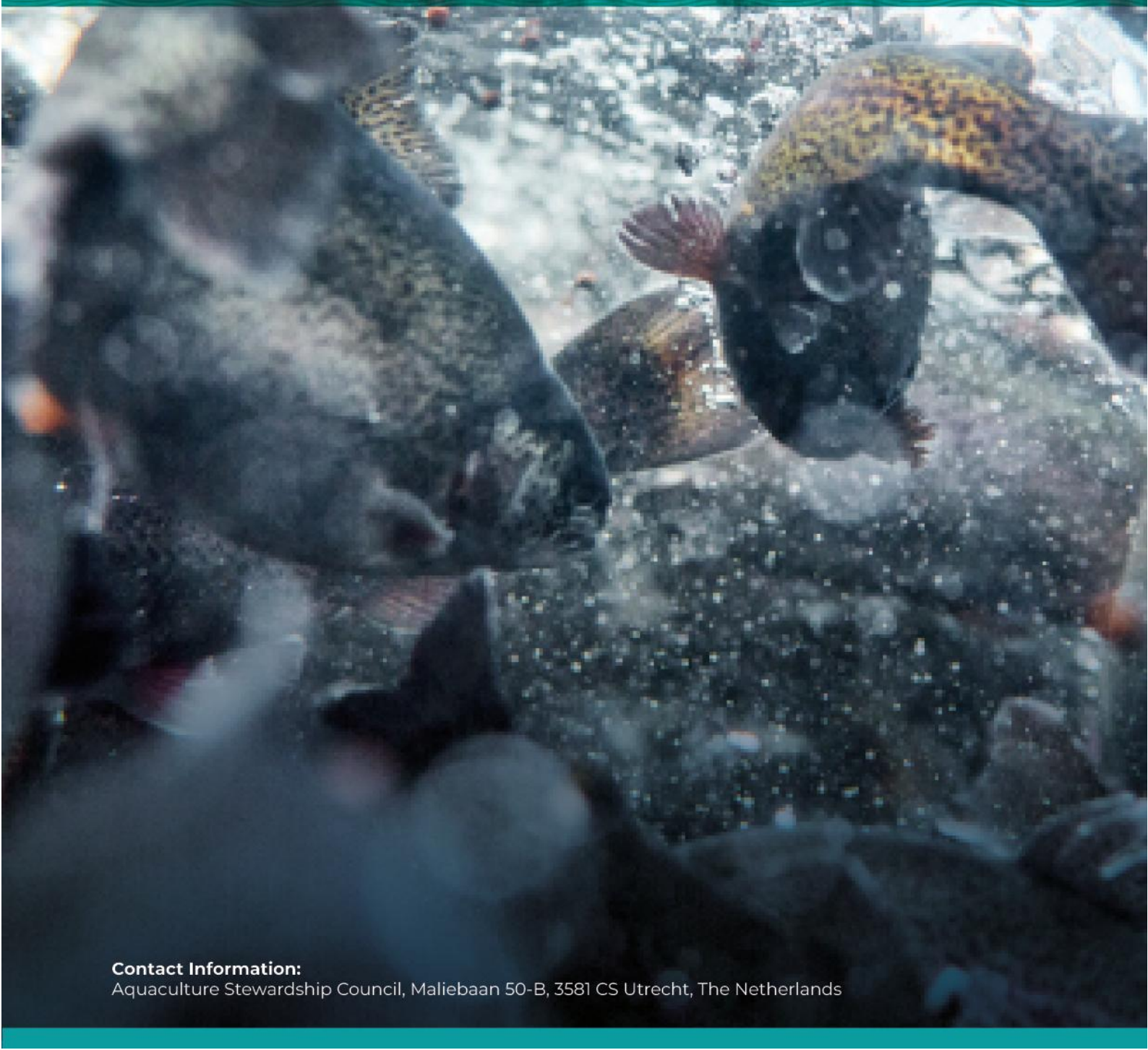
ASC Farm Interpretation Manual

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Version control

Document version history:

Version:	Issue Date:	Remarks/changes
V1.0	1 May 2025	New document - to be used with ASC Farm Standard V1.0
V1.0.1	1 Sept 2025	Revised document (non-substantive changes) - to be used with ASC Farm Standard V1.0.1. • Amendments to referenced Indicators to reflect changes in the Farm Standard V1.0.1. • Indicator 3.9.3 - new bullet point on risks of multiple jobs. • Indicator 4.1.1.10.2 - K Factor statement added. • Indicator 4.1.2.10, Footnote 56 - Clarification of certified product. • Indicator 4.4.10 - Correction in fourth main bullet point. • Indicator 4.4.16 - new bullet point on historical antibiotic use.
V1.1	1 November 2026	Changes made across the document in line with the updates made to the ASC Farm Standard V1.1.

The ASC Farm Standard Interpretation Manual is a **non-normative** document that provides guidance, explanations and illustrative examples to support farms and auditors consistently interpret and implement the normative requirements of the ASC Farm Standard.

The Interpretation Manual itself is not auditable; audits assess conformance with the requirements of the ASC Farm Standard. Auditors may refer to the Interpretation Manual during an audit, even though it is not the basis for assessing conformance. The Interpretation Manual does not introduce, modify or replace any requirement in the ASC Farm Standard. Accordingly, it uses 'should' to indicate a recommendation and uses 'shall' only when quoting an Indicator or Appendix from the ASC Farm Standard. If the Interpretation Manual is inconsistent with the ASC Farm Standard, the requirements of the ASC Farm Standard prevail.

It is the responsibility of the user of the document to use the latest version as published on the ASC website.

Review and revision

ASC will review this Interpretation Manual periodically as and when required.

If review determines that revision is necessary, ASC will revise the document accordingly, publishing the new version on the ASC website.

Available language(s)

The ASC Farm Standard Interpretation Manual is available in the following language(s):

Version:	Available languages
V1.1	English (official language)
	Japanese
	Korean
	Spanish
	Turkish
	Vietnamese

In case of any inconsistencies and/or discrepancies between available translation(s) and the English version, the online English version (PDF format) will prevail.

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Principle 1

The aquaculture industry ensures legal compliance and effective business management



Criterion 1.1 – Legal Compliance

Indicator:	Requirement:
1.1.1	The UoC shall hold all applicable legal licences and permits.

How do I interpret this requirement?

- The UoC should be responsible for:
  - Having a good understanding of local licensing and permit systems that apply to their operations.
  - Obtaining and maintaining all necessary documentation for siting, constructing and operating their sites and facilities. Examples of these can include:
    - Business/operational licences
    - Land deeds
    - Leases or concession agreements
    - Construction permits
    - Water use permits
    - Effluent permits
    - Landfill operation permits
    - Fire safety certificate
    - Building fitness certificate
    - Permit or licence to store fuel (such as oil and/or gas)
    - Licences or permits to house workers in provided accommodation
    - Changes to labour legislation, regulations and laws are reflected in workers' contracts.
  - Monitoring:
    - Pending licence renewal for applications of, e.g. Relocation of sites, biomass increase.
    - Conditions set as part of the licence/permits.

Evidence of implementation should be maintained, e.g.:

- Up-to-date documentation for siting, constructing and operating, including any applications in progress.

Auditors should confirm:

- Documentation confirming required legal licences and permits are in place.
- Conditions required as part of business licence applications are adhered to. For example:
    - In some parts of the world, a business licence is not issued unless mandatory certificates of building fitness and emergency preparedness for natural disasters are obtained.

Useful Resources

- Assistance in determining necessary licences and permits can be sought from governmental agencies dealing with business and the environment and communities.

Indicator:	Requirement:
1.1.2	The UoC shall comply with all applicable legal requirements, including those relevant to the Criteria within the ASC Farm Standard.

How do I interpret this requirement?

- 'Applicable legal requirements' are any legally binding obligations that apply to the site in the jurisdiction where it operates.
    - These extend beyond aquaculture licences and include environmental, labour, animal health, food safety, and business regulations, among others.
    - Under the ASC Farm Standard, these generally encompass:
        - Laws enacted by national, regional, or local governments.
        - Regulations issued under those laws.
        - Permits, licences, and authorisations that contain legally binding conditions.
        - Legally binding orders or notices issued by competent authorities.
        - Court decisions or legally enforceable requirements applicable to the farm.

- Examples of applicable legal requirements are provided in the table below:

ASC Farm Standard Topic	Examples of applicable legal requirements
Farm licensing and permits	Aquaculture licence, seabed lease, water abstraction permits, discharge permits, planning permission, navigation permits, operating permits.
Environmental protection	Environmental impact assessment requirements, water quality regulations, waste management, hazardous waste disposal, emissions, protected habitats and species, chemical storage, pollution prevention, environmental monitoring obligations.
Animal health and welfare	Fish health legislation, notifiable disease reporting, movement controls, veterinary medicine regulations, stocking density limits (where applicable), humane slaughter requirements, biosecurity measures.
Feed and veterinary medicines	Approval of feed ingredients, medicated feed regulations, medicine prescriptions, withdrawal periods, storage and record-keeping requirements, antimicrobial use restrictions.
Labour and human rights	Employment law, minimum wage, working hours, non-discrimination, freedom of association (where legally protected), prohibition of forced and child labour, migrant worker protections.
Occupational health and safety	Risk assessments, personal protective equipment (PPE), emergency preparedness, vessel safety, diving regulations, machinery safety, training requirements, accident reporting.
Food safety and traceability	Food hygiene regulations, Hazard Analysis and Critical Control Points (HACCP) requirements, traceability, registration of food businesses, residue monitoring programmes.
Chemical management	Storage and handling of fuels, pesticides, disinfectants, antifoulants and cleaning agents; spill prevention and reporting; Control of Substances Hazardous to Health (COSHH) or equivalent regulations.
Wildlife interactions	Protected species legislation, predator control permits, restrictions on lethal control, reporting of wildlife interactions.
Infrastructure and engineering	Cage design approvals, structural inspections, navigation marking requirements, electrical safety, mooring inspections.
Record keeping and reporting	Mandatory reporting of production, escapes, mortality, disease outbreaks, medicine use, environmental monitoring, employment records and tax records.
Business compliance	Company registration, taxation, insurance where legally required, import/export requirements, customs documentation.

- The UoC should be responsible for:
  - having a good understanding of laws, regulations, permits, licences, and authorisations including their applicability to the local context; and
  - facilitating any inspections by authorities.

Evidence of implementation should be maintained, e.g.:

- A register for legal compliance listing:
  - relevant applicable laws, regulations, permits, licences and authorisations, including, for labour-related laws and regulations, those within the home country of any migrant employees; and
  - compliance status, and any future actions needed to remain complaint; and
  - any measures needed to correct potential non-compliance with a law or regulation.
- Certificates or other records to confirm compliance with legal requirements.
  - e.g.; treatment records demonstrating compliance with Maximum Residue Limits (MRL).
- Documented outcomes and records of any inspections by authorities.

Auditors should confirm:

- Existence of any legal documentation, outcomes of inspections, or records kept by UoC to demonstrate legal compliance.
- Management understands the legal context in which they are operating.

Useful Resources

- The International Labour Organization (ILO) maintains NATLEX (https://natlex.ilo.org/dyn/natlex2/r/natlex/fe/home), a database of national labour, social security and related human rights legislation across 196 countries and more than 160 territories and subdivisions. NATLEX is a free source of information for all users.
- Country-specific examples of 'Applicable legal requirements':

Scotland

- Aquaculture Production Business authorisation.
- Controlled Activities Regulations (CAR) licence for discharges.
- Fish health legislation governing movement and disease control.
- Health and Safety at Work legislation.
- Waste management regulations.
- Marine licensing for certain developments.

Norway

- Aquaculture operating licence.
- Pollution Control Act requirements.
- NS 9415 technical requirements.
- Fish Health Regulations.
- Aquaculture Operation Regulations.
- Working Environment Act.

Chile

- Aquaculture concessions.
- Environmental Qualification Resolution (RCA).
- Environmental monitoring obligations.
- Fish health and sea lice regulations.
- Labour Code requirements.

Criterion 1.2 – Management System

Indicator:	Requirement:
1.2.1	The UoC shall develop, implement and maintain a management system to support the implementation of the ASC Requirements that is appropriate to the size and complexity of the UoC.

How do I interpret this requirement?

- The intent of this requirement is to ensure that the site has a structured management system that enables it to consistently implement and maintain conformance with the ASC Requirements.
  - The requirement does not intend to require a formal ISO-certified management system.
- A management system is the set of documented and operational processes that the site uses to plan, implement, monitor, review, and improve its activities to achieve conformance with the ASC Requirements.
  - The management system may consist of existing business processes and documentation and does not need to be developed solely for ASC certification.
- Depending on the size and complexity of the site, the management system may include:
  - Policies and objectives.
  - Organisational roles, responsibilities, and authorities.
  - Procedures and work instructions.
  - Risk assessments.
  - Legal compliance processes.
  - Operational controls.
  - Training and competency records.
  - Document and record control.
  - Monitoring and measurement activities.
  - Corrective action processes.
  - Internal inspections or audits.
  - Management review processes.
  - Stakeholder communication processes.

- The management system should be proportionate to the size, complexity, level of risk, and activities of the site.
- The scope of the management system should suit the operation that it is designed for and be appropriate to the characteristics of the site. For example:
  - A site operating a RAS system may not need additional elements in the management system to manage the risks of escapes.
  - A small site may only need simple documented procedures, limited number of records. Responsibilities are assigned to a small management team, and monitoring is integrated into daily operations.
  - A larger site may need more formal management procedures, a defined organisational structure, a centralised document control, an internal audit programme and site-specific operational procedures where appropriate.
- The site may use an existing management system (e.g. one developed for food safety, environmental management, occupational health and safety, quality management, or another certification scheme), provided it effectively supports implementation of the ASC Requirements.
  - Documentation does not need to be duplicated where existing systems already address the relevant ASC Requirements.

Evidence of implementation should be maintained, e.g.:

- Documents of the management system, including policies, procedures and records.
- Evidence that demonstrates management's ownership of the management system (see Indicator 1.2.2).

Auditors should confirm:

- Whether the management system:
  - is appropriate to the size and complexity of the site;
  - supports consistent implementation of the ASC Requirements;
  - is understood by relevant personnel;
  - is implemented in practice, rather than existing only as documented procedures; and
  - is capable of identifying and addressing non-conformities and supporting continual conformance.
- Existence of up-to-date policies, procedures and records.

- Management's ownership of the management system:
    - attendance at management reviews (see Indicator 1.2.4); and
    - active role in the development, implementation and maintenance of the management system.
        - demonstrable during interviews with the management.

Note: It is recommended that auditors determine conformity with this indicator at the end of the audit process, allowing for a complete assessment of the management system implemented by the site.

Note: for ASC Group Certification UoCs, this indicator should be audited at Group level.

Useful Resources

- Policies: explain why a site is operating in such a way. They can be beneficial for employees to understand their rights and duties.
    - it is not necessary to have a policy for every topic in the ASC Farm Standard and sometimes topics are grouped together in one policy.
        - for example, forced labour, child labour, discrimination, collective bargaining and freedom of association and others can all be addressed together through the human rights policy.
    - policies are most valuable for topics that are not straightforward in the context of the site.
        - for example, where employees have an inconsistent or incomplete understanding of an issue, a policy might be needed.
- Procedures: explain how a site operates in a certain way and specify how to put policies into operation to ensure the outcome intended.
- Records: provide an essential source of information for both internal self-assessments and external audits, documenting that policies and procedures have been followed in specific instances.
    - sites can use recording templates to guide the user through all of the steps of a record and provide accurate information in a set format.
    - records should be adequately maintained and controlled, including ensuring only up-to-date versions of documents are used.
- The ISO 9001:2015 management system standards: https://www.iso.org/management-system-standards.html
- Plan Do Check Act Cycle: https://asq.org/quality-resources/pdca-cycle

Indicator:	Requirement:
1.2.2	The UoC shall appoint at least one member of management responsible for the implementation of the ASC Requirements.

How do I interpret this requirement?

- The responsible person may be one person or several persons, covering the wide range of issues addressed by the ASC Requirements.
    - For example, a human resources manager may be responsible for the requirements on labour rights and working conditions, and a fish health and welfare manager may be responsible for the requirements on fish health;
        - senior management should be responsible for seeking more specialised knowledge when needed.
- The responsibility should be embedded in the organisational structure documentation to ensure clear accountability.

Evidence of implementation should be maintained, e.g.:

- Records:
    - That evidence the person(s) responsible were designated by the management.
    - Role description of the person(s) responsible for the implementation of ASC requirements.

Auditors should confirm:

- The management designated responsible person(s) for the implementation of the ASC Requirements;
    - through records and interviews with employees and the management.
- Role description of the person(s) responsible for the implementation of the ASC requirements.

Note: for ASC Group Certification UoCs, this indicator should be audited at Group level.

Useful Resources

N/A

Indicator:	Requirement:

1.2.3 The UoC shall ensure that relevant[1] employees have the necessary skills and training to implement ASC Requirements.

How do I interpret this requirement?

- "Relevant employees" are those who carry out tasks or activities within the scope of the ASC Farm Standard and whose work affects the implementation of, or conformance with, the ASC Requirements.
    - The intent of this requirement is to ensure that relevant employees have the competence necessary to perform their responsibilities in a manner that supports that conformance.
    - Employees are not expected to have comprehensive knowledge of the ASC Farm Standard. Instead, they should understand the requirements relevant to their responsibilities and how their day-to-day activities contribute to meeting those requirements.
- The site should identify relevant employees and determine the competence needed for each role.
    - Relevant employees may include, as applicable:
        - Site managers
        - Production managers
        - Site supervisors
        - Fish or shellfish husbandry staff
        - Environmental monitoring personnel
        - Fish health personnel
        - Harvesting staff
        - Maintenance personnel

[1] Relevant employees are those who carry out tasks or activities within the scope of the ASC Farm Standard and whose work affects the implementation of, or conformance with, the ASC Requirements.

- Subcontractors performing activities that affect conformance with the ASC requirements.

- Relevant employees should have:
  - Knowledge
  - Experience
  - Training (theory and on the job)
  - Capacity
  - Decision-making permissions
- Training and competency should be appropriate to each employee's responsibilities. For example:
  - environmental monitoring personnel should understand the monitoring methods, sampling procedures, and reporting requirements relevant to their work;
  - fish health personnel should understand the applicable biosecurity, treatment, and animal health requirements;
  - harvesting personnel should understand the procedures necessary to meet animal welfare, traceability, and product handling requirements; and
  - managers and supervisors should understand their responsibilities for implementing, monitoring, and maintaining conformance with the ASC Requirements.
- Employees are not required to be trained on every requirement of the ASC Farm Standard, only on those requirements that are relevant to the activities they perform.
  - Training should focus primarily on how to perform activities in a manner that conforms with the ASC Requirements, rather than on explaining or interpreting the wording of the standard itself. For example, employees should understand:
    - what procedures they are expected to follow;
    - why those procedures are necessary;
    - what records they are required to complete; and
    - what actions to take when problems are identified.
- Training should be provided:
  - during induction, where appropriate;
  - when responsibilities change;
  - when ASC Requirements are revised; and

- when competency gaps are identified.

- Competence may be demonstrated through:
  - education or professional qualifications;
  - practical experience;
  - internal or external training;
  - supervised on-the-job learning;
  - competency assessments or observation of work.

Evidence of implementation should be maintained, e.g.:

- Job descriptions of all employees.
- Organisational chart with clarity on who is responsible for what.
- Records and documents of training.

Auditors should confirm:

- The site has identified relevant employees and the roles that affect implementation of, or conformance with, the ASC Requirements.
- Employees and management understand their roles and responsibilities in the implementation of, or conformance with, ASC Requirements.
- Employees have the necessary competencies, knowledge and experience to implement the ASC Requirements.
- Training is provided where needed.
- Competency records are maintained.
- Employees can demonstrate an understanding of the ASC Requirements relevant to their responsibilities.

Note: In case of Group Certification, this indicator should be audited at Site level.

Useful Resources

N/A

Indicator:	Requirement:

1.2.4 The UoC shall annually review the management system and revise it where necessary to ensure its continued suitability, adequacy and effectiveness in implementing the ASC Requirements.

How do I interpret this requirement?

- The intent of this requirement is to ensure that the management system remains appropriate and effective as the site, its operations, applicable legal requirements, risks, or the ASC Requirements might change over time.
    - The management system review should provide an opportunity for the UoC to assess whether its management system remains suitable, adequate and effective in ensuring ongoing conformance with the ASC Requirements
- The annual review should consider, as appropriate:
    - progress towards management objectives;
    - results of internal inspections or audits;
    - certification audit findings;
    - corrective and preventive actions;
    - incidents, complaints and grievances;
    - monitoring and measurement results;
    - compliance with applicable legal requirements;
    - changes in operational risks;
    - changes to the ASC Requirements;
    - stakeholder feedback, where relevant;
    - adequacy of resources, training and competencies;
    - progress towards longer-term ASC targets, e.g. an increase in wage payments;
    - financial and personnel resources necessary to maintain the management system;
    - performance review since the previous management review; and
    - a mechanism for employees' feedback on the effectiveness of the management system.
- As required by the indicator, the management system shall be reviewed annually. Additional reviews may be appropriate following significant changes, such as:

- changes to the ASC Requirements;
- changes in applicable legal requirements;
- expansion or modification of site operations;
- introduction of new production systems or technologies;
- significant non-conformities or recurring incidents;
- disease outbreaks or major environmental events; and
- changes in organisational structure or key staff.

- The outcome of the review should include addressing any need for changes and opportunities for improvement in the management system, which is documented and communicated to relevant employees for implementation.
  - The review should determine whether changes are needed to:
    - policies or objectives;
    - procedures or work instructions;
    - responsibilities or organisational arrangements;
    - monitoring or record-keeping processes;
    - training programmes;
    - operational controls;
    - risk assessments; or
    - resource allocation.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Management review meeting minutes.
  - Annual management review reports.
  - Action plans arising from the review.
  - Updated procedures or policies.
  - Records showing completion of identified actions;
    - The format of the records should be appropriate to the size and complexity of the site.

Auditors should confirm:

- The review is conducted at least annually.

- The review considered information relevant to the implementation of the ASC Requirements.
- Actions arising from the review have been identified and implemented where necessary.
- The management system continues to be suitable for the size, complexity, and activities of the UoC.

Note: for ASC Group Certification UoCs, this indicator should be audited at Group level.

Useful Resources

N/A

Criterion 1.3 – Business Ethics

Indicator:	Requirement:
1.3.1	The UoC shall discourage all forms of corruption and shall encourage ethical behaviour and integrity in their business operations.

How do I interpret this requirement?

- Corruption can:
  - Happen anywhere;
  - Involve anyone;
  - Take many forms[2]. For example:
    - extortion
    - embezzlement
    - bribery
- Examples of corruption are:
  - A manager buys supplies from a friend and in return, the friend gives 20% of the profits to the manager. This may go as far as the manager excluding other appropriate suppliers from the system of approved suppliers.
  - A piece of infrastructure has an unsafe mechanism**,** and the owner pays the manager cash to not disclose this at the next audit.
- Examples of extortion are:
  - Employee A threatens to provide information to the manager which could get Employee B into trouble or fired, unless Employee A is paid a requested amount of money.
  - A site owner threatens to hurt the owner of the neighbouring plot of land unless the landowner agrees to give up some of his land so that the site can build an additional building.
- Examples of embezzlement are:
  - A site manager getting cash from the first point of sale in exchange for under-declaring harvest volumes (i.e. the purchaser receiving more product that they are paying for).

[2] https://www.transparency.org/en/what-is-corruption

- A sourcing manager purchases cheaper non-eligible feed but registers them as eligible and provides documentation falsely declaring it as more costly eligible feed, as financial sourcing performance increases the sourcing manager's bonus.

- Examples of bribery are:
  - A supplier buys a new car for a site manager, in exchange for the site manager giving the sourcing contract to that supplier.
  - A site pays cash to customs officials to speed up the passage of their feed through the import and export system.
  - A sustainability manager offers auditors excessive accommodation and lunches to reduce the audit effort or to turn a blind eye to non-conformities.

Evidence of implementation should be maintained, e.g.:

- Policies preventing corruption, including extortion, embezzlement and bribery.
- Terms of dismissal should employees engage in these practices.

Auditors should confirm:

- Management and employees are aware of:
  - what these practices involve and how to recognise them.
  - the policies in place for preventing corruption, including extortion, embezzlement and bribery.

Useful Resources

- Transparency International: https://www.transparency.org/en

Indicator:	Requirement:
1.3.2	The UoC shall ensure that information provided as evidence of conformance to the ASC Requirements is not falsified or misrepresented.

How do I interpret this requirement?

- Records are documented information that provides permanent evidence about past events. They should:

- Be completed and maintained in a way that ensures information is accurate and preserved;
- Be genuine;
  - they should be completed at the time of the checks or shortly after.
- Capture and illustrate information when processes do not perform as expected.
  - for example, if the cooling system ceases to work, it is important that temperatures above the acceptable range according to internal requirements are recorded so that management can learn from these events.
    - recording temperatures only within the acceptable range will lead to management not understanding that a backup temperature regulator might be needed.
- Be legible;
- Be complete;
  - which may include a form of authorisation through the initials of the supervisor verifying records are complete;
- Be stored appropriately:
  - paper records should be stored in a way that prevents damage.
  - where records are stored electronically, this storage should be backed up.

o If incidences of falsification of records or misrepresentation of information are identified, corrective action and actions to prevent recurrence should be taken.

Evidence of implementation should be maintained, e.g.:

o Records:

- that are genuine;
- corrective action and actions to prevent recurrence when incidences of falsification of records or misrepresentation of information are identified.

Auditors should confirm:

o Records are genuine.

o Effectiveness of corrective action and actions to prevent recurrence.

Useful Resources N/A

Criterion 1.4 – Traceability and Disclosure

Indicator:	Requirement:
1.4.1	The UoC shall identify, evaluate and mitigate risks of mixing and substituting ASC-certified products with non-ASC-certified products at all sites.

How do I interpret this requirement?

- The intent of this requirement is to maintain the integrity of ASC-certified products by ensuring that certified products are not unintentionally or intentionally mixed with, substituted by, or misidentified as non-certified products.
    - The site is responsible for ensuring it mitigates risks of substitution and mixing of certified and non-certified products.
    - The level of detail of the evaluation should be proportionate to the complexity of the operation.
- The site may apply the Risk Assessment Method outlined in Appendix 3 (Section 3.2) of the ASC Farm Standard as a structured approach to identify, evaluate and mitigate risks of mixing and substitution of ASC certified and non-certified products.
    - The assessment should consider all sites and activities within the UoC where there is a risk that ASC-certified and non-certified products could be mixed or substituted, including:
        - grow out sites;
        - harvesting operations;
        - grading and handling areas;
        - temporary storage locations;
        - transport between sites; and
        - loading and dispatch areas.
- The site should identify circumstances that could result in mixing or substitution, for example:
    - certified and non-certified products produced at the same site;
    - shared equipment or storage facilities;
    - inadequate product identification;

- errors in labelling;
- transfer of products between sites;
- subcontractor activities;
- manual record-keeping errors;
- insufficient staff awareness.

- Depending on the identified risks, mitigating measures should include:
  - physical segregation of certified and non-certified products;
  - clear identification and labelling;
  - documented handling procedures;
  - traceability and inventory controls;
  - segregation during harvesting, transport, and storage;
  - staff training on product identification and handling;
  - restricted access to storage areas;
  - periodic reconciliation of production and inventory records;
  - routine verification of traceability records.

Evidence of implementation should be maintained, e.g.:

- Records:
  - completed risk assessment and measures implemented to prevent or mitigate identified risks;
  - any incidents of mixing or substitution;
  - corrective actions taken where issues are identified.

Auditors should confirm:

- The site has assessed the risk of mixing and substitution at all relevant sites.
- Appropriate controls have been implemented based on the identified risks.
- Staff responsible for handling certified products understand the relevant procedures.
- Records support the integrity and traceability of ASC-certified products throughout the site's operations.

Useful Resources

N/A

Indicator:	Requirement:

1.4.2

The UoC shall develop, implement and maintain a traceability system, covering all sites, to ensure that the following conditions are met:

a. all stocked animals are traceable back to the direct supplier; and

b. all **batches** of ASC-certified product and, where applicable, non-ASC-certified product, are identifiable and segregated at all sites and at all times; and

c. all batches of ASC-certified product are traceable at all times to:

   i. the site(s) used; and

   ii. the production unit(s) used; and

d. corrective actions are taken if **non-conforming product** is identified, sold or dispatched; and

e. accompanying documentation shall identify product sold or dispatched as ASC-certified and, where applicable, as non-ASC-certified.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:

1.4.3

Indicator applicability: every UoC using compound feed

The UoC shall demonstrate that feed products, subject to conformance with Indicator 2.12.1, are accompanied by the following information:

a. the originating feed mill holds valid certification against the ASC Feed Standard with the appropriate scope of certification in relation to the ASC Production Model (i.e. Mass Balance Production Model or Segregation Production Model product); and

b. feed is traceable as ASC-conforming throughout all steps between the feed mill and site; and

c. documentation accompanying the feed identifies the feed as ASC-conforming; and

d. documentation accompanying the feed identifies the production model applied (i.e. Mass Balance Production Model or Segregation Production Model); and

e. for ASC-conforming Segregation Production Model feed, the product is identifiable by a distinct feed name in formal documentation accompanying the product.

How do I interpret this requirement?

- Indicator 2.12.1 requires the UoC to only use ASC-conforming compound feed.
  - Use of non-conforming feed will be treated as a non-conformity against Indicator 2.12.1.
- For product that is sold under the segregation production model, identifying the feed production model and distinct feed name is required by the ASC Feed Standard, Indicator 3.3.4.

Evidence of implementation should be maintained, e.g.:

- Process to confirm the originating feed mill holds valid certification against the ASC Feed Standard.
- Records:
  - traceability system and its verification, for example:
    - use of a digital traceability system
    - outcome of any input-output exercises and traceability tests.
  - accompanying documents incorporating information required by 1.4.3(c), (d) and (e).

Auditors should confirm:

- Process to confirm the originating feed mill holds valid certification against the ASC Feed Standard.
- Effective traceability and segregation systems are in place.
- Outcome of any input-output exercises and traceability tests.

Useful Resources

N/A

Indicator:	Requirement:

1.4.4

Indicator applicability: every UoC using compound feed

The UoC shall disclose to all buyers of their ASC-certified product when a product's feed contains >0.9%[3] Genetically Modified Organisms (GMO) or macro ingredients[3] produced from GMO.

How do I interpret this requirement?

- The required disclosure is to the UoC's buyers of ASC-certified products.
  - Where the UoC dispatches its ASC-certified products to a processing or packing facility owned by the UoC's Certificate Holder, the disclosures should be made to that facility.
- A public disclosure is possible but not required.
- Disclosure may be provided to buyers individually or collectively.

Evidence of implementation should be maintained, e.g.:

- Records:
  - disclosure to buyers.

Auditors should confirm:

- Evidence of disclosure to buyers.

Useful Resources

N/A

[3] European Council. (2003). Regulation (EC) No 1830/2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC. European Parliament, Council of the European Union.

Indicator:	Requirement:

1.4.5 The UoC shall not identify, sell or dispatch the following as ASC-certified:

a. any product treated with **antimicrobials** listed as Authorised for use in Humans Only (Indicator 4.4.12), Highest Priority Critically Important Antimicrobials (HPCIA) or Critically Important Antimicrobials (CIA) (Indicator 4.4.13) by the World Health Organisation (WHO)[4], at any stage in the lifecycle of the product; or

b. crustaceans treated with any antibiotic at the UoC (Indicator 4.4.14).

How do I interpret this requirement?

- This requirement addresses situations where a product may conform to the standard, however it cannot be sold or dispatched as ASC-certified.
- The UoC should:
  - Maintain detailed records of any antibiotic treatments applied prior to the UoC.
  - Implement a process to ensure that the product under 1.4.5(a) or (b) is not sold or dispatched as ASC-certified.

Evidence of implementation should be maintained, e.g.:

- Records:
  - antibiotic treatments, including those applied prior to the UoC.

Auditors should confirm:

- UoC's process to ensure that the product under 1.4.5(a) or (b) is not sold or dispatched as ASC-certified.

Useful Resources

N/A

[4] https://cdn.who.int/media/docs/default-source/gcp/who-mia-list-2024-lv.pdf?sfvrsn=3320dd3d_2

Indicator:	Requirement:
1.4.6	The UoC shall disclose to buyers of their ASC-certified product, upon request, a list of all veterinary therapeutants applied to the product.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
1.4.7	The UoC shall report the related data for production volumes and sales/dispatch volumes of ASC-certified and non-ASC-certified products originating from each site and the specified traceability data (when requested) in accordance with the ASC Data Submission Procedure.

How do I interpret this requirement?

- The intent of the requirement is to support the integrity of the ASC Programme by enabling traceability, certificate oversight, and programme monitoring.
- The site should ensure that the data submitted to ASC is consistent with its internal production records, inventory records, sales records and traceability system.

Evidence of implementation should be maintained, e.g.:

- Copies or confirmation of data submitted to ASC.
- Production reports by site.
- Inventory and stock reconciliation records.
- Sales invoices and dispatch records.
- Batch and traceability records.
- Export files from the sit's traceability system.
- Correspondence demonstrating submission of additional traceability data requested by ASC.

Auditors should confirm:

- The UoC has submitted the required data in accordance with the ASC Data Submission Procedure.

- Submitted production and sales/dispatch volumes are supported by the site's records.
- Reported data can be reconciled with the traceability system and, where applicable, a mass balance reconciliation.
- Production and sales/dispatch data are reported separately for ASC certified and non-certified products.
- Where ASC has requested additional traceability data, the site has submitted the requested information.

Useful Resources

N/A

Criterion 1.5 – Upstream Supply Chain

Indicator:	Requirement:
1.5.1	The UoC shall maintain an up-to-date list of all supplier sites in its upstream supply chain[5], in accordance with the ASC Data Submission Procedure.

How do I interpret this requirement?

- The intent of the requirement is to enable ASC to identify and maintain visibility of the UoC's upstream supply chain to support traceability, programme integrity, and oversight activities.
- The upstream supply chain includes all sites that produced product supplied to the UoC (e.g., broodstock, nurseries, hatcheries, or other upstream sites).
- **Examples of implementation:**
  - Single supplier: A salmon farm (i.e. the UoC) obtains all its smolts from one hatchery. The UoC should list the hatchery.
  - Multiple suppliers:
    - A shrimp farm (i.e. the UoC) sources post-larvae from three hatcheries during the year. The UoC should list all three hatcheries.
    - A Certificate Holder (CH) operates its own hatchery that supply its grow out site (i.e. the UoC). The UoC also obtains product from external hatcheries. The UoC identifies the own CH´s hatchery and the external ones in the list required by the indicator.

Evidence of implementation should be maintained, e.g.:

- Confirmation that the upstream supply chain information has been submitted to ASC in accordance with the ASC Data Submission Procedure.
- A current list of upstream suppliers.
- Purchasing records, contracts, or supply agreements identifying upstream suppliers.
- Stocking records identifying the origin of larvae, juveniles, smolts, seed, etc.

[5] The upstream supply chain to be listed includes all supplier sites involved in the production chain from which the fish originate (e.g., eggs, spats, nauplii, alevin, fry, fingerlings, post-larvae, juveniles and smolts production sites).

- Delivery notes, invoices, transport documentation, or other records demonstrating the identity of upstream suppliers.
- Traceability records linking stocked products to the identified upstream suppliers.
- Correspondence or system records confirming submission to ASC.

Auditors should confirm:

- The UoC has submitted its upstream supply chain information to ASC in accordance with the applicable ASC Data Submission Procedure.
- The submitted information is consistent with the UoC's purchasing, stocking, production, and traceability records.

Useful Resources N/A

Indicator:	Requirement:

1.5.2

Indicator applicability: cod, flatfish, salmonids, seabass, seabream and meagre

The UoC shall only stock fish from direct supplier sites that conform with the requirements in Appendix 14[6].

An exception applies to UoCs stocking marine salmonids, in which case:

a. all land-based sites[7] in the upstream supply chain shall conform with the requirements in Appendix 14 at the time of stocking at the UoC; and

b. all cage culture sites[7] in the upstream supply chain shall:

   i. hold valid ASC certification at the time of stocking at the UoC[8]; and

   ii. if producing smolts in freshwater cage culture, operate in regions where native salmonids of the same species are present.

[6] An exemption applies to supplier sites that hold valid ASC certification. These sites do not need to conform with the requirements in Appendix 14.
[7] An exemption applies to broodstock sites.
[8] Exception *b.i.* applies from the start of the production cycle following the cycle ongoing at the time of the first certification to the ASC Farm Standard. However, where the UoC is supplied with smolts produced in freshwater cage culture, exception *b.i.* applies from the production cycle ongoing at the time of the first certification to the ASC Farm Standard.

How do I interpret this requirement?

- This indicator ensures that fish stocked by the UoC originate from sites within its upstream supply chain that conform with the requirements of Appendix 14 or hold valid ASC certification.
- The UoC is responsible for verifying the conformity of the upstream site(s) with Appendix 14.
- Direct supplier sites refer to the sites that directly supply fish to the UoC.
    - Depending on the species and production system, these may include egg/juvenile suppliers, nurseries, hatcheries, land-based salmon/smolt facilities, etc.
        - Appendix 14 does not apply to broodstock sites.
- For all species within the scope of the indicator, except marine salmonids, only the direct supplier of the UoC is subject to Appendix 14.
- For UoCs producing marine salmonids:
    - All sites in the UoC's upstream supply chain producing fish in land-based sites are subject to Appendix 14.
    - Upstream sites producing in cage culture are not subject to Appendix 14. These upstream sites shall be ASC-certified.
        - Where the cage culture upstream site produces smolts in freshwater, it shall operate in regions where native salmonids of the same species are present.
- The implementation date for exception *b.i.* depends on the type of cage culture supplier:
    - Where the UoC is supplied with smolts produced in freshwater cage culture, exception *b.i.* applies from the production cycle ongoing at the time of the first certification to the ASC Farm Standard.
    - For all other UoCs supplied with fish produced in cage culture, exception *b.i.* applies from the start of the production cycle following the cycle ongoing at the time of the first certification to the ASC Farm Standard. For example:

Date	Production cycle	Indicator applies?
Jan-27	Production Cycle 1 begins	No
Dec-27	UoC is first certified against the ASC Farm Standard	---
Feb-28	Production Cycle 1 ends	No
Apr-28	Production Cycle 2 begins (new fish stocked)	Yes

In this example, the fish stocked in Production Cycle 1 were already at the UoC when the UoC was first certified to the ASC Farm Standard and are therefore not subject to Indicator

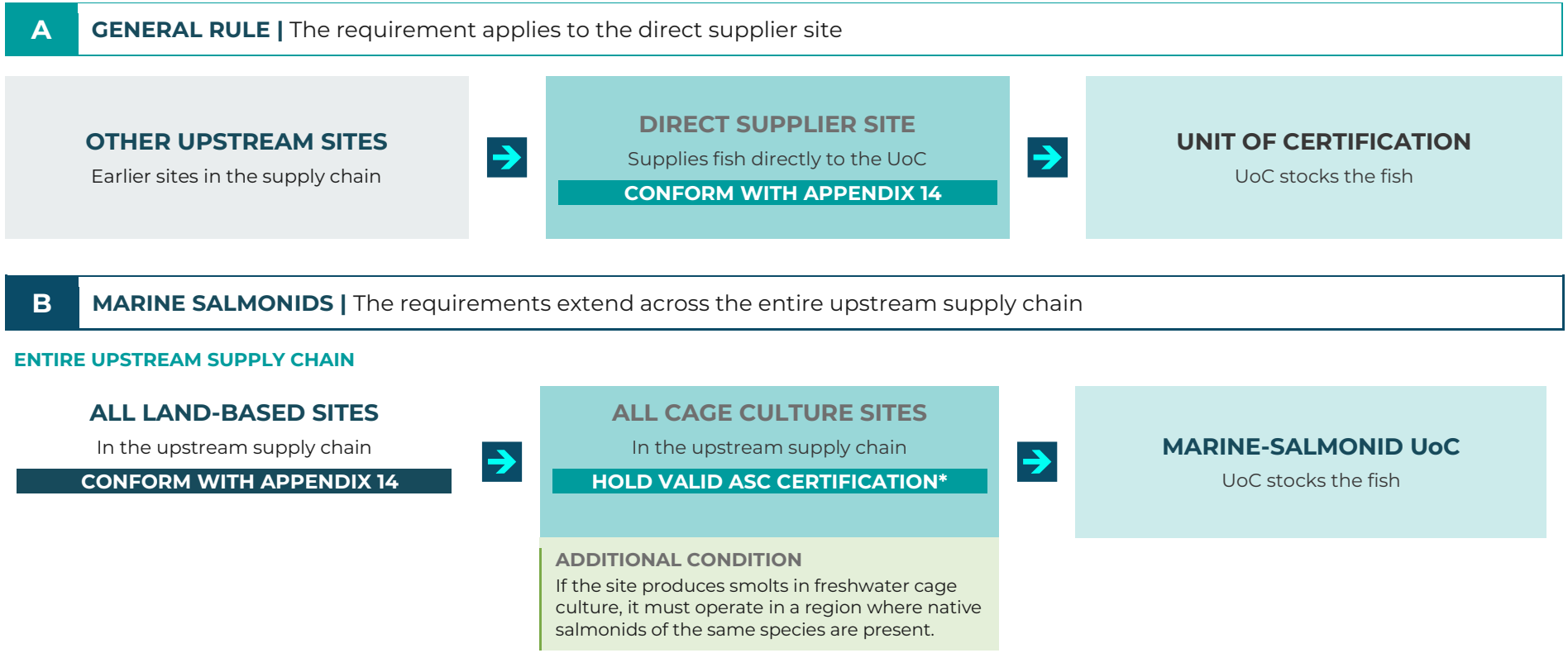
1.5.2. The indicator applies when the UoC stocks the next batch of fish in Production Cycle 2; that batch shall come from a site holding valid ASC certification.

Appendix 14 and Certification

- Appendix 14 establishes that documentation is required to be maintained from the sites in the upstream supply chain to demonstrate that these sites conform with the requirements of this appendix.
    - The documentation should provide information to the extent necessary to ensure that the supplier sites conform with the requirements of Appendix 14.
    - The UoC should establish arrangements with its upstream suppliers to ensure that evidence of conformity with Appendix 14 is available at the certification audit.
        - Early engagement with upstream suppliers can help avoid disruptions to the UoC's supply chain.
- The UoC should engage with its upstream cage suppliers well in advance of the applicable implementation date of this indicator to ensure they are aware of the requirement to obtain ASC certification.
    - Early engagement can help suppliers prepare for ASC certification and minimise disruptions to the UoC's supply chain.
- Figure 1 below illustrates how the requirements of Indicator 1.5.2 apply to supplier sites in the UoC’s upstream supply chain, including the specific provisions for UoCs producing marine salmonids.

