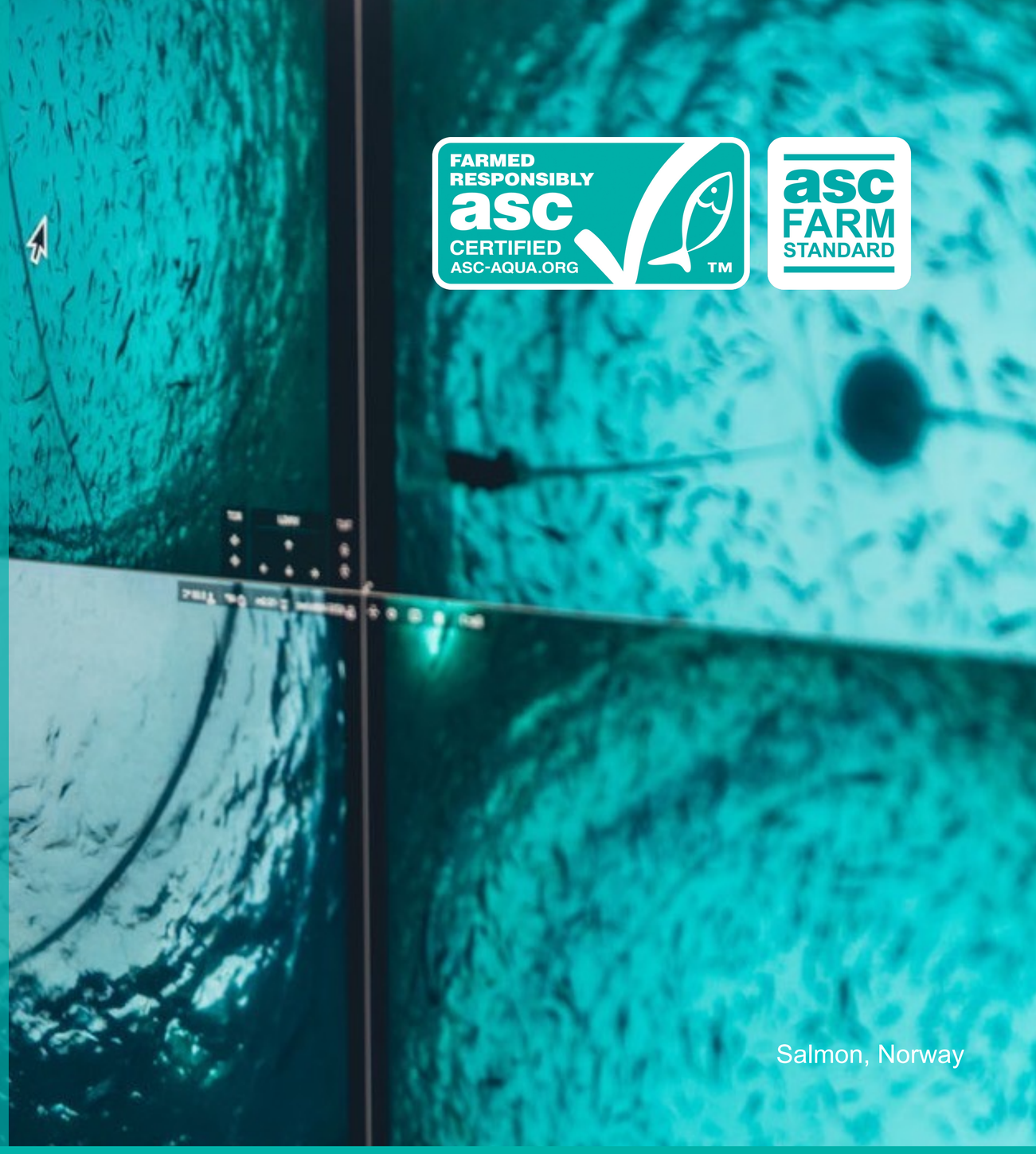
Public Consultation VI
ASC Farm Standard

Criterion 2.6 – Benthic Impacts

Criterion 2.14a-c – Fish Health and Welfare

September 2022

Aquaculture Stewardship Council
www.asc-aqua.org



Salmon, Norway

Introduction

What's happening?

- Public consultation on the Fish Health and Welfare and Benthic Impacts sections of the ASC Farm Standard

When?

- From 1 September to 31 October 2022

Which topics will be covered?

