant, high-risk, or irreversible impacts, a more comprehensive impact assessment should be conducted.*
- Identification and quantification of inputs and outputs of production, emissions to water, and resource use (land, water, fishmeal, etc.). The contribution of inputs, outputs, emissions and resource use to eutrophication, water stress, and resource depletion should be estimated using appropriate methods.*
- For each impact identified, a description of actions that will be taken to reduce, mitigate or manage the impact.*
- Description of the environmental monitoring and*

reporting system that will be followed. • Specification of the time interval between internal reviews of the risk assessment and management plan. An environmental manual should be compiled that includes the documents and standard operating procedures used to address each environmental impact. Each section should describe the procedures for management of each impact. Include training materials for workers. A team to implement the management plan should be organized. An employee or worker responsible for implementation of the plan should be identified and other responsibilities assigned as appropriate. Regular internal meetings should be held to assess the current situation and such meetings should be documented, with document review by auditors.

Discussion

The significance of animal welfare in business practices has been heightened by the emphasis on sustainable development. Consumers are increasingly interested in product origin and are opting for socially and environmentally responsible supply chains. Consequently, companies are reviewing their methods and embracing more ethical sourcing practices. This shift in consumer behavior has led businesses to rely on trust and credibility, making the timely adoption of sustainable practices even more crucial.

Aquatic Life Institute (ALI) introduced our Corporate Initiative in early 2023 to support large-scale buyers in integrating aquatic animal welfare into their procurement policies. ALI provides tailored consultancy services through this program, collaborating closely with companies to assess and enhance existing animal welfare policies for their seafood products.

Through collaborative, thorough evaluations, we help identify improvement areas and establish feasible targets that align with their values and sustainability goals. ALI develops comprehensive implementation plans that prioritize measurable accountability, enabling companies to track their progress, identify achievements, and address any challenges that may arise. Our role extends beyond policy review; we assist companies in effectively communicating their animal welfare objectives and commitments to both internal teams and external stakeholders. Transparent and compelling communication helps build consumer trust and reinforces the company's dedication to responsible sourcing and compassionate business practices.

The Aquaculture Certification Schemes Benchmark will serve as a tool to empower businesses in making informed decisions about sourcing from global certification schemes that prioritize and lead in aquatic animal welfare. Companies can effectively demonstrate their commitment to ethical sourcing, resonate with conscientious consumers, and strengthen their brand's reputation as a responsible and compassionate industry leader by sourcing from certification labels evaluated under this benchmark. Embracing the benchmark fosters supply chain resilience and promotes long-term sustainability, ensuring that companies contribute positively to animal welfare and the environment while exceeding consumer expectations.

Through the Corporate Initiative and the Aquaculture Certification Schemes Benchmark, Aquatic Life Institute is at the forefront of promoting humane practices and sustainable choices in the corporate world. Together, we are shaping a future where responsible business practices and compassionate choices harmoniously coexist for the betterment of our planet and its inhabitants.