Figure 1. Application of Indicator 1.5.2 to upstream supplier sites.

APPLICABILITY: cod, flatfish, salmonids, seabass, seabream and meagre



*The requirement to hold valid ASC certification applies from the start of the production cycle following the cycle ongoing at the time of the first certification to the ASC Farm Standard. However, where the UoC is supplied with smolts produced in freshwater cage culture, it applies from the production cycle ongoing at the time of the first certification to the ASC Farm Standard.

The requirements in Appendix 14 are based on the four Principles of the ASC Farm Standard and address the environmental and social impacts most relevant to upstream supply-chain sites. The guidance for the corresponding ASC Farm Standard requirements may be used to support the implementation and interpretation of Appendix 14. For ease of reference, the table below lists the Appendix 14 indicators alongside their corresponding indicators in the ASC Farm Standard:

Appendix 14 Indicator		**ASC Farm Standard Indicator**
14.1	The UoC shall demonstrate that supplier sites hold all applicable legal licences and permits.	1.1.1
14.2	The UoC shall demonstrate that supplier sites are not located in Protected Areas (PA). An exception applies where conditional siting is allowed according to Appendix 4.	2.2.1
14.3	*Indicator applicability: land-based systems* The UoC shall demonstrate that supplier sites do not convert natural wetland after May 1999. An exception applies where conversion is needed for establishing and maintaining pumping stations, water pipes or canals, in which case the sites shall successfully restore 100% of the converted area.	2.2.10
14.4	The UoC shall demonstrate that supplier sites have a Human-Wildlife Interaction Plan, which includes at least the following: a. identification of Threatened Species present in the region; and b. mitigation measures to avoid injuries or cause mortalities of any Threatened Species.	2.3.1; 2.3.2
14.5	The UoC shall demonstrate that supplier sites have an Escape Prevention Plan, which includes at least the following: a. consideration of the installation, inspection and maintenance of containment structures appropriate for the species, size, life stages and the conditions in which the site operates; and b. procedures for the handling of fish; and c. procedures in case of severe weather events; and d. escape response procedures.	2.4.2; 2.4.3
14.6	The UoC shall demonstrate that supplier sites have a procedure for the responsible disposal of waste, which includes at least the following types of waste: a. organic waste, including mortalities and human waste b. biosolids c. chemicals d. therapeutants	2.11.3

14.7	The UoC shall demonstrate that supplier sites using hormones have a procedure to hold water containing hormones for at least 48 hours or as per product specifications, whichever is greater, prior to discharge.	N/A*
14.8	The UoC shall demonstrate that supplier sites have a site-specific Health and Welfare Plan (HWP), approved by a registered veterinarian, with the intention of preventing disease outbreaks, and ensuring the good health and welfare of farmed fish. The HWMP shall include at least the following: a. disease monitoring; and b. response, including quarantine, treatment, and humane culling; and c. reporting mechanisms, including reporting WOAH-notifiable disease to authorities; and d. biosecurity risks; and e. predation risks. The HWP shall be reviewed and revised as necessary: f. at least annually for sites with cycles under one year or using continuous production methods; or g. after each cycle for sites with longer cycles or all-in-all-out production methods.	4.1.1.10
14.9	The UoC shall demonstrate that supplier sites only use therapeutants as prescribed by a registered veterinarian or aquatic animal health professional.	4.4.1
14.10	The UoC shall demonstrate that supplier sites disclose the antibiotic treatments on fish supplied to the UoC, including the number of treatments, the reason for their use and the quantity used.	N/A**
14.11	The UoC shall demonstrate that supplier sites do not use antimicrobials listed as Authorised for use in Humans Only, Highest Priority Critically Important Antimicrobials (HPCIA) or Critically Important Antimicrobials (CIA) by the World Health Organisation (WHO).	N/A***
14.12	The UoC shall demonstrate that supplier sites have policies for at least the following: a. not engaging in or supporting forced labour; and b. not engaging in child labour; and c. not engaging in or tolerating any form of discrimination; and d. allowing all employees to join or form a trade union or worker organisation. An exception applies where this is restricted by law,	3.2.1; 3.3.1; 3.4.1; 3.6.1; 3.6.2

	in which case an alternative lawful mechanism for employee engagement is allowed; and e. allowing all employees to engage in collective bargaining. An exception applies where this is restricted by law, in which case an alternative lawful mechanism for employee engagement is allowed.	
14.13	The UoC shall demonstrate that supplier sites: a. carry out a site-specific health and safety risk assessment; and b. provide health and safety training for any person working on the site as required to carry out their job.	3.5.1 & 3.5.5
14.14	The UoC shall demonstrate that supplier sites have a community grievance mechanism that is proactively communicated, accessible, fair and applicable to Indigenous and tribal peoples, and local communities.	3.12.4

* No additional guidance is provided for this Indicator.
** No corresponding Indicator in the ASC Farm Standard.
***Indicator differs from the corresponding Indicator in the ASC Farm Standard; therefore, the associated guidance is not applicable.

Evidence of implementation should be maintained, e.g.:

- The UoC should identify the sites in its upstream supply chain and maintain documented evidence demonstrating that they conform with the requirements in Appendix 14, where applicable.
  - Acceptable evidence may include records, contracts, internal verification reports, audit reports, or other documentation demonstrating conformity with Appendix 14. For example:
    - Records identifying the direct supplier of each stocked batch.
    - Purchase, delivery, fish-movement and stocking records.
    - Evidence demonstrating the direct supplier's conformance with Appendix 14.
    - For marine salmonids:
      - records identifying all land-based and cage-culture sites in the upstream supply chain;
      - evidence demonstrating that each land-based site conforms with Appendix 14;
      - valid ASC certificates covering each cage-culture site and the relevant species;

- records confirming that the certificates were valid on the date the fish were stocked into the UoC; and
- official records, recognised species-distribution databases or scientific publications demonstrating the presence of native salmonids of the same species in regions where smolts are produced in freshwater cage culture.

- Traceability records linking each stocked batch to the relevant upstream supplier sites

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Auditors should confirm:

- Whether the general requirement or the marine-salmonid exception applies.
- That the direct supplier of each sampled stocked batch has been identified and, where the general requirement applies, conforms with Appendix 14.
- For marine salmonids:
  - all land-based and cage-culture sites in the upstream supply chain have been identified;
  - each land-based site conformed with Appendix 14 when the fish were stocked into the UoC;
  - each cage-culture site held valid ASC certification covering the relevant site and species when the fish were stocked into the UoC; and
  - any freshwater cage-culture site producing smolts is located in a region where native salmonids of the same species are present.
- Supplier, fish-movement and stocking records are consistent and provide traceability between each sampled batch and the relevant upstream sites.
- The evidence used to demonstrate the presence of native salmonids is credible, relevant to the region and applicable to the species concerned.

Useful Resources

N/A



Principle 2

The aquaculture industry demonstrates environmental stewardship



Criterion 2.1 - Environmental Risk Assessment

Indicator:	Requirement:

2.1.1 The UoC shall conduct an Environmental Risk Assessment (ERA) per site, following the method outlined in **Appendix 3 (3.3)**.

How do I interpret this requirement?

- The Environmental Risk Assessment (ERA) determines the risk level of environmental risks resulting from operational activities in the vicinity of the site. A default set of environmental risks are listed in Appendix 3 (3.3) as a minimum.
- The outcome of the ERA will be used to determine conformance and impacts on Ecologically Important Habitats (Criterion 2.2) and Wildlife Interactions (Criterion 2.3).
- Where a legally required Environmental Impact Assessment (EIA), or equivalent legal environmental assessment, exists for the site, it may be used to demonstrate conformance with Indicator 2.1.1 where the decision tree in Appendix 3 (3.3.1) confirms that it is site-specific, externally reviewed, current and materially covers the ERA scope.
- Where the existing EIA or equivalent assessment covers the main ERA scope but does not address all ASC-specific components, the missing components should be addressed through a documented gap review or addendum, rather than preparing a duplicate ERA.
- Where no suitable EIA or equivalent assessment is available, the UoC shall conduct an ERA following the method and requirements in Appendix 3.

Evidence of implementation should be maintained, e.g.:

- A completed decision tree showing whether an existing EIA/equivalent assessment was accepted, supplemented by an addendum, or whether a separate ERA was required.
- An ERA has been conducted, following the method outlined in Appendix 3, and records are available to demonstrate that actions are taken to reduce risks with risk level 'medium' or 'high'.
- Evidence that that all reasonably practicable controls have been implemented, where a ‘medium’ risk cannot be reasonably be reduced to ‘low’.

Auditors should confirm:

- The UoC has presented the ERA, or an accepted legally required EIA or equivalent legal environmental assessment, which was conducted in accordance with the method in Appendix 3.
- Where a legally required EIA or equivalent legal environment assessment has been used, the UoC has documented how it covers the ERA scope and, where relevant, how missing ASC-specific components have been addressed.
- That the assessment includes relevant environmental risks, impact pathways, mitigation measures and monitoring needs.

Useful Resources

- European Food Safety Authority: Environmental Risk Assessment: Environmental risk assessment | EFSA.
- The following table headings may serve as a risk register to support in the following the method outlined in Appendix 3 (3.3). One line should be completed per risk factor.

ID #	Risk name and/or description	Risk driver(s)	Existing control measures	Evidence	Rating[9]			Required action[10]	Responsible person(s)	Deadline[11]	Monitoring (what, how often)	Residual Rating			Review trigger/date
					L	S	R					L	S	R	

[9] L = Likelihood | S = Severity | R = Risk – Where Risk is 'Medium' or 'High', control measures must be defined and implemented.
[10]: Mitigation: reduce but not fully eliminate | Remediation: reduce until the risk factor is no longer relevant
[11] *Example* reduction timelines: High → Medium: ~6–9 months | Medium → Low: ~12–18 months

Indicator:	Requirement:

2.1.2 The UoC shall ensure that the ERA (see Indicator 2.1.1) is conducted by a person with the necessary competencies, experience and training, following the method in **Appendix 3 (3.3)**.

Where applicable regulatory competency requirements exist, the UoC shall ensure that the person conducting the ERA complies with these requirements.

How do I interpret this requirement?

- The decision tree in Appendix 3 should be used to determine whether an independent person is required to conduct the ERA. Independency is expected where:
  - the site presents higher environmental risk or assessment complexity, such as where the site is located in or adjacent to an officially designated sensitive habitat; or
  - meets a scale-related trigger for intensive or industrial aquaculture; or
  - has multiple cumulative risk factors.
- Where a legally required EIA, or equivalent legal environmental assessment, has been externally reviewed and accepted through the decision tree, this may satisfy the need for independent review of the ERA scope.
- Where the decision tree does not require an independent person, the ERA may be conducted internally. To demonstrate competence, personnel conducting the ERA should be able to:
  - Identify and analyse environmental risks.
  - Conduct data analysis.
  - Record, review and authorise the release of results.
  - Contribute to or produce reports that can clearly and concisely follow the method outlined in Appendix 3.3.
  - Have undergone training, or have experience, relating to ERAs.

Evidence of implementation should be maintained, e.g.:

- Completed decision tree showing whether an independent person was required.

- Documents outlining the person conducting the ERA has experience and competences that are relevant to the size and complexity of the site.

Auditors should confirm:

- The UoC has applied the decision tree in Appendix 3.3.1 to determine whether an independent person was required.
- Evidence and documents have been presented to demonstrate the person conducting the ERA has the necessary experience, competencies and qualifications.

Useful Resources

N/A

Criterion 2.2 - Ecologically Important Habitats

Indicator:	Requirement:

2.2.1

Indicator applicability: all species except bivalves, abalone, pangasius and tilapia.

The UoC shall ensure that the site is not located in **Protected Areas** (PA). An exception applies where conditional siting is allowed according to **Appendix 4 (4.2)**.

How do I interpret this requirement?

- Conditional allowances to the siting in Protected Areas (PA) have been taken from the ASC species standards while work is ongoing to develop updated conditional allowances.

Evidence of implementation should be maintained, e.g.:

- Whether the site is in a PA and if so:
  - Evidence that the PA meets the conditional allowances specified in Appendix 4 (4.2).
  - The management plan for the PA, including any conservation objectives.

Auditors should confirm:

- Whether the site is in a PA. If so, evidence has been provided to demonstrate that the site meets the conditional allowances in Appendix 4 (4.2).

Useful Resources

- Protected Planet: World Database on Protected Areas (WDPA): Explore the World's Protected Areas.

Indicator:	Requirement:

2.2.2 The UoC shall ensure that the site has a low risk of negative impact on **critical habitats**, as determined through the ERA (see Indicator 2.1.1).

How do I interpret this requirement?

- The Environmental Risk Assessment (ERA) will determine whether there are critical habitats within the vicinity of the site and the risk drivers that increase the likelihood of negative impacts on any critical habitats.

Evidence of implementation should be maintained, e.g.:

- An ERA report has been completed, which assesses the risk of negative impacts on any relevant critical habitats.
- The ERA report demonstrates whether the risk of negative impacts on critical habitats is 'low'.
    - In cases where the risk level is not 'low', the ERA report identifies the risk drivers.
    - In cases where the risk level is 'medium' or 'high', the site demonstrates the actions taken to reduce the risk level to 'low'.
- Where there are no critical habitats within the vicinity of the site, the ERA report should provide evidence supporting this conclusion, including the data sources, spatial screening method and search area used.

Auditors should confirm:

- Whether there are critical habitats in the vicinity of the site. If so, evidence has been provided in the ERA that the risk of negative impacts on the critical habitats is low.

Useful Resources

N/A

Indicator:	Requirement:
2.2.3	The UoC shall preserve any critical habitat identified within the site.

How do I interpret this requirement?

- In accordance with Indicator 2.2.2, the ERA report should identify whether critical habitats are located within the boundaries of the site.
    - The size and biodiversity characteristics of critical habitats should either remain the same since the ERA was conducted or have increased/improved.

Evidence of implementation should be maintained, e.g.:

- The ERA report has identified the presence of critical habitats within the boundaries of the site.
- Documented measures and outcomes that demonstrate critical habitats have been preserved and that their size and biodiversity have not decreased.

Auditors should confirm:

- Whether critical habitats have been identified in the ERA report.
- If critical habitats are present, evidence has been provided to demonstrate measures to preserve the documented critical habitats.
    - Outputs of preservation measures should also be available where appropriate.

Useful Resources

- GIS portal: GIS portal - ASC International (asc-aqua.org)

Indicator:	Requirement:

2.2.4 The UoC shall ensure that the site has a low risk of negative impact on **sensitive habitats**, as determined through the ERA (see Indicator 2.1.1).

How do I interpret this requirement?

- The Environmental Risk Assessment (ERA) should determine whether there are sensitive habitats within the vicinity of the site and the risk drivers that increase the likelihood of negative impacts on any sensitive habitats.
    - The ERA will determine whether the risk of negative impacts on the identified sensitive habitats is minimal.
- Appendix 3.3.1 outlines the risk factors that shall be considered as a minimum when conducting the ERA.
    - Appendix 3.3.1 also outlines the types of sensitive habitats that shall be considered as a minimum.
    - Other types of sensitive habitats may be identified in the ERA.

Evidence of implementation should be maintained, e.g.:

- An ERA report has been completed, which assesses the risk of negative impacts on any relevant sensitive habitats.
- The ERA report demonstrates whether the risk of negative impacts on sensitive habitats is low.
- Where there are no sensitive habitats within the vicinity of the site, the ERA report should provide evidence supporting this conclusion, including the data sources, spatial screening method and search area used.

Auditors should confirm:

- An ERA has been completed, which includes at a minimum the risk factors outlined in Appendix 3.3.
- The ERA determined whether sensitive habitats are located within the vicinity of the site.
    - If sensitive habitats were identified, the ERA determined whether the risk of negative impacts on the sensitive habitats is low.

Useful Resources

- GIS portal: GIS portal - ASC International (asc-aqua.org)

Indicator:	Requirement:

2.2.5

Indicator applicability: seabass, seabream and meagre

The UoC shall maintain a buffer between the Zone 1 boundary and the nearest edge of seagrass habitat, following the method outlined in **Appendix 7 (7.6)**, with a minimum distance of either 500m or as determined through the ERA (see Indicator 2.1.1), whichever is stricter.

How do I interpret this requirement?

- Seagrass habitats are sensitive benthic habitats that can provide important ecosystem functions, including nursery habitat, sediment stabilisation, carbon storage and support for biodiversity.
- The ERA will determine whether seagrasses (*Posidonia oceanica*, *Cymodocea nodosa*, *Zoostera marina* and *Zoostera noltii*) are present within the vicinity of the site and whether the site has taken adequate measures to maintain them.

Evidence of implementation should be maintained, e.g.:

- The ERA demonstrates whether seagrasses are present within the vicinity of the site and whether the buffer is adequately maintained.
- Spatial data and maps demonstrating:
  - the location of the farm relative to nearby seagrass habitat.
  - evidence of the Zone 1 boundary, determined in accordance with Appendix 7 (7.2).
  - the distance between the Zone 1 boundary and the nearest edge of seagrass habitat.
- Where no seagrass habitat is identified in the vicinity of the site, evidence supporting this conclusion, including the data sources, spatial screening method and search area used.

Auditors should confirm:

- Whether the ERA report has identified the presence of seagrass habitats within the vicinity of the site.
- Review map and cross-check against independent information sources to determine if the distance between the Zone 1 boundary and the nearest edge of seagrass habitat is at least 500m, or greater; as determined by the ERA.

Useful Resources

- GIS portal: GIS portal - ASC International (asc-aqua.org)

Indicator:	Requirement:
2.2.6	*Indicator applicability: land-based systems* The UoC shall maintain any natural **wildlife corridors** within the site, as determined through the ERA (see Indicator 2.1.1).

How do I interpret this requirement?

- Maintaining wildlife corridors mitigates impacts on biodiversity and allows for wildlife movement across larger landscapes within their habitats or natural ranges.
  - Examples include ensuring corridors are maintained to allow the movement of wildlife to and from feeding or breeding sites either side of the site.
- The ERA shall determine whether any wildlife corridors are present within the site and whether the site has taken adequate measures to maintain them.

Evidence of implementation should be maintained, e.g.:

- The ERA demonstrates whether wildlife corridors are present within the site and whether the corridors are adequately maintained.
- Spatial data and maps over a relevant timescale can determine if wildlife corridors are maintained.

Auditors should confirm:

- Whether the ERA report has identified the presence of wildlife corridors within the site.
- If present, the ERA determines the site is maintaining the wildlife corridors.
- The UoC has presented maps or spatial data to demonstrate wildlife corridors have been maintained.

Useful Resources

- GIS portal: GIS portal - ASC International (asc-aqua.org)

Indicator:	Requirement:
2.2.7	*Indicator applicability: land-based systems producing catfish, crustaceans, freshwater salmonids or pike-perch* The UoC shall[12] maintain a **riparian zone** between the site and any confined or linear waterbody, with a minimum width of either 15m or as determined through the ERA (see Indicator 2.1.1), whichever is stricter.

How do I interpret this requirement?

- Confined or linear waterbodies include rivers, streams, tidal creeks, and estuaries.
- Riparian zones provide a buffer between natural waterbodies and adjacent terrestrial ecosystems.
    - A 15m buffer zone is the minimum width to provide habitats for wildlife, minimise erosion and run-off, improve water quality and stabilise the ecosystem around the water source.
- The ERA will determine the minimum width of the riparian zone which needs to be maintained to ensure the functioning of the zone.
    - The ERA should also assess the functioning of the riparian zone, for example species diversity.
- The UoC shall ensure the width of the riparian zone is at least 15m, or greater if the ERA determines the buffer zone needs to be wider.

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[12] An exemption applies to: (i) the site's inflow and outflow systems; (ii) sites adjacent to artificial canals or natural waterways that have undergone considerable man-made modification; and, (iii) sites producing pike-perch and salmonids in freshwater that were installed before February 2013. Exemption (iii) does not apply to sites that were installed before this date but have subsequently undergone significant expansion.

Evidence of implementation should be maintained, e.g.:

- The ERA report demonstrates the required width of the riparian zone.
- The site ensures the riparian zone is maintained and is at least 15m wide. The buffer zone shall be wider if determined by the ERA.
    - Spatial data and maps over a relevant timescale can demonstrate the width of the riparian zone is maintained.

Auditors should confirm:

- The ERA report has assessed the suitable width and functioning of the riparian zone.
- The width of the riparian zone is at least 15m, or wider as determined by the ERA.
- Evidence has been presented, e.g. spatial data and maps, demonstrating the riparian zone is maintained at 15m or greater; as determined by the ERA.

Useful Resources

- GIS portal: GIS portal - ASC International (asc-aqua.org)
- United States Environmental Protection Agency (2005): Riparian Buffer Width, Vegetative Cover, and Nitrogen Removal Effectiveness: A Review of Current Science and Regulations: Riparian buffer width, vegetative cover, and nitrogen removal effectiveness: A review of current science and regulations
- Climate ADAPT (2023): Establishment and restoration of riparian buffers: Establishment and restoration of riparian buffers.
- National Institute of Water and Atmospheric Research (2005): Review of Riparian Buffer Zone Effectiveness: Review of Riparian Buffer Zone Effectiveness.

Indicator:	Requirement:

2.2.8

Indicator applicability: land-based systems producing catfish or crustaceans

The UoC shall maintain a **coastal barrier** between the site and any large or open waterbody, with a minimum width of either 100m or as determined through the ERA (see Indicator 2.1.1), whichever is stricter.

How do I interpret this requirement?

- Large, open waterbodies include oceans, seas, large lakes, or expansive lagoons.
- Coastal barriers can be either artificial or natural and mitigate concerns relating to storm or flood risks. The ERA should assess the required width of the coastal barrier to mitigate these risks.
    - An additional benefit of coastal barriers is that they control environmental events directly linked to escapes and disease transfer.
    - Communities can also access marine resources through the maintenance of a coastal barrier.
- The UoC shall ensure the width of the coastal barrier is at least 100m, or greater if the ERA determines the coastal barrier needs to be wider.

Evidence of implementation should be maintained, e.g.:

- The ERA has determined the suitable width of the coastal barrier.
- The maintained coastal barrier has a minimum width of 100m or greater, as determined by the ERA.
- Spatial data and maps can provide evidence of the width of the coastal barrier and its maintenance.

Auditors should confirm:

- The ERA has assessed the width of the coastal barrier.
- The coastal barrier is 100m or greater, as determined by the ERA.
- Spatial data or maps are presented to demonstrate the width of the coastal barrier and that it is maintained.

Useful Resources

N/A

Indicator:	Requirement:
2.2.9	*Indicator applicability: land-based and suspended systems located in natural wetlands* The UoC shall have successfully **restored** a minimum of 50% of **natural wetland** converted before May 1999.
2.2.10	*Indicator applicability: land-based and suspended systems* The UoC shall not convert natural wetland after May 1999. An exception applies where conversion is needed for establishing and maintaining pumping stations, water pipes or canals, in which case the UoC shall successfully restore 100% of the converted area.

How do I interpret this requirement?

- Rehabilitation projects should be located within or adjacent to farming activities, to restore ecosystem function close to where it has originally been lost.
  - If this is not feasible, the UoC may contribute to regional rehabilitation activities.
  - Restoration activities should ensure habitats and biodiversity are equivalent to habitat and biodiversity lost through conversion.

Evidence of implementation should be maintained, e.g.:

- Spatial mapping of the converted and restored areas:
  - Time series maps showing changes in the cover of natural wetlands.
  - Polygons or measurements of the converted and restored areas showing the surface areas of conversion and rehabilitation.
- The location of rehabilitation projects. If local rehabilitation efforts were not possible, evidence should be presented demonstrating why they were not possible.
- Where time-series GIS data are unavailable or incomplete, the UoC may use alternative credible evidence, such as historical maps or imagery, land-use records, permits, environmental assessments, official datasets, or third-party verification.

Auditors should confirm:

- The appropriate area of natural wetland has been successfully rehabilitated.
- Polygons or measurement of the areas showing conversion and rehabilitation have been presented by the UoC.

Useful Resources

- Best Practice Guidelines for Mangrove Restoration developed by the Global Mangrove Alliance and the Blue Carbon Initiative: Best-Practice-Guidelines-for-Mangrove-Restoration_v4.pdf.
  - The guidelines lay out the steps for rehabilitation project design, setting goals and assessing feasibility, project implementation, monitoring, evaluation and adaptive management.
- Spatial mapping tools:
  - GIS portal: GIS portal - ASC International (asc-aqua.org)
  - Clark Labs Coastal Habitat Mapping: Mangrove and Pond Aquaculture Conversion Coastal Habitat Mapping: Mangrove and Pond Aquaculture Conversion - Clark Labs.
  - Global Mangrove Watch country-level information on mangrove habitat extent and change: Global Mangrove Watch.
- Additional rehabilitation tools:
  - The Climate-Smart Mangrove Tool (CSMT) is designed to aid conservation practitioners in selecting appropriate “climate-smart” actions to reduce the current and future impacts of climate change on mangrove ecosystems: https://www.worldwildlife.org/publications/the-climate-smart-mangrove-tool-excel-based-workbook.
- Where to restore mangrove habitats:
  - The Mangrove Restoration Potential Mapping Tool provides information on the ecosystem services provided in restoration of regions within a country https://maps.coastalresilience.org/mangrove-restoration/.
  - SFP Technical Paper: How coastal shrimp farming can support effective mangrove regeneration: FINAL - Shrimp Farming and Mangroves Technical Paper Dec2022.pdf - Google Drive.
  - To help the farmed shrimp industry more effectively identify and protect mangrove habitat, SFP and Longline Environment developed the Aquascape mangrove-shrimp pond mapping tool to show where shrimp farming regions and mangrove habitat overlap in India, Indonesia, Thailand, and Vietnam. Register to use the tool at: Mangrove mapping tool - Sustainable Fisheries Partnership.

Indicator:	Requirement:

2.2.11

Indicator applicability: all bivalve species

The UoC shall[13] ensure that total bivalve culture in a waterbody does not result in phytoplankton depletion either by:

a. demonstrating that the waterbody has a ratio of **Clearance Time** (CT) over **Retention Time** (RT) > 1, following the method outlined in **Appendix 5 (5.2)**. Where CT over RT is <1, demonstrate that the waterbody has a ratio of CT over **Primary Production Time** (PPT) > 3, following the method outlined in **Appendix 5 (5.3)**; or

b. conducting a modelling study that demonstrates that the carrying capacity of the waterbody is not exceeded.

How do I interpret this requirement?

- The ratio of Clearance Time (CT) and Retention Time (RT) demonstrates whether the carrying capacity of a waterbody for bivalve production has been exceeded.
- Primary Production Time (PPT) is calculated when cultured bivalves may negatively impact the carrying capacity of a waterbody.

Evidence of implementation should be maintained, e.g.:

- The method used to calculate CT, RT and PPT, in accordance with Appendix 5.
  - Maps demonstrating whether the site is in an easily definable waterbody. This will support the selection of the correct method in Appendix 5 (5.2) regarding estimating the zone of influence.
- Results demonstrating the ratio of CT over RT, or CT over PPT.
- A modelling study has been conducted to demonstrate the carrying capacity of the waterbody, if the method outlined in Appendix 5 has not been followed.

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[13] An exemption to Indicator 2.2.11 applies for situations where the total surface area of aquaculture within a waterbody is less than 10% of the total surface area of the waterbody.

Auditors should confirm:

- Methods and results have been presented demonstrating the ratio of CT over RT, or CT and PPT depending on whether CT over RT > 1, in accordance with Indicator 2.11.
- A modelling study has been conducted to demonstrate the carrying capacity of the waterbody, if the method outlined in Appendix 5 has not been followed.
    - The modelling study shall demonstrate carrying capacity has not been exceeded.

Useful Resources

N/A

Criterion 2.3 - Wildlife Interactions

Indicator:	Requirement:
2.3.1	The UoC shall ensure the site has a low risk of Human-Wildlife Conflict within the site and in the area surrounding the site, as determined through the ERA (see Indicator 2.1.1).

How do I interpret this requirement?

- Indicator 2.1.1 and Appendix 3.1 outline the site-specific Environmental Risk Assessment (ERA) following the Standardised Risk Methodology.
- Mitigation measures may need to be implemented to manage Human-Wildlife Conflict within the site and in the area surrounding the site.
- The risk level and identified mitigation measures (if applicable) should be identified in the ERA.

Evidence of implementation should be maintained, e.g.:

- The ERA assesses the risk of Human-Wildlife Conflict. Evidence should be presented to demonstrate that the risk is low.
- Mitigation measures implemented to manage Human-Wildlife Conflict to maintain the low risk level.

Auditors should confirm:

- The ERA has assessed the risk of Human-Wildlife Conflict and determined the risk level is low.
- Mitigation measures are implemented (if required and recommended by the ERA) to maintain the low risk level.

Useful Resources

N/A

Indicator:	Requirement:

2.3.2

The UoC shall not cause the mortality of any **Threatened Species**.

An exception applies for occasional incidents that do not affect the population status, and where a written statement from a **registered veterinarian** or the responsible authorities is available to confirm that:

a. injured animals are unlikely to recover; or

b. immediate human safety is threatened; or

c. legal requirements mandate emergency euthanasia.

2.3.3

The UoC shall not injure or cause mortality of mammals, elasmobranchs or reptiles (excluding **vermin**).

An exception applies for occasional incidents where:

a. injured animals are unlikely to recover; or

b. immediate human safety is threatened; or

c. legal requirements mandate emergency euthanasia.

How do I interpret this requirement?

- Mortalities include animals intentionally killed through lethal action, as well as accidental deaths through entanglement or other means.
- Mortality or injury is considered caused by the UoC where there is reasonable evidence that it resulted from UoC activities, infrastructure or management actions. This may include,
  - entanglement in nets or predator exclusion devices,
  - collision with UoC infrastructure or vessels,
  - interaction with deterrent systems,
  - exposure to UoC waste or chemical inputs, or
  - injury during site operations.
- Mortalities or injuries observed in the vicinity of the site are not automatically attributable to the UoC. Where the cause is unclear, the UoC should document the incident and assess whether there is a reasonable causal link to the UoC. For example, a bird collision with a third-

party power line, or a marine mammal stranding with no evidence of interaction with the UoC, would not normally be considered caused by the UoC.

- Occasional incidents of injury or mortality should be rare and only occur in exceptional circumstances which are necessary for the reasons outlined in Indicators 2.3.2 and 2.3.3. All other feasible measures should be pursued prior to causing injury or mortality.
- 'Vermin' does not include wild mammals, reptiles or elasmobranchs interacting with the UoC, including predators of production species, or any species that is threatened, protected or otherwise subject to conservation requirements.

Evidence of implementation should be maintained, e.g.:

- A list of Threatened Species, mammals, elasmobranchs and reptiles that are present in the vicinity of the site should be presented.
- Records of any interactions, injuries or mortalities concerning these species.
- Where there are occasional incidents of interactions with or mortalities of Threatened Species, evidence has been maintained to demonstrate that the incidents will not affect the population status.
    - A written statement has also been obtained from a registered veterinarian or the responsible authorities to confirm at least one of the three points (a-c) in Indicator 2.3.2 has been met.
- Records of investigations into mortalities or injuries observed in the vicinity of the site, including the species involved, date and location, condition of the animal, evidence of interaction with UoC infrastructure or operations, likely cause where known, whether the incident was considered attributable to the UoC, and any supporting evidence from responsible authorities, veterinarians or other competent persons.
- Records demonstrating that if there are occasional injuries or mortalities of mammals, elasmobranchs or reptiles, the incidents meet the exception in Indicator 2.3.3.

Auditors should confirm:

- Records of interactions with Threatened Species, mammals, elasmobranchs and reptiles have been maintained. Specifically, records of any injuries or mortality.
- Written statements are present from a registered veterinarian or the responsible authorities, in accordance with Indicators 2.3.2, if mortalities of Threatened Species have occurred.
    - The statement confirms that at least one of the three points (a-c) in Indicator 2.3.2 have been met.

- Records demonstrate that if there are occasional injuries or mortalities of mammals, elasmobranchs or reptiles, the incidents meet the exception in Indicator 2.3.3.

Useful Resources

N/A

Indicator:	Requirement:
2.3.4	The UoC shall investigate all wildlife mortality incidents to determine the root cause and shall implement appropriate corrective actions to prevent recurrence.

How do I interpret this requirement?

- To support accurate identification, the UoC should maintain a site-specific list of relevant species that may occur in the vicinity of the site, including Threatened Species and other species covered by this criterion.
- Staff responsible for monitoring, recording or responding to interactions, injuries or mortalities should be trained to identify these species, or relevant species groups, and to recognise common signs that may indicate the likely cause of injury or mortality.
- Where identification to species level or cause of mortality cannot be confirmed by trained site staff, the UoC should record the uncertainty and seek support from a competent person, responsible authority, veterinarian or other appropriate expert where necessary.

Evidence of implementation should be maintained, e.g.:

- Records showing that the UoC has provided training to staff responsible for monitoring, recording or responding to interactions, injuries or mortalities
- Records showing that the UoC has investigated each mortality incident and how the investigation has led to the implementation of appropriate actions to prevent recurrence.
- Documents demonstrating the actions have been implemented and prevented recurrence.

Auditors should confirm:

- Investigations have taken place following each mortality event.
- Actions have been implemented to prevent recurrence of wildlife mortalities.

Useful Resources

N/A

Indicator:	Requirement:
2.3.5	The UoC shall only use **aquatic acoustic deterrence** where peer-reviewed or otherwise scientifically robust evidence demonstrates that its use does not result in significant stress, injury to, or mortality of, affected species or their population(s).

How do I interpret this requirement?

- Acoustic deterrence includes any device or method where acoustic ('sound'/'noise') is used to deter wildlife. This includes, but is not limited to, the use of acoustic deterrent devices (ADDs) and acoustic harassment devices (AHDs).

Evidence of implementation should be maintained, e.g.:

- Records of the use of any aquatic acoustic deterrence, which includes the frequency and duration of the deterrence.
- If aquatic acoustic deterrence is used:
  - Scientific reports/publications are obtained that demonstrate that the deterrence does not result in significant stress, injury to, or mortality of, the species impacted/targeted by the deterrence.
  - Affected species should be identified as part of the Environmental Risk Assessment (see Indicator 2.1.1)

Auditors should confirm:

- Records are provided to demonstrate whether any aquatic acoustic deterrence has been used.
- If aquatic acoustic deterrence has been used, scientific reports/publications have been presented by the UoC to demonstrate that the deterrence does not result in significant stress, injuries to, or mortality of, the species impacted/targeted by the deterrence.

Useful Resources N/A

Indicator:	Requirement:

2.3.6

Indicator applicability: all fish species

The UoC shall only stock fish that is hatchery-raised.

An exception applies where the UoC can demonstrate the following for Seriola/Cobia, in which case wild caught fish are permitted to be stocked:

a. the species is not listed as a Threatened Species; and

b. the originating fishery is certified under the Marine Stewardship Council (MSC) standard, or equivalent to an ASC-recognised fisheries certification scheme[14]; and

a. traceability back to the originating fishery is provided.

How do I interpret this requirement?

N/A

Evidence of implementation should be maintained, e.g.:

- Batch records or other documentations are maintained to demonstrate stocked fish are hatchery-raised.
- For Seriola/Cobia, where wild caught fingerlings are stocked, documentation demonstrating the species is not listed as a Threatened Species and records demonstrating the traceability of the fish.
  - The IUCN Red List can be used to check whether the species is listed as Threatened.
  - Documentation demonstrating the fish was sourced from an ASC-recognised fisheries certification scheme can facilitate traceability back to the fishery if chain of custody documentation has been maintained.
  - Traceability documentation should include the species, catch method and area in which the fish was caught.

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[14] Equivalence to the MSC standard shall be determined by ASC based on an assessment of compliance with the ISEAL Code of Good Practice, and consideration of sustainability criteria referenced in the MSC Principles and Criteria. Equivalent standards shall be set in accordance with the ISEAL Code of Good Practice and shall be recognised by, or meet the requirements of, the Global Sustainable Seafood Initiative (GSSI) Global Benchmark Tool. The standard shall be based on a full ecosystem approach, including specific provisions for the management of low trophic level species and the protection of populations of dependent predators. Recognition of equivalent standards shall be made publicly available by ASC.

Auditors should confirm:

- Batch records or other documentation demonstrate stocked fish are hatchery-raised.
- For Seriola/Cobia stocked from a wild fishery, adequate documentation is presented to demonstrate traceability back to the fishery and the certification of the originating fishery (to an ASC-recognised fisheries certification scheme).

Useful Resources

- IUCN: The IUCN Red List of Threatened Species: IUCN Red List of Threatened Species.

Indicator:	Requirement:
2.3.7	The UoC shall not use Threatened Species for wild broodstock.

How do I interpret this requirement?

N/A

Evidence of implementation should be maintained, e.g.:

- Documentation (e.g. batch records) demonstrating the wild broodstock species is not listed as a Threatened Species.
    - The IUCN Red List can be used to check whether the wild broodstock species is listed as Threatened.
    - Traceability documentation can be used to demonstrate the origin of the wild broodstock species. Traceability should be back to the source fishery.

Auditors should confirm:

- Evidence has been presented that wild broodstock is not a Threatened Species.
    - This may include verifying traceability documentation, that demonstrate traceability back to the source fishery.

Useful Resources

- IUCN: The IUCN Red List of Threatened Species: IUCN Red List of Threatened Species.

Indicator:	Requirement:
2.3.8	*Indicator applicability: all crustacean species* The UoC shall only stock larvae that are hatchery-raised. An exception applies where the UoC can demonstrate the following for extensive crustacean production, in which case wild larvae are permitted to be stocked: a. the larvae are collected passively; and b. the production system is a non-fed, low-intensive pond production system; and c. inflow of larvae occurs through natural tidal flow into the ponds.

How do I interpret this requirement?

N/A

Evidence of implementation should be maintained, e.g.:

- Hatchery permits and import licences that demonstrate the source of the larvae.
- If applicable, documentation that confirms crustacean production is extensive.
  - Documentation demonstrating points a-c under the exception in Indicator 2.3.8 are met if wild larvae are sourced and stocked for extensive crustacean production.
  - If the UoC is not vertically integrated, larvae suppliers should provide documentation to the UoC to verify how wild larvae are collected.

Auditors should confirm:

- Hatchery permits and import licences are presented that demonstrate wild larvae is hatchery-raised.
- If crustacean production is extensive and wild larvae are stocked, documents are presented demonstrating the exception in Indicator 2.3.8 is met.

Useful Resources

N/A

Indicator:	Requirement:

2.3.9 *Indicator applicability: hatchery-raised bivalve seed*

The UoC shall only source from hatcheries that have procedures to address genetic concerns specific to the species and geographical region where the seed will be stocked.

How do I interpret this requirement?

- The translocation of wild bivalve seed can pose risks to the genetic diversity of wild populations.
    - Genetic risks to wild populations therefore need to be assessed and procedures need to be implemented to address any genetic risks. These will be based on the species and geographic region where the seed will be stocked.
- Efforts should be made to address genetic concerns specific to the species and the geographic region where the seed will be stocked.
    - This may include preserving diversity of broodstock and seed by:
        - Using local broodstock,
        - Rotation of broodstock within spawning seasons and between years, and
        - Avoiding the use of hatchery-propagated stock in the hatchery as broodstock.
    - The scale of farming and the reproductive potential of crops (e.g. whether diploid or triploid, or considering age at harvest and age at first maturation) are well below the size and reproductive potential of the natural population within a reasonable 'dispersal kernel' from the site.
    - Sterile seed may be produced for stocking.

Evidence of implementation should be maintained, e.g.:

- An assessment of genetic risks presented from the translocation of wild bivalve seed, based on the species and geographic region where the seed will be stocked.

- The hatchery has procedures and measures in place to address any genetic concerns. For example:
    - Documentation of the use of local, wild broodstock to address genetic concerns specific to the species and the geographic region where the seed will be out-planted.
    - Documentation of the scale of farming activities and the reproductive potential of crops (e.g. whether diploid or triploid, or considering age at harvest and age at first maturation) are well below the size and reproductive potential of the natural population within a reasonable 'dispersal kernel' from the site.
    - Documentation on the production of sterile seed for out-planting from breeding programmes that intentionally alter wild stocks for improved culture traits, such as growth, yield, survival and morphology.
    - Provide documentation of cooperation with restoration efforts in the geographic region using out-planting that involves the intentional divergence from wild stocks to produce disease resistant wild populations.

Auditors should confirm:

- Evidence has been presented that genetic risks to wild populations have been assessed and the hatchery has implemented procedures and measures to address these risks. For example:
    - Verify that efforts have been made to address genetic concerns specific to the species and the geographic region where the seed will be out-planted.
    - Document the site's use of the local, wild population for the broodstock with appropriate rotation of spawned individuals. If there is uncertainty about whether a broodstock is of local origin, record source locality.
    - Verify that the reproductive potential (e.g. whether diploid or triploid, or considering age at harvest and age at first maturation) of the hatchery produced seed is well below the size and reproductive potential of the natural population within a reasonable 'dispersal kernel' from the site.
    - Verify the existence of a breeding programme that produces altered sterile seed for out-planting.
    - Verify that the site's breeding programme is in coordination with existing restoration efforts in the geographic region.

Useful Resources

N/A

Indicator:	Requirement:

2.3.10 Indicator *applicability: all bivalve species*

The UoC shall[15] only use wild caught seed if:

a. the species is not listed as a Threatened Species; and

b. the seed is **harvested** from a regulated source.

How do I interpret this requirement?

N/A

Evidence of implementation should be maintained, e.g.:

- Documentation (e.g. batch records) demonstrating that the species used for wild caught seed is not listed as a Threatened Species.
  - The IUCN Red List can be used to check whether the species used for wild caught seed is listed as Threatened.
  - Traceability documentation can be used to demonstrate the origin of the species used for wild caught seed.
  - Traceability should be back to the source and demonstrate it is regulated and not from an open-access, unregulated source.

Auditors should confirm:

- Evidence has been presented that the species used for wild caught seed is not a Threatened Species.
  - This may include verifying traceability documentation, demonstrating traceability back to the source.
  - The evidence demonstrates the source is well regulated and not from an open-access unregulated source.

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[15] An exemption applies to wild caught larvae.

Useful Resources

- IUCN: The IUCN Red List of Threatened Species: IUCN Red List of Threatened Species.

Indicator:	Requirement:
2.3.11	*Indicator applicability: all abalone farming in regions where the farmed species is Threatened* The UoC shall only use seed originating from native wild broodstock (not selectively bred animals).

How do I interpret this requirement?