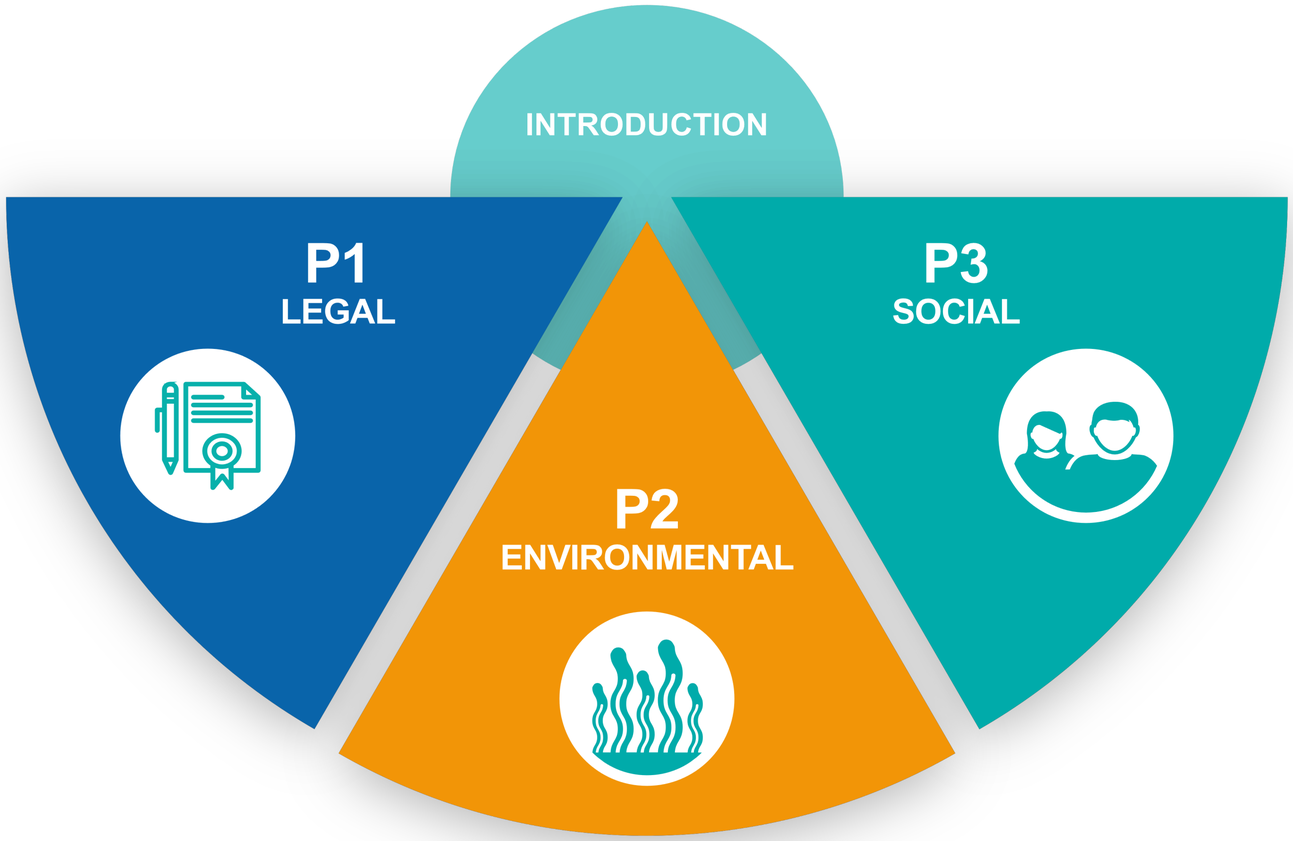
- Criterion 2.6 – Benthic Impacts
- Criterion 2.14a-c – Fish Health and Welfare

Why a public consultation?

- ASC is committed to best-practice standard-setting. We are proud to be an ISEAL Member.