- Wild abalone populations can be impacted through selectively bred animals recruiting into, and breeding with, wild abalone populations.
- Potential genetic impacts to at-risk populations can be mitigated by means of minimising escapes from abalone sites and by farming with stock originating from the same genetic stock as the local wild populations surrounding the site.

Evidence of implementation should be maintained, e.g.:

- Documentation demonstrating the origin of seed and that it originates from native wild broodstock.

Auditors should confirm:

- Documentation has been presented demonstrating the origin of seed and that it originates from native wild broodstock.

Useful Resources

N/A

Indicator:	Requirement:
2.3.12	The UoC shall publicly disclose all wildlife mortalities per site within 30 days of each incident.

How do I interpret this requirement?

N/A

Evidence of implementation should be maintained, e.g.:

- Wildlife mortalities are disclosed and are easily and publicly available.
- Hardcopies of mortalities are available to stakeholders, if requested.
- Records are kept demonstrating when mortalities have been disclosed.

Auditors should confirm:

- Sampling results are easily and publicly available. If applicable, confirm that the site has made hard copies of test results easily available to stakeholders.
- Mortalities have been publicly disclosed per site within 30 days of each incident.

Useful Resources

N/A

Indicator:	Requirement:
2.3.13	The UoC shall report wildlife mortality related data in accordance with the ASC Data Submission Procedure.

How do I interpret this requirement?

N/A

Evidence of implementation should be maintained, e.g.:

- Records of data submissions to ASC.

Auditors should confirm:

- Data on wildlife mortalities has been submitted to ASC and is accessible.

Useful Resources

N/A

Criterion 2.4 - Escapes and Native Biodiversity

Indicator:	Requirement:
2.4.1	The UoC shall not stock **transgenic** animals.

How do I interpret this requirement?

- The stocking and culture of transgenic animals is not permitted on ASC certified sites.
  - Transgenic animals are not common in aquaculture, but transgenic stocks of Atlantic salmon, rainbow trout, channel catfish and Nile tilapia are known to exist.

Evidence of implementation should be maintained, e.g.:

- Evidence that non-transgenic animals are stocked should be presented to the auditor. This could consist of a declaration from the hatcheries that non-transgenic animals are used.
  - In case of doubt regarding origin, submitting animals for DNA-testing could be considered.

Auditors should confirm:

- All stock is from non-transgenic origin.

Useful Resources

N/A

Indicator:	Requirement:

2.4.2

*Indicator applicability: all species except **sessile** bivalves*

The UoC shall implement escape prevention measures that include the installation, inspection and maintenance of containment structures suitable for the species, life stages and environmental conditions under which the site is operating.

How do I interpret this requirement?

- This Indicator requires the UoC to prevent the escape of cultured animals. It focuses on three key aspects:
  - Installation of containment structure; these structures must be appropriate for:
    - The species; consider size and behaviour
    - Different life stages; consider that smaller animals require different mesh sizes compared to larger animals
    - Environmental conditions; consider currents, tides, floodings, floating debris, natural predators that can damage the containment structure.
  - Inspection of containment structures to check for structure integrity, including:
    - Signs of damage or weaknesses; consider especially moving elements of the construction for 'wear and tear' signs
    - Environmental conditions that impact the structure (e.g. erosion)
    - Species-specific behaviours (e.g. net-biting, burrowing)
  - Maintenance of containment structure:
    - Regular maintenance needs to be conducted so that containment structures are kept in, or restored to, a good state, or to prepare for known severe weather events (e.g. forecasted storms, flooding, etc.).

Evidence of implementation should be maintained, e.g.:

- Escape prevention measures are installed according to construction specifications that incorporate environmental conditions and species-specific characteristics.
- Documents demonstrating inspection and maintenance is occurring regularly and when needed (e.g. after a storm).

Auditors should confirm:

- Escape prevention measures have been installed according to construction specifications and are appropriate to environmental conditions and species-specific characteristics.
- Documents have been presented that demonstrate inspection and maintenance has occurred regularly and as required.

Useful Resources

- https://www.gov.scot/publications/aquaculture-code-practice-containment-prevention-escape-fish-fish-farms-relation-marine-mammal-interactions/pages/1/

Indicator:	Requirement:
2.4.3	*Indicator applicability: all species except sessile bivalves* The UoC shall carry out a site-specific handling and containment risk assessment, approved by a member of management, following the method outlined in **Appendix 3 (3.2)**.

How do I interpret this requirement?

- This Indicator requires the UoC to conduct a site-specific risk assessment to proactively identify and mitigate risks associated with handling and containment of cultured animals. The Indicator emphasises the need for tailored evaluation rather than a generic approach as site-specific circumstances may require different responses. Management approval ensures that the assessment is formally reviewed, acknowledged and integrated into wider management structures.
- A company-level or multi-site risk assessment may be used as a framework, provided it is adapted to the specific conditions of each UoC/site. The assessment should not rely only on generic company procedures.
- Site-specific factors may include, as relevant, culture system, water type, site layout, containment infrastructure, net/cage/pond/tank condition, mooring or anchoring arrangements, exposure to weather or flood events, predator interactions, handling activities, transfer points, staff responsibilities, emergency response capacity and historical incidents.

- Where relevant, risks associated with early maturation and spawning in culture systems should be considered. This includes potential genetic interaction with wild populations and mitigation or contingency measures to prevent reproductive interaction.

Evidence of implementation should be maintained, e.g.:

- Documentational evidence of a risk assessment, the identification of appropriate risk levels and any mitigation actions taken including the implementation thereof. The evidence should also include proof of management approval and periodic review of the risk assessment to ensure that it remains relevant.
- Where a company-level or multi-site assessment is used, evidence that the assessment has been adapted for the UoC/site, including site-specific risk factors, local mitigation measures, responsible personnel, review dates and management approval.

Auditors should confirm:

- Presence of a documented risk assessment, that:
  - Is specific to the conditions of the site.
  - Covers all handling and containment risks.
- That the risk assessment identifies:
  - Risk factors and the associated risk levels.
  - Mitigation actions and records the implementation, including the desired outcome (i.e. reduction of risk level).
- That the risk assessment is approved by management and there is evidence of periodic review to keep it relevant.
- Where the risk assessment forms part of a company-level or multi-site system, auditors should confirm that it has been localised for the UoC/site and reflects the actual site conditions, infrastructure, operational practices and escape risks present at that location.

Useful Resources

N/A

Indicator:	Requirement:

2.4.4

Indicator applicability: all species except sessile bivalves

The UoC shall ensure that any person involved in handling activities is trained on handling procedures to minimise escapes.

How do I interpret this requirement?

- Training and handling procedures includes:
  - An understanding of which staff are involved in animal handling including external services providers that conduct activities at the site.
  - Coverage of relevant training content, e.g. correct handling process, correct use of equipment and emergency protocols.
  - Appropriate means of training delivery relevant to the site-specific conditions (e.g. considering whether a workshop is sufficient or whether 'live training' on-site is more appropriate).

Evidence of implementation should be maintained, e.g.:

- Training documents and records of staff attendance.
- Presence of relevant procedures/protocols.

Auditors should confirm:

- Training documents and records of staff attendance.
- Presence of relevant procedures/protocols.
- Interviews with staff.

Useful Resources

N/A

Indicator:	Requirement:

2.4.5

Indicator applicability: all species except sessile bivalves

The UoC shall log all handling and containment incidents.

How do I interpret this requirement?

- This indicator requires the UoC to log (i.e. register) all handling and containment incidents, in order to inform the risk assessment (see Indicator 2.4.3) and the training (2.4.4) on situations that have resulted in registered escapes.

Evidence of implementation should be maintained, e.g.:

- A documented register of all handling and containment incidents.

Auditors should confirm:

- Presence of the register.
- Interviews with employees to confirm that employees are aware of the register and that it is being used.

Useful Resources

N/A

Indicator:	Requirement:

2.4.6

Indicator applicability: land-based systems producing flatfish, pangasius, seabass, seabream, meagre, tilapia or tropical marine finfish

The UoC shall maintain a bund or equivalent physical barrier between the site and the waterbody and shall demonstrate that the barrier is higher than the maximum recorded water level at the site during the previous ten years.

How do I interpret this requirement?

- A bund or physical barrier is an engineered structure designed to prevent uncontrolled water movement between the farm and the adjacent natural waterbody.
- Equivalent physical barriers may include dykes, levees, embankments, raised perimeter walls, flood protection structures, or other permanent infrastructure that provides the same level of protection against inundation and fish escapes.
- The purpose of the barrier is to reduce the risk of flooding, prevent the flow of external waters into the facility, and minimise the likelihood of stock escaping during extreme water level events.

Evidence of implementation should be maintained, e.g.:

- The UoC should demonstrate that the crest or highest protective point of the barrier remains above the maximum water level recorded at the site during the previous ten years. For example, if the highest water level was 2.5m, the barrier shall exceed this elevation. Evidence may include:
    - Engineering drawings, design specifications, or as-built plans showing the location and elevation of the bund or equivalent barrier.
    - Topographic surveys, elevation measurements, or geospatial data demonstrating the height of the barrier relative to the maximum recorded water level.
    - Historical water-level records, flood records, tidal records, hydrological data, or government datasets used to determine the highest water level in the past ten years.
- The assessment should consider all relevant water-level influences, including river flooding, tidal fluctuations, storm surges, seasonal high-water events, and other locally relevant hydrological conditions.
- Where ten years of site-specific records are unavailable, the UoC should use the best available evidence, such as government flood records, hydrological studies, site surveys, engineering

assessments, or other credible datasets demonstrating equivalent historical water-level information.

- The UoC should provide records demonstrating that the barrier remains effective and ensure that erosion, subsidence, damage, or modifications have not reduced its protective height below the required level. Records may include:
    - Inspection records confirming the condition and integrity of the barrier.
    - Maintenance logs, repair records, or records of improvement works undertaken to maintain the barrier effectiveness.
    - Flood risk assessments, engineering reports, or hydrological assessments supporting the adequacy of the barrier.

Auditors should confirm:

- A bund or equivalent physical barrier is present between the farm site and the adjacent waterbody.
- The UoC has identified and documented the maximum recorded water level at the site during the previous ten years, with credible evidence to demonstrate that the barrier height exceeds the maximum recorded water level over the previous ten-year period.
- The barrier is maintained in good condition and there are no signs of deterioration, erosion, subsidence, or damage that could compromise its effectiveness.
- Records are available demonstrating recurring inspection, maintenance, and verification of barrier height and integrity.

Useful Resources

N/A

Indicator:	Requirement:

2.4.7 *Indicator applicability: all bivalve species*

The UoC shall make efforts to address genetic concerns specific to the species and geographic region where hatchery-raised seed will be out-planted.

How do I interpret this requirement?

- This Indicator requires the UoC to make efforts to mitigate genetic risks associated with releasing hatchery-raised bivalve seed into the environment.
    - The emphasis is on species-specific and region-specific genetic concerns, meaning the UoC must consider the local ecosystem and population genetics before out-planting.

Evidence of implementation should be maintained, e.g.:

- Any of the following:
    - Documentation of the use of local, wild broodstock to address genetic concerns specific to species and the geographic region where the seed will be out-planted;
    - Documentation of the scale of farming activities and the reproductive potential of crops (e.g. whether diploid or triploid, or considering age at harvest and age at first maturation) are well below the size and reproductive potential of the natural population within a reasonable 'dispersal kernel' from the site;
    - Documentation of the production of sterile seed for out-planting from breeding programmes that intentionally alter wild stocks for improved culture traits, such as growth, yield, survival and morphology;
    - Documentation of cooperation with restoration efforts in the geographic region using out-planting that involves the intentional divergence from wild stocks to produce disease-resistant wild populations.

Auditors should confirm:

- In relation to the items listed under 'Evidence of implementation':
    - Verify that the site uses local, wild population for the broodstock with appropriate rotation of spawned individuals;
    - Verify that the reproductive potential (e.g. whether diploid or triploid, or considering age at harvest and age at first maturation) of the hatchery produced seed is well below the size

and reproductive potential of the natural population within a reasonable 'dispersal kernel' from the site;

- Verify the existence of a breeding programme that produces altered sterile seed for out-planting;
- Verify that the site's breeding programme is in coordination with existing restoration efforts in the geographic region.

Useful Resources

N/A

Indicators 2.4.8 - 2.4.13: Additional requirements for fish species with a published ASC EICAT evaluation[16]

Indicator:	Requirement:
2.4.8	*Indicator applicability: fish species with an EICAT Category MO* The UoC shall[17] calculate the number of **known escapes** per site following the method outlined in **Appendix 6 (6.2)**, the maximum number of which shall not exceed: a. cod and marine salmonids: 300 individuals per production cycle b. other fish species: 6% in the last 12 months If the maximum number of known escapes is exceeded more than once in a six-year period, the UoC shall: c. by the next working day: a. submit a formal request to the CAB for cancellation of the certificate or site under the certificate; and b. notify ASC of the exceedance of known escapes in accordance with the ASC Data Submission Procedure. d. not identify, sell or dispatch the fish as ASC-certified[18].

[16] Species-specific EICAT evaluations are published on the ASC Website.
[17] An exemption applies where no species-specific EICAT evaluation is available at the time of audit. Where an evaluation becomes available during the certification cycle, the Indicator applies from the next audit.
[18] This applies to all fish present at the site at the time the UoC submits the formal notification of cancellation of certification to the CAB, including any fish recovery thereafter.

How do I interpret this requirement?

- Note: Indicator 2.4.8 only applies for species/regions that are classified as 'Category Moderate (MO)' in the appropriate EICAT Species Factsheet. This indicator does not apply to species/regions classified as Data Deficient (DD), Minimal Concern (MC), Major (MR) or Massive (MV).
- This Indicator requires a strict limit on the number of known escapes allowed per production cycle or per year, whichever threshold is stricter.
    - 'Known escapes' refers to escape incidents that are either observed directly or detected through monitoring. It does not include unverified or speculative losses.
- Escape limits:
    - Cod and marine salmonids (e.g. Atlantic salmon, trout): A strict limit of 300 individuals per production cycle. The formula for calculation can be found in Appendix 6 (6.2).
    - Other fish species: A percentage-based limit of 6% of the total stocked population in the last 12 months**.** The formula for calculation can be found in Appendix 6 (6.2).
- "In the last 12 months" is interpreted as the 12-month period immediately preceding the first day of the audit being undertaken.
- If the UoC exceeds the set limit, a formal notification to the CAB shall be submitted by the next working day.

Evidence of implementation should be maintained, e.g.:

- The UoC has a register of known escapes in which exceedance of the set limit is monitored.

Auditors should confirm:

- Records of known escapes are maintained.
- Escape limits remain below the set threshold and that calculations are made correctly.

Useful Resources

N/A

Indicator:	Requirement:

2.4.9

Indicator applicability: fish species with an EICAT Category MO

The UoC shall[17] not exceed one mass escape event per site in a six-year period, defined as:

a. cod and marine salmonids: >5000 individuals per production cycle

b. other fish species: >6%

If a mass escape event occurs more than once in a six-year period, the UoC shall:

c. by the next working day:

   a. submit a formal request to the CAB for cancellation of the certificate or site under the certificate; and

   b. notify ASC of the exceedance of known escapes in accordance with the ASC Data Submission Procedure.

d. not identify, sell or dispatch the fish as ASC-certified[18].

How do I interpret this requirement?

- Note: Indicator 2.4.9 only applies for species/regions that are classified as 'Category Moderate (MO)' in the appropriate EICAT Species Factsheet. This indicator does not apply to species/regions classified as Data Deficient (DD), Minimal Concern (MC), Major (MR) or Massive (MV).
- This Indicator requires a strict limit on mass escape events over a six-year period to ensure that large-scale fish escapes are rare and properly managed. It also requires certification cancellation if the limit is exceeded.
- "In a six-year period" is interpreted as the six-year period immediately preceding the first day of the audit being undertaken.
- An event counts as a 'mass escape' if the thresholds are exceeded, regardless of cause (e.g. storm damage, net failure, human error). The thresholds are:
  - For cod and marine salmonids: more than 5,000 individuals escaping at once. The formula for calculation can be found in Appendix 6 (6.2).
  - For other fish species: More than 6% of the stocked population escaping at once. The formula for calculation can be found in Appendix 6 (6.2).

- The UoC is allowed only one mass escape event in a rolling six-year period. If a second mass escape event occurs within six years, the UoC must notify the CAB the next working day and request cancellation of certification.
- The UoC should have a system, or method, to detect and document mass escape events, including the identification of root cause(s) and determination of corrective action(s) to prevent re-occurrence.

Evidence of implementation should be maintained, e.g.:

- The UoC has a register of known escapes in which exceedances of the set limit are monitored.

Auditors should confirm:

- Records of mass escape events are maintained.
- Escape limits remain below the set threshold and that calculations are made correctly.

Useful Resources

N/A

Indicator:	Requirement:
2.4.10	*Indicator applicability: fish species with an EICAT Category MR/MV* The UoC shall[17] calculate the number of known escapes per site following the method outlined in **Appendix 6 (6.2)**, the maximum number of which shall not exceed: a. cod and marine salmonids: 300 individuals per production cycle b. other fish species: 6% in the last 12 months If the maximum number of known escapes is exceeded, the UoC shall: c. by the next working day: a. submit a formal request to the CAB for cancellation of the certificate or site under the certificate; and b. notify ASC of the exceedance of known escapes in accordance with the ASC Data Submission Procedure. d. not identify, sell or dispatch the fish as ASC-certified[18].

How do I interpret this requirement?

- Note: Indicator 2.4.10 only applies for species/regions that are classified as 'Category Major/Massive (MR/MV)' in the appropriate EICAT Species Factsheet. This indicator does not apply to species/regions classified as Data Deficient (DD), Minimal Concern (MC), or Moderate (MO).
- This Indicator requires a strict limit on the number of known escapes allowed per production cycle or per year, whichever threshold is stricter. 'Known escapes' refers to escape incidents that are either observed directly or detected through monitoring. It does not include unverified or speculative losses.
- Escape limits:
  - Cod and marine salmonids (e.g., Atlantic salmon, trout): A hard limit of 300 individuals per production cycle. The formula for calculation can be found in Appendix 6 (6.2).
  - Other fish species: A percentage-based limit of 6% of the total stocked population in the last 12 months. The formula for calculation can be found in Appendix 6 (6.2).
- "In the last 12 months" is interpreted as the 12-month period immediately preceding the first day of the audit being undertaken.
- Calculation methods may include, as relevant, reconciliation of opening inventory, stocking records, transfer records, harvest records, mortality records, counter records, biomass estimates, cage or net volume estimates, and post-incident stock counts.
- Where volumetric, biomass-based, or hand calculations are used, the UoC should document the method, assumptions, data sources, and any known limitations. Where uncertainty exists, the calculation should be precautionary and shall not result in likely underestimation of the number of escaped individuals.
- If the estimated number of escapes is close to the applicable limit, the UoC should use additional verification where available, such as recounting, independent review, equipment records, or reconciliation against production records.
- If the UoC identifies an escape event where preliminary information indicates that the set limit has been, or is likely to have been, exceeded the UoC shall notify the CAB and ASC by the next working day.
- Where the exceedance is confirmed in accordance with the applicable Appendix 6 method, the UoC shall submit a formal notification to the CAB by the next working day following confirmation.

Evidence of implementation should be maintained, e.g.:

- The UoC has a register of known escapes in which exceedance of the set limit is monitored.

Auditors should confirm:

- Records of known escapes are maintained.
- Escape limits are to remain below the set threshold and that calculations are made correctly.

Useful Resources

N/A

Indicator:	Requirement:
2.4.11	*Indicator applicability: fish species with an EICAT Category MR/MV* The UoC shall[17] not have any mass escape events, defined as: a. cod and marine salmonids: >5000 individuals per production cycle b. other fish species: >6% If a mass escape event occurs, the UoC shall: c. by the next working day: i. submit a formal request to the CAB for cancellation of the certificate or site under the certificate; and ii. notify ASC of the mass escape event in accordance with the ASC Data Submission Procedure. d. not identify, sell or dispatch the fish as ASC-certified[1817].

How do I interpret this requirement?

- Note: Indicator 2.4.11 only applies for species/regions that are classified as 'Category Major/Massive (MR/MV)' in the appropriate EICAT Species Factsheet. This indicator does not apply to species/regions classified as Data Deficient (DD), Minimal Concern (MC), or Moderate (MO).
- This indicator requires a zero limit on mass escape. It also requires certification cancellation if the limit is exceeded.

- An event counts as a ‘mass escape’ if the thresholds are exceeded, regardless of cause (e.g. storm damage, net failure, human error). The thresholds are:
  - For cod and marine salmonids: more than 5,000 individuals escaping at once. The formula for calculation can be found in Appendix 6 (6.2).
  - For other fish species: More than 6% of the stocked population escaping at once. The formula for calculation can be found in Appendix 6 (6.2).
- Calculation methods may include, as relevant, reconciliation of opening inventory, stocking records, transfer records, harvest records, mortality records, counter records, biomass estimates, cage or net volume estimates, and post-incident stock counts.
- Where volumetric, biomass-based, or hand calculations are used, the UoC shall document the method, assumptions, data sources, and any known limitations. Where uncertainty exists, the calculation shall be precautionary and shall not result in likely underestimation of the number of escaped individuals.
- If the estimated number of escapes is close to the applicable mass escape threshold, the UoC should use additional verification where available, such as recounting, independent review, equipment records, or reconciliation against production records.
- If the UoC identifies an escape event where preliminary information indicates that a mass escape event has occurred, or is likely to have occurred, the UoC shall notify the CAB and ASC by the next working day.
- Where a mass escape event is confirmed in accordance with the definition in the Standard and the applicable Appendix 6 method, the UoC must request cancellation of certification from the CAB by the next working day following confirmation.
- The UoC should have a system, or method, to detect and document mass escape events, including the identification of root cause(s) and determination of corrective action(s) to prevent re-occurrence.

Evidence of implementation should be maintained, e.g.:

- The UoC has a register of known escapes in which exceedances of the set limit are monitored.

Auditors should confirm:

- Records of mass escape events are maintained.
- Escape limits remain below the set threshold and that calculations are made correctly.

Useful Resources

N/A

Indicator:	Requirement:

2.4.12

Indicator applicability: fish species with an EICAT Category MO or MR/MV

The UoC shall[17] count fish with a minimum of 98% accuracy.

How do I interpret this requirement?

- Note: Indicator 2.4.12 only applies for species/regions that are classified as 'Category Moderate/Major/Massive (MO/MR/MV)' in the appropriate EICAT Species Factsheet. This indicator does not apply to species/regions classified as Data Deficient (DD) or Minimal Concern (MC).
- This Indicator requires the UoC to ensure that fish counting procedures achieve a minimum accuracy of 98%, meaning that the error margin must not exceed 2% and applies to both manual and automated counting methods.
- The total number of fish at key stages of production (e.g. stocking and harvesting) needs to be counted.
- The actual count should be within 2% of the true number (e.g. if 100,000 fish are stocked, the count must be between 98,000 and 102,000).
- Acceptable counting methods include e.g.:
  - Automated systems: optical counters, AI-based image recognition or volumetric counting.
  - Manual counting: hand counting, sample-based extrapolation or visual verification.

Evidence of implementation should be maintained, e.g.:

- The UoC should demonstrate that fish are counted at key stages of production (e.g. stocking and harvesting) using a method that achieves 98% accuracy.
  - If automated systems are used, ensure they are regularly calibrated.
- Documentation of counting procedures, accuracy checks and error rates.

Auditors should confirm:

- Results of fish counts at key stages of production have been presented.
- That calibration of the counting method is conducted.
- Documents are maintained to record counting procedures, accuracy checks and error rates.

Useful Resources N/A

Indicator:	Requirement:

2.4.13 *Indicator applicability: tilapia with an EICAT Category MO or MR/MV*

The UoC shall use all-male stock.

How do I interpret this requirement?

- This Indicator requires that the UoC only stocks tilapia that is 'all-male' if the EICAT Category is set at Moderate (MO), Major (MR) or Massive (MV) in the Nile tilapia EICAT Species Factsheet. This indicator does not apply to regions classified as Data Deficient (DD) or Minimal Concern (MC).

Evidence of implementation should be maintained, e.g.:

- Documents demonstrating that the UoC is aware of the EICAT Category.
- If the EICAT Category is set at Moderate (MO), Major (MR) or Massive (MV) documents demonstrate that the stocked tilapia is 'all-male'.

Auditors should confirm:

- The correct EICAT categorisation is applied.
- If the EICAT Category is set at Moderate (MO), Major (MR) or Massive (MV), documents have been presented to demonstrate all stocked tilapia are 'all-male'.

Useful Resources

N/A

Indicators 2.4.14 – 2.4.17 Additional requirements for cage culture sites producing smolts in freshwater

Indicator:	Requirement:
2.4.14	The UoC shall communicate each **escape incident** to the local fishery trust(s).

How do I interpret this requirement?

- This indicator requires the UoC to notify local fishery trusts whenever an escape incident occurs to ensure transparency, facilitate environmental monitoring and support mitigation efforts.
- For each escape incident, the UoC must report key details such as:
  - Date and time of the escape.
  - Estimated number of escaped fish.
  - Species involved.
- The UoC should identify the relevant local fishery trust(s) and establish clear communication channels. Fishery trusts are typically regional organisations responsible for managing wild fish populations and aquatic ecosystems. They may include government agencies, conservation groups or local fisheries management bodies.

Evidence of implementation should be maintained, e.g.:

- In case of escapes, the UoC shall maintain records of communications with fishery trusts (emails, reports or acknowledgments).

Auditors should confirm:

- Verify that, in case of escapes, the UoC has communicated each escape incident to the fishery trusts.

Useful Resources

N/A

Indicator:	Requirement:

2.4.15 The UoC shall collaborate with fishery trust(s) in conducting native salmonid monitoring programme(s) in the waterbody where it operates.

How do I interpret this requirement?

- This Indicator requires the UoC to collaborate with local fishery trusts in conducting native salmonid monitoring programmes within the waterbody where it operates.
    - The purpose is to track the status of native salmonid populations and assess potential impacts from aquaculture activities. 'Collaborate' would imply involvement e.g. beyond providing funding or passive support.
- Collaboration may include:
    - Sharing data on site operations and potential interactions with native salmonids.
    - Assisting in monitoring efforts (e.g. providing access to sites, participating in surveys).
    - Supporting scientific research or environmental assessments.
- The monitoring programme should address as minimum:
    - Tracking population health, abundance and migration patterns of wild salmonids.
    - Assessing genetic integrity (to detect any impact from escaped farmed fish).

Evidence of implementation should be maintained, e.g.:

- The UoC maintains records (e.g. agreements, partnerships, etc.) of collaboration with fishery trust(s).

Auditors should confirm:

- Records have been presented to demonstrate collaboration with fishery trust(s).

Useful Resources

N/A

Indicator:	Requirement:

2.4.16

The UoC shall conduct, in collaboration with the local fishery trust(s) and/or competent authority, a scientific baseline study to determine the genetic composition of the contemporary native and farmed salmonid population(s) in the waterbody where it operates. The baseline study shall:

a. use credible methodologies and analysis and undergo peer review; and

b. include known historical farmed and native salmonid genetic profiles; and

c. determine if changes in the genetic composition of the contemporary native salmonid population(s) have occurred; and

d. if changes in the genetic composition of the contemporary native salmonid population(s) are detected, seek to determine if these have occurred through introgression of farmed salmon or through other mechanisms; and

e. be updated every three years.

An exception applies where the UoC can demonstrate that the local competent authority has undertaken or commissioned an equivalent assessment for the waterbody where the UoC operates, in which case the UoC shall provide evidence that the assessment:

f. determines the genetic composition of the relevant contemporary native and farmed salmonid population(s); and

g. considers known historical farmed and native salmonid genetic profiles, where available; and

h. determines whether changes in the genetic composition of the contemporary native salmonid population(s) have occurred; and

i. where changes are detected, seeks to determine whether these have occurred through introgression of farmed salmon or through other mechanisms; and

j. is updated at least every three years.

How do I interpret this requirement?

- This Indicator requires the UoC to conduct a collaborative scientific baseline study on the genetic composition of both native and farmed salmonid populations in the waterbody where it operates.
  - The goal is to assess potential genetic changes in wild populations, particularly from interbreeding (introgression) with farmed salmon, and ensure ongoing monitoring.

- The study should establish a genetic baseline for comparison over time and should follow rigorous scientific methods and undergo peer review for credibility.
- The study should use established genetic analysis techniques (e.g. DNA sequencing, microsatellite markers, SNP analysis).
- The study should, if available, include known historical genetic profiles of both native and farmed salmonid populations in the waterbody.
- The study should determine if genetic changes have occurred in native populations and identify if this is the result from introgression from farmed fish or other evolutionary pressures.
- The study must be updated every three years.

Evidence of implementation should be maintained, e.g.:

- The UoC maintains records of the conducted study or demonstrates that the study is under development.

Auditors should confirm:

- Verify that the study has been concluded and has been conducted according to the requirements or is under development.

Useful Resources

N/A

Indicator:	Requirement:
2.4.17	The UoC shall publicly disclose the scientific baseline study (see Indicator 2.4.16).

No additional guidance is provided for this Indicator.

Criterion 2.5 – Benthic Impact

Indicator:	Requirement:
2.5.1	*Indicator applicability: cage culture and suspended marine mollusc systems* The UoC shall[19] determine benthic status, following the method outlined in **Appendix 7 (7.2.1, 7.3.1, 7.4.1, 7.8)**.
2.5.2	*Indicator applicability: cage culture and suspended marine mollusc systems* The UoC shall demonstrate an 'Acceptable' benthic status[20], following the method outlined in **Appendix 7 (7.2.2, 7.3.2, 7.4.2).**
2.5.3	*Indicator applicability: cage culture and suspended marine mollusc systems* The UoC shall ensure that the person conducting sediment sampling and analysis (see Indicator 2.5.1) is independent and has the necessary competencies, experience and training. Where applicable regulatory competency requirements exist, the UoC shall ensure that the person conducting the sampling and analysis complies with these requirements.

How do I interpret this requirement?

- The method for benthic monitoring for cage culture and suspended marine mollusc systems is composed of:
  - Sediment sampling zones and sampling locations across transects.
  - Benthic quality categories and thresholds for defining those categories and the benthic status.

<u>Sampling approach</u>

- The method uses a three-level sampling approach:
  - The number of transects and sampling locations, as well as the complexity of analysis, may increase based on Level 1 or Level 2 monitoring results:

[19] An exemption applies to sites situated in areas classified as having a 'hard bottom'. Evidence is required to support the classification 'hard bottom'.
[20] An exemption applies to cage sites situated in lakes and reservoirs, where determination of benthic status is required (Indicator 2.5.1) but demonstration that the status is 'Acceptable' is not required for the first three years of the ASC Farm Standard being mandatory.

- Level 1 requires sampling along one transect in the direction of the predominant current. The samples are to be analysed for redox potential and total free sulphide.
    - The direction of the predominant current is the compass direction in which the water flows the majority of the time.
    - The following options can be used to identify the Level 1 transect direction when there are challenges identifying the predominant current direction:
        - If the two current directions flow in different compass directions for an equal proportion of the time, then the transect should be in the direction for when benthic impact is expected to be highest (and when sampling is conducted). For example, during peak biomass, maximum annual bottom water temperature, or peak feeding.
        - If the current direction varies daily/seasonally and current speeds are relatively low, the Level 1 sampling direction is not critical because the benthic impact will be spread around the farm during the grow out period.
        - If the direction of greatest impact has been identified through a modelled Allowable Zone of Effect (AZE), then the direction outlined by the AZE can be used to identify the Level 1 transect direction.
- Level 2 requires sampling along three additional transects. The samples are to be analysed for redox potential and total free sulphide.
- Level 3 requires sampling as per Level 2 (at a minimum, on the two transects in the direction of the predominant current). The samples are to be analysed for three (of the 14) biotic indicators selected from Table 2 of Appendix 7 (7.1).
    - Sites should select biotic indicators that are more appropriate based on their location or based on regulatory requirements.

- Sites can choose to commence monitoring at any of the three levels.
    - Previous benthic impact results can provide an indication of the level at which monitoring should commence.
- The same sediment samples collected for Level 1 or Level 2 sampling can be used for the analysis required by Level 3 sampling.
    - Sites are not required to collect new sediment samples.
- Transects:
    - In cases where a transect overlaps with another site, the direction of the overlapping transect should be adjusted.

        - The same applies to any transect/sampling station overlapping with land.
    - Transect directions should also be adjusted to avoid sampling in areas where water depth changes rapidly along the transect.
    - In all cases, each transect should be as close to 90 degrees from each other as possible.
    - In cases where multiple cages are located in close proximity, transects should be located at the edge of the last cage site.
- Given the low complexity associated with Level 1 and Level 2 sampling and analysis, it is advisable for sites to conduct monitoring not only at the required timings by the indicator but also prior to those timings.
    - The results can indicate the need for Level 3 sampling at the timings required by the indicator, thereby assisting in monitoring planning.

Ecological Quality Status (EQS) categories

- Ecological Quality Status (EQS) categories are used to determine the benthic status (see more details on the categories in the Useful Resources section).

Conformance Framework

- A numerical scoring method that combines all indicator data collected from each sampling zone is used to determine the EQS Category and benthic status:
    - The method requires calculating the mean value for each indicator in each sampling zone to determine the Indicator EQS Score for that zone.
    - Next, an overall Zone EQS Score is calculated by combining the Indicator EQS Scores.
    - The overall Zone EQS Score is used to determine the final EQS Category for each sampling zone and the 'acceptable' benthic status.
        - In the case of cages, the EQS Category of the Reference Zone will determine the EQS Categories for 'acceptable' benthic status of the sampling zones.

Sampling Timing

- Sampling is required to be conducted during the period when the benthic impact is expected to be highest, i.e. at peak impact, and uses proxies for determining peak impact:
    - Peak biomass (cage culture and suspended marine mollusc systems).
    - Maximum annual bottom water temperature (cage culture and suspended marine mollusc systems).

- Peak feeding (cage culture only).
  - By considering these proxies, cage culture sites shall (see Appendix 7 (7.2.1 and 7.3.1)):
    - Provide the CAB with information on when the highest impact on the benthos is predicted to occur.
    - Determine the timing sampling that applies.
      - For cage sites with multiple peaks in feeding/biomass occurring in any year and for suspended marine mollusc systems, the requirements allow for reducing the sampling frequency as long as there have been no significant changes to farming practices. Examples of significant changes to farming practices are:
        - Modification of the disposition of cages/long lines.
        - Addition of cages/long lines.
        - Increase of biomass.
        - Change in species produced.
- An independent person is a person who is not an employee of the ASC Certificate Holder.
- To demonstrate competence, the person conducting sediment sampling and analysis should be able to:
  - Perform requested sampling and/or analysis.
  - Operate equipment
  - Develop, verify and validate methods.
  - Use suitable reference standards.
  - Analyse sampling and calibration results, including statements of conformity and interpretations.
  - Record, review and authorise the release of results.
  - Contribute to, or produce, reports that can clearly and concisely explain how the results are able to meet or otherwise not meet the requirement.
  - Perform internal audits on the sampling, analysis and results.

Evidence of implementation should be maintained, e.g.:

- Production overview information:

- Biomass (projected and current).
- Feed delivered (projected and current).
- Harvest (biomass, time of harvesting).

- Bottom water temperature data.
- Visual imagery confirming hard bottom.
- Records:
  - Sampling activity, including:
    - Timing and person conducting sampling.
    - GPS sampling locations.
    - Competence, experience and training of the person conducting sampling and analysis.
    - Sampling analysis results.

Auditors should confirm:

- Sampling was conducted according to the method and timing stated in Appendix 7 (7.2, 7.3, 7.4), by cross-checking production overview information and records.
- Competence, experience and training of the person conducting sampling.
  - Adequate level of personnel competence should be verified by observations and interviews.
- The sampling analysis results that demonstrate an acceptable EQS.

Useful Resources

The benthic monitoring method for cage culture and suspended marine mollusc systems uses five Ecological Quality Status (EQS) categories to define abiotic and biotic qualities based on the seabed macrofaunal communities. The EQS categories are outlined in Table 1 below.

Table 1. Descriptions of benthic macrofauna assemblages for each of the five Ecological Quality Status (EQS) categories of the benthic monitoring method for cage culture and suspended marine mollusc systems:

EQS Category	Description
High	***No or very minor disturbance***: Species abundance, richness and diversity is high and sensitive taxa dominate. Opportunistic taxa are absent or of negligible

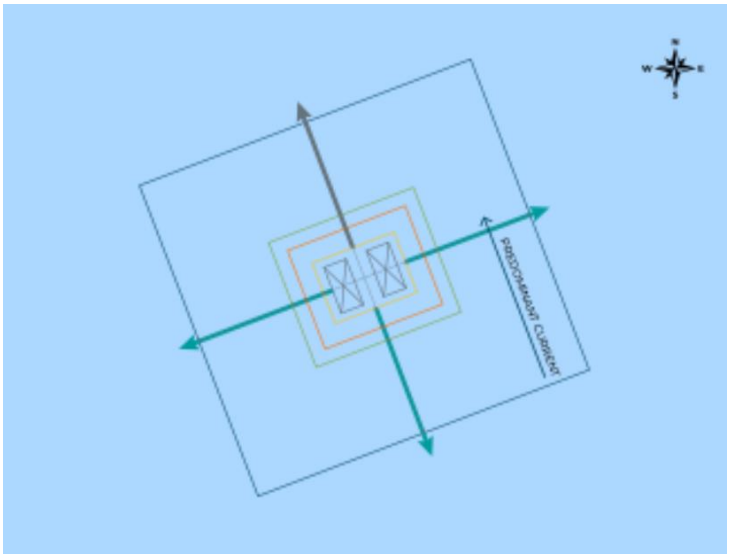
EQS Category	Description
	abundance. Geochemical quality elements indicate aerobic conditions with low free sulphide toxicity.
Good	***Slight disturbance***: The level of diversity and abundance of invertebrate taxa is slightly reduced. Most of the sensitive taxa are present but slightly reduced. Opportunistic taxa are present but negligible. Geochemical quality elements indicate aerobic sediment conditions with a slight increase in free sulphide levels.
Moderate	***Moderate disturbance***: The level of diversity and abundance of invertebrate taxa is moderately reduced. Sensitive taxa have negligible abundance or are absent. Tolerant and first-order opportunistic taxa co-dominate in abundance. Geochemical quality elements indicate a moderate increase in anaerobic conditions with free sulphide levels known to be lethal to sensitive and indifferent taxa.
Poor	***Major disturbance***: Evidence of major alterations to the values of the biological quality elements. Diversity is greatly reduced with sensitive and indifferent taxa showing negligible abundance or are absent. Tolerant taxa are sub-dominant to first-order opportunistic taxa. Geochemical quality elements indicate a major increase in anaerobic conditions and sulphide concentrations lethal to most taxa.
Bad	***Severe disturbance***: Evidence of severe alterations to the values of the biological quality elements and in which large portions of the relevant biological communities normally associated with undisturbed conditions are absent. First-order opportunistic taxa dominate but are greatly reduced in abundance. Geochemical quality elements indicate a severe increase in sulphide concentrations that are lethal to all taxa.

Chile Module Systems – Salmonids

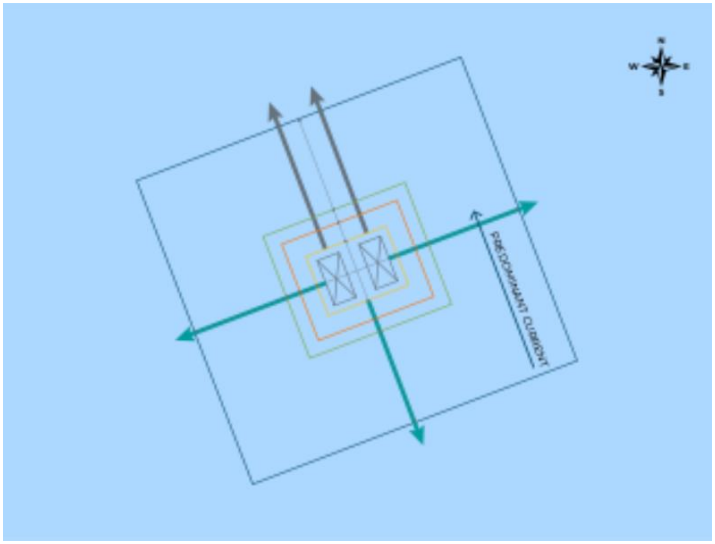
Salmonid cage culture systems in Chile typically operate in module systems, where there are modules (i.e. cage systems) which are within a broader cage array.

- The placement and direction of transects should be determined based on the layout of the modules within the cage array.
    - Level 1: Individual transects per module in the predominant current direction when individual modules are more than 30 m apart. The rationale is that the Level 1 sampling method provides a rapid and cost-effective assessment of benthic status.
    - The Level 1 transect should be at the edge of the cage array when modules are less than 30 m apart, or when sampling per module would result in overlapping transects in the direction where impacts are expected to be greatest.

- Levels 2 and 3 transects should start at the edge of the cage array. This mitigates the risk of transects overlapping with modules within the cage array. Level 3 sampling shall take place along at least two transects.



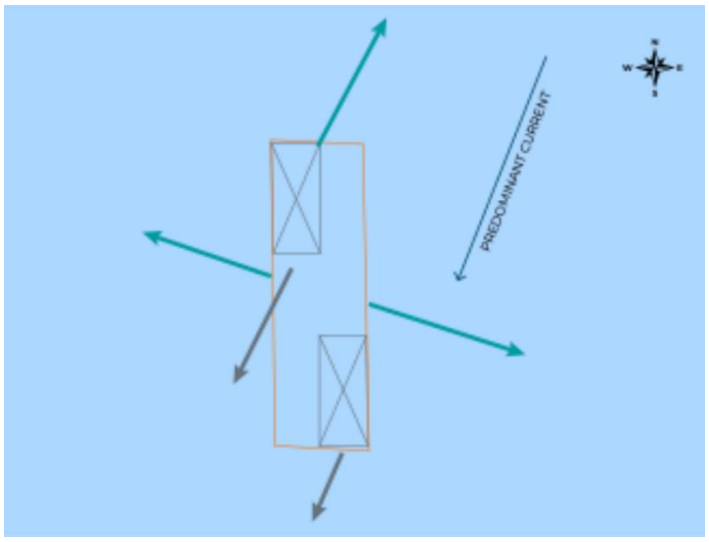
Example 1: At Level 1, sampling should take place along an individual transect from the edge of the cage array (between the two cages) in the predominant current direction (grey arrow). This is because the modules are less than 30 m apart. Level 2 sampling should take place along transects from the edge of the cage array (teal arrows). Level 3 sampling should take place along the transect indicated by the grey arrow, and at a minimum along the transect indicated by the teal arrow in the opposite direction to the predominant current direction.



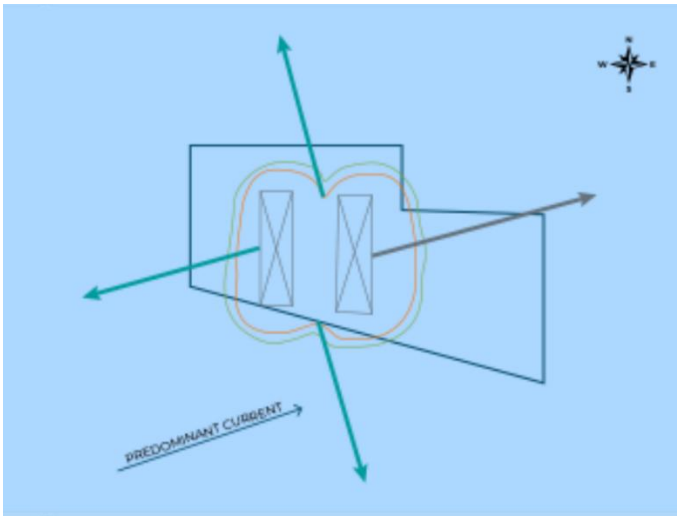
Example 2: At Level 1, sampling should take place along individual transects per module in the predominant current direction (grey arrows). This is because the modules are more than 30 m apart. Level 2 sampling should take place along transects in line with the grey and teal arrows. Level 3 sampling should take place along the transects indicated by the grey arrows, and at a minimum along the transect indicated by the teal arrow in the opposite direction to the predominant current direction.



Example 3: At Level 1, sampling should take place along individual transects per module in the predominant current direction (grey arrow). This is because the modules are more than 30 m apart. Level 2 sampling should take place along transects in line with the grey and teal arrows. Level 3 sampling should take place along the transects indicated by the grey arrows, and at a minimum along the transect indicated by the teal arrow in the opposite direction to the predominant current direction.



Example 4: At Level 1, sampling should take place along individual transects per module in the predominant current direction (grey arrows). This is because the modules are more than 30 m apart. Level 2 sampling should take place along transects in line with the grey and teal arrows. Level 3 sampling should take place along the transects indicated by the grey arrows, and at a minimum along the transect indicated by the teal arrow in the opposite direction to the predominant current direction.



Example 5: At Level 1, sampling should take place along an individual transect from the edge of the cage array in the predominant current direction. This is because sampling per module would result in overlapping transects. Level 2 sampling should take place along transects from the edge of the cage array (grey and teal arrows). Level 3 sampling should take place along the transect indicated by the grey arrow, and at a minimum along the transect indicated by the teal arrow in the opposite direction to the predominant current direction.

Indicator:	Requirement:
2.5.4	*Indicator applicability: freshwater systems discharging into rivers producing freshwater salmonids or pike-perch* The UoC shall demonstrate that the benthic status does not deteriorate downstream from the site's effluent point, following the method outlined in **Appendix 7 (7.5)**.
2.5.5	*Indicator applicability: freshwater systems discharging into rivers producing freshwater salmonids or pike-perch* The UoC shall ensure that: a. the person conducting sediment sampling (see Indicator 2.5.3) has the necessary competencies, experience and training; and b. the laboratory conducting the analysis of the samples is accredited and has approved the sampling methodology. Where applicable regulatory competency requirements exist, the UoC shall ensure that the person conducting the sampling and/or the laboratory conducting the analysis complies with these requirements.

How do I interpret this requirement?

- The benthic monitoring method for freshwater systems discharging into rivers:
  - Uses sediment sampling upstream and downstream from the site outflow point to:
    - Determine the presence, composition, abundance and diversity of invertebrate fauna; and
    - Categorise the benthic status upstream and downstream as a measure of assessing the aquatic ecosystem health.

Sampling Timing

- Should consider the seasonality of the presence of the macroinvertebrate species, e.g. insects in their larval stage of the life cycle.
  - It is recommended that sampling is conducted during summer and winter.
  - In geographical regions like Scandinavia, spring and autumn are recommended as the best times for sampling.

Location

- Practical considerations should be taken into account regarding the sampling locations midstream (e.g. strong currents, particularly in wide, deep rivers).
  - In cases where it is impossible to collect samples in locations midstream, sites should ensure sampling all available substrate types present along the bank and in areas with slower water flow.

Gear

- Standard equipment such as a Surber sampler, hand net and grab should be used.

Sampling analysis

- ISO/IEC 17025 is an example of laboratory accreditation.
- For more guidance, see the section Useful Resources below.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Sampling activity, including:
    - Scope of the sampling

  - Timing and frequency of the sampling and the person conducting sampling.
  - GPS sampling locations.
- Classification system.
- Analysis results.
- Competence, experience and training of the person conducting sampling and analysis.
- Accreditation of the laboratory conducting the analysis of the samples.

Auditors should confirm:

- Sampling was conducted as per the minimum requirements in Appendix 7 (7.5) by cross-checking records.
- Sampling analysis results demonstrate benthic status downstream from the effluent discharge similar to, or better than, upstream benthic status.
- Sampling frequency agrees with the frequency required by Appendix 7 (7.5).

Useful Resources

- ISO 10870:2012, Water quality — Guidelines for the selection of sampling methods and devices for benthic macroinvertebrates in fresh waters.

Indicator:	Requirement:
2.5.6	*Indicator applicability: cage culture systems in freshwater lakes/reservoirs* The UoC shall report benthic related data in accordance with the ASC Data Submission Procedure.

No additional guidance is provided for this Indicator.

Criterion 2.6 – Water Quality

Indicator:	Requirement:
2.6.1	*Indicator applicability: fed systems* The UoC shall calculate Total Nitrogen (TN) and Total Phosphorus (TP) release, following the method outlined in **Appendix 8 (8.2)**.
2.6.2	*Indicator applicability: crustaceans, freshwater salmonids, pangasius and tilapia* The UoC shall adhere to species-specific limits on TN and TP release, according to **Appendix 2 (2.1)[21].**

How do I interpret this requirement?

- If there is no species-specific limit in Appendix 2 (2.1), then there are no limits for that species/production system. However, the UoC is required to calculate TN and TP release (in accordance with Indicator 2.6.2).
- TN and TP in the feed are required for the calculations. TN and TP content in the feed should be obtained from the feed supplier.
- The proxy values in the table below can be used in TN and TP release calculations for the TN and TP content in the animal and feed.
  - Proxy values should only be used in the absence of accurate values (for example from the feed supplier).
  - The UoC should work towards obtaining precise values if they are not available.

Variable	Proxy value (%)
TN in feed – fish species	5.4
TN in feed – crustacean species	6.4
TN in animal – fish species	2.8
TN in animal – crustacean species	2.5

[21] An exemption applies where there is no species-specific metric listed in Appendix 2.

TP in feed – fish species	1.5
TP in feed – crustacean species	1.3
TP in animal – fish species	0.6
TP in animal – crustacean species	3.5

- The suitability of the TN and TP limits per tonne of production should be reviewed if the UoC is in a Type A waterbody and needs to implement corrective actions, in accordance with Indicator 2.6.12.
- The annual limits may need to be reduced to prevent shifts in trophic status or correct increases in limiting nutrients.
- Equipment used to measure TN and TP per tonne of production should be calibrated according to the technical specifications. The equipment used will be based on the formula used in Appendix 8 (8.2):
    - Equipment is required for Formula 2 to measure TN and TP concentration in the influent and effluent water and the volume of the effluent water.
    - Equipment is required for Formula 3 to measure TN and TP concentration in the influent and effluent water.

Evidence of implementation should be maintained, e.g.:

- The formula (outlined in Appendix 8 (8.2)) used to determine the TN and TP load per tonne of production.
- Results of the TN and TP load per tonne of production based on the relevant calculation.
- Equipment to measure TN and TP load per tonne of production has been calibrated according to the manufacturer's instructions, based on the formula used in Appendix 8 (8.2).

Auditors should confirm:

- TN and TP load per tonne of production has been determined.
- Species-specific limits have been adhered to (where applicable) over the previous 24-month period.
    - TN and TP have been determined and reported where species-specific limits are not available.

- The UoC has calibrated the equipment used to determine the TN and TP load per tonne of production, based on the formula used in Appendix 8 (8.2).

Useful Resources

N/A

Indicator:	Requirement:
2.6.3	*Indicator applicability: cage-fed systems with feed of a diameter ≥3mm* The UoC shall ensure that feed used contains <1% fines, following the method outlined in **Appendix 8 (8.3)**.

How do I interpret this requirement?

- Indicator 2.6.3 complements the other water quality indicators by addressing the direct release of uneaten feed in the form of fines into the environment.
- Setting a maximum percentage of fines in the feed addresses the efficient and proper transport, storage and physical delivery of feed pellets to the site.
- Poor performance in any of the above phases of feed handling will result in a higher percentage of fines (fine particles of feed) and potentially greater impacts on water quality, due to an increase in suspended organic particles and nutrients released into the environment.
- Sampling of feed lots includes feed delivered as material in bulk, big bags and small bags to the site.
- Testing by the feed manufacturer to the UoC is permissible where there is no significant risk of feed deterioration during subsequent handling, storage or application.
    - The UoC should demonstrate that deterioration in feed does not take place during the processes outlined above.
    - The UoC should report the schedule and location of testing of feed if it is not conducted on-site.
    - Rationale for not testing on site should also be reported.

Evidence of implementation should be maintained, e.g.:

- The method used to determine the percentage of fines in feed, in accordance with Appendix 8 (8.3).
- The determination and documentation of a schedule and location for the testing of feed.
- If testing takes place prior to delivery to the site, the rationale should be documented for not testing on site.
- Calibration of sieving machines (if used) in accordance with the manufacturer's recommendations.

Auditors should confirm:

- The rationale for the timing and location of feed sampling.
- The UoC has appropriate testing technology on site and that, if applicable, it is calibrated as required.
- The method used to determine the percentage of fines in feed, in accordance with Appendix 8 (8.3).
- Review testing results and confirm that results demonstrate feed contains <1% of fines.

Useful Resources

N/A

Indicator:	Requirement:
2.6.4	The UoC shall ensure that the **Receiving Waterbody (RW)** has been classified per site as Type A, B or C, following the method outlined in **Appendix 8 (8.4)**.

How do I interpret this requirement?

- The UoC should initially define the boundaries of the Receiving Waterbody (RW) based on hydrological characteristics, which determines its sensitivity to nutrient enrichment.
    - The RW type should be determined for the first natural waterbody into which effluent water is discharged.

- Once the boundaries of the RW are defined, HRT should be calculated unless one of the default waterbody types has been met.
    - HRT therefore does not need to be calculated if one of the default waterbody types has been met.

- Marine waterbodies include:
    - Off-shore and inshore coastal systems.
    - More enclosed waterbodies susceptible to seawater intrusion through tidal exchange or storm surges.
    - The default waterbody type for enclosed freshwater and semi-enclosed marine/brackish waterbodies is Type A, unless the HRT has been determined as < 5 days.
        - Examples of enclosed freshwater bodies are lakes. Examples of semi-enclosed marine/brackish waterbodies are bays and fjords.
- Marine/brackish waterbodies that are not enclosed, for example, channelised systems, exposed near-shore, and offshore waterbodies will be classified as Type C.
    - Sites which discharge effluent water into man-made canals/channels prior to the effluent water entering a confined or linear waterbody will be classified as Type B, unless the Type C requirements are met.
    - Examples of confined or linear waterbodies classified as Type B include rivers, streams, tidal creeks, and estuaries. These waterbodies may be freshwater or brackish.
- Waterbody types designated under national legislation should be used only if the following are met:
    - The classification includes area-based water quality monitoring.
    - Targets are used to determine good ecological status. An example is the Water Framework Directive.

Evidence of implementation should be maintained, e.g.:

- A map of the RW that outlines the requirements for the applicable default waterbody type in Appendix 8.4 (Table 1) has been met to classify the RW.
- If HRT has been used to calculate the RW, information on the following is available:
    - Area and average depth of the RW.
    - Flow rate (Q) data.

- The location where the flow rate (Q) was determined.
- Measurements of TSS (if used to distinguish between a Type B and C waterbody).
- The methods used to measure flow rate and TSS are in accordance with Appendix 8 (8.4 and 8.11).

Auditors should confirm:

- A map has been presented by the UoC that outlines the RW, and supports the classification of the RW.
- Where applicable, the results of the HRT calculation and flow rate/TSS measurements conducted by the UoC.
    - These results will support the RW classification determined by the UoC.
- Evidence presented by the UoC, demonstrating the methods used to measure flow rate and TSS are in accordance with Appendix 8 (8.4 and 8.11).

Useful Resources

- If measurements of HRT or flow rates are not available, publicly accessible global databases can be used to obtain annual outflow estimates. Data sources include:
    - HydroAtlas, accessed November 22, 2023: https://www.hydrosheds.org/hydroatlas
    - G-RUN: Global Runoff Reconstruction, accessed November 2023: https://doi.org/10.6084/m9.figshare.9228176
- Google Earth Pro can be used to estimate the area and average depth of a waterbody to help calculate the HRT, accessed May 2024: Earth Versions – Google Earth and Measure distance & elevation - Google Earth Help

Indicator:	Requirement:
2.6.5	The UoC shall define the **Waterbody Unit of Management (WUM)**, following the method outlined in **Appendix 8 (8.5)**. An exception applies where a WUM is already defined, in which case the UoC shall provide evidence of the defined WUM.

How do I interpret this requirement?

- The following characteristics should be used to define the Waterbody Unit of Management (WUM):
  - The WUM reflects a logical geographic scope, for example, a lake and its catchment area.
  - The boundaries of the waterbody reflect the ability to realistically manage eutrophication risk within it.
  - Boundary setting should consider hydro-morphology, bathymetry, water movement and stratification characteristics.
  - Areas with high risk of adverse impacts due to cumulative effects, for example semi-enclosed bays in larger waterbodies, should be a separate WUM.
  - Areas established for water quality monitoring at a national or regional level.
  - The Water Quality Advisory Committee (WQAC) can resolve issues with defining the WUM where the WUM boundaries are not clear.

Evidence of implementation should be maintained, e.g.:

- A map of the WUM which includes the components outlined in Appendix 8 (8.5).
  - The map should be updated on an annual basis where required.

Auditors should confirm:

- A map of the WUM has been developed and presented by the UoC, according to the method outlined in Appendix 8 (8.5).

Useful Resources

N/A

Indicator:	Requirement:
2.6.6	The UoC shall ensure that the person conducting water quality monitoring has the necessary competencies, experience and training. Where applicable regulatory competency requirements exist, the UoC shall ensure that the person conducting water quality monitoring complies with these requirements.

How do I interpret this requirement?

- To demonstrate competence, personnel responsible for conducting water quality analysis should be able to:
  - Perform the required sampling and/or analysis.
  - Operate sampling/analytical equipment.
  - Develop, change, verify and validate methods.
  - Use suitable reference standards.
  - Analyse sampling and calibration results, including statements of conformity and interpretations.
  - Record, review and authorise the release of results.
  - Contribute to or produce reports that can clearly and concisely explain whether the results meet the requirements.
  - Have completed relevant ASC training modules.

Evidence of implementation should be maintained, e.g.:

- The personnel responsible for conducting water quality analysis have competencies to do so, for example a suitable level of education and/or experience.
  - Where applicable, the personnel meet national requirements/qualifications for the spatial definition and/or management of waterbodies.
- Relevant training modules have been completed by the personnel responsible for conducting water quality analysis.

Auditors should confirm:

- The personnel responsible for conducting water quality analysis have the necessary competencies.
    - Where applicable, national requirements/qualifications are met by the personnel conducting water quality analysis.
- Evidence has been presented that relevant training modules have been completed.

Useful Resources

N/A

Indicator:	Requirement:
2.6.7	The UoC shall establish a Water Quality Monitoring Network (WQMN), following the method outlined in **Appendix 8 (8.6)**. An exception applies where a WQMN is already established, in which case the UoC shall participate in the WQMN.

How do I interpret this requirement?

- Evidence of spatial management at a national/regional level for water quality can be used by the UoC to demonstrate that the intent of Indicator 2.6.7 has been met. To use this evidence, the following should be met:
    - The boundaries of waterbodies are defined.
    - Waterbodies are managed to ensure water quality remains at a 'Good' or 'Very Good' status.
    - Where required, corrective actions are implemented by the regulator and complied with to ensure water quality status improves.
    - Examples of spatial management at a national/regional level include the European Union Water Framework Directive.
- It is the responsibility of the UoC to conduct outreach to ASC Certified sites and non-certified sites belong to ASC Certificate Holders if a Water Quality Monitoring Network (WQMN) has not been established.

- Examples of outreach can include:
  - Copies of correspondence (written and email).
  - Agendas and minutes of meetings.
  - Third-party stakeholder testimony.

- As per Appendix 8, section 8.6, a Terms of Reference (ToR) document shall be drafted and agreed upon by all members of the WQMN upon formation, which includes the following:
  - The membership list and commitments from members to meet the WQMN requirements, as outlined in Appendix 8 (8.6.1).
  - The assignment of a focal point, who will coordinate data sharing, the drafting of the ToR and agreement to the ToR by all members of the WQMN.
    - The focal point should ideally be a rotating position, though determination is left to discretion of the WQMN membership.
  - A commitment to review the ToR on a regular basis (for example every 12 months) or as and when required, such as when changes in membership of the WQMN occur, or when the waterbody demonstrates evidence of excessive nutrient loading, eutrophication or trophic status shifts.

Evidence of implementation should be maintained, e.g.:

- An agreed map of the WUM by members of the WQMN, which includes the components outlined in Appendix 8 (8.6).
  - The map should be updated on an annual basis where required.
- Evidence of outreach efforts and responses (where applicable) to ASC Certified site and non-certified sites belong to ASC Certificate Holders if a WQMN needs to be established.
- If a WQMN has been established, the UoC presents evidence that they have joined the WQMN or the UoC can demonstrate the spatial management of water quality at a national/regional level.
- A ToR has been agreed upon by all members of the WQMN, which includes commitments to the WQMN requirements, as outlined in Appendix 8 (8.6.1).

Auditors should confirm:

- A map of the WUM has been developed by the WQMN and presented by the UoC, which includes the components outlined in Appendix 8 (8.6).

- Evidence of outreach efforts and responses to ASC Certified site and non-certified sites belong to ASC Certificate Holders if a WQMN needs to be established.
    - Auditor discretion should be used to determine if sufficient levels of outreach has been conducted, when such outreach has not been reciprocated.
- Evidence that the UoC has formed/joined a WQMN, or that the UoC presents evidence that water quality is managed at a national/regional level.
- A ToR has been presented, that has been agreed upon by all members of the WQMN. The ToR includes commitments to the WQMN requirements, as outlined in Appendix 8 (8.6.1).

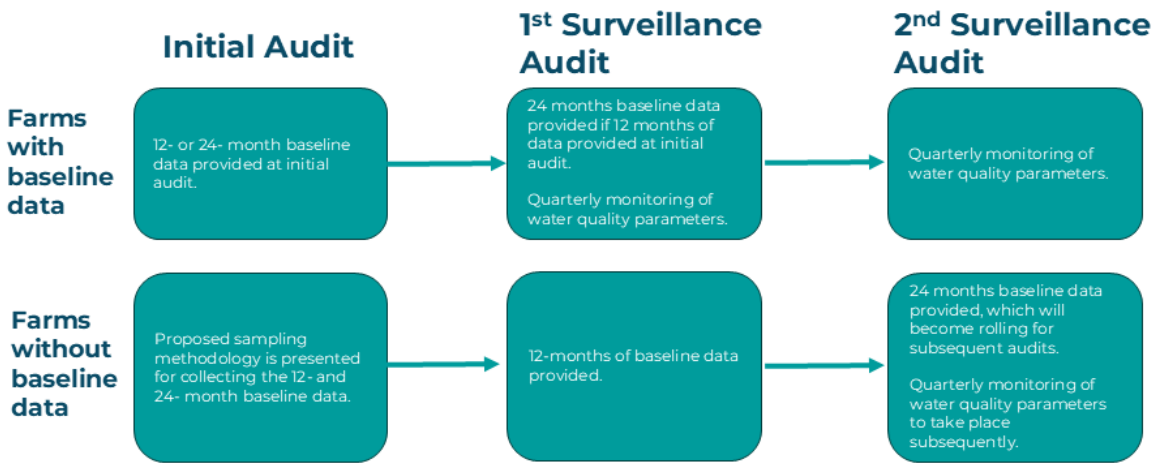
Useful Resources

N/A

Indicator:	Requirement:
2.6.8	The UoC shall conduct a water quality survey and determine the water quality baseline, including the trophic status, following the method outlined in **Appendix 8 (8.7)**.

How do I interpret this requirement?

- The data collected as part of the 24-month site level monitoring survey is submitted by the UoC to the ASC Water Quality Calculator.
    - When submitting data to the ASC Water Quality Calculator, the date of the last measured parameter should be submitted in the 'Sampling date' field.
    - If parameters are measured more than two weeks apart, a new row should be created for the applicable parameters with the different date.
- The water quality baseline is based on 24-months of monitoring data from the site level monitoring survey. However, the following phased approach is permitted when sites do not have sufficient data prior to the initial audit:



- The water quality baseline is characterised by the ASC Water Quality Calculator, in accordance with Appendix 8 (8.7).
- The baseline should be conducted per site and per waterbody. The results should then be shared with members of the WQMN.
- The baseline determines whether primary production in the waterbody is limited by nitrogen (N), phosphorous (P), or if it is co-limited. Other factors (than N or P) may be limiting primary productivity in a waterbody.
    - The UoC should present evidence of these other limiting factors (e.g. temperature or altitude) where applicable.
- Harmful algal blooms (HABs) and Adverse Turnover Events (ATEs) are required to be reported as part of the baseline characterisation. The number of ATEs and HABs that have occurred can be recorded by conducting the following:
    - Reviewing news media and consulting local stakeholders. Alternatively, reviewing data collected by regulatory bodies where available.
    - Reporting the number of ATEs and HABs that have resulted in fish mortality events (farmed or wild) or the mortality of other aquatic species.
    - Reporting instances where fish mortality events or loss of other aquatic species can be attributed to natural phenomena. These instances will not count towards the frequency limits for ATEs and HABs.
    - Reporting the number of ATEs and HABs, as determined by national or regional regulatory/scientific organisations.
    - The proxy values in the table below can be used in the biological oxygen demand calculation for the Total Nitrogen (TN) and Total Carbon (TC) content in the feed and animal (fish or crustacean species) respectively.

- Proxy values should only be used in the absence of accurate values (for example from the feed supplier).
- The UoC should work towards obtaining precising values if they are not available.

Variable	Proxy Value (%)
TN in feed – fish species	5.4
TN in feed – crustacean species	6.4
TN in animals – fish species	2.8
TN in animals – crustacean species	2.5
TC in feed – fish species	47.0
TC in feed – crustacean species	47.5
TC in animals – fish species	13.5
TC in animals – crustacean species	12.5

Evidence of implementation should be maintained, e.g.:

- The methodology and analytical methods used to conduct site level monitoring survey are in accordance with Appendix 8 (8.7).
- The sampling methodology for collecting 24-months of data for the site level monitoring survey, if this is not available at the initial audit.
- The results of the site level monitoring survey, as determined by the ASC Water Quality Calculator.
- The results of the 24-month baseline characterisation, as determined by the ASC Water Quality Calculator.
- Records of HABs and ATEs from the last 10 years.

Auditors should confirm:

- A water quality monitoring survey has been conducted by the UoC. Results are presented from the ASC Water Quality Calculator.
- A sampling methodology has been presented for collecting 24-months of data for the site level monitoring survey, if this is not available at the initial audit.

- The data collected for the site level monitoring survey followed the methodology and analytical measures outlined in Appendix 8 (8.7).
- A water quality baseline has been characterised. Results are presented from the ASC Water Quality Calculator.
- The results of the review by the UoC into adverse turnover events and harmful algal blooms in the waterbody.

Useful Resources

- Vollenweider, R.A., Rinaldi, A. and Montanari, G. (1992) Eutrophication, structure and dynamics of a marine coastal system: results of ten-year monitoring along the Emilia-Romagna Coast (Northwest Adriatic Sea). *Marine Coastal Eutrophication, Proceedings of an International Conference, Bologna, Italy, 21–24 March 1990, Pages 63-106*: https://doi.org/10.1016/B978-0-444-89990-3.50014-6
- More information about the equations used for TSI assessment, including the relevant peer-reviewed scientific literature, is provided in Carlson, R.E. and Simpson, J. (1996) A Coordinator's Guide to Volunteer Lake Monitoring Methods. *North American Lake Management Society, 96 p.*

Indicator:	Requirement:
2.6.9	The UoC shall, after the determination of the water quality baseline, conduct monitoring of the water quality parameters listed below, following the method outlined in **Appendix 8 (8.7)**: a. Total Nitrogen (TN) concentration; and b. Total Phosphorous (TP) concentration; and c. Dissolved Oxygen (DO); and d. Secchi Disk (SD) depth[22]; and - Chlorophyll-a (Chl-a).

How do I interpret this requirement?

- Quarterly monitoring ensures the UoC can capture any seasonal or inter-annual variations in the data collected.

[22] An exemption applies if the mean of Secchi Disk (SD) depth calculated over any rolling two-year period remains ≥10m.

- Measurements should be timed to coincide with, or immediately follow, annual turnover events when the waterbody is not permanently stratified (holomictic).
- The UoC should calibrate equipment used to measure DO, TN concentration, TP concentration, SD and Chl-a according to the technical specifications of the equipment.
- The UoC should conduct measurements of the parameters in-situ.
    - Samples may be sent for laboratory analysis, however variability with sample maintenance during transit can lead to inconsistent results. This is particularly evident with DO and Chl-a samples.

Evidence of implementation should be maintained, e.g.:

- Documentation outlining the sampling plan to conduct quarterly monitoring and that is in accordance with Appendix 8 (8.7).
- Quarterly monitoring data has been collected and submitted to the ASC Water Quality Calculator. Data should be submitted at least annually.
- Evidence that quarterly monitoring data has been timed with annual turnover events (where applicable).
- That equipment to measure DO, TN concentration, TP concentration, SD and Chl-a has been calibrated according to technical specifications.

Auditors should confirm:

- The sampling methodology to conduct quarterly monitoring is in accordance with Appendix 8 (8.7).
- The UoC has conducted quarterly monitoring of the water quality parameters and submitted data to the ASC Water Quality Calculator at least annually.
- Evidence has been provided demonstrating the UoC has calibrated equipment to measure DO, TN concentration, TP concentration, SD and Chl-a in accordance with the technical specifications.

Useful Resources

- Paerl, H.W., Scott, J.T., McCarthy, M.J., Newell, S.E., Gardner, W.S., Havens, K.E., Hoffman, D.K., Wilhelm, S.W. and Wurtsbaugh, W.A., 2016. It takes two to tango: when and where dual nutrient (N & P) reductions are needed to protect lakes and downstream ecosystems. *Environmental science & technology, 50(20), pp.10805-10813*.

- Information on the appropriate use of Secchi Disks can be found here: 'What is a Secchi disk', accessed November 22, 2023: https://www.nalms.org/secchidipin/monitoring-methods/the-secchi-disk/what-is-a-secchi-disk/
- Example of a method for Chl-a measurements made using ethanol extraction followed by spectrophotometric measurement at wavelengths 665 and 750nm (using accredited methods: EPA method 445.0: Method 445.0 In Vitro Determination of Chlorophyll a and Pheophytin ain Marine and Freshwater Algae by Fluorescence, accessed November 22, 2023: https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NERL&dirEntryId=309417
- Cost effective example for measuring using in-situ Chl-a using a field spectroflurometer include the FluoroSense handheld fluorometer manufactured by Turner Designs and the YSI handheld meter with EXO1 (#599080) or EXO2 (#599201) sondes.
- Hamdhani, H., Eppehimer, D.E., Walker, D. and Bogan, M.T. (2021) Performance of a Handheld Chlorophyll-a Fluorometer: Potential Use for Rapid Algae Monitoring. *Water, 13, 1409*: https://doi.org/10.3390/w13101409
- Kuha, J., Järvinen, M., Salmi, P. and Karjalainen, J. (2020). Calibration of in situ chlorophyll fluorometers for organic matter. *Restoration of Eutrophic Lakes, 847, 4377-4387*: https://doi.org/10.1007/s10750-019-04086-z

Indicator:	Requirement:

2.6.10 The UoC shall, based on the monitoring of the water quality parameters, ensure that there is no decline in trophic status compared to the water quality baseline determined, following the method outlined in **Appendix 8 (8.7)**.

2.6.11 The UoC shall, based on the monitoring of the water quality parameters, ensure that there is no upward rate of change >25% over the past 24 months, for any of the water quality parameters listed below, following the method outlined in **Appendix 8 (8.7)**:

- TN concentration; and
- TP concentration; and
- Chl-a; and
- Biological Oxygen Demand (BOD).

2.6.12 The UoC shall implement a nutrient reduction plan when at least one of the following is identified:

- TN concentration, TP concentration or Chl-a has increased by ≥5 index points according to Table 2 in **Appendix 8 (8.7)**, compared to the water quality baseline; or
- TN, TP or Chl-a has increased by ≥15% over the past 24 months; or
- the distance from the surface to the **zone of oxygen depletion** or to the **zone of anoxia** has decreased by ≥25% over the past 24 months; or
- BOD has increased by ≥15% over the past 24 months; or
- ≥1 **adverse turnover event (ATE)** or ≥1 **harmful algal bloom (HAB)** within the past 10 years.

How do I interpret this requirement?

- Quarterly monitoring of TN concentration, TP concentration and Chl-a will determine whether there has been a change in the status of the limiting nutrients or a decline in trophic status. BOD will also need to be calculated annually. The calculated data will be compared to the water quality baseline.
- Quarterly monitoring data will be submitted to the ASC Water Quality Calculator at least annually. The ASC Water Quality Calculator will determine rates of change in the limiting nutrient(s) and trophic status compared to the baseline.

- A decline in trophic status will be determined when the next Trophic Status Index (TSI) breakpoint has been exceeded, in accordance with Table 2 in Appendix 8 (8.7).
    - Exceedance of the next TSI breakpoint will occur when one parameter falls into the next TSI category.
    - Index points, with regards to TN concentration, TP concentration or Chl-a values in Table 2 in Appendix 8 (8.7), refers to the numerical value of the parameters.
        - An increase of ≥5 index points means the concentration of the parameter has increased by five numbers/decimal values.
- The ASC Water Quality Calculator also determines whether one of the scenarios in Indicator 2.6.12 has occurred based on the quarterly monitoring data.
    - If one of scenarios has occurred, an action plan needs to be implemented to reduce nutrients released by the site and/or to have improved the efficiency of the feed used.
    - The action plan should be specific, measurable, achievable, relevant and time bound.

Evidence of implementation should be maintained, e.g.:

- Monitoring data has been submitted annually to the ASC Water Quality Calculator and results have been obtained.
- Results will determine the trophic status and status of TN concentration, TP concentration, Chl-a and BOD, in accordance with Indicator 2.6.11. Results will also be compared to the water quality baseline after the first annual submission.
    - Any upward transitions in trophic status at the compared to the water quality baseline will be determined based on the results from the ASC Water Quality Calculator.
    - Results from the ASC Water Quality will determine rate of change for TN concentration, TP concentration, Chl-a and BOD compared to the water quality baseline, specifically whether this exceeds 25% over the previous 24 months.
- Results from the ASC Water Quality Calculator will be obtained to determine whether one of the scenarios in Indicator 2.6.12 has occurred.
    - This will be based on the TN concentration, TP concentration, Chl-a and BOD data submitted to the ASC Water Quality Calculator.
    - It will also be based on submissions of the number of HABs and ATEs to the ASC Water Quality Calculator.

- If one of the scenarios has occurred, an action plan will have been produced which outlines the actions/steps to reduce nutrients released by the site, and/or to improve the efficiency of the feed used.

Auditors should confirm:

- The UoC presents evidence demonstrating monitoring data has been submitted annually to the ASC Water Quality Calculator.
- The UoC presents the outputs from the ASC Water Quality Calculator, that demonstrates whether there has been a decline in trophic status or upward rate of change >25% for TN concentration, TP concentration, Chl-a and BOD.
- The UoC presents evidence that determines whether one or more of the scenarios in Indicator 2.6.12 have occurred.
- A specific, measurable, achievable, relevant and time bound action plan has been documented by the UoC, and has been presented, if one of the scenarios in Indicator 2.6.12 has occurred.

Useful Resources

- Trophic status is determined using the Carlson Index values (0-100), with 'breakpoints' set at minimum internals of 10 index points.
  - Carlson's Index is used to classify Type A waterbodies and consists of four separate normalised indices: Chlorophyll-a, Total Phosphorous, Total Nitrogen and Secchi Disk transparency measurements.
  - Normalised TSI values range from 0 (ultra-oligotrophic) to 100 (hypereutrophic). A TSI of less than 40 is indicative of oligotrophic conditions, while TSI values greater than 50 are indicative of eutrophic conditions. TSI values between 40 and 50 are indicative of mesotrophic conditions.
- More information about the equations used for TSI assessment, including the relevant peer-reviewed scientific literature, is provided in Carlson, R.E. and Simpson, J. (1996) A Coordinator's Guide to Volunteer Lake Monitoring Methods. *North American Lake Management Society, 96 p.*

Indicator:	Requirement:
2.6.13	The UoC shall report WUM related data in accordance with the ASC Data Submission Procedure.
2.6.14	The UoC shall report water quality monitoring related data, including BOD values in accordance with the ASC Data Submission Procedure.

How do I interpret this requirement?

- Water quality monitoring data will be submitted to the ASC Water Quality Calculator in MyASC, which will be used to characterise the baseline of the RW, in accordance with Appendix 8 (8.7.4).
- The data reported will facilitate the implementation of the requirements for sites located in Type A waterbodies.
- Auditors will have access to the reported data to support with the auditing process.

Evidence of implementation should be maintained, e.g.:

- Complete data has been submitted to the ASC Water Quality Calculator and results have been obtained.

Auditors should confirm:

- Data has been submitted by the UoC and results have been obtained from the ASC Water Quality Calculator.

Useful Resources

N/A

Indicator:	Requirement:

2.6.15 The UoC shall use a treatment system prior to the discharge of effluent water[23] that ensures:

- ≥65% of **Total Suspended Solids (TSS)** are captured; and
- concentration of **settleable solids** in effluent water is <3.3ml/L.

How do I interpret this requirement?

- Treatment systems do not need to be technology or equipment.
  - An alternative example could be settling ponds or any other process that ensures ≥65% of TSS are captured and the concentration of settleable solids in effluent water is consistently <3.3ml/L.
- Methods to measure Total Suspended Solids (TSS) can be found in Appendix 8 (8.11).
- Concentration of settleable solids (ml/L) can be measured by calculating the volume of solids that settles to the bottom of a conical cone (Imhoff cone) in one hour.
- More sophisticated methods such as spectrophotometer readings can also be used to measure settable solids.

Evidence of implementation should be maintained, e.g.:

- Details and location of the system used to treat effluent prior to discharge.
- Evidence regular testing of TSS and settleable solids has taken place. Quarterly testing would demonstrate best practice.
- Results from the testing of point source releases that demonstrate ≥65% of TSS are captured and the concentration of settleable solids in effluent water is consistently <3.3ml/L.

Auditors should confirm:

- A treatment system is in place and located prior to the point of discharge.
- Results of testing from the UoC which confirm the treatment system captures ≥65% of suspended solids and that the concentration of settleable solids in effluent water is <3.3ml/L.

[23] An exemption applies when the Receiving Waterbody has a higher or equal level of Total Suspended Solids and concentration of settleable solids than in the effluent water.

Useful Resources

N/A

Indicator:	Requirement:

2.6.16

Indicator applicability: waterbody Type B

The UoC shall conduct monitoring of TN concentration, TP concentration and TSS upstream from the inflow point and downstream from the outflow point, following the method outlined in **Appendix 8 (8.8)**, if one of the following conditions applies:

- the site effluent flow contribution to the receiving water flow is >10%, as calculated following the method outlined in **Appendix 8 (8.9)**; or
- the site effluent enters a river or channel <1km upstream of a Type A waterbody.

2.6.17

Indicator applicability: waterbody Type B

The UoC shall, if Indicator 2.6.16 applies, ensure there is <25% increase in TN concentration, TP concentration and TSS concentrations between the measured upstream concentration and the calculated downstream concentration.

How do I interpret this requirement?

- The methods for measuring TN concentration, TP concentration and TSS can be found under Appendix 8 (8.11).
- The UoC can measure flow contribution, TN concentration, TP concentration and TSS upstream from the inflow point of the first site and immediately downstream of the outflow point of the last site in a waterbody.
  - This may reduce sampling costs when there are multiple sites discharging point source effluent releases to a Type B waterbody near each other.
  - When the inflow point is groundwater, the UoC can measure nutrients upstream from the outflow point and downstream from the outflow point.
  - The UoC can measure flow contribution, TN concentration, TP concentration and TSS upstream from the first inflow point and downstream of the last outflow point, when a site has more than one inflow and/or outflow point.

Evidence of implementation should be maintained, e.g.:

- Maps demonstrating the sampling locations are upstream from the inflow point and downstream from the outflow point.
- Annual calculation of site effluent flow contribution to the receiving water flow based on the methodology in Appendix 8 (8.9).
- Results of the site effluent flow contribution calculation, which demonstrate whether the contribution is greater than or less than 10%.
- If Indicator 2.6.17 applies, results of measurements of TN concentration, TP concentration and TSS upstream from the inflow point and downstream from the outflow point.
- Results of calculations to demonstrate there is <25% increase in site effluent flow between upstream and downstream sample sites.

Auditors should confirm:

- A map has been presented which demonstrates the sampling locations are upstream from the inflow point and downstream from the outflow point.
- The UoC has conducted an annual calculation of the site effluent flow contribution to the receiving water flow.
- Whether the site effluent flow contribution calculation presented by the UoC exceeds 10%.
- If Indicator 2.6.17 applies, the UoC has presented quarterly results of TN concentration, TP concentration and TSS measurements from sampling locations upstream from the inflow point and downstream from the outflow point, whilst still following the sampling method in Appendix 8 (8.8 and 8.9).
- Results of calculations presented to demonstrate there is <25% increase in site effluent flow between upstream and downstream sample sites.

Useful Resources

N/A

Indicator:	Requirement:
2.6.18	The UoC shall conduct monitoring of DO concentration and DO saturation, following the method outlined in **Appendix 8 (8.10)**.
2.6.19	The UoC shall demonstrate that the weekly average of daily DO saturation is ≥65% in freshwater or ≥70% in marine waterbodies. An exception applies if the UoC cannot demonstrate this, in which case the UoC shall ensure the weekly average of daily DO percentage saturation at a 'downstream, near-field' impacted location is equal to, or higher than, results from an 'upstream, far-field' non-impacted reference location, at least 500m upstream of the site.
2.6.20	The UoC shall demonstrate that ≤5% of the weekly averages of daily DO concentrations are <2mg/L.[24] An exception applies if the UoC cannot demonstrate this, in which case the UoC shall: o demonstrate ≥70% saturation by conducting continuous monitoring using an electronic probe and recorder with a 15-minute sampling frequency for at least one week; or o ensure percentage saturation at a 'downstream, near-field' impacted location is equal to, or higher than, results from an 'upstream, far-field' non-impacted reference location, at least 500m upstream of the site.

How do I interpret this requirement?

- Indicator 2.6.18 requires that salinity is measured at the same time as DO concentration and saturation.
  - Salinity does not need to be continuously measured if it can be demonstrated that there are no daily or seasonal changes based on a record of previous measurements.
- Indicator 2.6.19 only applies to sites located in/discharging into freshwater or marine waterbodies. The indicator does not apply to sites located in/discharging into brackish waterbodies.
- For both diffuse-source and point-source effluent releases, the UoC should monitor and record percent saturation of DO.

[24] This is demonstrated annually using the DO measurements from Indicator 2.6.18.

- DO should be measured at 5m depth at a location close to the cages/culture systems for diffuse-source effluent releases. For example, at the edge of the cage array and in the direction of the predominant current.

- All measurements should be taken using a calibrated oxygen meter or equivalent method.
  - A continuous oxygen sensor can be used to record data at frequent intervals over a 24-hour period. The minimum and maximum values should then be used to determine DO concentration and saturation.
- The percent saturations should then be calculated based on the monitoring data.
- The analytical methods for DO sampling can be found in Appendix 8 (8.11).
- Any missed samples or deviations in sampling time should be accompanied by a written justification.
- The UoC can measure DO concentration and saturation immediately downstream of the last site in a waterbody whilst still following the sampling method in Appendix 8 (8.10).
  - This may reduce sampling costs when there are multiple sites discharging point source effluent releases to a Type B waterbody near each other.
  - The first exception for Indicator 2.6.19 more suitable for sites located in/discharging into marine waterbodies. The second exception is more suitable for sites located in/discharging into freshwater or brackish waterbodies.
    - For brackish waterbodies, information on the predominant tidal flow direction may be required to determine what is the most suitable 'upstream, near-field' non-impacted reference location.
  - At least 12-months of data should be used to demonstrate ≤5% of the weekly averages of daily DO concentrations are <2mg/l.

Evidence of implementation should be maintained, e.g.:

- The oxygen meter has been calibrated according to the technical specifications.
- Records of measurement locations, demonstrating monitoring took place immediately downstream from the outflow point, or in the receiving waterbody downstream from the site for diffuse source releases.
- Records of daily monitoring of DO concentration and saturation, which result in weekly averages of daily DO saturation.
- ≤5% of the weekly averages of daily DO concentrations are 2mg/l.

- Written justifications are maintained for any missed samples or deviations in sampling times.

Auditors should confirm:

- The UoC has calibrated the oxygen meter according to the technical specifications.
- Measurement locations were immediately downstream from the outflow point, or in the receiving waterbody downstream from the site for diffuse source releases.
- Weekly averages of daily DO saturation are presented by the UoC and that the averages are ≥65% for freshwater and ≥70% for seawater.
- The UoC has presented evidence that ≤5% of weekly samples fall under 2 mg/L DO.
- Written justifications are provided for any missed samples or deviations in sampling times.

Useful Resources

N/A

Indicator:	Requirement:
2.6.21	*Indicator applicability: point-source systems in waterbody Types A and B* The UoC shall conduct DO monitoring downstream from the outflow point and shall demonstrate that daily diurnal DO (DDDO) fluctuation is ≤65% saturation, following the method outlined in **Appendix 8 (8.10)**.

How do I interpret this requirement?