The ASC Farm Standard

Current Consultation covers two Criteria within Principle 2

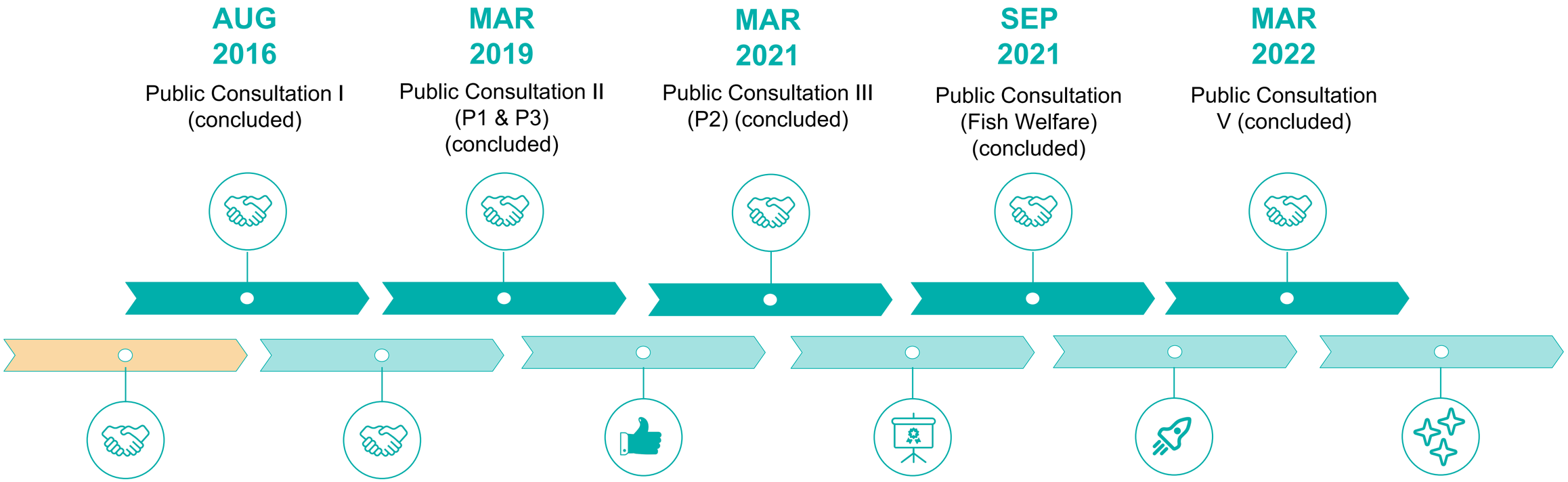


Principle 2:

Environmental Sustainability

- Criterion 2.6 – Benthic Impacts
- Criterion 2.14a-c Fish Health and Welfare

Development Timeline



How to get involved

Watch the introductory video and get an overview of the project

What do **You** think?

Complete our **Survey**

Register here for the live feedback webinars

And contact your local ASC team if you have any questions

Spread the word within your network

ASC Farm Standard Scope

Initially the ASC Farm Standard will be applicable to the 11 species groups currently covered by the ASC programme:

- Abalone
- Bivalve
- Flatfish
- Freshwater Trout
- Pangasius
- Salmon
- Seabass, Seabream and Meagre
- Seriola and Cobia
- Shrimp
- Tilapia
- Tropical Marine Finfish

The ASC Farm Standard will allow for faster addition of new species to the program scope.

Criterion 2.6: Benthic Impacts

Aquaculture Stewardship Council
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Salmon Farming, Chile

Principle 2	CRITERION 2.6: BENTHIC IMPACTS

Rationale

- Deposition of organic materials from aquaculture production can negatively impact receiving ecosystems if deposition exceeds assimilation rates.
- Various conditions determine the likely impact (e.g., depth, current, type of seabed, etc.).
- If managed well, the rate of deposition is kept within the rate of natural aerobic decomposition, thereby minimising benthic impacts.

Intent

- To maintain the ecosystem structure and function of the area surrounding the farm

Principle 2	CRITERION 2.6: BENTHIC IMPACTS

Key Changes

- Three-tiered sampling approach to reduce compliance burden while improving impact awareness.
- Tier 3 sampling and testing regime only needed if Tier 1 and Tier 2 fail compliance:

Tier	Description	Indicators	Sampling Locations
Tier 1	**Rapid screening:** Low-cost farm impact screening using practical, near-real-time abiotic measurements to determine the risk for organic enrichment impacts.	S^{2-} and *Eh*	At 30, 100, 150 and 500 m distances in the predominant current direction.
Tier 2	**Impact delineation:** Enhanced spatial analysis of abiotic impacts around the farm using practical monitoring tools.	S^{2-} and *Eh*	Same as Tier 1 but including sampling in three additional directions.
Tier 3	**Biotic impact:** Comprehensive characterisation of biotic impacts around the farm.	Additionally, 3 biotic indicators	Same locations as Tier 1 and Tier 2.

Principle 2	CRITERION 2.6: BENTHIC IMPACTS

Key Changes cont'd

- Compliance with Tier 1 and 2 are defined based on the concept of Ecological Quality Status (EQS) categories and abiotic and biotic indicator thresholds and numerical boundaries for each of the five EQS categories
- Revised testing for free sulphide; previous ISE-method, now UV spectroscopy technique (S^{2-}_{UV}).
- Application to marine/brackish cage systems, suspended mollusc systems, and cages in lakes and reservoirs.

Key Considerations

- Applicable for cage culture regardless of species.
- Currently only monitoring of freshwater cage systems in lakes and reservoirs is required. The intent is to develop a greater understanding of these systems and, eventually, confirm proposed metric requirements.