- For UoCs located in tidal systems, timing of measurements should correspond with high and low tides, to reflect variations related to the tidal regime.
- The UoC can conduct DO monitoring immediately downstream of the last site in a waterbody whilst still following the sampling method in Appendix 8 (8.10).
    - This may reduce sampling costs when there are multiple sites discharging point source effluent releases to a Type B waterbody near each other.
- The methods outlined in Appendix (8.10.1 and 8.10.2) shall be used to record DO concentrations used to determine daily diurnal DO (DDDO).
- Any missed samples or deviations in sampling time should be accompanied by a written justification.

Evidence of implementation should be maintained, e.g.:

- Records that DO measurements correspond to high and low tides in tidal systems.
- The location of the sampling point, demonstrating that measurements have taken place downstream from the outflow point.
- Results of daily DO monitoring and DDDO fluctuation calculations.

Auditors should confirm:

- DO measurements have taken place at high and low tides in tidal systems.
- DO measurements have taken place downstream from the outflow point.
- The UoC has presented results of the DDDO calculations based on DO measurements collected in accordance with the methods outlined in Appendix 8.10.
- Confirm the fluctuation level based on the DDDO calculation is ≤65% saturation level.
- Written justifications were provided if there were any missed samples or deviations in the sampling time.

Useful Resources

N/A

Criterion 2.7 - Salinisation

Indicator:	Requirement:

2.7.1

Indicator applicability: brackish or saltwater pond culture

The UoC shall[25] use low permeable liners.

How do I interpret this requirement?

- The exemption to Indicator 2.7.1 may apply when either the land (e.g., agricultural land) or waterbodies (e.g., channels or canals) around a site are brackish or saline.
- Low permeable liners include liners made from:
  - Plastic,
  - Imported clays,
  - Ripping and re-compaction of in situ clays, mixing with bentonite,
  - Geo-membranes, and
  - Composite liners.

Evidence of implementation should be maintained, e.g.:

- Records demonstrating the installation and maintenance of low permeable liners in ponds.

Auditors should confirm:

- Low permeable liners have been installed and maintained in ponds.

Useful Resources

N/A

[25] An exemption applies where ponds are located in naturally brackish or saline environments.

Indicator:	Requirement:

2.7.2 The UoC shall not discharge brackish or saltwater effluent over land.

How do I interpret this requirement?

N/A

Evidence of implementation should be maintained, e.g.:

- The location and/or route of the discharge of brackish or saltwater effluent to demonstrate discharge does not take place over land.
  - Examples of evidence may include maps/plans of the discharge locations/routes.

Auditors should confirm:

- Evidence has been presented, such as maps/plans, to demonstrate brackish or saltwater effluent is not discharged over land.

Useful Resources

N/A

Indicator:	Requirement:

2.7.3 The UoC shall only discharge effluent water of a salinity level equal to or lower than the salinity level of the receiving waterbody or natural wetland.

An exception applies to waterbodies and natural wetlands that have naturally periodic varying salinity levels, in which case the salinity level of the effluent water shall be within range of the natural variation.

How do I interpret this requirement?

- Salinity levels are: Freshwater (limnetic; <0.5 ppt), slightly saline (oligohaline; 0.5-4.9 ppt), moderate saline (mesohaline; 5-17.9 ppt), highly saline (polyhaline; 18-29.9 ppt) and seawater (euhaline; 30-34.9 ppt).
- River estuaries are an example of a waterbody that have periodic varying salinity levels. These can also be referred to as poikilohaline waterbodies.
- Salinity testing of effluent water in the receiving waterbody or natural wetlands should be conducted.
    - Salinity levels in the receiving waterbody or natural wetlands may be obtained from credible sources, e.g. results of government monitoring.
- To conform with the exception in the indicator, salinity testing in the waterbody or natural wetland should take place. Alternatively, test results can be obtained from credible sources, e.g. scientific or government body.
    - Results should then be compared to the salinity level of the effluent water to determine whether it is within the range of natural variation for the receiving waterbody or natural wetlands.

Evidence of implementation should be maintained, e.g.:

- Results of salinity testing for effluent water and in the receiving waterbody or natural wetlands.
- If applicable, reports or measurements determining whether waterbodies and natural wetlands have naturally varying salinity levels.
    - Reports or measurements determining whether the salinity level of the effluent water is within the range of the natural variation for the receiving waterbody or natural wetlands.

Auditors should confirm:

- Salinity test results have been presented that determine one of the following:
  - Salinity level of the effluent water is equal to or lower than the salinity level of the receiving waterbody or natural wetlands.
  - Salinity level of the effluent water is within the range of natural variation for the receiving waterbody or natural wetlands that have naturally varying salinity levels.

Useful Resources

N/A

Indicator:	Requirement:
2.7.4	The UoC shall ensure that freshwater-wells used for freshwater culture do not exceed a conductivity of 1,500 micro-mhos per centimetre (µmho/cm) or chloride concentration of 300mg/L. An exception applies where well-monitoring is not permitted by applicable law, in which case regulatory records shall be obtained to provide evidence of conductivity levels.

How do I interpret this requirement?

- Freshwater wells with a conductivity or chloride concentration above the thresholds in Indicator 2.7.4 will demonstrate that salinisation has taken place.
- Specific conductance or chloride concentration should be monitored at a frequency adapted to fluctuations due to natural factors, such as seasonal rains.
- This indicator relates to Indicators 2.9.4 and 2.9.5, which prohibit the use of freshwater to reduce the salinity of culture water, and the use of salt to increase the salinity of fresh culture water respectively.

Evidence of implementation should be maintained, e.g.:

- Records of specific conductance of freshwater wells on, or in proximity to the site (within 1km radius).

- Records should demonstrate monitoring has taken place at least every six months and considered natural factors, such as seasonal rains.

- Regulatory records obtained where applicable, that demonstrate well-monitoring is not permitted by law.
  - Records shall contain evidence of conductivity testing.

Auditors should confirm:

- Monitoring records are available for freshwater wells in proximity to the site, which demonstrate either conductivity or chloride concentration is below the relevant threshold specified in Indicator 2.7.4.
  - Monitoring has taken place at least every six months and considered natural factors, such as seasonal rains.
- Regulatory records are available for instances where well-monitoring is not permitted by law.
- The records demonstrate conductivity testing has taken place.

Useful Resources

- Hand-held refractometers can be used to measure salinity. These devices are appropriate for salinities of approximately 2 or 3 ppt, but they are not sensitive enough to determine if sites are causing the salinisation of freshwater bodies.
- The quickest and easiest method to evaluate salinity of water is to measure specific conductance with a conductivity meter. An alternative method is a chloride test kit, which is typically cheaper.

Criterion 2.8 – Biosolids

Scope – Land-based sites.

Indicator:	Requirement:
2.8.1	The UoC shall ensure that **biosolids** are appropriately contained.

How do I interpret this requirement?

- The UoC should develop and implement a biosolids management plan, which includes procedures relating to the containment of biosolids.
- The appropriate containment of biosolids should consider the risk of runoff during anticipated and/or recurring extreme weather events, such as tropical storms or flooding.
    - This risk is higher when biosolids are removed from culture systems, canals and/or treatment systems.

Evidence of implementation should be maintained, e.g.:

- Documents demonstrating the appropriate containment of biosolids. An example may be a biosolids management plan.
    - The management plan may include a flow diagram that outlines key steps for the containment of biosolids.

Auditors should confirm:

- Documents, for example a biosolids management plan, have been presented that demonstrate the appropriate containment of biosolids.
- Conformance should be confirmed through a visual inspection of the site.

Useful Resources

N/A

Indicator:	Requirement:
2.8.2	The UoC shall ensure that biosolids are not disposed or released into receiving waterbodies, natural wetlands or other ecosystems.

How do I interpret this requirement?

- This requirement will mitigate impacts on water quality and the risk of salinisation, therefore supporting the implementation of Criterion 2.6 and 2.7 respectively.

Evidence of implementation should be maintained, e.g.:

- Records that demonstrate:
    - Information on the disposal and/or release of biosolids.
        - Biosolids should be disposed of and/or released where it is legally permitted and where impacts on biodiversity are unlikely to occur.
    - The location where biosolids are disposed and/or released, which confirm they are not disposed of and/or released into receiving waterbodies, natural wetlands or other ecosystems (such as natural grasslands or forests).

Auditors should confirm:

- Records have been presented that demonstrate biosolids are not disposed of and/or released into receiving waterbodies, natural wetlands or other ecosystems.
- There is no evidence of the discharge and/or release of biosolids into receiving waterbodies, natural wetlands or other ecosystems during the audit.
    - This may be carried out through a visual inspection of the site and any surrounding waterbodies.

Useful Resources

N/A

Indicator:	Requirement:

2.8.3 The UoC shall only re-use uncontaminated biosolids.

How do I interpret this requirement?

- The following outlines examples of the purposes for uncontaminated biosolids re-use:
  - Fertiliser in agriculture.
  - Maintenance and building of dykes.
  - Maintenance of roads or infrastructure.
  - Biogas.

Evidence of implementation should be maintained, e.g.:

- Documents demonstrating the appropriate treatment and re-use of biosolids.
  - An example may be a biosolids management plan.
    - The management plan may include a flow diagram that outlines key steps for the treatment of biosolids prior to re-use to ensure they are uncontaminated.

Auditors should confirm:

- Documents, for example a biosolids management plan, have been presented that demonstrate only uncontaminated biosolids are re-used.

Useful Resources

N/A

Indicator:	Requirement:

2.8.4 The UoC shall dispose of biosolids responsibly if they cannot be re-used.

How do I interpret this requirement?

- The responsible disposal of biosolids mitigates impacts on natural ecosystems and waterbodies.
    - Impacts may include salinisation or eutrophication.
- The UoC should develop and implement a biosolids management plan that includes procedures relating to the responsible disposal of biosolids.

Evidence of implementation should be maintained, e.g.:

- Documents outlining the process and location of biosolids disposal.
    - The documents should demonstrate biosolids are disposed of responsibly. An example may be a biosolids management plan.
        - The management plan may include a flow diagram that outlines key steps for the disposal of biosolids.
- If biosolids are transferred to a third party, evidence should be available to confirm that the third party has disposed of biosolids responsibly.

Auditors should confirm:

- Documents, for example a biosolids management plan, have been presented that demonstrate the responsible disposal of biosolids.
- If biosolids are transferred to a third-party, evidence has been presented to confirm that the third-party has responsibly disposed of biosolids.

Useful Resources

N/A

Criterion 2.9 - Freshwater Use

Indicator:	Requirement:
2.9.1	The UoC shall develop, implement and maintain a Water Efficiency Management Plan (WEMP) in areas identified as having 'high' or 'extremely high' water stress according to the Aqueduct 'Water Risk Atlas'[26], with the intent to reduce water consumption.
2.9.2	*Indicator applicability: areas identified as having 'high' or 'extremely high' water stress* The UoC shall ensure the WEMP is annually reviewed and revised as necessary.

How do I interpret this requirement?

- The Aqueduct 'Water Risk Atlas' measures all water-related risks. Higher values indicate higher water risk.
  - 'Water Stress' is an indicator under 'Physical Risks Quantity' and measures the ratio of total water demand to available renewable surface and groundwater supplies.
  - The site needs to check whether its location is classified as being in an area of 'high' or 'extremely high' water stress.

Evidence of implementation should be maintained, e.g.:

- The 'Water Stress' classification of the area in which the site is located. This must match the coordinates of where the site is located.
- A Water Efficiency Management Plan (WEMP) has been developed, implemented and maintained if the site is in an area identified as having 'high' or 'extremely high' water stress.
  - The WEMP should have specific, measurable, achievable, realistic and time-bound objectives and targets to reduce water consumption.
- Documents demonstrating the WEMP has been reviewed annually, to determine whether it is meeting the objective of reducing water consumption.
- Data or documents to demonstrate the WEMP is effective at reducing water consumption.

[26] https://www.wri.org/applications/aqueduct/water-risk-atlas/#/?advanced=false&basemap=hydro&indicator=w_awr_def_tot_cat&lat=-14.445396942837744&lng=-142.85354599620152&mapMode=view&month=1&opacity=0.5&ponderation=DEF&predefined=false&projection=absolute&scenario=optimistic&scope=baseline&timeScale=annual&year=baseline&zoom=2

- Revisions to the WEMP if it has not been deemed effective at reducing water consumption.

Auditors should confirm:

- The risk of water stress according the 'Water Risk Atlas'.
- Evidence that a WEMP has been developed, implemented and maintained, if the site is in an area identified as having 'high' or 'extremely high' water stress.
  - Objectives and targets are in place in the WEMP which aim to reduce water consumption.
  - Evidence of an annual review of the WEMP.
  - Evidence has been presented to demonstrate the WEMP is effective at reducing water consumption.
  - Revisions to the WEMP have been made if the WEMP has not been effective at reducing water consumption.

Useful Resources

- Aqueduct Water Risk Atlas: Aqueduct Water Risk Atlas.

Indicator:	Requirement:
2.9.3	*Indicator applicability: areas identified as having 'high' or 'extremely high' water stress* The UoC shall monitor and record water levels in groundwater wells, and shall include the results in the WEMP. An exception applies where monitoring is not permitted by applicable law, in which case regulatory records shall be obtained to provide evidence of recording of water levels.

How do I interpret this requirement?

- Water levels in groundwater wells should be tested and recorded at similar times during the year.
- Monitoring of water levels in groundwater wells determines whether water is being replenished in the ground. When water abstraction increases beyond the rate of replenishment, the result is a reduction in the water table.

- A reduction in the water table would demonstrate that the WEMP is not effective at reducing water consumption.

Evidence of implementation should be maintained, e.g.:

- Results from the monitoring of water levels in groundwater wells.
- Documents demonstrating the monitoring results have been included in, and informed revisions of, the WEMP (where required).
- Regulatory records that provide evidence of the recording of water levels, if monitoring is not permitted by law.

Auditors should confirm:

- Monitoring results have been presented that demonstrate the recording of water levels in groundwater wells.
  - Results can either be from testing conducted by the site or a regulatory body if monitoring is not permitted by law.
- Monitoring results have informed the drafting or revision of the WEMP.

Useful Resources

N/A

Indicator:	Requirement:
2.9.4	The UoC shall not use freshwater to reduce the salinity of culture water. An exception applies if discharged effluent water is desalinated.
2.9.5	The UoC shall not use salt to increase the salinity of freshwater for culture purposes. An exception applies if discharged effluent water is desalinated.

No additional guidance is provided for these indicators.

Indicator:	Requirement:
2.9.6	The UoC shall not divert >50% volume of **surface water**. An exception applies if the UoC can demonstrate that the diversion of water is based on a minimum **Vital Flow** determined by a regulatory permit or scientific study.
2.9.7	The UoC shall return >90% of the diverted surface water volume to its source.

How do I interpret this requirement?

- The diversion of water refers to the process of taking water from a natural source, in this case surface water (also referred to as abstraction).
- Responsible abstraction, or a minimum vital flow, is important for mitigating impacts on freshwater ecosystems and water quality.

Evidence of implementation should be maintained, e.g.:

- Records demonstrating the volume of water abstracted from surface water and the volume returned to the source from which the water was originally abstracted.
- A minimum vital flow has been determined by a regulatory permit or scientific study, if the exception in Indicator 2.9.6 applies.

Auditors should confirm:

- Records have been presented that demonstrate the volume of water diverted from surface water and the volume returned to the source from which the water was originally extracted.
- Evidence of a minimum vital flow determined by a regulatory permit or scientific body, if the exception in Indicator 2.9.6 applies.

Useful Resources

N/A

Criterion 2.10 - Energy Use and Greenhouse Gas (GHG) Emissions

Indicator:	Requirement:

2.10.1 The UoC shall calculate the energy use of production following the method outlined in **Appendix 9 (9.3)**.

How do I interpret this requirement?

- Tracking use of energy inputs is a necessary step in calculating the GHG emissions associated with aquaculture production and products.
- Energy inputs include all those sources of energy used for the purpose of production, including electricity and energy carriers such as diesel or natural gas.
- Certificate Holders may choose to calculate energy use specific to one site or across multiple certified sites
- If calculating values across a number of sites, all sites included should farm the same species, use the same production method, and be located in the same country.
    - For some inputs, it may be difficult to allocate inputs between activities or sites. For example, fuels used by supply vessels may serve multiple sites or electricity may be shared between production and non-production buildings.
- In these cases, a portion of the overall input may be allocated to the certified site based on a logical allocation basis. Energy inputs to hatcheries are not included in calculations of on-site energy use. However, in cases where the juvenile stage of the supply chain is integrated with grow out, sites may choose to include this stage in their calculations to simplify calculations.
- When reporting energy use data to ASC, energy density values are applied automatically to ease calculations.
- Other tools and frameworks (to the ASC Greenhouse Gas Calculator) may be used if they follow the methodological requirements in Appendix 9.
    - Other tools and frameworks used to calculate energy use and GHG emissions may vary in their methods, data sources, and assumptions. If the UoC is using an in-house or third-party tool to assist in calculating energy use and GHG emissions, they are required to demonstrate that they follow the methodological requirements of Appendix 9.

Evidence of implementation should be maintained, e.g.:

- Other tools and frameworks used to calculate energy use and GHG (to the ASC Greenhouse Gas Calculator) follow the methodological requirements in Appendix 9.
- Documentation of energy intensity factors (e.g., MJ of energy per L of diesel) used if they are different to the default values used in the ASC Farm Standard.
- Evidence to support the quantity of each energy input specified in calculations is available on request, along with any allocation of energy inputs between multiple sites if applicable.
    - This may be, for example, fuel purchase invoices or electricity use records.

Auditors should confirm:

- The energy use value is calculated and reported in MJ of energy per tonne of live weight production.
- Energy use of production is calculated for either (a) the most recent completed production cycle; or (b) three consecutive years of production.
- Documentation is provided to support input variables and calculations.
- Where other tools and frameworks have been used to calculate energy use and GHG emissions, the following should be verified:
    - An attributional life cycle assessment approach has been followed.
    - Values relative to live weight net production have been calculated.
    - Necessary inputs as outlined in Tables 1 and 3 of Appendix 9 have been included.
    - Either the energy density and emission factors in Tables 2 and 4 of Appendix 9 have been used, or the value and source of factors used has been indicated.
    - All GHG groups as defined by the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6) have been included.
    - GHG emissions in carbon dioxide-equivalent (CO2e) units have been communicated.
    - Mass allocation or economic allocation with regards to data provided by feed suppliers has been consistently applied.

Useful Resources

- Additional energy intensity factors for a range of energy inputs are available from the UK Department of Energy Security and Net Zero[27].

Indicator:	Requirement:
2.10.2	The UoC shall calculate the feed and farm-related GHG emissions of production following the method outlined in **Appendix 9 (9.4)**.

How do I interpret this requirement?

- Consistent and transparent measurement of GHG emissions following a life cycle assessment approach is necessary to underpin effective GHG reduction and management and to inform broader efforts to understand and reduce the GHG impact of global food systems.
    - This indicator ensures that all ASC certified sites undertake this important first step in contributing to efforts to combat climate change.
- ASC does not require the use of any particular GHG calculation framework or tool or conformance with any particular GHG methodology or standard. However, some methodological requirements are stipulated in Appendix 9 to ensure a sufficient level of consistency, completeness and accuracy of GHG calculations.
    - Further guidance is outlined for Indicator 2.10.1.
- Certificate Holders should consider the reporting format of the ASC Farm Standard GHG Data Submission Template in undertaking their calculations.
    - This includes the characterisation of GHG emissions in three distinct ways:
        - By scope (based on Scope 1, Scope 2, and Scope 3 GHG emissions as defined in the GHG Protocol),
        - By category (e.g., land use change emissions, if known; if unknown, emissions may be characterised as 'unspecified'), and
        - By input (e.g., broad categories of feed ingredients, energy inputs, etc.).

[27] DESNZ (2022). Greenhouse gas reporting: Conversion factors 2022. United Kingdom Department for Energy Security and Net Zero. Available at https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022

- Certificate Holders may choose to calculate GHG values specific to one site or across multiple certified sites. are encouraged to calculate GHG emissions specific to the certified site. However, in some cases, this may be difficult to do. For example, fuel purchased may be used to supply vessels servicing many sites, potentially both certified and non-certified sites, or even multiple sites or companies.
    - For some inputs, it may be difficult to allocate inputs between activities or sites. For example, fuels used by supply vessels may serve multiple sites or electricity may be shared between production and non-production buildings.
    - In these cases, a portion of the overall input may be allocated to the certified site based on a logical allocation basis.
- GHG profiles from hatcheries are not required.
    - The hatchery or juvenile stage of the aquaculture supply chain typically accounts for a very small percentage of overall GHG emissions, and due to the varied nature of sourcing juveniles, requiring their inclusion in calculations could result in confusion and unnecessary burden.
        - Instead, sites may account for juvenile inputs as described in Appendix 9.
    - GHG calculations may optionally still include hatchery-specific data, and efforts to reduce GHG emissions at the hatchery stage may also be included to demonstrate efforts in the site's GHG management plan for Indicator 2.10.4.
- GHG emissions should first be calculated relative to live weight production, as kg CO_2-equivalent (CO_2e) emissions per tonne of live weight production. As a final step, emissions are converted to an edible weight basis.
    - This step is facilitated when submitting data to ASC.
    - By default, the muscle fraction of the animal is the conversion factor, such that a muscle fraction of 0.5 results in an edible weight GHG value double that of the live weight basis value.
    - If, however, a portion of the non-edible fraction of the animal is used for other purposes (e.g., by-product meal), a portion of emissions may be allocated to the non-edible product.
        - In these cases, the allocation is undertaken by dividing emissions between edible and non-edible product on the basis of their relative mass, and/or on the basis of their relative economic value as expressed by their revenue generation.
            - This allocation step is not applicable to bivalve and abalone shells; for these species, the muscle fraction alone is used for converting results to an edible weight basis.

Evidence of implementation should be maintained, e.g.:

- GHG profiles for feeds used, specific to the feed supplier and species or species group and updated on an annual basis, as required to be shared by the feed supplier according to Criterion 1.21 of the ASC Feed Standard and using the format of ASC GHG data submissions.
- *For marine salmonids only*: GHG profiles for any supplying grow out site(s) as required to be shared by the previous grow out site(s).
- Documentation of the source of any GHG emission factors used.
    - This may be documentation of calculation tools (e.g., the ASC GHG Calculator) or documentation of specific emission factors and their source if calculating emissions manually.
- Documentation of the input variables used (e.g., quantity of electricity).
    - Inputs of energy should reflect those calculated in Indicator 2.10.1. All input variables should be supported by evidence such as invoices or feed use records if requested.
- Documentation of conversion factor and, if applicable, allocation factors, used to convert GHG calculations from a live weight basis to an edible weight basis.
- Documentation of power purchase agreements, if applicable, to demonstrate use of electricity from specific dedicated sources rather than the national or regional electricity grid.

Auditors should confirm:

- Records of GHG profiles from feed suppliers and (for marine salmonids) prior grow out sites are available.
- GHG emissions are calculated in kg CO_2e relative to live weight production and edible weight product.
- If using a tool other than the ASC GHG Calculator, documentation showing how the tool conforms to the methodological requirements outlined in Appendix 9;
    - This may be a signed declaration from the tool provider or highlighted elements in the tool's user documentation.
    - Further guidance is outlined for Indicator 2.10.1.
- Values input into the ASC GHG Calculator, another tool, or manual calculations are supported with evidence (e.g., fuel purchase invoices).

- If undertaking calculations manually, demonstration of the calculations undertaken, including the use of GHG data from feed suppliers and (for marine salmonids) prior grow out sites in conformance with the requirements of Appendix 9.
- The scope of included activities reflects the requirements outlined in Appendix 9.
- GHG emissions are not adjusted using carbon credits or offsets.

Useful Resources

- Certificate Holders are encouraged to use the ASC GHG Calculator, available at https://ghg.asc-aqua.org, to ensure conformance with regards to calculation scope, methods, data sources and reporting format. Use of this tool is voluntary; other tools, consultants, or internal procedures may be used if documentation is available to demonstrate conformance with the requirements in Appendix 9.
- Recommended factors for converting GHG emissions from a live weight basis to an edible weight basis may be sourced from supplemental material of Gephart et al. (2021[28]). Other conversion factors may be used if they reflect the actual edible yield (i.e., muscle fraction) of the animal.
- A range of methodological frameworks and standards are available to guide life cycle assessments and GHG accounting. Use of any of these is optional, provided that calculations are still in conformance with the requirements of Appendix 9. Examples include:
    - General life cycle assessment methods in ISO 14040[29] and ISO 14044[30]
    - The GHG Protocol from the World Resources Institute[31]
    - ISO 14067[32] and marine fish product category rules in ISO 22948[33]
    - The Product Environmental Footprint (PEF) marine fish product category rules[34]
    - PAS 2050[35] and seafood product category rules in PAS 2050-2[36]

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[28] Gephart, J. A., Henriksson, P. J., Parker, R. W., Shepon, A., Gorospe, K. D., Bergman, K., ... & Troell, M. (2021). Environmental performance of blue foods. Nature, 597(7876), 360-365. https://doi.org/10.1038/s41586-021-03889-2
[29] ISO. (2006). ISO 14040 — Environmental management — Life cycle assessment — Principles and framework. Geneva, Switzerland: ISO.
[30] ISO. (2006). ISO 14044 — Environmental management — Life cycle assessment — Requirements and guidelines. Geneva, Switzerland: ISO.
[31] WRI. (2004). The greenhouse gas protocol: A corporate accounting and reporting standard. Washington, D.C., USA: World Resources Institute.
[32] ISO. (2013). ISO 14067 — Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification and communication. Geneva, Switzerland: ISO.
[33] ISO. (2020). ISO 22948 — Carbon footprint for seafood — Product category rules (CFP–PCR) for finfish. Geneva, Switzerland: ISO.
[34] Marine Fish PEFCR. (2024). Product Environmental Footprint Category Rules (PEFCR) for unprocessed Marine Fish Products. In draft available at: https://www.marinefishpefcr.eu/
[35] BSI. (2011). PAS 2050:2011 - Specification for the assessment of the life cycle greenhouse gas emissions of goods and services. London, UK: British Standards Institution.
[36] BSI. (2012). PAS 2050-2:2012 - Assessment of life cycle greenhouse gas emissions. Supplementary requirements for the application of PAS 2050:2011 to seafood and other aquatic food products. London, UK: British Standards Institution.

Indicator:	Requirement:

2.10.3 The UoC shall develop, implement and maintain a GHG Management Plan, and shall ensure the plan is annually reviewed, and revised as necessary, following the targets set out in **Appendix 9 (9.5)**.

How do I interpret this requirement?

- After calculating GHG emissions and identifying major contributors ('hot spots') to overall emissions, a Management Plan allows a site to identify actions to reduce, minimise and/or avoid GHG emissions.
- Actions proposed in a GHG Management Plan should demonstrably relate to emissions identified during GHG calculations. Actions may also relate to GHG emissions beyond the scope of ASC's GHG calculation requirements if evidence is shown that these emissions are substantial.
    - For example, efforts to reduce GHG emissions from product transport can have a significant effect in some cases, particularly if air freight is used.
- Actions proposed in a GHG Management Plan should be accompanied with means to track implementation and effectiveness.
- Not all GHG emission reduction efforts require major changes to operations or large new infrastructure investments.
    - Incremental improvements to feed conversion ratios, mortality rates, and energy efficiency can also be effective ways to reduce GHG emissions.
- GHG targets, relative to both live weight production and edible weight product, are provided in Appendix 9.
    - These targets are not intended as thresholds for standard conformance.
        - Rather, they provide a guide for Certificate Holders to assess their performance against established benchmarks, support efforts in their GHG Management Plan and facilitate tracking over time.
- By calculating and reporting emissions on an annual basis, sites will be able to track their GHG performance over time and assess the effectiveness of actions taken in their GHG Management Plan.

- If emissions relative to production are increasing, the GHG Management Plan should be reviewed and, if needed, revised.

- Reporting of GHG emissions to ASC, with a consistent approach across certified sites, will also support ASC's efforts to provide guidance back on the types of actions that are achieving significant improvements in GHG performance.
- For many sites, emissions may come primarily from the production and use of feed.
    - Coordinating with feed suppliers may be an effective way to target improvement of GHG emissions in these cases.
        - This may take the form of identifying lower GHG ingredients, transitioning to ingredients associated with lower rates of deforestation and land conversion, or improving feed conversion ratios through improved feed compositions.
- The GHG Management Plan may be site-specific or may be applicable across many sites or developed at a corporate level, provided that the GHG tracking and actions taken are demonstrated to be relevant to the site and to reflect identified hot spots of emissions.

Evidence of implementation should be maintained, e.g.:

- Copies of current and previous versions of the GHG Management Plan.

Auditors should confirm:

- Presence of a GHG Management Plan.
- The GHG Management Plan is maintained by a designated member of staff and is regularly reviewed and updated.
- Actions proposed in the GHG Management Plan reflect identified sources of GHG emissions.
- The GHG Management Plan includes tracking of GHG emissions over time relative to the targets set out in Appendix 9.

Useful Resources

N/A

Indicator:	Requirement:

2.10.4 The UoC shall report energy use and GHG emissions related data in accordance with the ASC Data Submission Procedure.

How do I interpret this requirement?

- Public disclosure of energy use and GHG data are not required by the ASC Farm Standard. Instead, reporting to ASC is required.
    - This ensures that energy use and GHG performance of ASC certified production can be tracked and communicated in an aggregated form and also supports assessment of the requirements and identification of common issues, errors or need for improved guidance.
        - Data submitted to ASC is used in accordance with ASC's data use policies.
- Data submitted to ASC should reflect the same calculation results as demonstrated during the audit in conformance with Indicators 2.10.1 and 2.10.2.
- Data submission for both energy use and GHG emissions is on an annual basis. However, in some cases, sites may not have new data to submit in a given year.
    - If the site is calculating values relative to a production cycle and a new production cycle has not completed since the prior year's data submission. In this case, data submission is still required but may reflect the same submission as the prior year.
    - If calculating values for three consecutive years of production and previous records are not available, data submissions in the first and second years may reflect one or two years of production, respectively.

Evidence of implementation should be maintained, e.g.:

- Demonstration of successful data submission on an annual basis.

Auditors should confirm:

- Successful annual data submissions using the ASC Farm Standard Energy Use Data Submission Template and the ASC Farm Standard GHG Data Submission Template.
- Data reported in data submissions reflect results shown in audit for Indicators 2.10.1 and 2.10.2.

Useful Resources

N/A

Indicator:	Requirement:

2.10.5

Indicator applicability: marine salmonids

The UoC shall provide GHG emissions data to any subsequent ASC certified site to which it supplies fish for grow out.

How do I interpret this requirement?

- In the case of marine salmonids, grow out sites that supply fish to subsequent grow out sites are required to be certified under the ASC Farm Standard.
    - This necessitates that they calculate and report GHG emissions as per Indicator 2.10.2.
        - This facilitates the sharing of data with subsequent grow out sites to ensure that GHG calculations at the point of harvest include relevant inputs from the prior site.
- Specific data on the energy inputs and feeds used from the prior site are not required. Only the GHG profile is needed.
    - This does not apply to other species that do not require full certification of prior sites.
- The Certificate Holder may choose to calculate GHG emissions across multiple sites, including previous grow out. If this is the case, calculations may be undertaken as if all sites were a single system, ensuring that all inputs are accounted for.
- GHG profiles from hatcheries are not required, as explained above for Indicator 2.10.2.

Evidence of implementation should be maintained, e.g.:

N/A

Auditors should confirm:

- Subsequent grow out sites are provided sufficient information to allow for GHG calculations to be conducted, either as part of a regular process or upon request.

Useful Resources

N/A

Criterion 2.11 – Material Use, Waste and Pollution Control

Indicator:	Requirement:

2.11.1 The UoC shall assess and, where feasible, implement measures to reduce, reuse and recycle waste materials.

How do I interpret this requirement?

- 'Reducing' refers to using fewer materials, such as fewer plastic bottles or buying materials, for example products or equipment, with less packaging.
  - This will cut down on waste from the start.
- 'Reusing' refers to using materials again instead of disposing of them.
  - This produces economic savings and reduces the amount of materials that end up as waste.
- 'Recycling' refers to collecting and processing materials to be turned into new materials.
  - This gives materials a new use instead of disposing of them as waste in landfills.
- Sites should identify the materials used and assess whether it is reasonably practical to prioritise reduction, reuse and recycling over disposal.
  - The assessment should consider, for example, the availability of recycling facilities in the area.
  - If applicable, the outcome of the assessment should be turned into policies and/or procedures.

Evidence of implementation should be maintained, e.g.:

- Identification of materials used and an assessment of the feasibility of reducing, reusing and recycling.
- Policies and/or procedures outlining the steps to handle materials deemed feasible for reduction, reuse and recycling.
  - Employees should be aware of these policies and/or procedures.

Auditors should confirm:

- The site identified the material used and assessed the feasibility of reducing, reusing and recycling.
- Materials identified as feasible to reduce, reuse or recycle are effectively and appropriately reduced, reused or recycled.
- Employees' awareness of the policies and/or procedures that outline the steps to handle materials deemed feasible for reduction, reuse and recycling.
    - This may be demonstrated through training conducted by the site or the presence of signs/posters regarding the appropriate reduction, reuse and recycling of materials.

Useful Resources

N/A

Indicator:	Requirement:
2.11.2	*Indicator applicability: point-source discharge* The UoC shall capture non-biological solid waste, including plastics, prior to effluent discharge.

How do I interpret this requirement?

- Filters or screen barriers installed in the effluent pipe/channel prior to discharge are examples of methods for capturing non-biological solid waste.
- Based on their context, sites should identify and assess non-biological solid waste that could end up in the effluent to determine the most appropriate method for its capture.

Evidence of implementation should be maintained, e.g.:

- Identification (e.g. a list) of non-biological solid waste generated at the site.
- An assessment of the characteristics of non-biological solid waste to determine the most appropriate method for capturing it in case it ends up in the effluent.
- Records of maintenance of the method used to capture non-biological solid waste (if applicable, e.g. filter or screen barriers).

Auditors should confirm:

- The site has identified and assessed non-biological solid waste generated.
- Through site inspection, the method to capture non-biological solid waste prior to effluent discharges and its suitability.

Useful Resources

N/A

Indicator:	Requirement:
2.11.3	The UoC shall dispose of waste[37] responsibly.

How do I interpret this requirement?

- Sites should identify and classify waste based on where it will be disposed of. This includes the following types of waste:
  - Recyclables: e.g. plastics, metals and paper.
  - Hazardous: e.g. chemicals, batteries and medical waste.
  - Non-recyclable: e.g. biological and non-biological waste
- Based on the classification, sites should determine the facilities to use for waste disposal, for example:
  - Recycling facility.
  - Landfill.
  - Waste management company.

Evidence of implementation should be maintained, e.g.:

- Identification and classification of waste.

[37] Including human waste and production mortalities.

- Records confirming that waste is disposed of in appropriate facilities according to its classification and the legality of those facilities.

Auditors should confirm:

- The site:
  - Has identified and classified the waste it generates.
  - Uses facilities that are appropriate for the type of waste and that they legally operate.

Useful Resources

N/A

Indicator:	Requirement:
2.11.4	The UoC shall not use pesticides that are banned or restricted by any of the following conventions or organisations: o The Rotterdam Convention on Prior Informed Consent (PIC)[38] o The Stockholm Convention on Persistent Organic Pollutants (POPs)[39] o The World Health Organisation (WHO), for products classed as 'extremely hazardous' or 'highly hazardous' (classes Ia and Ib).[40]
2.11.5	The UoC shall only use net antifouling agents containing biocides that are approved by local regulations in either Australia, the European Union, Japan or the United States of America.

How do I interpret this requirement?

- Pesticides (Indicator 2.11.4): The Rotterdam Convention on Prior Informed Consent (PIC) defines pesticides as chemicals used to destroy, prevent, or control pests, including vectors of human or animal disease, and unwanted species of plants or animals causing harm during or

[38] http://www.pic.int/TheConvention/Chemicals/AnnexIIIChemicals
[39] http://chm.pops.int/TheConvention/ThePOPs/ListingofPOPs/tabid/2509/Default.aspx
[40] https://www.who.int/publications/i/item/9789240005662

otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural commodities, wood, and wood products or animal feedstuffs.

- Biocides (Indicator 2.11.5): The Biocidal Products Regulation (BPR, Regulation (EU) 528/2012) defines biocides as any substance or mixture, in the form in which it is supplied to the user, consisting of, containing or generating one or more active substances, with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on, any harmful organism by any means other than mere physical or mechanical action.
- If biocides are used, these would also be considered pesticides, as all biocides are pesticides.

Evidence of implementation should be maintained, e.g.:

- List of pesticides and biocides used by the site.
  - Including purchase records.
- Copy of the list of banned or restricted pesticides by the conventions or organisations stated by the indicator.
- Copy of the list of biocides approved by local regulations in either Australia, the European Union, Japan or the United States of America.

Auditors should confirm:

- Pesticides used by the site are not on the list of banned or restricted pesticides by the conventions or organisations stated by the indicator.
- Biocides used by the site are not on the list of net antifouling agents containing biocides approved by local regulations in either Australia, the European Union, Japan or the United States of America.

Useful Resources

- REGULATION (EU) No 528/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 May 2012 concerning the making available on the market and use of biocidal products.

Indicator:	Requirement:

2.11.6 The UoC shall hold water containing hormones for at least 48 hours or as per product specifications, whichever is greater, prior to discharge.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:

2.11.7 *Indicator applicability: every UoC with a processing facility on site*

The UoC shall ensure that all processing effluent is treated to minimise biosecurity and environmental risks.

How do I interpret this requirement?

- Processing activities within the scope of the ASC Farm Standard would normally be limited to slaughter activities, where applicable. This indicator applies to processing effluent generated by these activities and does not apply to effluent generated by the aquaculture grow out facility itself.
- An appropriate effluent treatment should be able to eliminate or reduce to acceptable levels the discharge of (amongst others):
  - Organic matter: measured, for example, as the reduction of Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) or Total Suspended Solids (TSS) after treatment.
  - Nutrients: measured, for example, as the reduction of nitrogen and phosphorous after treatment.
  - Pathogenic microorganisms: measured, for example, as the reduction of microbial counts after treatment.
  - Oils and greases.

Evidence of implementation should be maintained, e.g.:

- An effluent monitoring plan appropriate for the type and amount of effluent from processing activities discharged.

- Including the parameters, frequency of monitoring and acceptable limits.

- Analysis results of the parameters included in the effluent monitoring plan.
- Corrective actions when analysis results exceed acceptable levels.

Auditors should confirm:

- Effluent monitoring plan has been developed and implemented.
  - This includes monitoring analysis results.
- Corrective actions taken when analysis results exceed acceptable levels.

Useful Resources

- V. Venugopal, A. Sasidharan (2021). Seafood industry effluents: Environmental hazards, treatment and resource recovery. Journal of Environmental Chemical Engineering.

Indicator:	Requirement:
2.11.8	*Indicator applicability: cage culture and suspended culture not using copper-treated gear or infrastructure* The UoC shall clean **aquaculture gear or infrastructure** in land-based facilities only if the facility treats effluents.
2.11.9	*Indicator applicability: cage culture and suspended culture using copper-treated gear or infrastructure* The UoC shall not treat or clean aquaculture gear or infrastructure in situ.
2.11.10	*Indicator applicability: cage culture and suspended culture using copper-treated gear or infrastructure* The UoC shall clean aquaculture gear or infrastructure in land-based facilities that treat effluents, including the capturing of copper.

How do I interpret this requirement?

- Cleaning aquaculture gear or infrastructure in situ is permitted if the gear/infrastructure has not been treated with copper.

Evidence of implementation should be maintained, e.g.:

- Documentation confirming land-based facilities treat effluents.
  - Including verification that the facility captures copper in its effluent treatment, if applicable.

Auditors should confirm:

- Documentation confirming land-based facilities treat effluents.
- Whether gear/infrastructure has been treated/cleaned in situ, and if so, whether the gear/infrastructure has been copper-treated

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Useful Resources

N/A

Indicator:	Requirement:
2.11.11	*Indicator applicability: cage culture in marine/brackish waters using copper-treated gear or infrastructure* The UoC shall demonstrate that copper levels in the sediment are ≤ 34 mg Cu/kg dry sediment weight, following the method outlined in **Appendix 7 (7.7)** [41]. An exception applies where copper levels in sediment > 34 mg Cu/kg dry sediment weight, in which case the UoC shall demonstrate that the levels fall within the range of background concentrations measured following the method outlined in **Appendix 7 (7.7)**.

No additional guidance is provided for this Indicator.

[41] An exemption applies to sites situated in areas classified as having a "hard bottom". Evidence is required to support the classification "hard bottom"

Indicator:	Requirement:
2.11.12	The UoC shall handle, use, store and dispose of chemicals according to the Safety Data Sheets (SDS) provided by the supplier.
2.11.13	The UoC shall not discharge effluent containing chemicals without adequate treatment.

How do I interpret this requirement?

- A list of chemicals that are handled, used and stored on the site should be maintained.
- Indicator 2.11.13 is applicable to any effluent that is discharged by the site, which includes the culture units, as well as from any storage spaces or offices on the site.
- The adequacy of a treatment depends on the types of chemicals found in the effluent, such as heavy metals, organic compounds, acids and bases.
    - To determine the most adequate treatment, it is essential to understand the following characteristics of the effluent:
        - Chemical composition (organic vs. inorganic, hazardous vs. non-hazardous).
        - pH levels (acidic, neutral or alkaline).
        - Solubility (dissolved, suspended or emulsified).
        - Toxicity (bioaccumulative, carcinogenic, etc.).
    - Based on the above characteristics, examples of treatments that might be used are:
        - Physical-Chemical Treatment: pH neutralisation, coagulation and flocculation, chemical precipitation, adsorption, membrane filtration, electrochemical treatment, solvent extraction.
        - Advanced Oxidation Processes (AOPs): ozonation, ultraviolet + hydrogen peroxide.
        - Biological Treatment: aerobic and anaerobic treatment, bioaugmentation.

Evidence of implementation should be maintained, e.g.:

- A list of chemicals used, handled or stored on the site.
- Presence of treatment method for effluents containing chemicals.

- Including the rationale for determining the most adequate method.

Auditors should confirm:

- The chemicals used, handled or stored on the site.
  - Through site inspection, that the use, handling, storage and disposal of the listed chemicals has been conducted in accordance with the Safety Data Sheets (SDS) provided by the supplier.
- Through site inspection, the presence of a treatment method for effluents containing chemicals.
  - Including the rationale for determining the most adequate method

Useful Resources

N/A

Indicator:	Requirement:
2.11.14	The UoC shall adequately contain **hazardous materials** to prevent spillage, contamination and pollution.
2.11.15	The UoC shall implement spill prevention and emergency response procedures for hazardous materials.