Questions

Indicator 2.6.1

- Does the monitoring programme accurately estimate the spatial distribution of organic waste from a farm?
  - Strongly disagree
  - Disagree
  - Neither agree nor disagree
  - Agree
  - Strongly agree

If you disagree / strongly disagree, please explain why

Questions

Indicators 2.6.1 and 2.6.3

- The indicators require cage farms located in lakes and reservoirs to monitor the benthos, following the programme outlined in Appendix I, and to report to ASC the results of that monitoring. However, for these systems, demonstration of compliance against the requirement to meet "acceptable" benthic status (2.6.2) is not required for the first three years of the ASC Farm Standard being effective. It is expected that the information generated during this period will provide meaningful knowledge and data which will serve to better understand the impact of aquaculture in lakes and reservoirs. The information will then be used to support or revise the proposed requirements, with the long-term goal of helping the industry to mitigate impacts on those systems. Do you agree with this approach?

    - Strongly disagree
    - Disagree
    - Neither agree nor disagree
    - Agree
    - Strongly agree

    If you disagree / strongly disagree, please explain why

Questions

Indicator 2.6.2

- Do you agree with the following statement: “The EQS categories are applicable to all benthic habitats suitable for marine aquaculture”?

  - Strongly disagree
  - Disagree
  - Neither agree nor disagree
  - Agree
  - Strongly agree

  If you disagree / strongly disagree, please explain why

Questions

Appendix I, Section 1.2

- Do you agree that the abiotic and biotic indicator thresholds and numerical boundaries of the EQS categories in Table 2 of Appendix I reflect the goal to minimise, mitigate or eliminate negative benthic habitat, biodiversity and ecosystem effects from seabed organic enrichment?

  - Strongly disagree
  - Disagree
  - Neither agree nor disagree
  - Agree
  - Strongly agree

  If you disagree / strongly disagree, please explain why

Questions

Appendix I, Section 1.4

- Are you aware of any information or scientific references that ASC could review to support or refine the proposed timing for sampling?

  - Yes
  - No
  - Don’t know

  If yes, please provide details:

Questions

Appendix I, Section 1.5

- Do you agree that the number of samples for Tier 1, 2 and 3 are practical?

  - Strongly disagree
  - Disagree
  - Neither agree nor disagree
  - Agree
  - Strongly agree

  If you disagree / strongly disagree, please explain why

Questions

Appendix I, Section 1.5

- Do you agree that the distances specified for the monitoring zones accurately reflect the spatial distribution of organic waste from the farm?

  - Strongly disagree
  - Disagree
  - Neither agree nor disagree
  - Agree
  - Strongly agree

  If you disagree / strongly disagree, please explain why

Questions

Appendix I, Section 1.5

- The sampling protocol for cage farms in lakes and reservoirs requires the use of redox potential, pH and TAN as indicators of organic enrichment. Do you agree that these are adequate indicators for these environments?

  - Strongly disagree
  - Disagree
  - Neither agree nor disagree
  - Agree
  - Strongly agree

  If you disagree / strongly disagree, please explain why

Questions

Appendix I, Section 1.5

- The sampling protocol for cage farms in lakes and reservoirs requires the use of redox potential, pH and TAN as indicators of organic enrichment. Do you have any information or scientific references that ASC can review to support or refine the proposed indicators of organic enrichments for lakes and reservoirs?

  - Yes
  - No
  - Don’t know

  If yes, please provide details:

Questions

Appendix I, Section 1.6

- Do you agree that the requirements for the user-defined specific benthic monitoring programme are clear and auditable?

  - Strongly disagree
  - Disagree
  - Neither agree nor disagree
  - Agree
  - Strongly agree

  If you disagree / strongly disagree, please explain why

Questions

Appendix I, Section 1.7

- Do you perceive any potential challenges with the use of the sulphide UV methodology?

  - Yes
  - No
  - Don’t know

  If yes, please explain why

Questions

Appendix I, Section 1.7

- Do you perceive any potential challenges with measuring Total Ammonia Nitrogen (TAN) as required by the standard?

  - Yes
  - No
  - Don’t know

  If yes, please explain why:

Criterion 2.14: Fish Health and Welfare

Aquaculture Stewardship Council
www.asc-aqua.org

Seabream, Croatia

Principle 2	CRITERION 2.14: FISH HEALTH AND WELFARE

Rationale

- If certain farming principles are not met, the commercial rearing of animals can jeopardize their health and welfare, as well as that of wild species living in the vicinity of the farm and the actual environment where the farm is set.
- Responsible farming practices include the monitoring of fish health and welfare, application of site-specific biosecurity plans, implementation of diseases prevention schemes, adherence to good welfare practices and responsible use of veterinary therapeutants when needed, amongst other requirements.

Intent

- To ensure farms maintain good health and welfare so that detrimental effects on the environment, wildlife and cultured animals are minimal.