How do I interpret this requirement?

- Sites should consider their context and external circumstances when determining the most adequate containment method.
  - Examples of external circumstances are natural disasters and sabotage.
- Containment should be:
  - Impervious.
  - Capable of containing at least 110% of the volume of the largest container stored within it.
- The spill prevention and emergency response procedures for hazardous materials should:

- Outline the preventative maintenance of equipment destined to prevent and respond to spills from, for example, vehicles, winches, cranes, and mechanical equipment on land and water.
- Be tested for adequacy at established frequencies.
    - Depending on the test results, the plan should be revised.

- Employees should be trained on the spill prevention and emergency response procedures.

Evidence of implementation should be maintained, e.g.:

- List of hazardous materials present or used on the site.
- Records of employee training on the spill prevention and emergency response procedures.

Auditors should confirm:

- List of hazardous materials present or used on the site.
- Employees have been trained on the spill prevention and emergency response procedures.
    - Cross-check during employees' interviews.
- Through site inspection:
    - That hazardous materials are adequately contained.
- There have been no significant fuel spills and/or sewage overflows to determine whether containment and response procedures were adequate and effective.

Useful Resources

N/A

Indicator:	Requirement:

2.11.16 The UoC shall adequately store perishable materials to minimise spoilage, spillage, contamination or pest damage.

How do I interpret this requirement?

- Examples of perishable materials include fish feed, food for human consumption, medicines/vaccines and other goods that have a limited shelf life and would spoil, degrade or decay if not stored correctly.

Evidence of implementation should be maintained, e.g.:

N/A

Auditors should confirm:

- Through site inspection, that perishable materials have been adequately stored.

Useful Resources

N/A

Indicator:	Requirement:

2.11.17 The UoC shall adequately maintain machinery, aquaculture gear and infrastructure to minimise performance degradation and failure.

How do I interpret this requirement?

- The site should maintain equipment and machinery to prevent environmental impacts from degradation, for example oil leaks.
- The site should develop a maintenance plan that identifies the schedule for regular maintenance of machinery, aquaculture gear and infrastructure.
- The person(s) conducting maintenance should have an adequate level of competence based on the type of maintenance required.

Evidence of implementation should be maintained, e.g.:

- Maintenance plan that identifies the schedule for regular maintenance of machinery, aquaculture gear and infrastructure.
- Records to demonstrate maintenance was performed according to the schedule outlined in the maintenance plan.
    - Written justification should be in place in cases of deviation from the schedule outlined in the maintenance plan.

Auditors should confirm:

- The site has a maintenance plan covering regular maintenance of machinery, aquaculture gear and infrastructure.
- Records that the schedule has been adhered to.

Useful Resources

N/A

Indicator:	Requirement:
2.11.18	*Indicator applicability: water-based UoC* The UoC shall mark and record substantial aquaculture gear.
2.11.19	*Indicator applicability: water-based UoC* The UoC shall retrieve lost aquaculture gear.

How do I interpret this requirement?

- Intent of Indicator 2.11.18 is that substantial aquaculture gear is identifiable as belonging to the site.
    - Examples of marking substantial aquaculture gear include paint, stamps or identification numbers which are unique to the site.

- Attributing gear to the site is important in case of gear loss and facilitates retrieval (see Indicator 2.11.9).
    - Substantial gear should be retrieved when it is feasibly possible to do so and when retrieval does not cause a health and safety risk. For example, not during extreme weather events.
- Substantial gear includes:
    - Floats.
    - Cages.
    - Bags.
    - Predator nets.
    - Racks.
- The site should maintain equipment and/or mechanisms for retrieving lost aquaculture gear, for example, scoop nets and grapple hooks (Indicator 2.11.19).

Evidence of implementation should be maintained, e.g.:

- A record, or log, of substantial aquaculture gear should be maintained.
    - At a defined frequency, the substantial aquaculture gear record should be contrasted with the physical inventory present at the site to determine whether any gear has been lost.
- Procedures for locating and retrieving substantial aquaculture gear.

Auditors should confirm:

- Record, or log, of substantial aquaculture gear.
- Through site inspection:
    - That substantial aquaculture gear is attributable to the site and recorded.
    - That the site maintains equipment and/or mechanisms for retrieving lost aquaculture gear.
- Employees are aware of how to locate and retrieve substantial aquaculture gear. Awareness may be demonstrated through:
    - Written policies and/or procedures.
    - Employee training.

Useful Resources

- Global Ghost Gear Initiative (2021) Best Practice Framework for the Management of Aquaculture Gear. Prepared by Huntington, T. of Poseidon Aquatic Resources Management Ltd. for GGGI. 81 pp. plus appendices: GGGI_Best_Practice_Framework_for_the_Management_of_Aquaculture_Gear.pdf

Indicator:	Requirement:
2.11.20	The UoC shall clean up waste from the receiving shoreline or land surrounding the site.

How do I interpret this requirement?

- Litter collection activities should take place in areas of the receiving shoreline or land surrounding the site where such activities are feasible.
    - Examples of areas where litter collection activities may not be feasible include areas where there are access restrictions or which pose a health and safety risk.

Evidence of implementation should be maintained, e.g.:

- Records of regular litter collection activities and the responsible disposal of any items recovered.

Auditors should confirm:

- Regular litter collection activities have taken place.
- Alternatively, conduct a visual inspection to demonstrate low levels of waste are present on the receiving shoreline or land surrounding the site.

Useful Resources

- Global Ghost Gear Initiative (2021) Best Practice Framework for the Management of Aquaculture Gear. Prepared by Huntington, T. of Poseidon Aquatic Resources Management Ltd. for GGGI. 81 pp. plus appendices: GGGI_Best_Practice_Framework_for_the_Management_of_Aquaculture_Gear.pdf

Indicator:	Requirement:

2.11.21

Indicator applicability: water-based UoC

The UoC shall not use any floats made from polystyrene foam.

An exception applies where:

- Floats made from polystyrene foam are fully enclosed; and
- Floats are inspected monthly and following storm or collision events; and
- Floats are replaced when damaged or visibly deteriorated, as determined upon inspection.

How do I interpret this requirement?

- Fully enclosed floats are floats that have no sections of exposed polystyrene foam.
- An example of a collision event is a boat or vessel colliding with the floats.
- Floats are visibly deteriorated when they are no longer fully enclosed and have exposed sections of polystyrene foam.

Evidence of implementation should be maintained, e.g.:

- Records that indicate the number of floats made from polystyrene foam or other materials.
- If applicable (in accordance with the exception):
  - The number of fully enclosed polystyrene floats should be recorded.
  - Records of the inspections of floats are maintained.
  - Records demonstrate damaged or visibly deteriorated floats have been replaced following the inspections.

Auditors should confirm:

- Whether floats are made from polystyrene foam or alternative materials.
- If applicable (in accordance with the exception):
  - If floats are made from polystyrene foam, evidence demonstrate that the floats are fully enclosed.

- Records demonstrate floats have been inspected at least monthly and following any storm or collision events.
- Records demonstrate floats have been replaced when damaged or visually deteriorated, in accordance with the inspection records.

- A visual assessment of floats should be conducted during the audit.

Useful resources

- The following examples show floats that are not fully enclosed and would therefore need to be replaced.





- The following example shows a float made of polystyrene foam that is fully enclosed and therefore does not initially need to be replaced. However, as it contains polystyrene foam, it needs to be inspected and replaced if it becomes damaged or visually deteriorates.



Indicator:	Requirement:

2.11.22 *Indicator applicability: water-based UoC*

The UoC shall ensure that visible aquaculture infrastructure is uniform in positioning and orientation.

2.11.23 *Indicator applicability: all bivalve species*

The UoC shall ensure that surface floats are uniform in colour.

How do I interpret this requirement?

- Indicator 2.11.22 relates to the structural design/integrity of the infrastructure, with the intent of ensuring there are no visual impacts caused by the positioning and orientation of the infrastructure.
- Aquaculture infrastructure should not impede navigation.
- Legal requirements might impose the use of specific colour floats, for example, for navigational purposes.

Evidence of implementation should be maintained, e.g.:

N/A

Auditors should confirm:

- Through site inspection:
  - That visible aquaculture infrastructure is uniform in positioning and orientation.
  - That surface floats are uniform in colour.

Useful Resources

N/A

Criterion 2.12 – Feed

Indicator:	Requirement:

2.12.1

*Indicator scope: every UoC using **compound feed**.*

The UoC shall only use ASC-conforming compound feed.

How do I interpret this requirement?

- ASC-conforming compound feed is sourced from feed mills certified to the ASC Feed Standard.
  - It includes feeds produced under the mass balance model, as well as feeds produced under the segregation model.
- This requirement does not apply to non-certifiable species (e.g., cleaner fish).

Evidence of implementation should be maintained, e.g.:

- Documented process to confirm feed is ASC-conforming that includes verification of (see Indicator 1.4.3):
  - The feed mill certification against the ASC Feed Standard.
  - The documentation that identifies:
    - The feed as ASC-conforming.
    - The feed production model applied (i.e., mass balance or segregation).
    - In the case of segregated feed, a distinct feed name.
    - Whether the feed is traceable as ASC-conforming throughout all steps between the feed mill and site.
- Records:
  - Feed purchased and type.
  - Feed delivery notes - confirming traceability between feed mill and site.
  - Feeding records.

Auditors should confirm:

- Documented process to confirm feed product is ASC-conforming that includes verification of (see Indicator 1.4.3):
  - The feed mill certification against the ASC Feed Standard.
  - The documentation identifies:
    - The feed as ASC-conforming.
    - The feed production model applied (i.e., mass balance or segregation).
    - In the case of segregated feed, a distinct feed name.
    - Whether the feed is traceable as ASC-conforming throughout all steps between the feed mill and site.
- Records
  - Feed purchased and type.
  - Feed delivery notes - confirming traceability between feed mill and site.
  - Feeding records.

Useful Resources

N/A

Indicator:	Requirement:

2.12.2

Indicator applicability: every UoC using seaweed as a direct feed source.

The UoC shall only use seaweed from regulated sources.

How do I interpret this requirement?

- Regulated source means that there are national/international laws, agreements or policies governing the harvesting or farming of seaweed and that these are complied with, or the seaweed is from a certification scheme which addresses the responsible management of seaweed, whether wild-harvested or farmed.

- Seaweed certified to the following standards meet this ASC requirement on regulated sources:
  - ASC-MSC Seaweed Standard
  - FairWild Standard
  - Standards approved in the IFOAM Family of Standards Organic Standards

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Evidence of implementation should be maintained, e.g.:

- Legislation which stipulates responsible harvesting or farming.
- Supplier harvesting or farming permits.
- Certification documentation.
- Records:
  - Harvest.
  - Transport to the UoC.

Auditors should confirm:

- Legislation which stipulates responsible harvesting or farming.
- Presence and validity of permits.
- Certification documentation.
- Records.
  - Harvest.
  - Transport to the UoC.

Useful Resources

N/A

Indicator:	Requirement:

2.12.3

The UoC shall not use feed containing protein derived from the same genus as the species being farmed.

An exception applies:

a. where it can be demonstrated that same-species protein hydrolysates have a molecular weight of <10,000 daltons, in which case their use is allowed.

b. for cod, in which case the use of protein derived from wild-caught cod is allowed.

How do I interpret this requirement?

- The requirement establishes a general prohibition on “intra-genus feeding”.
  - Two exceptions apply:
    - Same-species protein hydrolysates may be used if the UoC can demonstrate that their molecular weight is below 10,000 daltons. This evidence could include product specifications, certificates of analysis or test results.
    - Cod may be fed protein derived from wild-caught cod. This exception is not limited to hydrolysates or to protein below 10,000 daltons. However, it does not allow protein derived from farmed cod.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Feed purchased (including information on species/genus used as marine ingredients for fishmeal).
  - Feed fed.

Auditors should confirm:

- Records:
  - Feed purchased (including information on species/genus used as marine ingredients for fishmeal).
  - Feed fed.

Useful Resources

- Although the science behind prion diseases, infectivity and pathogenicity in fish in association with Transmissible Spongiform Encephalopathies (TSEs) is not very well developed, ASC has taken a precautionary approach and followed the guidelines of FAO (2011) Aquaculture Development. 5. Use of Wild Fish as Feed in Aquaculture Principle 9.1 "For biosecurity reasons, intraspecies recycling is an unacceptable practice that should be prohibited"[42].
- Protein hydrolysates verified to <10,000 daltons are allowed as controlling the molecular weight provides a good verification of the appropriateness of an applied transformation process. This is in line with Regulation (EU) 142/2011 regarding the use of animal by-products.

Indicator:	Requirement:
2.12.4	The UoC shall not feed **wet feedstuffs**, **moist pellets**, or **uncooked/ unprocessed marine raw materials**.

How do I interpret this requirement?

- Wet feedstuffs used as binders for probiotics and other feed additives in top-coating or top-dressing applications are allowed.
- Wet feedstuffs can be used as carbon sources for water quality control i.e., anaerobic fermentation or biofloc technology.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Feed purchased.
  - Feed fed.

Auditors should confirm:

- Wet feedstuffs, moist pellets, or uncooked/ unprocessed fish are not used by the UoC by cross-checking records with observations and personnel interviews.

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[42] FAO. Aquaculture development. 5. Use of wild fish as feed in aquaculture. FAO Technical Guidelines for Responsible Fisheries. No. 5, Suppl. 5. Rome, FAO. 2011. 79p.

- Records:
  - Feed purchased.
  - Feed fed.

Useful Resources

N/A

Indicator:	Requirement:
2.12.5	The UoC shall calculate feed efficiency, according to **Appendix 15**, and shall adhere to the species-specific limits on feed efficiency, according to **Appendix 2 (2.2)**[43].

How do I interpret this requirement?

- To facilitate conformity with the feed efficiency requirements the UoC should consider:
  - Using feed formulations:
    - With a high percentage of marine by-products and trimmings.
    - That includes alternatives to fishmeal/fish oil.
  - Implementing on-site feed management measures, for example:
    - The use of:
      - Feed trays.
      - Cameras.
      - Pellet sensors.
    - Staff training on the use of feed management measures.
    - Verification process to confirm management measures are operational and continuously meet their intent, for example, documented records of visual feed response.

Evidence of implementation should be maintained, e.g.:

- Records:

[43] An exemption applies where there is no species-specific metric listed in Appendix 2.

- Feed purchased (including % of whole fish ingredients, EPA and DHA).
- Feed fed.
- Feed efficiency calculations.
- Visual feed response.
- Staff training.
- Stocking biomass.
- Production (weight harvested).

Auditors should confirm:

- Feed efficiency metrics are met.
- Records:
  - Feed purchased (including % of whole fish ingredients, EPA and DHA).
  - Feed fed.
  - Feed efficiency calculations.
  - Visual feed response.
  - Staff training.
  - Stocking biomass.
  - Production (weight harvested).

Useful Resources

N/A

Indicator:	Requirement:
2.12.6	The UoC shall report feed related data in accordance with the ASC Data Submission Procedure.

No additional guidance is provided for this Indicator.



Principle 3

The aquaculture industry is committed to respecting and promoting human rights



Criterion 3.1 – Rights Awareness

Indicator:	Requirement:
3.1.1	The UoC shall have a written human rights policy, approved by senior management, with the intent of publicly demonstrating its commitment to at least the following: o freedom of association and the effective recognition of the right to collective bargaining; and o the elimination of all forms of forced or compulsory labour; and o the effective abolition of child labour; and o the elimination of discrimination in respect of employment and occupation; and o a safe and healthy working environment; and o being a good neighbour and respecting the rights of surrounding communities.

How do I interpret this requirement?

- A human rights policy:
  - is the "company's public expression of its commitment to meet its responsibility to respect internationally recognized human rights standards"[44]
  - is appropriate to the strategic direction, context and purpose of the organisation
  - provides a framework for setting quality objectives
  - includes an explicit commitment to respect all other internationally recognised human rights standards[45] that apply to people that may be impacted by the UoC's operations
  - includes stipulations concerning the company's expectations of personnel, business partners and other relevant parties
  - includes information on how the company will implement its commitment
  - is aligned with the requirements in the ASC Farm Standard, and local and international human rights laws and standards
  - is signed by senior management

[44] United Nations Global Compact (2015), A Guide for Business: How to Develop a Human Rights Policy. Available at: How to Develop a Human Rights Policy 20151013.indd (ohchr.org)
[45] International Bill of Human Rights, A Brief History and the two International Covenants. Available at: International Bill of Human Rights | OHCHR

- is understood by all employees.

- The required elements of the human rights policy do not need to exist in one single policy, and may be spread across several different documents, whatever is appropriate for the systems already in operation at the UoC.
- Each company will need to determine for itself which human rights may need to be prioritised in its policy because this will depend on the risks associated with the company's location, type of farming practices, and composition of the workforce.
- The content of the human rights policy may vary according to the UoC's size and national legal frameworks, and could also include the following topics:
  - recruitment and termination (see Indicators 3.2.3-3.2.7, 3.3.3-3.3.5, 3.4.1, 3.4.3, 3.4.4, 3.7.1-3.7.5)
  - employee representation (see Indicator 3.1.3)
  - loans and advances (see Indicator 3.2.8)
  - remediation (see Indicators 3.2.2, 3.3.2)
  - anti-discrimination (see Criterion 3.4)
  - training (see Indicators 3.1.4, 3.5.5)
  - freedom of association and collective bargaining (see Criterion 3.6)
  - transparent contracts (see Criterion 3.7)
  - fair wages (see Indicators 3.8.1, 3.8.4, 3.8.5, 3.8.6)
  - working hours (see Criterion 3.9)
  - performance and workplace conduct (see Criterion 3.10)
  - employee accommodation (see Criterion 3.11)
  - grievance mechanisms (see Criterion 3.12)
  - community relations and Indigenous rights (see Criterion 3.13).

Evidence of implementation should be maintained, e.g.:

- human rights policy
- evidence that senior management have signed it off

Auditors should confirm:

- that the human rights policy is in place, approved by a member of senior management;

- whether the policy is communicated and available publicly;
- whether the policy is available to all relevant stakeholders;
- that the human rights policy is consistent with other company policies and procedures.

Useful Resources

- Some examples of human rights policies can be found here.
- United Nations (2011), Guiding Principles on Business and Human Rights. Available at: https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf
- ILO (2022), ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up. Available at: wcms_716594.pdf (ilo.org)
- International Bill of Human Rights, A Brief History and the two International Covenants. Available at: International Bill of Human Rights | OHCHR
- United Nations Global Compact (2015), A Guide for Business: How to Develop a Human Rights Policy. Available at: How to Develop a Human Rights Policy 20151013.indd (ohchr.org)
- OECD (2023), OECD Guidelines for Multinational Enterprises on Responsible Business Conduct. Available at: https://www.oecd-ilibrary.org/docserver/81f92357-en.pdf?expires=1729687419&id=id&accname=guest&checksum=62CA2A98BB5F19532709D450D88B4404

Indicator:	Requirement:
3.1.2	The UoC shall have at least one named member of management who is responsible for the implementation and maintenance of the human rights policy.

How do I interpret this requirement?

- Implementing and maintaining the human rights policy means that the named member of management is responsible for:
  - translating the policy statement into practical actions and initiatives within the UoC and in day-to-day operations
  - monitoring the UoC's human rights performance, including:

  - identifying areas of improvement
  - reporting progress or issues to senior management or relevant stakeholders
  - overseeing continuous improvement
- overseeing training and awareness programmes aimed at educating employees and stakeholders about human rights principles, policies, and procedures
- updating the policy regularly or when there are changes at the UoC.

- The intent of this indicator is that one person is responsible for the implementation of the whole human rights policy, and can oversee all the different aspects of the policy. The UoC may have staff responsible for different elements (such as health and safety), but there should still be one named member of management responsible for the whole human rights policy.
- This can be the same person who is also responsible for some of the smaller elements.
- The named member of management should also commit to working with employees who are engaged in the implementation of the policy, ensuring that employees' views are taken into account.

Evidence of implementation should be maintained, e.g.:

- records that allow for the verification of the named member of management
- plan of actions involved in implementing the policy
- plans for monitoring implementation of the policy
- evidence of any remediation or corrective actions that have taken place
- plans for regularly updating and revising the policy.

Auditors should confirm:

- that the named member of management understands their responsibilities in implementing and maintaining the policy;
- that employees are aware of the named member of management responsible for the human rights policy;
- that the human rights policy is being implemented, which can include checking:
  - progress against any action plans and monitoring plans,
  - if employees are aware of and understand the contents of the policy,

- evidence of any remediation or corrective actions where there are negative human rights impacts.

Useful Resources

N/A

Indicator:	Requirement:
3.1.3	The UoC shall ensure that employees are engaged in the implementation and maintenance of the human rights policy.

How do I interpret this requirement?

- Engaging employees in the implementation and maintenance of the human rights policy:
  - ensures that the voices and perspectives of employees are heard and considered in matters related to human rights
  - can vary with the size and context of the UoC
  - can be more formal, such as through a committee or nominated representatives, or can be more informal, such as:
    - informal conversations with employees
    - asking for feedback during staff meetings
    - engaging interested employees as and when they would like to take part
    - creating opportunities for open discussion with the employees about their working conditions
- Where the UoC decides to establish a committee, the structure of this committee preferably:
  - represents the composition of employees, enhancing inclusivity
  - holds elections for the employee committee, allowing all employees to nominate and vote for members.
  - meets on a regular basis and occasionally on a more ad-hoc basis, where need arises.
- A committee's role includes:

- assisting in the development of strategies, initiatives, and activities that promote human rights within the organisation
- helping to monitor the UoC's human rights performance
- identifying areas where the policy might not be effectively implemented or where issues arise
- engaging in dialogue with management to address concerns, propose improvements, and ensure that the policy remains relevant and effective
- raising awareness among their colleagues about the UoC's human rights policy, principles, and procedures.

- The UoC should ensure that any employee engaged in the implementation of the policy, employee representative or committee has knowledge about the human rights policy, and understands what their role involves. That can include ensuring that they have access to training.
- Employees can choose whether or not to engage in this work, the UoC cannot force them to do so, but can give them opportunities to engage.
- Where there is a multi-site farm, employees from one site may represent employees at other sites, provided there are effective communication channels in place. These channels should ensure that employees at all sites have the opportunity to raise concerns, share issues, and receive feedback.

Evidence of implementation should be maintained, e.g.:

- list of members of the employee committee or employee representation
- records of meetings and actions
- records of election procedures.

Auditors should confirm:

- employees are aware of who represents them and how to contact them;
- the employee representation understands their role and the human rights policy.

Useful Resources

N/A

Indicator:	Requirement:

3.1.4 The UoC shall ensure that employees are trained on the human rights policy.

How do I interpret this requirement?

- The policy is:
  - distributed to all employees
  - available for all employees to access
  - in a format and language that they can understand, with provisions for illiteracy, if necessary.
- Informing employees about their human rights can help:
  - prevent issues such as harassment, discrimination, or other human rights abuses within the workplace
  - demonstrate transparency and commitment to the human rights policy to employees and stakeholders
  - develop a more inclusive, equitable and ethical work environment.
- Training for employees on the policy should include:
  - an understanding of the significance of the human rights policy
  - the rights and responsibilities that the policy includes
  - how to report human rights violations or concerns through the UoC's grievance mechanism
  - information in a format that is understandable and accessible to all employees, including those who may have language or literacy barriers.
- Training should take place annually or when there are new employees.
- Records of training attendance and content should be maintained.

Evidence of implementation should be maintained, e.g.:

- records of the training, including attendees and topics covered

- policy available for employees in an accessible format.

Auditors should confirm:

- employees understand the purpose and contents of the policy;
- training is taking place annually and all employees are trained.

Useful Resources

N/A

Indicator:	Requirement:
3.1.5	The UoC shall publicly disclose the human rights policy and actively communicate it to all suppliers, buyers and other relevant stakeholders.

How do I interpret this requirement?

- The policy can be published:
  - on the UoC's website
  - in annual reports anywhere where it is easily accessible to anyone interested in learning about the UoC's commitment to human rights
  - in written (printed) materials to distribute to employees, suppliers, and communities
  - through local media or social media
  - through letters to suppliers
  - in collaboration with local organisations (such as NGOs).
- The policy should be:
  - actively communicated to all suppliers, including subcontractors and business partners, some examples of active communication can include:
    - sending the policy to suppliers when the UoC initially signs a contract with them
    - adding a link to the relevant page on the website, in a newsletter, or other update email to suppliers

    - directing suppliers to the relevant page on the website during other interactions with them.

  - included in contracts and agreements with suppliers.

- For some specific target groups, such as local communities, it may be necessary to communicate more actively about (parts of) the policy, for example, during stakeholder meetings.
- 'Other relevant stakeholders can include anyone who is interested in or impacted by the operations of the UoC, for example:
  - anyone in the supply chain
  - local community members
  - local NGOs and community organisations.

Evidence of implementation should be maintained, e.g.:

- publication of the policy

Auditors should confirm:

- that the policy is publicly available and easily accessible;
- that stakeholders are aware of the existence and contents of the policy.

Useful Resources

N/A

Criterion 3.2 – Forced Labour

Indicator:	Requirement:

3.2.1 The UoC shall not engage in, or support, forced labour[46].

How do I interpret this requirement?

- Forced labour can take many forms and can include:
  - work that is exacted from any person under the threat of any penalty:
    - penalties do not need to actually take place for forced labour conditions to occur. The threat itself of the penalty or any other type of retaliation, as well as the penalty itself, constitutes forced labour
    - penalties and other types of retaliation include but are not limited to the following (adapted from ILO Handbook on Forced Labour[47]):
      - isolation, restriction of movement, confinement or imprisonment
      - physical and sexual violence against employees, family or close associates
      - abusive working and living conditions
      - excessive overtime
      - financial penalties, withholding of wages
      - shift to even worse working conditions, removal of rights or privileges
      - exclusion from future employment
      - deprivation of food, shelter or other necessities
      - denunciation to authorities such as police or department of immigration, deportation
      - any other type of physical, mental or social harm
  - work for which the person has not offered himself or herself voluntarily, including where employees are not allowed to terminate employment at any time

[46] If forced labour is identified, a critical non-conformity shall be raised by the CAB.
[47] ILO (2015), Combating Forced Labour: A Handbook for Employers and Business. Available at: https://www.ilo.org/media/441596/download

- the use of deception or other forms of coercion, including where employees are not informed of working conditions prior to or during employment
- the use of exploitative loans to prevent employees from leaving their jobs. This is also referred to as debt bondage.

- The International Labour Organisation (ILO) has developed a list of indicators of forced labour, as follows, taken from their 2025 revised booklet[48]:
  - **Abuse of vulnerability** - this occurs when an employer or recruiter intentionally takes advantage of a workers' vulnerable position
  - **Deception** - this refers to the failure to deliver what has been promised to the worker
  - **Restriction of movement** - workers can have their movements restrained during recruitment (e.g. while being transported) and/or at their workplace or employer-provided accommodation
  - **Isolation** - victims of forced labour are often kept secluded to better control them and prevent them from escaping or seeking help
  - **Physical and sexual violence** - this is not acceptable under any circumstance and constitutes a strong indicator of forced labour
  - **Intimidation and threats** - victims of forced labour may be subjected to intimidation and threats, either when they complain about their conditions or try to leave their jobs
  - **Retention of identity documents** - this is a very common means of control, especially for migrant workers. Without their documents, workers may feel unable to approach authorities for help, to change jobs, access essential services or leave the country
  - **Withholding of wages** - this occurs when payments are deliberately and systematically withheld to compel workers to remain in their jobs and prevent them from leaving
  - **Debt bondage** - this arises when people are coerced into working against their will to repay a debt to an employer or recruiter, or when a debt is deliberately manipulated to ensure it cannot be repaid. This may be due to loans with high interest rates, or when employees are forced to pay high portions of their salaries to employer-provided accommodation or supplies purchased at an inflated cost at employer-run stores.
  - **Abusive working and living conditions** - victims of forced labour may be subjected to degrading or hazardous working conditions, in violation of labour law and human dignity, and may also be forced to live in substandard conditions

[48] https://www.ilo.org/sites/default/files/2025-11/ILO%20Indicators%20of%20Forced%20Labour%202025.pdf

- **Excessive overtime** - excessive working hours alone do not automatically constitute forced labour, but they should trigger closer scrutiny.

- The wording ‘or support’ in the indicator means that the UoC:
  - does not use any suppliers, subcontractors or other workers who are in any way involved in a system of forced labour
  - does not engage in forced labour through any other third parties or business relationships.

Evidence of implementation should be maintained, e.g.:

- employee contracts
- licences or certificates of any recruitment agencies used (see Indicator 3.2.3)
- evidence that any recruitment agencies used are complying with relevant regulations (see Indicator 3.2.3)
- records from internal audits.

Auditors should confirm:

- that where there is any non-conformity in 3.2, there has been careful evaluation and scrutiny of the risk of forced labour, as any non-conformity can signal that there is a risk. ILO's indicators of forced labour and their guidance on detecting forced labour can be particularly useful[49].
- general risk factors for forced labour in a country (see useful resources section);
- NGOs’ or other local organisations’ knowledge of any reports of forced labour in the sector in this region;
- human resources personnel’s awareness of any issues in the workplace;
- worker or union representative’s awareness of any issues in the workplace;
- whether or not any migrant workers are working at the UoC whether local or international, as a heightened risk factor for forced labour;
- whether or not recruitment agencies are being used, as a heightened risk factor for forced labour;
- that employees are not threatened with any penalties or retaliation;
- that employees are not in any form of debt bondage;

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[49] https://www.ilo.org/sites/default/files/2025-11/ILO%20Indicators%20of%20Forced%20Labour%202025.pdf

- that employee contracts are clear and up-to-date, and employees understand their terms and conditions of employment;
- consistency with records related to other parts of the ASC Farm Standard that represent risk factors for forced labour, e.g.:
- recruitment and workplace policies
- wage and payroll records
- overtime records
- employee committee records
- grievance mechanism records.

Useful Resources

- ILO (2025), Combating Forced Labour: A Handbook for Employers and Business. Available at: https://www.ilo.org/sites/default/files/2025-11/Combating%20forced%20labour%20-%20A%20handbook%20for%20employers%20and%20business.pdf
- US State Department country reports for human trafficking: https://www.state.gov/trafficking-in-persons-report/

Indicator:	Requirement:

3.2.2

Indicator applicability: Every UoC where forced labour has been identified.

If forced labour is identified, the UoC shall implement remediation processes that prioritise the best interest of the person, following the method outlined in Appendix 10.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if forced labour has been identified. If no forced labour has been identified, then this indicator should be marked N/A.

- This indicator is applicable only if forced labour is identified. The UoC does not need to have a remediation procedure in place to conform.

- If forced labour is identified, the UoC shall follow the remediation framework, which is set out in Appendix 10, including timelines, corrective action and reporting obligations.
- Remediation of forced labour:
  - will vary depending on the situation and the needs of the employee in question
  - always takes into account the best interest of the employee, respecting their wishes and protecting their privacy
  - is ideally carried out in consultation with local experts, such as NGOs.
- When remediating a case of forced labour, there can be different steps in the process, which can include:
  - immediate actions to safeguard the employee, for example removing them to a safe location
  - medium term actions to develop a plan to provide appropriate remedy to the victim, including but not limited to:
    - restoration of original job terms
    - wage repayment or other compensation
    - medical or other care as necessary
    - repatriation or other steps deemed necessary
  - long term actions to enact and monitor the plan, which can take up to several years.
- The UoC should then engage in a process of developing corrective actions to prevent forced labour reoccurring. This can include:
  - performing an analysis of what went wrong in their system to prevent it
  - implementing measures to prevent future recurrence
  - considering working with local experts on this corrective action.
- Given the complexity of human rights issues, partnership with external partners is often necessary to provide effective remediation. They can:
  - provide support for the development of a remediation plan
  - help in implementing the remediation plan
  - help to implement corrective actions to prevent recurrence.
- These potential partners can include:

- local NGOs
- individual experts
- community liaisons/leaders
- government offices
- supply chain partners, or others.

- Potential support that these partners can provide could include:
  - training
  - improved access to social services and education
  - advocacy
  - direct financial support or other support for the affected person and their families to find other sources of income.

Organisation Type	Potential Services to Remediate Child Labour or Forced Labour
Human rights organisations or expert consultants	○ Support with identification of the affected person(s) ○ Support for remediation plan development ○ Human rights and worker rights training ○ Addressing root causes of abuse
Unions or worker organisations	○ Support for remediation plan development ○ Remediation plan monitoring ○ Human rights and worker rights training ○ Addressing root causes of abuse
Community-based and religious organisations and leaders	○ Support services to former child or forced labourers ○ Advocacy and awareness raising regarding external drivers of the risk of child or forced labour—for example local advocacy with the government to provide access to schools, or campaigns against child labour as a cultural practice
School leadership and staff	○ Facilitate access to education for former child labourers ○ Support advocacy efforts to address external drivers of child labour with community, parents and children

Healthcare providers	○ Medical support to former child or forced labourers ○ Input into remediation plan when there are health concerns
Government agencies	○ Social support services to former child or forced labourers— for example access to government benefits or social programmes
Buyers and retailers	○ Joint efforts to address root causes ○ Financial support for remediation and prevention efforts
Industry organisations and multistakeholder groups	○ Advocacy for system and national-level change in conditions that lead to child or forced labour or other human rights abuses ○ Joint efforts to address root causes

Evidence of implementation should be maintained, e.g.:

- documented remediation procedures
- records and documents of any remediation process that has taken place
- records and documents of any corrective actions that have been put into place
- documented monitoring system in place.

Auditors should confirm:

- knowledge and capacity of staff to implement remediation procedures, or availability of external capacity;
- the ability of the site to monitor any corrective actions within their management system;
- knowledge and capacity of staff to develop corrective actions, where necessary;
- amended contracts with recruitment agencies, where relevant.

Useful Resources

- Bureau of International Labor Affairs, Forced Labor Remediation Guide. Available at: https://www.dol.gov/agencies/ilab/comply-chain/steps-to-a-social-compliance-system/step-6-remediate-violations/key-topic-forced-labor-remediation-guide#:~:text=REMEDIATION%20ACTION%3A,-Ensure%20that%20wages&text=Ensure%20that%20payment%20schedules%20are,receive%20their%20full%20wages%20due.

- ILO (2015), Combating Forced Labour: A Handbook for Employers and Business. Available at: https://www.ilo.org/media/441596/download

Indicator:	Requirement:

3.2.3

The UoC shall ensure that original identity documents are not retained, including by any recruitment agencies used. If a storage option for identity documents is provided, the UoC shall ensure that:

a. the storage is secure; and

b. it is the choice of the employee to use the storage; and

c. stored items are logged; and

a) employees have free access to the storage.

How do I interpret this requirement?

- The retention of identity documents is a violation of employees' basic rights.
- When employees cannot easily prove their identity or citizenship status or have the documents required to travel, they become more vulnerable to exploitation.
- Employees should always either possess or have access at any time to their original personal documentation, including documentation needed to terminate employment, and to leave the country and travel freely. For example: ID cards, passports, visas.
- If a recruitment agency is involved and stores employees' personal documentation there, it is still the responsibility of the UoC to ensure that the conditions outlined in the indicator are met.

Evidence of implementation should be maintained, e.g.:

- storage solutions for personal documents
- policies about the retention of employee documents.

Auditors should confirm:

- whether or not employees store personal documents anywhere at the UoC;
- that employees are not asked to hand over any personal documents.

Useful Resources

N/A

Indicator:	Requirement:
3.2.4	The UoC shall ensure that employees, whether employed directly or through a recruitment agency, are allowed to terminate their employment according to their employment terms and conditions.

How do I interpret this requirement?

- The word 'directly' means an employee who is employed by the UoC, rather than by a recruitment agency.
- The UoC is responsible for ensuring that any employees who are working at the UoC but recruited and/or contracted by a recruitment agency are also allowed to terminate their own employment.
- The UoC should also be aware of and comply with local labour laws and regulations related to employment termination.
- The UoC has fair and transparent employment agreements (see Criterion 3.7) that are, documented, and specify termination conditions, which may include providing written notices and maintaining records of the process.
- Examples of unacceptable terms and conditions relating to terminating employment are:
  - a defined period where employees are not allowed to resign or terminate their employment
  - employees are not allowed to resign without permission from management
  - employees are required to pay fees in order to resign or terminate their employment
  - anything in the terms and conditions that is contrary to local labour laws and regulations.
- To ensure that any disagreements or conflicts about termination are reported without fear of retaliation, and resolved, it is also important that there are accessible and effective grievance mechanisms in place (see Criterion 3.12).

Evidence of implementation should be maintained, e.g.:

- employee contracts that include conditions for termination of employment
- records of resignation
- evidence that recruitment agencies allow employees to terminate their employment.

Auditors should confirm:

- whether or not employees are aware of how they can terminate their employment if they wish, and what the terms and conditions are for doing so.

Useful Resources

N/A

Indicator:	Requirement:
3.2.5	The UoC shall ensure that employees, whether employed directly or through a recruitment agency, do not have any part of their salary, property, or benefits unlawfully withheld.

How do I interpret this requirement?

- A common tactic in forced labour situations can be to withhold salary, property or benefits, to pressure an employee to stay in employment.
- Benefits can be:
  - those allowed by law
  - defined by contract
  - defined by collective bargaining agreement
  - inclusive of, for example, paid time off, sick leave, health insurance, private pensions scheme.
  - can include bonuses.
- There are situations where withholding salary, property or benefits are legally required and so allowed under this indicator. For example:
  - Salary withholdings, as required by the government. For example, part of a salary is sometimes withheld by a government for:

- statutory pensions
- health insurance
- taxes
- or a government can sometimes require the withholding of salary to pay overdue child-care support costs to another parent
- or a government can require the withholding of salary to pay overdue taxes.

- Salary deductions, as defined in a contract or collective bargaining agreement, that are agreed by both parties. For example, an agreed voluntary deduction for housing costs could be allowable.
- Bonuses, which are considered optional and additional to the agreed salary and benefits. However, if clearly defined performance targets related to a bonus payment have been achieved, then the bonus cannot be withheld.

- The UoC is responsible for ensuring that any employees who are working at the UoC but recruited and/or contracted by a recruitment agency do not have any parts of their salary, property or benefits withheld unlawfully.

Evidence of implementation should be maintained, e.g.:

- employee contracts that include information about any wage deductions
- payslips and payroll records
- evidence that recruitment agencies do not unlawfully withhold any salary, property or benefits.

Auditors should confirm:

- contracts do not contain any unlawful deductions;
- wage terms listed in contracts match payslips or payroll records;
- any deductions made from wages such as taxes, or social security, are lawful, transparent, and authorised by the employee;
- employees are aware of the purpose of any deductions being made.

Useful Resources

N/A

Indicator:	Requirement:
3.2.6	The UoC shall ensure that employees, whether employed directly or through a recruitment agency, are not charged any fees associated with recruitment, employment or travel and repatriation.

How do I interpret this requirement?

- Charging employees fees for recruitment or during employment can lead to debt bondage and makes employees vulnerable to exploitation and coercion.
- A widely adopted approach to recruitment fees is the Employer Pays Principle (EPP)[50]:
    - an employer commitment to pay the full costs associated with recruitment
    - a commitment to ensure that no worker should pay for a job.
- If fees are found, the UoC should reimburse them as soon as possible.
- Following are a list of recruitment fees and related costs as determined by the ILO and adapted from their guidance[51] that may be incurred as a result of the recruitment process and that are not to be charged to potential or actual employees:
    - recruitment fees:
        - payment for services provided by a recruitment agency to match employers with applicants for employment
        - payment for the recruitment of potential employees for the purpose of employing them to perform work for a third party
        - payments to sub-agents as a finder's fee
        - payments required to cover costs of recruitment fees from employees
        - payments to cover costs of recruiting referral and placement services, for example advertising positions or conducting interviews.
    - related costs are expenses related to recruitment and placement within or across national borders, and when related to the recruitment process and initiated by a recruitment

[50] IHRB and Leadership Group for Responsible Recruitment, Six Steps to Responsible Recruitment. Available at: https://ihrb-org.files.svdcdn.com/production/assets/uploads/member-uploads/Six_Steps_to_Responsible_Recruitment_-_Leadership_Group_for_Responsible_Recruitment.pdf?dm=1726489439

[51] ILO (2019), General Principles and Operational Guidelines for Fair Recruitment and Definition of Recruitment Fees and Related Costs. Available at: https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_protect/@protrav/@migrant/documents/publication/wcms_703485.pdf

agency or employer or an agent acting on behalf of those parties, are not paid by the employee or potential employee. These can include:

- medical costs: payments for medical examinations, tests or vaccinations
- insurance costs: costs to insure the life, health or safety of an employee, including enrolment in migrant welfare funds
- costs for skills and qualification tests, for example: language tests
- costs for training and orientation: including on-site and pre-departure or post-arrival orientation of new employees
- travel and lodging costs within the recruitment process, including for training, interviews, consular appointments, relocation, and return or repatriation
- application and service fees that are required for the recruitment process, including fees for services in preparing, obtaining or legalising workers' employment contracts, identity documents, passports, visas, background checks, security and exit clearances, banking services, and work and residence permits
- equipment costs: for tools, uniforms, safety gear and other equipment needed to perform assigned work safely and effectively
- this list of costs is not exhaustive.

- Undisclosed costs are also never allowed, such as previously undisclosed cost recovery-fees for expenses after they occur.
- The UoC is responsible for ensuring that any employees who are working at the UoC but recruited and/or contracted by a recruitment agency have not been charged any fees or costs, as outlined above.

Evidence of implementation should be maintained, e.g.:

- employee contracts
- contracts with any recruitment agencies that contain an agreement that workers will not be charged any fees towards recruitment at any stage of recruitment
- payslips and pay records.

Auditors should confirm:

- whether a recruitment agency has been used for recruitment;
- that wage terms listed in contracts match payslips or payroll records and there are no hidden fees being deducted;

- whether contracts of migrant workers contain clauses about repatriation;
- that recruitment fees are not recovered through cash payments after employees have been paid their full wages, as this practice is not uncommon, and can make such fees difficult to detect during audits.
- employees' perceptions of the nature and conditions of their recruitment process.

Useful Resources

- ILO (2019), General Principles and Operational Guidelines for Fair Recruitment and Definition of Recruitment Fees and Related Costs. Available at: https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_protect/@protrav/@migrant/documents/publication/wcms_703485.pdf
- IHRB and Leadership Group for Responsible Recruitment, Six Steps to Responsible Recruitment. Available at: Six_Steps_to_Responsible_Recruitment_-_Leadership_Group_for_Responsible_Recruitment.pdf
- Responsible Recruitment Toolkit (2019) Guide to eliminating worker-paid recruitment fees and related costs: https://respect.international/wp-content/uploads/2022/06/Guide-to-Eliminating-Worker-Paid-Recruitment-Fees-and-Related-Costs-Third-Edition.pdf

Indicator:	Requirement:
3.2.7	The UoC shall not engage in **prison labour**, including where any recruitment agencies are used.