Principle 2 CRITERION 2.14: FISH HEALTH AND WELFARE

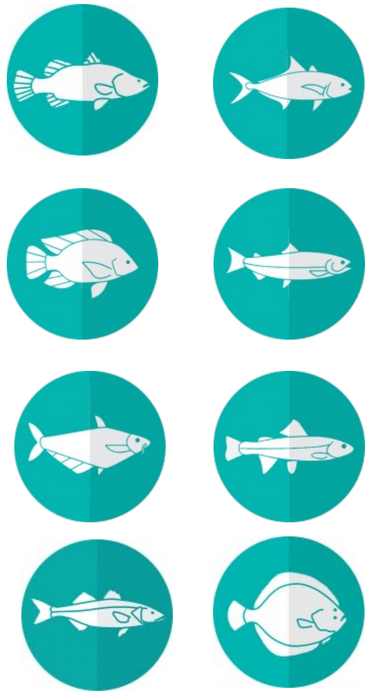
Overview of key changes

- Criterion 2.14 has been split in three sub-criteria: 2.14a Fish Health and Welfare (routine farming operations), 2.14b Handling (all handling operations), and 2.14c Slaughter (stunning and slaughter).
- New welfare content has been created for finfish; development of content for crustaceans, bivalves and abalone will be developed in the future.
- Site-specific Fish Health and Welfare Management Systems are required for all species and veterinary oversight is needed.

Key considerations

- Some content within criterion 2.14 went for consultation in March 2022. This consultation, therefore, only covers new content covering fish welfare

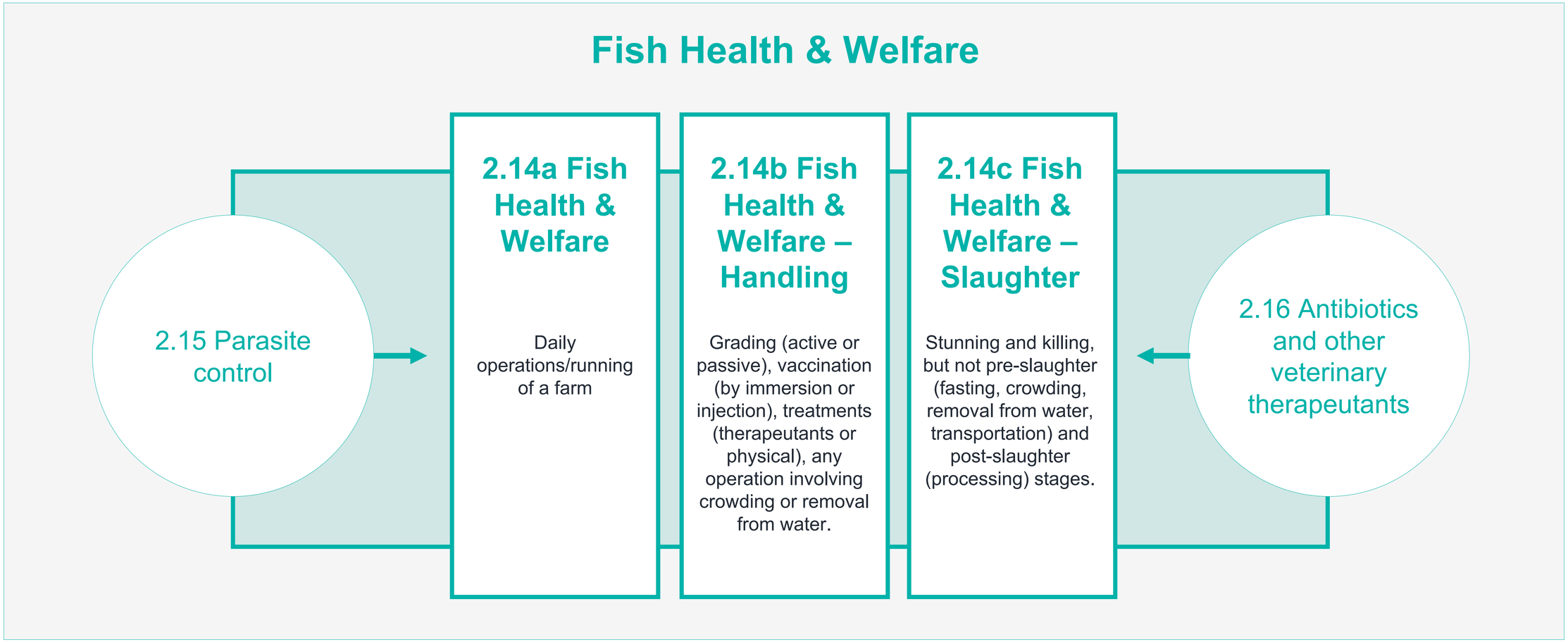
Key changes in more detail

Included	Not included (next revision)
	

- **Initial focus will be on finfish only**, including all species covered by the species-specific standards.
- **Rationale**: The choice of topics to be included into the standard was made based on relevance, availability of scientific knowledge, and applicability to commercial farming.
- Content for some species will need development with the support of a specific Technical Working Group and will therefore be incorporated in the next revision of the welfare requirements:
  - Shrimp: Eye-stalk ablation is not covered in this version but is currently being considered for a possible inclusion
  - Bivalves and abalone: currently limited welfare literature on these species
  - Cleaner fish

Key changes and rationale

Content organised around three main pillars:



Proposed content in more detail

Criteria	Proposed content	Important consideration
2.14a Fish Health & Welfare	Training Feeding Fish Health and Welfare Management System: 1) Biosecurity 2) Disease surveillance and reporting 3) Predator control measures 4) Operational Welfare Indicators (OWIs): • Morphological indicators • Behavioural indicators • Water quality • Mortality recover and classification 5) Traffic light system for OWIs, including response system and corrective actions 6) Trend analysis for OWIs 7) Reporting requirements, including stocking density 8) Veterinary endorsement	**Stocking density** shall be assessed using proxy indicators (OWIs) that allow farmers to monitor/assess if fish health and welfare is good or declining.

Minimum required Operational Welfare Indicators (OWIs) and their monitoring

1 **Water quality:**

- Monitoring of, at a minimum: temperature, dissolved oxygen, turbidity, carbon dioxide, pH, salinity, ammonia / nitrite / nitrate, and metals, at defined frequencies
- Species-specific limits and monitoring requirements for water quality parameters (as per Annex 1).

2 **Morphological scoring on live fish:** including at least the following:

- Morphological scoring parameters:
  - Eye damage
  - Operculum damage
  - Skin damage
  - Fin damage
  - Deformities
  - Change of colouration
  - Emaciation

Monitoring frequency minimum once a month.

Minimum required Operational Welfare Indicators (OWIs) and their monitoring

3 **Behavioural scoring:** Including at least the following:

- Daily monitoring frequency
- The farm must develop, describe and implement site-appropriate types of abnormal behaviour based on the guidelines and examples provided in the interpretation manual.

4 **Mortality:** Including at least the following :

- Daily monitoring frequency
- Monitoring parameters:
  - Classify all recovered mortalities
  - Carry out a post-mortem analysis for each mortality event
  - Investigate mortality events which remain unexplained or unattributed

Proposed content in more detail

Criteria	Proposed content
2.14b Fish Health & Welfare - Handling	Development of a Fish Handling Management System including the following aspects: 1) Description of handling processes (e.g., transport, vaccination) and contingency plans for emergencies 2) Suitable conditions for handling 3) Use of anaesthesia 4) Health status of the fish 5) Crowding, fasting, and time out of the water guidelines endorsed by a veterinarian 6) Biosecurity measures 7) Predator control and escape control measures 8) OWIs with analysis system and feedback mechanism 9) Creation of a handling log
2.14c Fish Health & Welfare - Slaughter	<u>Stunning:</u> 1) Compulsory and introduced in a phased approach (see next slide) 2) Stunning must last until fish is killed 3) Effectiveness of stunning needs to be routinely verified to be >98% <u>Killing methods:</u> 1) Asphyxia in air, CO_2, salt baths, ammonia baths, evisceration are **not** allowed 2) Effectiveness of killing method needs to be routinely verified to be >98% 3) Back-up systems both for stunning and killing in place

Details on permitted stunning methods & effective dates

	Species								
Permitted methods of stunning	Salmon	Trout	Seabass, seabream, meagre	Pangasius	Tilapia	Seriola	Cobia	Flatfish	Marine Tropical
Percussion	X	X				X			
Electrical	X	X	X	X	X	X	X	X	X
Transition period	Immediate	1 year	3 years	3 years	3 years	3 years	3 years	3 years	6 years
Effective date	Q2/2024	Q2/2025	Q2/2027	Q2/2027	Q2/2027	Q2/2027	Q2/2027	Q2/2027	Q2/2030

Questions

Indicator 2.14a.1

The UoC shall ensure that all employees are informed and aware of the importance of fish health and welfare, and that employees involved in fish husbandry and handling operations are trained and maintain qualifications on fish health and welfare, according to Annex xyz – Fish Health and Welfare Training.

- Do you agree that fish health and welfare training needs are adequately covered between indicator 2.14a.1 and Annex xyz?

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Indicator 2.14a.16 f) to j)

The UoC includes at least the following in the Fish Health and Welfare Management System: monitoring processes for water quality, morphological indicators, behavioural indicators, and mortality, and establishes a traffic light system for them.