How do I interpret this requirement?

- Prison labour often involves the use of incarcerated individuals under conditions that can amount to forced labour.
- Such employees may not have the freedom to choose their employment, which may be assigned as a condition of their incarceration or reintegration.
- This indicator applies to any person held involuntarily, which includes unauthorised immigrants, refugees, people awaiting trial or sentence, prisoners, people in drug rehabilitation programmes, people held for retraining or people held for political reorientation.
- This indicator also applies to reintegration programmes where work may be voluntary and persons held/prisoners may receive a salary.
    - Although the intention of such programmes is to facilitate an inmate's transition back into society, ASC does not allow such programmes under the ASC Farm Standard as it is not in

a position to monitor the fairness of such practices and ensure that there is no exploitation of people on a global scale.

- The UoC is responsible for ensuring that any recruitment agencies used are not engaged in prison labour for employees working at the UoC.

Evidence of implementation should be maintained, e.g.:

- employee contracts
- written agreements with any recruitment agencies.

Auditors should confirm:

- whether any recruitment agencies are used, and where they source employees from.

Useful Resources

N/A

Indicator:	Requirement:

3.2.8 *Indicator applicability: Every UoC that provides loans and advances*

The UoC shall have a policy if providing loans and advances, in which the terms and conditions are not used to bind employees to employment. The policy shall be communicated to employees in an understandable manner.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC provides loans and advances. If no loans or advances are provided, then this indicator should be marked N/A.

- This indicator only applies if loans and/or advances are provided by the UoC to its employees.
- The policy should be documented and accessible and could for example include the following items:
  - eligibility
  - types of financial assistance available (for example, loans for specific purposes such as medical emergencies, education, or unexpected expenses and advances)
  - approval process
  - repayment terms
  - applicable interest and fees (note: interest cannot be charged on advances)
  - confidentiality
  - transparency.
- The policy should include clear information about what happens if an employee leaves before they have paid off their loan:
  - an employee is always allowed to leave their job, even if they have not yet paid off the loan;
  - the employer can recover the debt through deduction from the employee's final wages, or through a request for immediate payment, or if necessary, through appropriate legal action.
- Communicating in an understandable manner means that the UoC ensures that all employees understand the policy.

Evidence of implementation should be maintained, e.g.:

- loans and advances policy
- payslips and pay records
- signed agreements with the employees who are entering into the loan.

Auditors should confirm:

- that employees understand the conditions around loans and advances.

Useful Resources

N/A

Indicator:	Requirement:
3.2.9	The UoC shall allow employees to move around the workplace to freely access sanitary facilities and drinking water during their **shift**.

How do I interpret this requirement?

- The UoC should ensure that employees' access to drinking water is unrestricted.
- Free movement of employees to use sanitary facilities and access water:
  - helps prevent dehydration, health stress, related health issues that can arise when workers are denied access to water, and accidents and injuries caused by discomfort or dehydration.:
  - is sometimes guided by health and safety or food safety procedures. For example, the farm may need employees to change clothes for food preparation or move to a designated area for health and safety reasons.
- Where employees have special needs, for example health needs that require frequent food and water, these needs are accommodated.
- Employee representation and clear grievance mechanisms (Criterion 3.12) can support these practices.

Evidence of implementation should be maintained, e.g.:

- clearly labelled sanitary facilities and drinking water.

Auditors should confirm:

- that employees are aware of this requirement and feel able to access these basic needs.

Useful Resources

N/A

Indicator:	Requirement:
3.2.10	The UoC shall not keep employees involuntarily at the site outside of a shift, including confining them in employee accommodation.

How do I interpret this requirement?

- Keeping employees trapped at the workplace is a key indication that there is forced labour.
- Preventing this can include that employers communicate to employees that they are allowed to leave the worksite and leave their accommodations when living on site, when they are not on their shift.
- This does not apply where staying on site is part of the agreement of contracts, for example a two-week shift on a feed barge followed by one-week off.

Evidence of implementation should be maintained, e.g.:

- employee contracts
- working hours records.

Auditors should confirm:

- that employees understand that they are free to leave the site when they are not on their shifts;
- that there are no restrictions evident, such as locked gates, or external locks on dormitories.

Useful Resources

N/A

Indicator:	Requirement:

3.2.11

Indicator applicability: Every UoC that has a site that is not easily accessible

The UoC shall offer free-of-charge and safe transportation for employees to leave the site when it is not easily accessible.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC has a site that is not easily accessible. If the site is easily accessible, then this indicator should be marked N/A.

- In order to ensure that the employee is freely able to leave the workplace as per Indicator 3.2.11, the UoC provides reasonable transportation for employees to reach nearby communities when:
  - there is no public transportation
  - there are no easily accessible, available and affordable private transportation options.
    - the UoC should agree with employees about what easily accessible and affordable means in their context. Employee representation can support with facilitating discussions about this.
- An example of reasonable transportation to leave the premises would be the provision of a free shuttle at the start and end of each shift to the nearby towns where employees live, in areas where there is no public transport.
- Where the workplace is remote, transportation may only be necessary at the end of an agreed upon time period, such as a shift.

Evidence of implementation should be maintained, e.g.:

- company policy about transport for remote sites
- transport logs / schedules
- vehicle maintenance logs
- third party transport contracts.

Auditors should confirm:

- whether there are public transport options to the site;
- how employees travel to and from the work site;

- available vehicles for transport appear safe and sufficient;
- there are no transport fees in wage records.

Useful Resources

N/A

Indicator:	Requirement:
3.2.12	*Indicator applicability: Every UoC that has a site that is easily accessible* The UoC shall not require employees to reside in employee accommodation as a condition of employment for easily accessible sites.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC has a site that is not easily accessible. If the site is easily accessible, then this indicator should be marked N/A.

- The UoC may provide housing for employees that meets the terms of Criterion 3.11: Employee Accommodation.
- When the UoC provides housing, whether it owns, leases or contracts the accommodation from a service provider, the UoC communicates to employees that living in this housing is optional for them.
- The freedom for employees to choose where they live respects employees' dignity and autonomy and prevents coercion and potentially trapping them in exploitative conditions.

Evidence of implementation should be maintained, e.g.:

- employee contracts.

Auditors should confirm:

- whether the worksite is easily accessible via public or private transport
- how many employees live in accommodation provided by the UoC
- that the decision to reside in accommodation provided by the UoC is the employee's own choice

Useful Resources

N/A

Indicator:	Requirement:
3.2.13	The UoC shall not require family members of owners or employees to work. Where family members have the opportunity to work, the UoC shall ensure they are separately and voluntarily contracted.

How do I interpret this requirement?

- If family members wish to be employed, the UoC respects their right to make independent employment decisions by contracting them separately.
- This indicator can be met by:
  - implementing independent recruitment processes for family members, similar to how one would hire any other employee
  - avoiding any forms of coercion or pressure to compel family members to work for the farm.

Evidence of implementation should be maintained, e.g.:

- employee contracts.

Auditors should confirm:

- whether family members live on site, which can increase the likelihood that they may work at the UoC;
- everyone working at the UoC has an employment contract.

  Auditors should not mark this indicator N/A, even where no family members of owners or employees are working at the site. The indicator assesses whether the UoC requires family members to work, which may indicate a risk of forced labour. Where no family members are working, the UoC is considered conforming.

Useful Resources

N/A

Indicator:	Requirement:

3.2.14 *Indicator applicability: Every UoC that operates a store or service*

The UoC shall not require employees to purchase from employer-operated stores or services as a condition of employment. Where alternative stores or services are not available due to the remote location, the UoC shall ensure that goods and services are sold at fair prices.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC operates a store or service. If it does not operate a store or service, then this indicator should be marked N/A.

- The words 'employer-operated' here includes the UoC itself and any services that they may contract to operate a store or service.
- A store may also be operated by employees or employee associations, and even in this case, other employees cannot be required to purchase from them.
- Examples of services can include:
  - laundry service
  - medical service
  - transport service
- Requiring employees to purchase goods or services from employer-operated stores or services is a form of economic coercion and can limit their economic freedom and choices.
- Prices of goods and services should be based on an understanding of reasonable pricing of the same goods and services in the local market. Employers can also make this transparent by providing a cost breakdown of these goods and services.

Evidence of implementation should be maintained, e.g.:

- employee contracts
- payslips and pay records
- any cost breakdown of goods and services in the local market.

Auditors should confirm:

- if there are employer-operated stores and services on site;

- the prices of goods at these facilities;
- if any deductions are made from wages for goods purchased on site;
- employees' perception of their ability to choose where to purchase goods or services.

Useful Resources

N/A

Criterion 3.3 – Child Labour

Throughout this criterion, when we refer to the age of the child, we are referring to a full Western calendar year, where the child is 0 at birth.

Indicator:	Requirement:
3.3.1	The UoC shall not engage in child labour[52]. **Child labour** is work that: o is mentally, physically, socially or morally dangerous and harmful to children; or o interferes with their schooling.

How do I interpret this requirement?

- 'No engagement' means that child labour does not occur:
  - within the UoC's production sites and facilities
  - as a result of actions taken by recruitment agencies for the UoC
  - within the UoC's supply chain.
- A child is anyone under the age of 18.
- Child labour is any unacceptable form of work carried out by children and is prohibited by ASC, including the following:
  - all children under the age of 13 taking part in any economic activity;
  - all children aged 13 and 14 years old engaged in more than light work as stipulated by national, regional and/or local regulations;
  - all children under the age of 18 involved in work that is mentally, physically, socially or morally dangerous and harmful to children or interferes with their schooling.
- Table 2 below shows the ages of children and the type of work that they are permitted to engage in:

[52] If child labour is identified, a critical non-conformity shall be raised by the CAB.

Table 2. Ages of children and type of work permitted:

Allowed type of work	Hazardous work	Non-hazardous work	Light work
Adult Employee aged 18 or older	**Allowed**	**Allowed**	**Allowed**
Young Employee between 15 – 17 years old (and older than the age of mandatory schooling)	**Not allowed**	**Allowed**	**Allowed**
Child engaged in light work between 13 and 14 years old (and anyone younger than the age of mandatory schooling)	**Not allowed**	**Not allowed**	**Allowed**
Child under 13 years old	**Not allowed**	**Not allowed**	**Not allowed**

- ILO notes: 'Not all work done by children should be classified as child labour that is to be targeted for elimination. The participation of children or adolescents above the minimum age for admission to employment in work that does not affect their health and personal development or interfere with their schooling, is generally regarded as being something positive. This includes activities such as assisting in a family business or earning pocket money outside school hours and during school holidays. These kinds of activities contribute to children's development and to the welfare of their families; they provide them with skills and experience, and help to prepare them to be productive members of society during their adult life.'[53]
- If children are assisting at the UoC as part of it being a family business, this would be covered by the scope of this Criterion.

Evidence of implementation should be maintained, e.g.:

- age verification records
- employee contracts

[53] ILO, What is Child Labour? Available at: https://www.ilo.org/international-programme-elimination-child-labour-ipec/what-child-labour

- job descriptions of all employees.

Auditors should confirm:

- presence of general risk factors for child labour in a country;
- NGOs' or other local organisations' knowledge of any reports of child labour in the sector in this region;
- human resources personnel's awareness of any issues in the workplace;
- worker or union representatives' awareness of any issues in the workplace;
- whether or not any children are present at the UoC;
- that employees and managers have an understanding of what is hazardous work and what is light work;
- confirm life or work histories of employees, when a suspicion exists that the age of an employee does not match the records.

Useful Resources

- What is Child Labour? What is child labour | International Labour Organization (ilo.org)
- Supplier Guidance on Preventing, Identifying and Addressing Child Labour, ILO https://www.ilo.org/ipec/Informationresources/WCMS_792211/lang--en/index.htm
- Roundtable on Sustainable Palm Oil Guidance on Child Rights for Palm Oil Producer https://rspo.org/wp-content/uploads/RSPO-GUI-T08-007_V1_ENG_Guidance_on_Child_Rights_for_PO_Producers.pdf#:~:text=The%20RSPO%20standards%20require%20palm,for%20employees%20and%20their%20families.
- Rainforest Alliance Child Labor Guide https://www.rainforest-alliance.org/resource-item/child-labor-guide-an-introduction/
- FAO Guidance on addressing child labour in fisheries and aquaculture: https://www.fao.org/3/i3318e/i3318e.pdf

Indicator:	Requirement:

3.3.2

Indicator applicability: Every UoC where child labour has been identified

If child labour is identified, the UoC shall implement remediation processes that prioritise the best interest of the child, following the method outlined in **Appendix 10**.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if child labour has been identified. If no child labour has been identified, then this indicator should be marked N/A.

- This indicator is applicable only if child labour is identified. The UoC does not need to have a remediation procedure in place to conform.
- If child labour is identified, the UoC shall follow the remediation framework, which is set out in Appendix 10, including timelines, corrective action and reporting obligations.
- Remediation of child labour:
  - will vary depending on the situation and the needs of the child in question
  - always takes into account the best interest of the child
  - is ideally carried out in consultation with local experts such as NGOs.
- When remediating a case of child labour, there can be different steps in the process, which can include:
  - immediate actions to safeguard the child, for example removing them from the work situation to a safe location and locating their parents;
  - medium-term actions to develop a plan to protect the child both in the short and longer term and provide appropriate remedy to the victim, including but not limited to:
    - medical or other care as necessary
    - ensuring they are being safely looked after
    - access to adequate resources for the child and for their education;
  - long-term actions to enact and monitor the plan, which can take up to several years.
- The UoC should engage in a process of developing corrective actions to prevent child labour reoccurring. This can include:

- performing an analysis of what went wrong in their system to prevent it
- implementing measures to prevent future recurrence
- considering working with local experts on this corrective action.

- Potential measures to prevent child labour include:
  - robust age verification system prior to employment
  - facilitate children's access to school
  - employee education about child labour and child rights
  - facilitate access to childcare for employees
  - pay workers a living wage
  - promote community awareness on child labour
  - provide literacy and numeracy training for employees
  - birth registration campaign.
- Given the complexity of human rights issues, partnership with external partners is often necessary to provide effective remediation. They can:
  - provide support for the development of a remediation plan
  - help in implementing the remediation plan
  - help to implement corrective actions to prevent recurrence.
- These potential partners can include:
  - local NGOs
  - individual experts
  - community liaisons/leaders
  - government offices
  - supply chain partners, or others.
- Potential support that these partners can provide could include:
  - training
  - improved access to social services and education
  - advocacy

- directly financial support or other support for the affected person and their families to find other sources of income.

Organisation Type	Potential Services to Remediate Child Labour or Forced Labour
Human rights organisations or expert consultants	○ Support with identification of the affected person(s) ○ Support for remediation plan development ○ Human rights and worker rights training ○ Addressing root causes of abuse
Unions or worker organisations	○ Support for remediation plan development ○ Remediation plan monitoring ○ Human rights and worker rights training ○ Addressing root causes of abuse
Community-based and religious organisations and leaders	○ Support services to former child or forced labourers ○ Advocacy and awareness raising regarding external drivers of the risk of child or forced labour—for example local advocacy with the government to provide access to schools, or campaigns against child labour as a cultural practice
School leadership and staff	○ Facilitate access to education for former child labourers ○ Support advocacy efforts to address external drivers of child labour with community, parents and children
Healthcare providers	○ Medical support to former child or forced labourers ○ Input into remediation plan when there are health concerns
Government agencies	○ Social support services to former child or forced labourers— for example access to government benefits or social programmes
Buyers and retailers	○ Joint efforts to address root causes ○ Financial support for remediation and prevention efforts
Industry organisations and multistakeholder groups	○ Advocacy for system and national-level change in conditions that lead to child or forced labour or other human rights abuses ○ Joint efforts to address root causes

Evidence of implementation should be maintained, e.g.:

- documented remediation procedures
- records and documents of any remediation process that has taken place
- records and documents of any corrective actions that have been put into place
- documented monitoring system in place**.**

Auditors should confirm:

- knowledge and capacity of staff to implement remediation procedures;
- the ability of the site to monitor any corrective actions within their management system;
- knowledge and capacity of staff to develop corrective actions, where necessary.

Useful Resources

- Eliminating Child Labor, Best Practice for Remediation, GoodWeave https://goodweave.org/best-practice-briefs/#:~:text=The%20GoodWeave%20System%20is%20a,root%20causes%20of%20child%20labor

Indicator:	Requirement:
3.3.3	The UoC shall implement an age verification mechanism for all employees and shall maintain records of verified ages.

How do I interpret this requirement?

- An employment process that includes an age verification mechanism helps to confirm that employees are of the age category indicated, thereby enabling the UoC to prevent all forms of child labour.
- Age is verified by legal documentation in a robust age identification process where the UoC requires proof of identity:
  - preferably an official photo ID card such as a national ID or passport, or
  - birth documentation.

- If there are concerns that the identification may not be authentic, the employer can interview the applicant including information on their background (for example about schooling history, family and family members) to make sure that the potential employee is being honest about their age, and the information provided is plausible.
- If there is no identification available, the employer can interview family members and community members, using significant events to help to place the year of the person's birth. For example, finding out if the person was born before or after the big flood in the village.

Evidence of implementation should be maintained, e.g.:

- age verification records.

Auditors should confirm:

- how management implements age verification, which includes checking the ages of employees, and also asking how these ages were verified
- the ages of employees.

Useful Resources

N/A

Indicator:	Requirement:
3.3.4	The UoC shall not employ children under the age of 13 under any circumstances.

How do I interpret this requirement?

- Employing children under the age of 13 carries risks for their physical, mental, social and moral development and wellbeing.
- There are no circumstances in which employing a child under the age of 13 is permitted under the ASC Farm Standard.

Evidence of implementation should be maintained, e.g.:

- age verification records
- employee contracts.

Auditors should confirm:

- whether there are any children living at the site or otherwise present;
- whether employee contracts match the age verification records;
- employees' knowledge of any children having been on site.

Useful Resources

N/A

Indicator:	Requirement:

3.3.5

Indicator applicability: Every UoC employing children aged 13 or 14, or below the age of completion of mandatory schooling

The UoC shall ensure any child employed aged 13 and 14, or below the age of completion of mandatory schooling, only conducts **light work** if permitted by applicable law and where the following conditions are met:

a) a risk assessment is conducted to determine that the work is non-hazardous; and

b) the child receives appropriate training prior to work; and

c) the child receives appropriate supervision; and

d) parental/guardian consent is given; and

e) the work does not interfere with schooling; and

f) the work is for limited hours (see Indicators 3.3.8- 3.3.13).

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing anyone aged 13 or 14, or below the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- The age of completion of mandatory schooling refers to the national, legal age at which children are allowed to leave school.

- If children are below this age, they cannot be employed as young employees and come under the category of only being allowed to conduct light work. For example, if school is mandatory in a country until the age of 16, a 15-year-old child may not be employed as a young employee, but only employed for light work.
- Allowing children to conduct light work means that there are stricter working conditions in place than for other employees, including:
  - the type of work they are able to do
  - the hours they can work
  - the extra support that they need
  - the place that work must have in the wider context of their lives.
- Children aged 13 and 14 may be employed by the UoC for light work when:
  - they are appropriately supervised and trained by adults
  - the work is non-hazardous
  - the work does not interfere with their schooling
  - the work does not take place during normal school hours
  - they have parental/guardian consent to work
  - work is limited to specific times of the day.
- Children helping parents at home with daily chores or participating in other activities unrelated to the function of the UoC are not covered in the scope of the ASC Farm Standard.

Evidence of implementation should be maintained, e.g.:

- age verification records
- job and activity descriptions
- training records
- working hours records
- evidence of parental/guardian consent.

Auditors should confirm:

- the kinds of tasks that all employees are carrying out;

- whether there are any children employed by the UoC;
- whether there are any children living at the UoC with their families;
- who provides supervision of young employees and how;
- young employees' description of their tasks and working hours.

Useful Resources

- United States Department of Labor: The Findings on the Worst Forms of Child Labour report (updated annually): https://www.dol.gov/agencies/ilab/resources/reports/child-labor/findings

Indicator:	Requirement:

3.3.6

Indicator applicability: Every UoC employing young employees aged 15 or above and above the age of completion of mandatory schooling

The UoC shall ensure any young employees only conduct work where the following conditions are met:

a) a risk assessment is conducted to determine that the work is non-hazardous; and

b) the young employee receives appropriate training prior to work; and

c) the young employee receives appropriate supervision; and

d) parental/guardian consent is given; and

e) work is for limited hours (see Indicators 3.3.8, 3.3.9, 3.3.14-3.3.17).

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing young employees aged 15 or above and above the age of completion of mandatory schooling. If there are no employees in this category, this indicator should be marked N/A.

- The UoC:
  - understands whether a child is allowed to be classed as a young employee
  - understands the legal requirements for children to attend school in their country of operation

- ensures that young employees do not engage in work that is hazardous
- conforms with the working hours limits set out in this criterion.

- Children aged 15, 16 and 17 may be employed by the UoC as young employees, as long as:
  - the work is not hazardous
  - they are appropriately supervised and trained
  - they are above the age of mandatory schooling
  - they have parental/guardian consent to work
  - the national, regional, and/or local law permits children to work.
- Children below the age of completion of mandatory schooling are not allowed to be employed as young employees but may be permitted to conduct light work. For example, if school is mandatory in a country until the age of 16, a 15-year-old child may not be employed as a young employee, but only employed for light work.
- Children are prohibited not only from any work that has been deemed hazardous for adults, but also from work that may not be hazardous for adults but that may be for children, for example:
  - a job that requires long periods of isolation without human contact, which can cause mental harm such as stress, anxiety and depression to a child;
  - physical work carrying heavy loads, which can lead to physical injury and permanent damage to a body that is still developing.

Evidence of implementation should be maintained, e.g.:

- risk assessment documents
- training records
- age verification records
- job and activity descriptions
- evidence of parental/guardian consent.

Auditors should confirm:

- the kinds of tasks that all employees are carrying out;
- whether there are any children employed by the UoC;

- whether there are any children living at the UoC with their families;
- who provides supervision of young employees and how;
- young employees' description of their tasks and working hours.

Useful Resources

- United States Department of Labor: The Findings on the Worst Forms of Child Labour report (updated annually): https://www.dol.gov/agencies/ilab/resources/reports/child-labor/findings

Indicator:	Requirement:

3.3.7 *Indicator applicability: Every UoC with children living at the site.*

The UoC shall facilitate school attendance for any children living at the site.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if there are children living on the site. If there are no children living on the site, then this indicator should be marked N/A.

- Ensuring access to education helps prevent child labour.
- No child under 18 working at the UoC may be:
  - deprived of educational opportunities (including attending school during school hours or after school activities)
  - forced to leave, drop out, or otherwise depart school early
  - forced to combine school attendance with long working hours.
- When employees and their families live on site, the UoC supports access to schools for employees' children. This may mean, for example:
  - providing parents the time to drop off and pick up their children
  - providing a bus service or bicycles to reach school when the nearest school is outside walking distance
  - raising awareness among employees about the importance of children attending school.

- If children live off the UoC site, but on another site or at accommodation provided by the UoC, this indicator applies.

Evidence of implementation should be maintained, e.g.:

- age verification records
- information about which children live on the site.

Auditors should confirm:

- whether there are any children living on the site with their families;
- the availability of schools in the local area
- whether children living on site are attending school and how they get there.

Useful Resources

N/A

Indicator:	Requirement:
3.3.8	*Indicator applicability: Every UoC employing people under the age of 18* The UoC shall ensure that all employees under the age of 18 have at least 48 consecutive hours of rest within a seven-day period.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing anyone under the age of 18. If there are no employees under the age of 18, then this indicator should be marked N/A.

- Excessive working hours can have a detrimental physical and mental impact on all people, but particularly on children under the age of 18 who have not yet reached adulthood.
- Protecting children from excessive working hours is an important part of the prevention of child labour.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records
- young employee contracts.

Auditors should confirm:

- whether anyone under the age of 18 is employed at the UoC;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Indicator:	Requirement:
3.3.9	*Indicator applicability: Every UoC employing people under the age of 18.* The UoC shall not allow overtime hours for employees under the age of 18.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing anyone under the age of 18. If there are no employees under the age of 18, this indicator should be marked N/A.

- Any hours over and above the standard contracted hours are considered overtime. For example, an employee could be contracted to a standard four-hour week and if they were to work the fifth hour, this would be deemed as overtime.
- Employees under the age of 18 are not allowed to work any hours over their standard contracted hours.

- Excessive working hours can have a detrimental physical and mental impact on all people, but particularly on children under the age of 18 who have not yet reached adulthood.
- Protecting children from excessive working hours is an important part of the prevention of child labour.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records
- young employee contracts.

Auditors should confirm:

- whether anyone under the age of 18 is employed at the UoC;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Indicator:	Requirement:

3.3.10 *Indicator applicability: Every UoC employing children aged 13 or 14, or below the age of completion of mandatory schooling*

The UoC shall ensure that children conducting light work:

a) do not work more than 14 hours per week (excluding breaks); and

b) do not work more than 2 hours per day on a school day (excluding breaks); and

c) do not work more than 3 hours per day on a non-school day (excluding breaks); and

d) have a combined time for school, work and transportation to and from school and work totalling less than 8 hours per day (excluding breaks).

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing anyone aged 13 or 14, or below the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- Excessive working hours can have a detrimental physical and mental impact on all people, but particularly on children under the age of 18 who have not yet reached adulthood.
- Protecting children from excessive working hours is an important part of the prevention of child labour.
- Children engaged in light work have restrictions on the number of hours that they can work:
  - on a school day to ensure that work does not interfere with their schooling
  - on a non-school day and across a week to ensure that they are not working an excessive number of hours, and have adequate time for education, rest and play.
- Requiring that a child conducting light work spends no more than 8 hours per day at school, work and on transportation is important for allowing them to have adequate rest and leisure time.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records

- payslips and pay records
- young employees' contracts.

Auditors should confirm:

- whether anyone under the age of 15 or below the age of completion of mandatory schooling is employed at the UoC;
- working hours and rest hours of employees under the age of 15 or below the age of completion of mandatory schooling;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Indicator:	Requirement:

3.3.11

Indicator applicability: Every UoC employing children aged 13 or 14, or below the age of completion of mandatory schooling

The UoC shall ensure that where children conduct light work for more than 2 hours on a non-school day, an additional 0.5-hour break period is included within the shift.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing anyone aged 13 or 14, or below the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- Excessive working hours can have a detrimental physical and mental impact on all people, but particularly on children under the age of 18 who have not yet reached adulthood.
- Protecting children from excessive working hours is an important part of the prevention of child labour.
- Children engaged in light work should have regular breaks.

- Where a child is conducting light work for a period of more than 2 hours (only applicable on a non-school day under the ASC Farm Standard), they shall be given a 0.5-hour break period.
- Some examples that demonstrate conformance with the ASC Farm Standard:
  - Child A works on a Saturday morning from 9:00 - 11:00. She has a 30-minute break and works again from 11:30 - 12:30.
    - Child A's example conforms because she is working no more than 3 hours on a non-school day, and she is given a break of 0.5 hours within the work shift.
  - Child B works on a Tuesday afternoon from 15:00 - 17:00 and then goes home.
    - Child B's example conforms because he is working no more than 2 hours on a school day.
- Some examples that demonstrate non-conformance with the ASC Farm Standard:
  - Child C works on a Saturday morning from 9:00 - 11:30 and then goes home.
    - Child C's example does not conform because she has worked more than 2 hours without a break.
  - Child D works on a Tuesday afternoon from 15:00 - 17:30 and then goes home.
    - Child D's example does not conform because he has worked more than 2 hours on a school day.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records
- young employees' contracts.

Auditors should confirm:

- whether anyone under the age of 15 or below the age of completion of mandatory schooling is employed at the UoC;
- working hours and rest hours of employees under the age of 15 or below the age of completion of mandatory schooling;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Indicator:	Requirement:

3.3.12 *Indicator applicability: Every UoC employing children aged 13 or 14, or below the age of completion of mandatory schooling*

The UoC shall ensure that children conducting light work have a daily rest period of at least 14 consecutive hours within a 24-hour period.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing anyone aged 13 or 14, or below the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- Excessive working hours can have a detrimental physical and mental impact on all people, but particularly on children under the age of 18 who have not yet reached adulthood.
- Protecting children from excessive working hours is an important part of the prevention of child labour.
- A rest period means a time when children are not working.
- A rest period of 14 consecutive hours in a 24-hour period means that children have a sufficient amount of time to rest and sleep in between times when they are conducting light work.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records
- young employees' contracts.

Auditors should confirm:

- whether anyone under the age of 15 or below the age of completion of mandatory schooling is employed at the UoC;
- working hours and rest hours of employees under the age of 15 or below the age of completion of mandatory schooling;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources N/A

Indicator:	Requirement:
3.3.13	*Indicator applicability: Every UoC employing children aged 13 or 14, or below the age of completion of mandatory schooling* The UoC shall ensure that children conducting light work do not work between 8pm and 6am.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing anyone aged 13 or 14, or below the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- Working at night can be hazardous, particularly for children:
  - they can be tired and therefore more susceptible to accidents
  - working conditions at night are often more dangerous and not suitable for children.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records

- young employees' contracts.

Auditors should confirm:

- whether anyone under the age of 15 or below the age of completion of mandatory schooling is employed at the UoC;
- working hours and rest hours of employees under the age of 15 or below the age of completion of mandatory schooling;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Indicator:	Requirement:

3.3.14

Indicator applicability: Every UoC employing young employees aged 15 or above and above the age of completion of mandatory schooling

The UoC shall ensure that young employees:

a. do not work more than 40 hours per week; and

b. do not work more than 8 hours per day; and

- have a combined time for school, work and transportation to and from school and work totalling less than 10 hours per day.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing young employees aged 15 or above and above the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- Excessive working hours can have a detrimental physical and mental impact on all people, but particularly on children under the age of 18 who have not yet reached adulthood.

- Protecting children from excessive working hours is an important part of the prevention of child labour.
- Young employees have restrictions on the number of hours that they can work to ensure that they are not working an excessive number of hours, and have adequate time for education, rest and play.
- Requiring that a young employee spends no more than 10 hours per day at school, work and on transportation is important for allowing them to have adequate rest and leisure time.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records
- young employees' contracts.

Auditors should confirm:

- whether anyone under the age of 18 is employed at the UoC;
- working hours and rest hours of employees under the age of 18;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Indicator:	Requirement:
3.3.15	*Indicator applicability: Every UoC employing young employees aged 15 or above and above the age of completion of mandatory schooling* The UoC shall ensure that young employees have a total break time of at least 1 hour within 8 consecutive hours of work, with at least 0.5 hours break within any 4.5 consecutive hours of work.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing young employees aged 15 or above and above the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- Excessive working hours can have a detrimental physical and mental impact on all people, but particularly on children under the age of 18 who have not yet reached adulthood.
- Protecting children from excessive working hours is an important part of the prevention of child labour.
- Young employees should have regular breaks. A young employee should have at least 1 hour break within 8 hours of work, and at least 0.5 hours break within 4.5 hours of work.
- Some examples that demonstrate conformance with the ASC Farm Standard:
    - A works on a Monday from 9:00 - 17:00 and has a break for lunch from 12:00 -13:00.
        - A's example conforms because her workday is no more than 8 hours long and within those 8 hours, she has 1 hour break.
    - B works on a Thursday afternoon from 10:00 - 14:30 and has a break from 12:00 - 12:30.
        - B's example conforms because he is working 4.5 hours with a 0.5-hour break in that time.
- Some examples that demonstrate non-conformance with the ASC Farm Standard:
    - C works on a Friday from 9:00 - 18:00 and has a break for lunch from 12:00 -13:00.
        - C's example does not conform because, even though she has a 1-hour break, her workday is 9 hours long.
    - Child D works on a Tuesday afternoon from 13:00 - 18:00 and then goes home.
        - Child D's example does not conform because he has worked more than 4.5 hours without a break.
- Some farms may not use a 'clocking in and out' system for breaks so may not have documented records of break times, in which case the auditor can verify this indicator through:
    - speaking to workers;
    - reviewing contracts; and

- any planning documents relating to working hours.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records
- young employees' contracts.

Auditors should confirm:

- whether anyone under the age of 18 is employed at the UoC;
- working hours and rest hours of employees under the age of 18;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Indicator:	Requirement:
3.3.16	*Indicator applicability: Every UoC employing young employees aged 15 or above and above the age of completion of mandatory schooling* The UoC shall ensure that young employees have a daily rest period of at least 12 consecutive hours within a 24-hour period.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing young employees aged 15 or above and above the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- Excessive working hours can have a detrimental physical and mental impact on all people, but particularly on children under the age of 18 who have not yet reached adulthood.

- Protecting children from excessive working hours is an important part of the prevention of child labour.
- A rest period means a time when employees are not working.
- A rest period of 12 consecutive hours in a 24-hour period means that children have a sufficient amount of time to rest and sleep in between times when they are conducting light work.
- This indicator refers to a 24-hour period, not a 24-hour working period.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records
- young employees' contracts.

Auditors should confirm:

- whether anyone under the age of 18 is employed at the UoC;
- working hours and rest hours of employees under the age of 18;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Indicator:	Requirement:

3.3.17

Indicator applicability: Every UoC employing young employees aged 15 or above and above the age of completion of mandatory schooling

The UoC shall ensure that young employees do not work between 10pm and 6am.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is employing young employees aged 15 or above and above the age of completion of mandatory schooling. If there are no employees in this category, then this indicator should be marked N/A.

- Working at night can be hazardous, particularly for young employees:
  - they can be tired and therefore more susceptible to accidents
  - working conditions at night are often more dangerous and not suitable for children under the age of 18.

Evidence of implementation should be maintained, e.g.:

- age verification records
- working hours records
- payslips and pay records
- young employees' contracts.

Auditors should confirm:

- whether anyone under the age of 18 is employed at the UoC;
- working hours and rest hours of employees under the age of 18;
- that information in contracts, age verification records and payslips match;
- young employees' description of their working hours.

Useful Resources

N/A

Criterion 3.4 - Discrimination and Harassment

Indicator:	Requirement:
3.4.1	The UoC shall not engage in or tolerate any form of discrimination, and shall ensure that all employees and applicants receive equal treatment and opportunities in all employment and recruitment practices.

How do I interpret this requirement?

- Discrimination is the unequal treatment of different of people, based on their personal characteristics, such as:
  - Identity: age, colour, disability, ethnicity or race, sexual orientation
  - Gender and family status: gender, martial or parental status, pregnancy
  - Social status and background: caste, nationality, legal status
  - Beliefs and associations: political opinion, participation in trade unions
- Discrimination is a global and pervasive problem that causes negative impacts on many levels. It can lead to unequal treatment, stress and harm for individuals at home, in society and in the workplace. Discrimination can also perpetuate poverty and hinder development and productivity.
- Sometimes discrimination can be obvious and clear, but at other times it can be difficult to detect and consequently, hard to address.
- Equal opportunities mean:
  - equal pay for equal work
  - equal living standard for equal work
  - equal employment possibilities for equal ability/engagement
  - equal promotion possibilities for equal ability/engagement.
- Equal opportunities at work means that all employees in an organisation, regardless of their personal characteristics, have the same opportunities for:
  - education
  - training

- career development
- chances to apply for and be selected for posts
- chances to be promoted.

- Table 3 below shows some examples of situations considered and not considered discrimination.

Table 3. Examples of discrimination situations:

Situations that are considered discrimination	Situations that are not considered discrimination
A and B are both managers doing the same job at the farm. A is a man and B is a woman. A is paid a higher salary than B, because he is a man.	A is a manager and B is a machine operator with less responsibility. A is paid a higher salary than B because the job has more responsibility.
A and B both apply for the same job. A has higher qualifications than B, but B is selected for the job because he comes from the same church as the farm manager.	A and B both apply for the same job. A has higher qualifications than B, so A is selected for the job.
A and B are both technical assistants. A has been in the company for a longer period of time than B and both have equal performance, however, only B has received access to multiple training courses and been offered a promotion to technical manager, because A is a migrant worker.	A and B are both technical assistants. A has been in the company for a longer period of time than B, but B has been showing a higher performance. B is promoted to technical manager.

Evidence of implementation should be maintained, e.g.:

- terms of service between recruitment agencies and the UoC
- documents from recruitment processes
- payslips and pay records
- employee contracts and terms and conditions
- anti-discrimination policies

- hiring and promotion policies
- diversity and inclusion policies
- training records for employees and managers related to non-discrimination
- termination and disciplinary records.

Auditors should confirm:

- whether employees feel that they and their colleagues receive equal treatment, and that promotions are based on merit;
- whether the composition of the workforce at different levels suggests there are no barriers for certain groups to be promoted.

Useful Resources

- The Equal Opportunities Commission: www.eoc.org.uk
- European Foundation for the Improvement of Living and Working Conditions: https://www.eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary/equal-opportunities

Indicator:	Requirement:
3.4.2	The UoC shall not engage in or tolerate any form of violence or harassment.

How do I interpret this requirement?

- 'The term 'violence and harassment' in the world of work refers to a range of unacceptable behaviours and practices or threats thereof, whether a single occurrence or repeated, that aim at, result in, or are likely to result in physical, psychological, sexual or economic harm, and includes gender-based violence and harassment.' [54]
- Violence and harassment can come in many forms, including[55]:
  - Sexual harassment;

[54] Convention C190 - Violence and Harassment Convention, 2019 (No. 190) (ilo.org)
[55] CCOHS: Violence and Harassment in the Workplace

- mental or emotional abuse;
- verbal abuse;
- threats, intimidation, or coercion;
- physical violence.

- Examples of harassment in the workplace can include the following[56]:
  - spreading malicious rumours
  - unfair treatment
  - picking on or regularly undermining someone
  - denying someone training or promotion opportunities.
- Harassment may occur in person, in writing, or online. It may happen at the farm or another place where work-related events or interactions occur.
- It can be:
  - undertaken by a single person or group of people
  - hidden (for example, gossiping about someone in their absence)
  - overt (for example, an unwanted nickname that undermines someone).
- One widespread form of harassment is sexual harassment, which can take place in the workplace and is any unwanted behaviour of a sexual nature. Examples can include[57]:
  - anything that violates someone's dignity
  - inappropriately and uncomfortably crowding someone else
  - telling sexually offensive jokes
  - making sexual remarks or gestures about someone's body, clothing or appearance
  - making sexual comments or jokes about someone's sexual orientation or gender reassignment
  - asking questions about someone's sex life
  - displaying or sharing pornographic or sexual images, or other sexual content

[56] Workplace bullying and harassment - GOV.UK (www.gov.uk)
[57] What sexual harassment is - Sexual harassment - Acas

- touching someone against their will
- sexual assault or rape.

- Power imbalances can play a part in harassment. Responsible management includes being aware of a manager's position in relation to the people who they manage. For example:
  - something that could be a joke between two friends outside the workplace can be a case of harassment in the workplace if there is an unequal balance of power;
  - someone in management making a flirtatious comment to a junior colleague is not appropriate, whereas the same comment between two friends might be acceptable.
- Some steps towards the prevention of harassment and discrimination can include:
  - employees and management are trained and know and understand what harassment and discrimination are
  - the UoC clearly states its position on discrimination through an internal code of conduct, policy or in a statement
  - the UoC assesses where there is potential for discrimination. For example, the UoC acknowledges the high number of migrant employees and understands that this is potentially a group who are at risk of being discriminated against
  - the UoC develops an action plan to prevent discrimination, which includes monitoring where there is a risk of discrimination.
- Providing good communication of what these behaviours look like and why they are not permitted creates awareness among employees in the workplace.
- Regular dialogue with employees and with employee representatives can be an effective way of monitoring what is going on.
- An accessible, safe and anonymous reporting system (grievance mechanism) can give employees the ability to report violence or harassment.

Evidence of implementation should be maintained, e.g.:

- anti-harassment policy that includes the prohibition of abusive and exploitative behaviour
- training records
- disciplinary records
- health and safety incident reports
- grievances that have been reported.

Auditors should confirm:

- employees understand what they should do if any violence or harassment takes place;
- employees are familiar with the UoC's position on violence and harassment;
- employees' perceptions of how they or their colleagues are treated;
- any instances of violence and harassment that have taken place and how they have been dealt with;
- there are no unusually high staff turnover rates;
- human resources personnel are aware of any issues in the workplace;
- worker or union representatives are aware of any issues in the workplace.

Useful Resources

N/A

Indicator:	Requirement:
3.4.3	The UoC shall ensure that employees, whether employed directly or through a recruitment agency, are not tested for pregnancy or virginity and are not forced or coerced into involuntary contraception.

How do I interpret this requirement?

- Tests for virginity sometimes take place in some parts of the world as a custom and practice, with the social expectation that women and girls should remain 'virgins' until they are married.
- The term 'virginity', as used in this way, is not a medical or scientific term, but a social and cultural construct that reflects discrimination against women and girls.
- It is discrimination if a woman is tested for pregnancy during recruitment.
- This indicator helps:
  - prevent this kind of discrimination by ensuring that testing for pregnancy or virginity is not permitted
  - protect women against unnecessary and potentially invasive tests.

- The ASC Farm Standard does not permit testing for pregnancy during recruitment or ongoing employment but having a company policy that states that pregnancies need to be declared from a certain point onwards, for health and safety reasons, is appropriate and can be necessary for safeguarding a mother and baby's health.

Evidence of implementation should be maintained, e.g.:

- terms of service between recruitment agencies and the UoC
- documents from recruitment processes
- information about which, if any, medical tests are conducted
- hiring and medical examination policies.

Auditors should confirm:

- the experiences of female employees during the hiring process;
- medical tests are only carried out based on a risk assessment (see also 3.4.5).
- When verifying this requirement through worker interviews, auditors should use general, open and neutral questions about medical tests, rather than asking directly about specific tests such as pregnancy or virginity testing. This helps reduce discomfort and encourages more open discussion of sensitive topics.

Useful Resources

- https://www.who.int/news/item/17-10-2018-united-nations-agencies-call-for-ban-on-virginity-testing

Indicator:	Requirement:

3.4.4 The UoC shall ensure that medical tests are only conducted during the recruitment process if required for the function of the job or by applicable law, including where any recruitment agencies are used.

How do I interpret this requirement?