Water quality: At least including the following as a minimum:

- Parameters as per table.
- Frequency as per table
- Species-specific limits and monitoring requirements for water quality parameters (as per Annex 1).

Mortality: Including at least the following as a minimum:

- Monitoring frequency: daily
- Monitoring parameters:
    - Classify all recovered mortalities
    - Carry out a post-mortem analysis for each mortality event
    - Investigate mortality events which remain unexplained or unattributed to fish health

Morphological scoring on live fish: Including at least the following as a minimum:

- Monitoring frequency minimum once a month.
- Morphological scoring parameters:
    - Eye damage
    - Operculum damage
    - Skin damage
    - Fin damage
    - Deformities
    - Change of colouration
    - Emaciation

indicators\Standard Text (Michele Stark)\Morphological scoring table.xlsx

Behavioural scoring: Including at least the following as a minimum:

- Frequency daily
- The farm has to develop, describe and implement site-appropriate types of abnormal behaviour based on the guidelines and examples provided in the interpretation manual.

PARAMETERS	TYPE OF CULTURE SYSTEM							
	FRESHWATER				SEAWATER			
	Ponds	RAS	Net pens	Flow-through	Ponds/Lagoons	RAS	Net pens	Flow-through
Temperature	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
Dissolved oxygen	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
Turbidity	Daily (for intensive[1] systems) Need based[2] (for semi-intensive and extensive systems)	Daily	Daily	Daily	Daily (for intensive systems) Need based (for semi-intensive and extensive systems)	Daily	Daily	Daily
Carbon dioxide	Biweekly (for intensive systems) Need based (for semi-intensive and extensive systems)	Daily		Biweekly	Biweekly (for intensive systems) Need based (for semi-intensive and extensive systems)	Daily		Biweekly
pH	Daily	Daily	Daily	Daily	Biweekly (for intensive systems) Need based (for extensive systems)	Daily	Need based	Biweekly
Salinity		Daily[3]			Need based	Daily	Need based	Need based
Ammonia/nitrite /nitrate	Biweekly	Daily		Biweekly	Biweekly	Daily		Biweekly
Metals	Need based	Need based		Need based	Need based	Need based		Need based
Water flow/velocity			Need based				Need based	
Hydrogen sulphide	Need based	Need based			Need based	Need based		

- Indicator 2.14a.16 f) to j) - Do you think it is realistic to develop and implement these monitoring programmes for all finfish species?

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

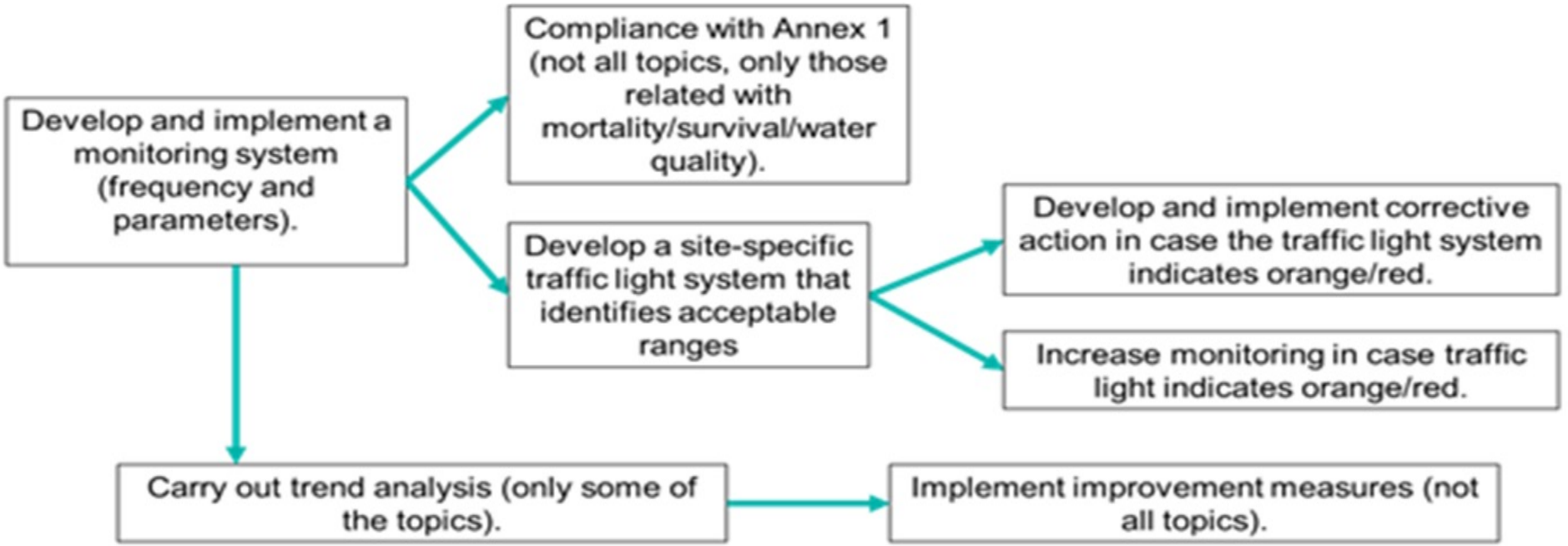
- Indicator 2.14a.16 f) to j) - Do you think the minimum monitoring frequencies proposed by ASC are too frequent/appropriate/not frequent enough?

1. Too frequent
2. Appropriate
3. Not frequent enough

Indicator 2.14a.16 a) to p)

- From the standard text, is the action mechanism proposed below clear? (see graphic)

1. Yes
2. No



Indicator 2.14a.16 o)

The UoC includes at least the following in the Fish Health and Welfare Management System: o) long-term fish health and welfare improvement measures as well as short-term mitigation measures to react to situations of declining health or welfare identified in 2.14a.16 j) and k).

- No metrics have been set for stocking densities, instead an alternative approach has been proposed using proxy indicators that allow farmers to assess whether fish health and welfare trends on site are adequate and improving. Through the monitoring and assessment of the various health and welfare indicators (water quality, morphology, behaviour, mortality), producers can determine whether fish health and welfare are adequate; if not, they must set and implement improvement measures, where the adjustment of stocking densities should be considered first. Do you agree with this approach?

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

If you disagree / strongly disagree, please explain why

Indicator 2.14b.1 e)

The UoC shall assess site-specific characteristics and develop a Fish Handling Management System (FHMS) accordingly. The UoC implements and monitors the FHMS for its effectiveness with the objective of ensuring good health and welfare of farmed animals. The UoC includes at least the following in the FHMS:

e) anesthesia of fish during handling operations that can inflict pain or injury if fish are moving,

- Indicator 2.14b.1 e) - Do you think anaesthesia should be required for those handling operations that, if the fish are moving, can inflict pain or injury?

1. Yes
2. No

Please explain why

- Indicator 2.14b.1 e) - Do you think the application of this requirement could be counter-productive (e.g., result in fish mortality or stress from the anaesthesia process)?

1. Yes
2. No

Please explain why

Indicator 2.14c.1

The UoC shall ensure all fish are stunned prior to killing, using permitted methods only, as of April 2025, including species-specific transition periods, as outlined in Table 1.

- Indicator 2.14c.1 – Are there any stunning methods missing from the suggested proposed list of permitted methods list (Table 1)?

1. Yes
2. No

- Indicator 2.14c.1 – Are the transition periods proposed in Table 1 adequate?

1. Yes
2. No

	Species								
Permitted methods of stunning	Salmon	Trout	Seabass, seabream, meagre	Pangasius	Tilapia	Seriola	Cobia	Flatfish	Marine Tropical
Percussion	X	X				X			
Electrical	X	X	X	X	X	X	X	X	X
Transition period	Immediate	1 year	3 years	3 years	3 years	3 years	3 years	3 years	6 years
Effective date	Q2/2024	Q2/2025	Q2/2027	Q2/2027	Q2/2027	Q2/2027	Q2/2027	Q2/2027	Q2/2030

Indicator 2.14c.4

The UoC shall not use the following methods to kill fish: asphyxia in air, CO_2, salt baths, ammonia baths, or evisceration.

- Indicator 2.14c.4 – Are there any killing methods missing from the proposed list of prohibited methods?

1. Yes
2. No

- Indicator 2.14c.4 - Should any of the proposed prohibited killing methods be removed from the list?

1. Yes
2. No

Indicator 2.14c.3 and 5

2.14c.3 The UoC shall ensure that fish are stunned effectively as of April 2025 (including species-specific transition periods as outlined in Table 1), assessing stunned fish for the absence of all of the following indicators: opercular (gill) movements, eye movements, body movements, reaction to a painful stimulus (e.g., tail-prick or eye corner tap).

2.14c.5 The UoC shall ensure fish are killed effectively by monitoring fish for the absence of all of the following indicators opercular (gill) movements, eye movements, body movements, reaction to a painful stimulus (i.e., tail-prick, eye corner tap).

- Indicator 2.14c.3 and 5 – Is a stunning/killing efficiency of 98% adequate?

1. Yes
2. No

- Indicator 2.14c.3 and 5 - If not, please specify an alternative percentage.

Additional Resources

Translations	Farm Standard Comparison Tool	FAQ
Link	Link	Link

Get in Touch!

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Thank you

Aquaculture Stewardship Council
www.asc-aqua.org

Salmon Farming, Chile