- There are occasional situations where the UoC, or the agency involved in recruitment may need to perform medical tests. For example:
  - it is required by law.
  - if the function of the job requires it.
  - for health and safety reasons.
  - determining whether a medical test is necessary happens through a health and safety risk assessment (Indicator 3.5.4).
- Examples of when medical tests may be allowed are:
  - when the function of a job might require a medical test, such as in the recruitment of divers. A diver may have to undergo a chest x-ray to demonstrate that they are fit enough to dive regularly.
  - when an employee is asked to test for COVID-19 before coming into the workplace, to avoid the spread of the disease.
  - when a test may be required by national law, such as the existence of laws in 25 countries that make HIV testing mandatory to obtain a work or residence permit: https://lawsandpolicies.unaids.org/topicresult?i=25&lan=en.
- Examples of when medical tests may not be allowed are:
  - a test for sexually transmitted infections (STI), which could lead to discrimination about someone's sexual practices and/or ability to work.
  - when an HIV test is given outside of the 25 countries that make HIV testing mandatory to obtain a work or residence permit, as they are not relevant for the function of any jobs in aquaculture.

Evidence of implementation should be maintained, e.g.:

- terms of service between recruitment agencies and the UoC
- documents from recruitment processes
- health and safety and food safety risk assessments that require medical testing
- information about which medical tests are required.

Auditors should confirm:

- where medical tests are required, the decision for these tests has been based on the outcome of a risk assessment;
- employees understand the reasons for the medical tests.

Useful Resources N/A

Indicator:	Requirement:
3.4.5	The UoC shall only require medical tests during employment if justified by a healthy and safety or food safety risk assessment or if required by law.

How do I interpret this requirement?

- There are occasional situations where the UoC, or the agency involved in recruitment may need to perform medical tests. For example:
  - it is required by law
  - if the function of the job requires it
  - for health and safety reasons.
- Determining whether a medical test is necessary happens through a health and safety risk assessment (Indicator 3.5.4).
- Examples of when medical tests may or may not be allowed are:
  - An example of when the function of a job might require a medical test is the recruitment of divers, a diver may have to undergo a chest x-ray to demonstrate that they are fit enough to dive regularly.

- An example of when a medical test might be necessary is if an employee is asked to test for Covid-19 before coming into the workplace, to avoid the spread of the disease.
- An example of when a medical test is not allowed is an STI test, which could lead to discrimination about someone's sexual practices and / or ability to work.
- An example of when a test may be required by national law is the existence of laws in 25 countries that have a law that makes HIV testing mandatory to obtain a work or residence permit: https://lawsandpolicies.unaids.org/topicresult?i=25&lan=en. Outside of these 25 countries, an HIV test is not necessary and would not be conducted as it is not relevant for the function of any jobs in aquaculture.

Evidence of implementation should be maintained, e.g.:

- terms of service between recruitment agencies and the UoC
- documents from recruitment processes
- health and safety and food safety risk assessments that require medical testing
- information about which medical tests are required.

Auditors should confirm:

- where medical tests are required, the decision for these tests has been based on the outcome of a risk assessment;
- employees understand the reasons for the medical tests.

Useful Resources

N/A

Indicator:	Requirement:

3.4.6

Indicator applicability: Every UoC that requires medical tests.

The UoC shall, when requiring medical tests (see Indicators 3.4.4 and 3.4.5), ensure that:

a. employees understand the reasons for the tests; and

b. employees' medical information is confidential; and

c. employees have access to their test results; and

d. employees are not charged for the tests.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC requires medical tests. If no medical tests are required, then this indicator should be marked N/A.

- Any reasons for medical tests are clearly communicated to the employee or prospective employee, at time of recruitment where necessary.
- The employee or prospective employee has the right to their test results and the UoC ensures that the results are kept confidential.
- The cost of medical tests is paid by the UoC and is not a cost that is charged to the employee or prospective employee.
- Costs incurred by employees or prospective employees towards medical tests, if using an independent doctor, are to be reimbursed within an agreed time period.

Evidence of implementation should be maintained, e.g.:

- terms of service between recruitment agencies and the UoC
- documents from recruitment processes
- information about which medical tests are required
- evidence of provision of copies of medical tests to employees.

Auditors should confirm:

- employees understand the reasons for the medical tests;
- employees have access to their test results and they are confidential;

- there are no costs incurred by employees for any medical tests.

Useful Resources

N/A

Criterion 3.5 – Health and Safety

Indicator:	Requirement:
3.5.1	The UoC shall carry out a site-specific health and safety risk assessment, approved by a member of senior management, following the method outlined in **Appendix 3 (3.4)**.

How do I interpret this requirement?

- "A risk assessment is simply a careful examination of what, in the workplace, could cause harm to people"[58].
- Appendix 3, sections 3.2 and 3.4 outline the steps that should be followed to conduct the Health and Safety risk assessment.

Examples of likelihood and severity are presented in Table 4 and Table 5 below.

Table 4. Example likelihood categories for a Health and Safety Risk Assessment (HSRA).

Likelihood category	Description	Example
Low	Could occur, but is unlikely to occur (e.g., once every 5-10 years or rarely).	A shark attack during a dive in a low-risk area or equipment failure (e.g., regulator malfunction) in well-maintained gear.
Medium	Might occur occasionally (e.g., once every 1–5 years).	Entanglement in nets during routine maintenance.
High	Expected to occur frequently (e.g., multiple times per year or operation).	Slips/trips on wet deck surfaces during daily farm operations.

Table 5. Example severity levels for a HSRA.

Severity	Description	Example
Low	Minor impact (e.g., no injury, first aid treatment, or negligible damage).	Minor scratch from handling equipment or a sprained ankle from slipping.
Medium	Moderate impact (e.g., medical treatment required, short-term disability, or equipment damage).	Decompression sickness (DCS) requiring chamber treatment or fracture from a fall.

[58] https://www.ilo.org/media/453896/download#:~:text=A%20risk%20assessment%20is%20simply,and%20members%20of%20the%20public.

High	Severe or catastrophic impact (e.g., fatality, permanent disability, or major damage).	Drowning due to entanglement or fatal decompression sickness.

- The risks assessment should:
  - cover all site activities;
  - result in contingency or prevention measures for all risks identified.
- The risk assessment should be reviewed and revised:
  - prior to starting a new activity;
  - following feedback on major issues from employees;
  - when a new site is added to the UoC;
  - when there has been a significant change to the process;
  - following accidents or near misses;
  - annually.

Evidence of implementation should be maintained, e.g.:

- documented health and safety risk assessments
- list of contingency and preventative measures to mitigate the risks.

Auditors should confirm:

- that the risk assessment is complete, and all risks have been identified and assessed;
- that control measures have been implemented and a plan for monitoring and reviewing those measures is in place;
- the member of staff that is responsible for conducting and maintaining the risk assessment has a good understanding of the different risks on site, and the actions taken to mitigate them.

Useful Resources

- https://www.ilo.org/media/453896/download#:~:text=A%20risk%20assessment%20is%20simply,and%20members%20of%20the%20public

Indicator:	Requirement:

3.5.2 The UoC shall ensure that the person conducting the site-specific health and safety risk assessment has the necessary competencies, experience and training. Where applicable regulatory competency requirements exist, the UoC shall ensure that the person conducting the site-specific health and safety risk assessment complies with these requirements.

How do I interpret this requirement?

- The UoC defines the competencies required to conduct an effective site-specific health and safety risk assessment and ensures that the person responsible meets these requirements.
  - Where legal or regulatory requirements specify what qualifications or training the person must have, these apply.
- The person carrying out the health and safety risk assessment should be able to show, appropriate to the size, complexity and risk profile of the UoC, that they have the knowledge, skills, experience and/or training needed to conduct a sound assessment. This may include:
  - Knowledge and understanding, e.g.:
    - different steps of a risk assessment process
    - health and safety risks inherent in aquaculture operations
    - the UoC's site context, activities, workforce and roles
  - Practical ability, e.g.:
    - record risks in a clear and consistent way
    - identify risks in all of the different areas of the site and operations of the UoC
    - identify preventative and mitigation measures for risks
  - Experience and training, e.g.:
    - previous experience conducting health and safety risk assessments
    - relevant training, which may include ASC training, training from an external provider, or on-the-job training from someone experienced in conducting health and safety risk assessments.

Evidence of implementation should be maintained, e.g.:

- records showing who conducted the health and safety risk assessment;
- evidence of the competence of the person conducting the assessment;
- health and safety risk assessment.

Auditors should confirm:

- what applicable legal requirements there are for health and safety risk assessments;
- how the UoC determined what competencies were necessary for the person conducting the assessment (e.g. through management interviews);
- the UoC's rationale for considering the responsible person competent; and
- how effective and thorough the risk assessment is that is in place.

Useful Resources

N/A

Indicator:	Requirement:
3.5.3	The UoC shall allow any person the freedom to remove themselves from an unsafe situation without seeking permission and without fear of retribution.

How do I interpret this requirement?

- This requirement is applicable to both the workplace and any accommodation facilities provided by the UoC.
- An employee could decide that a workplace is unsafe if there are significant risks to health or safety due to, for example:
  - inadequate safety measures
  - faulty equipment
  - lack of training
  - hazardous substances

- non-compliance with safety laws
- anything that makes the employee feel unsafe.

- If an employee feels unsafe, they do not need to ask prior permission to remove themselves from the situation.
- Retribution can take many forms and can be:
  - obvious punishment, for example, physical threats, verbal threats or warnings.
  - hidden punishment, for example, being ignored for a promotion, being refused requests that are unrelated to the unsafe situation, hostile treatment.
- Management can communicate to employees that they are able to remove themselves from any unsafe situations, for example through:
  - training
  - information in their contracts
  - verbal explanations.

Evidence of implementation should be maintained, e.g.:

- employee contracts
- health and safety training records

Auditors should confirm:

- employees understand that they are able to remove themselves from unsafe situations without fear of retribution;
- employees understand what unsafe situations may occur and are aware of escape routes and emergency procedures;
- management understand that employees have the right to remove themselves from unsafe situations without fear of retribution.

Useful Resources

N/A

Indicator:	Requirement:

3.5.4 The UoC shall ensure that any person with a medical condition, or who is pregnant, does not conduct hazardous work as determined by a personalised health and safety risk assessment (see also Indicator 3.5.1).

How do I interpret this requirement?

- This requirement is intended to prevent workplace incidents and protect workers who may be more vulnerable from harm.
- The UoC should ensure that this is not applied in a way that violates anti-discrimination laws or fails to consider individual circumstances.
- Implementation of this requirement could be considered discriminatory if:
  - It is applied as a blanket rule (e.g., all pregnant workers or all workers with medical conditions are automatically excluded from hazardous work without individual assessment).
  - It fails to provide reasonable adjustments or accommodations for workers with medical conditions or disabilities (e.g., adjusted work schedules, monitoring).
  - It is based on stereotypes or assumptions rather than objective risk assessments.
  - It lacks transparency or justification.
- Implementation of this requirement is non-discriminatory if:
  - It is based on an individual, objective risk assessment.
  - It provides reasonable accommodations where possible.
  - It complies with health and safety laws.
  - It is applied consistently.
  - It is temporary and proportional.
- To ensure the requirement is applied in a non-discriminatory way, the UoC can:
  - Conduct individual risk assessments based on medical condition and input from the employee involved (e.g., severity, stability, impact on diving fitness), role and tasks (e.g., diving vs. shore-based work), specific hazards of the work (e.g., depth, currents, equipment).

- Provide, in consultation with the employee, reasonable alternatives to exclusion, such as reassigning to non-hazardous tasks (e.g., office work, equipment maintenance on shore), adjusting work conditions (e.g., shorter dive times, shallower depths, additional breaks), providing assistive equipment (e.g., ergonomic tools for workers with mobility limitations).
- Base decisions on medical evidence
- Use the same risk assessment process for all workers, regardless of gender, pregnancy, or medical condition.
- Avoid stereotypes (e.g., assuming all pregnant workers are fragile or all workers with disabilities are incapable).
- Communicate transparently explaining the reasoning behind exclusions to the worker (e.g., "You are excluded from diving because the risk assessment determined that the physical strain could harm your pregnancy.") and provide written documentation of the risk assessment and medical advice.
- Comply with local laws and consult legal experts to ensure compliance with anti-discrimination and health/safety laws in your jurisdiction.

o Hazardous work can include:

- working with chemicals or dangerous substances
- working at heights or in dangerous situations
- heavy lifting or work that is physically challenging
- working with heavy machinery.

o Examples of adjusting working conditions for pregnant women can include:

- reducing physical stress, this includes limiting the weight that employees are lifting:
  - week 1-19 of the pregnancy: maximum of 10 kilos at a time
  - week 20-29 of pregnancy: maximum of 5 kilos up to 10 times a day
  - from week 30 of pregnancy, maximum of 5 kilos up to 5 times a day
  - from week 28 of pregnancy, the employee also shouldn’t bend or kneel more than once an hour
  - up to 6 months after giving birth, any work involving lifting, carrying, pulling, and pushing objects should be slowly built up

- avoiding pregnant women performing tasks under environmental (atmospheric) pressure, such as diving
- not exposing pregnant and breastfeeding mothers to hazardous substances and bacteria that can harm the (unborn) child.

Evidence of implementation should be maintained, e.g.:

- documented health and safety risk assessments.

Auditors should confirm:

- whether there are pregnant women or people with medical conditions working at the UoC;
- whether or not they have been included in the health and safety risk assessment;
- that staff responsible for health and safety have an understanding of the particular risks that face pregnant women and people with a medical condition, and how to mitigate those risks.

Useful Resources

N/A

Indicator:	Requirement:

3.5.5 The UoC shall ensure that any person working on the site receives health and safety training as required to carry out their job. The UoC shall ensure that training is:

a) free of charge; and

b) provided in a timely manner; and

c) repeated on a regular basis; and

d) conducted during regularly remunerated working hours, or the person is compensated for their time; and

e) updated as necessary based on new procedures or equipment; and

f) documented, and records maintained.

How do I interpret this requirement?

- Training is important because it contributes to shared responsibility for health and safety, and a workplace where everyone is protected.
- Training is delivered in a format and language that all employees can understand:
  - provisions are made for anyone who is illiterate
  - the UoC is responsible for ensuring that all employees have understood the training.
- Training is documented so that it is clear who has attended and what they were trained on.

Evidence of implementation should be maintained, e.g.:

- training records demonstrating regular training sessions and content trained on
- attendance records confirming that all employees have been trained.

Auditors should confirm:

- employees understand the different health and safety risks present at the site;
- employees understand good practices around health and safety at the site;
- employees have not paid for the training, and it has taken place either during working hours, or they have been paid for the time that they have given to the training.

Indicator:	Requirement:

3.5.6 The UoC shall maintain written records of health and safety accidents and near misses, determine the cause and implement appropriate corrective actions to prevent recurrence.

How do I interpret this requirement?

- An accident is an unexpected event that causes injury, illness, or material damage.
  - An injury or illness is considered work-related if an event or exposure in the work environment caused or contributed to the condition or significantly aggravated a preexisting condition.
  - The work environment includes the establishment and other locations where one or more employees are working or are present as a condition of their employment.
- A near miss is an incident that did not result in injury, illness, or damage but had the potential to do so[59].
- The recording and investigation of both accidents and near misses is important. By investigating to determine the root cause, the UoC is able to:
  - take corrective actions that will prevent incident to reoccur
  - spot potential problems and prevent them from occurring in the first place.
- Corrective actions are actions that the UoC can put in place to ensure that the incident does not occur again. Examples are in Table 6 below:

Table 6. Examples of incidents, their cause and the resulting corrective actions:

Incident	Determine the cause	Implement corrective action
Oil is spilt on the feed barge and an employee slips and hits their head	After working on a mechanism on the barge, an employee left the oil can without a lid on and someone knocked it over without noticing.	Assign a dedicated place to safely store oil cans when they are not being used.

[59] https://www.reengage.org.uk/about-us/policies-guidelines/accident-incident-and-near-miss-policy

		Ensure employees are trained on this and reminded to safely store equipment. Ensure the appropriate materials are available to clear up oil, if it does spill.
Employee trips over some rope	The rope was left coiled up on the floor.	Set up ropes in a way that people cannot trip over them, or a warning sign in front of any ropes that are a trip hazard.

- There is a difference between immediate corrective action and the corrective actions to take once the root cause has been determined. For example: a fire extinguisher is blocked by a bin being placed in front of the extinguisher:
  - staff take immediate corrective action and move the bin
  - however, the next day they find that someone has moved the bin back. The immediate corrective action did not prevent reoccurrence
  - staff investigate to determine the root cause and find out why the bin was placed there
  - the investigation shows that this is the most ergonomic layout of the workstation and the bin will always be moved back to that location by whoever is using the workstation
  - staff take long-term corrective action and move the fire extinguisher. This stops the issue from reoccurring.

Evidence of implementation should be maintained, e.g.:

- records of accidents or near misses
- records of corrective actions taken
- training records.

Auditors should confirm:

- employees feel comfortable to report any accidents or near misses;
- employees understand what the process is for reporting any accidents or near misses.

Useful Resources

N/A

Indicator:	Requirement:

3.5.7

Indicator applicability: Any UoC where a fatal incident has occurred

The UoC shall notify ASC of any fatal workplace accident. The notification shall be made within 14 days of the incident in accordance with the ASC Data Submission Procedure.

How do I interpret this requirement?

> **Indicator applicability:** This indicator is only applicable if a UoC has a fatal incident. If there is no such incident, then this indicator should be marked N/A.

- This is a notification requirement, not a disclosure requirement, which means that all information is held confidentially by ASC, who does not share it publicly.

Auditors should confirm:

N/A

Useful Resources

N/A

Indicator:	Requirement:

3.5.8 The UoC shall ensure that appropriate and understandable health and safety notices, instructions, and warning signs are visibly displayed.

How do I interpret this requirement?

- Potential hazards and risk areas around the site are clearly identified by warning signs.
- The choice of signs, notices and instructions are informed by the health and safety risk assessment.
- Written safety instructions for equipment use are accessible to all employees who need to use that equipment and are in a language that employees understand.
- Written safety procedures are available to employees and:
  - include details on accident prevention and response, and emergency procedures.
  - are in a language that they understand
  - can include pictures or diagrams, which can be helpful.

Evidence of implementation should be maintained, e.g.:

- warning signs around the site
- written safety instructions and procedures that are accessible for employees.

Auditors should confirm:

- warning signs are clearly visible, and potential hazards are clearly marked;
- employees understand where they can access safety instructions and procedures;
- employees understand what the warning signs mean and what they refer to.

Useful Resources

N/A

Indicator:	Requirement:

3.5.9 The UoC shall ensure that clear and understandable emergency and fire safety procedures are in place.

How do I interpret this requirement?

- The UoC should have procedures in place for emergencies that can have a significant impact on people on the site, including serious injuries, fire, explosion, flood, poisoning, electrocution, hazardous chemical spill.
- Emergency procedures can include:
  - outlining what might happen and how to raise an alarm
  - what to do if an alarm goes off
  - a plan showing the location of hazardous items
  - a plan for emergency shutdown, isolation or making processes safe
  - how to call the emergency services
  - where the escape routes are located
  - where the assembly points are
  - what the responsibility is of each employee and the management.
- Drills should be conducted regularly to ensure that employees understand the emergency procedures.

Evidence of implementation should be maintained, e.g.:

- documented fire and emergency safety procedures
- list of equipment and information about maintenance schedules
- list of hazardous items
- relevant signs around the workplace.

Auditors should confirm:

- employees have taken part in a drill;

- employees understand what to do in case of a fire or other emergency;
- equipment is up-to-date and in good working order.

Useful Resources

https://www.hse.gov.uk/workplace-health/emergency-procedures.htm

Indicator:	Requirement:
3.5.10	The UoC shall ensure that escape routes, fire exits, firefighting equipment and fire alarms are clearly marked and maintained in good working order.

How do I interpret this requirement?

- Fire safety and other emergency measures are in place, for example:
  - smoke alarms
  - carbon monoxide alarms
  - fire alarms
  - marked fire exits
  - marked, well-lit and well-maintained emergency escape routes
  - assembly points
  - firefighting equipment that is maintained annually or as required.
- Fire drills are conducted regularly to ensure that employees understand the emergency procedures.

Evidence of implementation should be maintained, e.g.:

- documented fire and emergency safety procedures
- list of equipment and information about maintenance schedules
- list of hazardous items
- relevant signs around the workplace.

Auditors should confirm:

- employees have taken part in a drill;
- employees understand what to do in case of a fire or other emergency;
- equipment is up-to-date and in good working order.

Useful Resources

N/A

Indicator:	Requirement:
3.5.11	The UoC shall ensure that escape routes, fire exits and firefighting equipment are accessible and clear of obstacles.

How do I interpret this requirement?

- The UoC is responsible for:
  - removing any obstacles around escape routes and fire exits
  - ensuring that emergency doors are not locked
  - ensuring that emergency equipment is not blocked by any obstacles.

Evidence of implementation should be maintained, e.g.:

- information about locations of emergency equipment.

Auditors should confirm:

- escape routes, fire exits and firefighting equipment are accessible
- employees understand where exits and equipment are located.

Useful Resources

N/A

Indicator:	Requirement:

3.5.12 The UoC shall provide and maintain appropriate Personal Protective Equipment (PPE) free of charge and monitor its proper use.

How do I interpret this requirement?

- The UoC assesses:
  - what Personal Protective Equipment (PPE) is needed (meeting legal stipulations if applicable)
  - for which functions it is needed
  - in which situations it should be used
  - how PPE is well maintained.
- The use of PPE should be the final option in protecting employees from hazards and the steps below are what comes before the use of PPE:
  - **Elimination:** Physically remove the hazard
  - **Substitution:** Replace the hazard with a non-hazardous process
  - **Engineering controls:** Isolate people from the hazard
  - **Administrative controls:** Change the way people work
  - **PPE:** Protect the worker with PPE.
- PPE often comes with manufacturers' instructions, which explain how to maintain equipment, and when equipment needs replacing.
- Providing appropriate storage for the PPE, where it is protected from adverse weather conditions, will prolong the life and useability of the PPE.
- Training for employees on the correct use of PPE is necessary for ensuring that PPE is used effectively.
- When new PPE is introduced, or the method of using it changes, updated training helps to ensure the safety of all employees.

- The list below is adapted from the EU's Compliance Help Centre[60]. PPE can include:

Type of PPE	Use
Head protection (helmets, hard hats)	When working in construction, work around heavy machinery, while working in a workplace with low-hanging objects, piping, moving parts.
Hand protection (gloves, wrist cuffs)	When working in hot or cold environments, with chemical or hazardous materials, when using abrasive or sharp objects.
Eye and face protection (safety glasses, goggles, eye and face shields, visors)	When working with power driven tools, welding tools, when handling hazardous substance.
Respiratory protection (breathing apparatus, mask respirators, disposable face masks, protective hoods)	When working in workplaces with high levels of dust, or when in contact with gases, powders and vapours.
Hearing protection (earplugs, ear defenders, noise meters)	When working in an environment with high noise levels.
Foot protection (safety boots and shoes)	When working around various hazards, hot and cold environments, when handling heavy objects.
Body protection (high-visibility clothing, harnesses, clothing for specific weather conditions, life jackets)	When there are vehicles, when doing maintenance work on machinery, when working outdoors, in extreme temperatures, for protection against chemical contamination, for protection against drowning.

- Employees need somewhere for PPE with:
    - adequate privacy to change into the PPE

[60] https://support.ce-check.eu/hc/en-us/articles/360021707072-8-Types-of-Personal-Protective-Equipment-PPE

- somewhere to store their belongings
- a designated place to store or return (e.g. laundry) the PPE after use.

Evidence of implementation should be maintained, e.g.:

- a record of available PPE, what it is used for and how it is maintained
- health and safety risk assessment demonstrating when PPE is needed.

Auditors should confirm:

- employees are using PPE correctly and consistently;
- the PPE is well maintained and in good working condition;
- employees understand the reasoning behind the use of PPE and why it is important.

Useful Resources

N/A

Indicator:	Requirement:
3.5.13	The UoC shall provide appropriate first aid in the event of a work-related injury, including access to professional medical assistance.

How do I interpret this requirement?

- The supplies needed for first aid at the UoC can be determined by the health and safety risk assessment.
- Professional medical assistance can include ensuring that the UoC is able to access doctors and an ambulance, where necessary.
- The following list of first aid kit supplies is adapted from the UK government Health and Safety Executive website[61]:
  - general guidance on first aid (an example from the UK government Health and Safety Executive can be found here: https://www.hse.gov.uk/pubns/indg347.pdf)

[61] https://www.hse.gov.uk/simple-health-safety/firstaid/what-to-put-in-your-first-aid-kit.htm

- individually wrapped sterile plasters of assorted sizes
- sterile eye pads/eye wash
- individually wrapped triangular bandages, preferably sterile
- safety pins
- large and medium-sized sterile, individually wrapped, unmedicated wound dressings
- disposable gloves
- scissors or cutting tool.

- First aid kits are:
  - checked regularly, to ensure that any items that are past their expiry date are safely disposed of and replaced
  - kept at several locations around the site
  - easily accessible
  - located near potential hazards or areas of risk.
- Emergency first aid should be in place for diving, including:
  - a continuous-flow emergency oxygen system;
  - a diving first-aid kit;
  - at least one team member (other than the working diver) should be certified in diving first aid and oxygen administration;
  - documented access to the nearest recompression chamber, including contact details and an evacuation protocol.

Evidence of implementation should be maintained, e.g.:

- complete and well maintained first aid kits in easily accessible locations
- information about what the first aid kits contain and how to use them.

Auditors should confirm:

- employees know where the first aid kits are kept and how to use them;
- the UoC has a process in place to ensure first aid kits remain fully stocked and serviceable.

Useful Resources

- https://www.hse.gov.uk/simple-health-safety/firstaid/what-to-put-in-your-first-aid-kit.htm

Indicator:	Requirement:

3.5.14

Indicator applicability: Every UoC located in a region where healthcare is not fully provided by a state or national social security or health system.

The UoC shall, where not provided by a state or national social security or health system, provide and pay for insurance or have a system to cover costs for all employees for all work-related accidents or injuries. This shall include at least the following:

a) the cost for transport and medical treatment and medication needed to treat the accident or injury; and

b) the cost for transport and medical treatment and medication needed for recovery; and

c) compensation for lost working hours; and

d) cost for any required repatriation in case of migrant workers.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC is located in a region where healthcare is not fully provided by a state or national social security of health system. If these provisions are in place at a state or national level, then this indicator should be marked N/A.

- The UoC is responsible for caring for its employees and protecting them from any financial impacts of an accident or injury.
- The UoC should ensure that employees are protected from unfair dismissal if they are unable to work for long periods.
- Depending on the level of the national social security of the country where the site is located, there are likely to be different costs that the UoC is responsible for.
- For example: an employee injures his back lifting boxes of feed from a truck. He suffers an acute injury, falls down and struggles to stand. The site manager provides him with some painkillers from the first aid kit and takes him in a site vehicle to the nearest hospital. The employee receives x-rays and is diagnosed as having strained his back. He is given pain relief and told he cannot work for 3 weeks. The site manager does not charge the employee for the

painkillers from the first aid kit, or the transport to the hospital. The UoC pays the full hospital bill and continues paying the employee's salary for the 3 weeks that he is off work.

- If this incident took place in Country A, where there is a social security and healthcare system, the site manager does not charge the employee for the painkillers from the first aid kit, or the transport to the hospital. The UoC does not have to pay any hospital bill because the national health system pays for that. The UoC does not have to pay any of the employee's salary for the 3 weeks that he is off work because that is covered by the national social security system.
- If this incident took place in Country B, where there is no social security and healthcare system, the UoC pays all of the costs, as outlined above.

Evidence of implementation should be maintained, e.g.:

- information about what is provided by the national government
- documentation showing how the site will cover or pay for any costs that are not covered by the national government, for example, insurance documents.

Auditors should confirm:

- the UoC has the right plans in place for paying costs of workplace injuries;
- management understands their role and responsibility in covering these costs;
- employees understand what happens financially if they have a workplace injury.

Useful Resources

N/A

Indicator:	Requirement:

3.5.15 The UoC shall ensure that any person who handles or comes into contact with hazardous substances has access to appropriate changing and washing facilities.

How do I interpret this requirement?

- Hazardous substances that are often used in aquaculture can include[62]:
  - disinfectants as part of biosecurity protocols
  - herbicides and pesticides used in pond maintenance
  - spawning aids
  - vaccines used in disease prevention
  - marking agents used in resource management.
- Contact with some substances can be harmful to employees and can cause ill health or injury, but this is preventable through:
  - the correct use of PPE
  - providing changing and washing facilities, including soap, for:
    - washing hands or skin that has come into contact with hazardous substances
    - washing out eyes
    - changing out of clothes that have come into contact with hazardous substances.

Evidence of implementation should be maintained, e.g.:

- availability of changing and washing facilities in easily accessible places.

Auditors should confirm:

- employees understand the risk of working with different hazardous substances;
- employees are aware of the correct procedures to handle hazardous substances;
- employees understand what to do if they come into contact with hazardous substances.

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[62] Microsoft Word - GUIDE_June_2019.docx (syndel.com)

Useful Resources

- https://www.hse.gov.uk/pubns/indg136.pdf
- Microsoft Word - GUIDE_June_2019.docx (syndel.com)

Indicator:	Requirement:

3.5.16 The UoC shall provide access to appropriate sanitary facilities that:

a) are clean and hygienic; and

b) include adequate privacy measures; and

c) include separation by gender if required; and

d) are sufficient for the number of people using them.

How do I interpret this requirement?

- Sanitary facilities are clean, dry, warm, have a source of ventilation (e.g. a window or fan), adequate lighting and doors that close and lock for privacy.
- Facilities include one of the following:
  - pit latrines
  - flush toilets
  - urinals.
- Taps and running water are also available.
- For women, facilities for safe disposal of sanitary products are provided.
- Facilities are constructed of hard materials that are easy to clean.
- Waste and wastewater are regularly disposed of in accordance with Criterion 2.11: Material Use, Waste and Pollution Control.
- They are separated by gender, where required.

Evidence of implementation should be maintained, e.g.:

- presence of clean and appropriate sanitary facilities that are accessible to all employees
- records of cleaning services.

Auditors should confirm:

- employees report that sanitary facilities are appropriate and they are able to access them without issue;

- it is clear who has the responsibility for cleaning the facilities and that this happens on a regular basis.

Useful Resources

N/A

Indicator:	Requirement:
3.5.17	The UoC shall provide access to free, clearly labelled, drinking water.

How do I interpret this requirement?

- Access to drinking water is essential for employees' health and the UoC is responsible for ensuring that:
  - employees know where they can access water
  - the water is clean and appropriate for drinking
  - employees are not charged for drinking water.
- Access to drinking water is particularly important in extreme heat and the UoC should be aware that they may need to provide more regular breaks and more opportunities for drinking water in hot weather.

Evidence of implementation should be maintained, e.g.:

- available drinking water stations around the site.

Auditors should confirm:

- employees understand that they are free to access drinking water, and they know where they can find it.

Useful Resources

N/A

Indicator:	Requirement:

3.5.18 The UoC shall provide access to an appropriate and clean area to prepare food and eat during breaks.

How do I interpret this requirement?

- The provision of a clean area to prepare food is important for employees' health and for reducing the risk of illness.
- In warm climates, there should be adequate shade for employees to have their breaks in.

Evidence of implementation should be maintained, e.g.:

- available place to prepare food and eat.

Auditors should confirm:

- employees are able to prepare food and eat in a clean and hygienic space.

Useful Resources

N/A

Indicator:	Requirement:

3.5.19 The UoC shall ensure that all buildings and structures on the site are safe to use through adequate construction, maintenance and repair.

How do I interpret this requirement?

- Without adequate construction, maintenance and repair, buildings could collapse if subjected to external forces, which could have devastating results.
- Materials can wear out over time, so continuous inspection and testing structures is important.
- Ensuring adequate construction, maintenance and repair involves regular monitoring by a knowledgeable, designated person, and maintenance and repair.

- Understanding when and by whom construction, maintenance and repair should be checked is a result of the health and safety risk assessment (Indicator 3.5.1).

Evidence of implementation should be maintained, e.g.:

- documentation about any surveys or construction carried out at the UoC
- maintenance records.

Auditors should confirm:

- someone at the UoC is responsible for the wear and tear of the building and for overseeing any construction and maintenance work and has the resources to carry out needed works.

Useful Resources

N/A

Indicator:	Requirement:
3.5.20	The UoC shall ensure that machinery and equipment: a) is compliant with applicable legal regulations or other recognised standards; and b) is safely installed, maintained and safeguarded; and c) is only operated by trained employees.

How do I interpret this requirement?

- Accidents and injuries involving machinery and equipment can arise from misuse, malfunctioning, or bypassing, disabling or malfunctioning safety features.
- All machinery and equipment should be:
  - compliant with national or other recognised health and safety standards
  - appropriately installed, maintained and safeguarded.
- Only employees trained to use machinery and equipment are permitted to operate it.
- Examples of improper use of machinery may include:

- bypassing or disabling emergency stop buttons, guards or interlocks to speed up processes
- overloading equipment and machinery beyond its capacity
- using equipment for a purpose it is not intended for
- making unauthorised modifications
- ignoring or disabling safety signals.

- Safely installed usually includes being installed according to manufacturer's instructions.
- Safeguarded means that any warning notices and operational guidance are in place for the machinery and equipment.

Evidence of implementation should be maintained, e.g.:

- records of who is trained to use the machinery or equipment
- maintenance records for machinery and equipment
- instruction manuals for the use of equipment.

Auditors should confirm:

- employees understand who is allowed to operate the machinery and equipment;
- the UoC has a process in place to ensure the maintenance and upkeep of the machinery and equipment.

Useful Resources

N/A

Indicator:	Requirement:
3.5.21	*Indicator applicability: Every UoC where diving activities are taking place* The UoC shall log all commercial diving activities and maintain records, which shall include, at a minimum: a. divers names and roles; and b. breathing apparatus and gas mixture per diver; and

c. exact departure time / return time from atmospheric pressure; and

d. bottom time; and

e. maximum depth reached; and

f. full decompression schedule used (pressures, depths, times); and

g. pre-dive plant inspection results (condition, functionality and safety status of a diver's life support equipment); and

h. any decompression illness incidents and treatment given; and

i. environmental conditions; and

j. associated dive table records.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if there are diving activities taking place on the site. If there is no diving, then this indicator should be marked N/A.

- Commercial divers are professional divers who engage in underwater operations and have specific skills and qualifications.
- Through keeping records of commercial diving activities, the UoC can:
  - monitor time spent diving
  - ensure qualifications of commercial divers
  - ensure that appropriate health and safety measures are in place.
- The types of records to keep depends on local regulations and the type of dive certification.
- This is usually recorded with a dive safety checklist.
- These records are also used for the daily diving plan.
- Best practice is to have a standby diver present at all times when a diver is in the water. Their role is to provide immediate assistance or perform a rescue. They should:
  - hold a valid commercial diver certification; and
  - be fully kitted and ready to enter the water within one minute; and
  - not be assigned any other duties that could delay their response; and
  - for surface supply operations, use surface-supplied breathing apparatus (not SCUBA).

Evidence of implementation should be maintained, e.g.:

- complete diving records
- list of persons involved in diving at the UoC.

Auditors should confirm:

- diving records are properly maintained for each dive and are up to date.

Useful Resources

HSE Commerical diving projects inland/inshore, Diving at Work Regulations 1997, L104 (https://www.hse.gov.uk/pubns/books/l104.htm)

Indicator:	Requirement:

3.5.22

Indicator applicability: Every UoC where diving activities are taking place.

The UoC shall ensure that any person involved in commercial diving activities holds commercial diver certification through an accredited organisation.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if there are diving activities taking place on the site. If there is no diving, then this indicator should be marked N/A.

- Different countries have different certifications for commercial diving, but a normal scuba certification (for example, PADI, NAUI, YMCA, etc.) is not and should never be accepted as adequate commercial diver training.
- Examples of accepted bodies for diving certification can include ADCI, DCBC, HSE-recognised bodies, ADAS (Australia), IDSA (South Africa).
- The Diving Supervisor should verify that the qualification covers the diving mode planned (e.g., a SCUBA-only certificate is not valid if surface supply is used).

Evidence of implementation should be maintained, e.g.:

- commercial diver certificates for all commercial divers working at the UoC.

Auditors should confirm:

- management understand the relevant qualifications that divers should have to be allowed to dive commercially;
- management are able to confirm that all divers are properly certified, whether they have been directly employed or are subcontracted through a diving company.

Useful Resources

N/A

Indicator:	Requirement:
3.5.23	*Indicator applicability: Every UoC where diving activities are taking place.* The UoC shall ensure that commercial divers undergo annual medical tests to confirm they are fit to dive.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if there are diving activities taking place on the site. If there is no diving, then this indicator should be marked N/A.

- By ensuring that divers are healthy enough to dive, this minimises the risk of negative impacts to their health and safety during dives.
- If a diver has been subcontracted from a diving company, the UoC can ensure that the diving company have taken responsibility for the medical tests.
- Best practice is that medical professionals have to undergo particular training or have particular qualifications to confirm someone's fitness to work as a commercial diver. They should be trained in hyperbaric medicine (HSE AMED, ADCI-recognised physician, or DMAC 11-qualified examiner.
- The medical certificate should be on file with the diving contractor and available for review.

Evidence of implementation should be maintained, e.g.:

- records of medical certificates of fitness to dive, signed by a qualified medical professional.

Auditors should confirm:

- management understand the importance of divers being medically fit and healthy;
- management are able to confirm that all divers are medically fit to dive, whether they have been directly employed or are subcontracted through a diving company.

Useful Resources

N/A

Indicator:	Requirement:

3.5.24 *Indicator applicability: Every UoC where diving activities are taking place*

The UoC shall ensure that every dive operation is supervised by a Diving Supervisor who is:

a) appointed in writing before diving begins; and

b) holds a recognised supervisor qualification; and

c) is present at the site and in continuous communication with divers; and

d) has authority to abort any dive on safety grounds without prior approval.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if there are diving activities taking place on the site. If there is no diving, then this indicator should be marked N/A.

- A Diving Supervisor is responsible for all aspects of the diving operations they supervise, including:
  - checking the divers are competent and qualified to dive and undertake the work of the dive plan;
  - planning and risk assessing the dive plan;

- ensuring everyone in the diving operation is familiar with the dive plan;
- ensuring the dive plan is appropriate and up to date;
- maintaining accurate records of all diving operations;
- ensuring there are adequate means of communication with divers in the water;
- checking the dive site on the day of the dive and, if conditions change, confirming that the risk assessment still applies;
- checking the diving equipment is appropriate for the project;
- maintaining accurate legal logs of the operation;

- Recognised supervisor qualifications include one of the following: ADCI, HSE, IMCA, or DCBC equivalent).
- The Diving Supervisor should not also act as a standby diver.
- The Diving Supervisor should approve the written dive plan, which should include:
  - site conditions and hazards;
  - maximum planned depth and bottom time;
  - gas mixture;
  - decompression schedule and table or algorithm;
  - team roles;
  - abort criteria and emergency procedures.
- The Diving Supervisor should ensure that the diving plan is kept on file.
- The Diving Supervisor should ensure that all diving is conducted using a recognised decompression procedure appropriate to the depth, gas mixture, and diving mode. Accepted options can include:
  - US Navy Diving Manual Rev. 7
  - DCIEM/DRDC tables (Canada)
  - NOAA Diving Manual 6th Ed.
  - HSE/MCA air decompression tables
  - or a validated dive computer using Buehlmann ZHL-16C or equivalent validated algorithm.

- Recreational dive tables (PADI/DSAT RDP) are not acceptable for commercial diving operations.

Evidence of implementation should be maintained, e.g.:

- written appointment of the Diving Supervisor;
- diving logs and records
- qualifications of the Diving Supervisor

Auditors should confirm:

- the Diving Supervisor has been appointed and is leading on all aspects of the dive;
- the divers know who the Diving Supervisor is;
- the Diving Supervisor has authority to abort a dive on safety grounds.

Useful Resources

N/A

Criterion 3.6 – Collective Bargaining and Freedom of Association

Indicator:	Requirement:
3.6.1	The UoC shall allow all employees to join or form a trade union or worker organisation. An exception applies where this is restricted by applicable law, in which case the UoC shall allow alternative lawful mechanisms for employee engagement.

How do I interpret this requirement?

- A trade union or worker organisation represents workers' labour interests and concerns.
- Employees are allowed to choose whether or not to become a member of a trade union or worker organisation, and which organisation they would like to become a member of.
- Freedom of association enable employees to:
  - collectively advocate for their rights
  - negotiate employment terms and conditions
  - address workplace grievances effectively.
- These practices make them less vulnerable to unfair and exploitative practices in the workplace.
- Allowing employees to engage in this process includes ensuring that they understand what freedom of association is, and that they have a right to engage in it.
- In cases in which national regulation does not reference migrant employees or does not allow them to join trade unions, the UoC must allow and should encourage them to form an internal employees' committee that meets periodically and represents migrant employees.
- The term 'lawful mechanism' means a legal process.
- In countries where the right to freedom of association is restricted by law, the management must allow employees to choose to have parallel means of association. For example, employees can develop an internal employee committee that meets periodically and represents the diversity of employees.

Evidence of implementation should be maintained, e.g.:

- documents, records or other evidence that show how sites have informed their employees that they are free to join or form workers' organisations of their own choosing, such as:

- employee contracts
- employee handbook
- training records
- written policy
- displayed information on the site

- documents that show how sites have informed their employees of the right to join an alternative organisation
- meeting minutes of alternative organisations.

Auditors should confirm:

- whether local laws and regulations permit freedom of association;
- employees' awareness and knowledge of their right to join trade unions and other workers organisations;
- information from documents and records match with information from employee interviews;
- employee knowledge and awareness on:
  - their right to form or join an alternative worker organisation
  - their ability to form or join a workers' organisation, and/or any barriers to doing so.

Useful Resources

- FOA & worker representation: company guidance. Ethical Trading Initiative.
- Q&As on Business and freedom of association. International Labour Organisation (ILO).

Indicator:	Requirement:

3.6.2 The UoC shall allow all employees to engage in collective bargaining. An exception applies where this is restricted by applicable law, in which case the UoC shall allow alternative lawful mechanisms for employee engagement.

How do I interpret this requirement?

- Collective bargaining:
  - is a voluntary negotiation between employers and workers organisations to establish the terms and conditions of employment by means of written collective agreements
  - aims to reach a collective agreement, however, if bargaining is undertaken in good faith but an agreement cannot be reached, this may still comply with the requirement
  - includes mutually agreed conditions that may be beneficial to workers and/or the management, for example, collective bargaining may mean that workers are:
    - paid a higher wage other than the minimum prescribed by law
    - work a different shift pattern that both workers and management agree is more appropriate to their context.
- Allowing employees to engage in this process includes ensuring that they understand what collective bargaining is, and that they have the right to engage in it
- Ensuring employees understand this can form part of training on the human rights policy (Indicator 3.1.4).
- The term 'lawful mechanism' means a legal process.
- In countries where collective bargaining is restricted by law, the management must allow workers to have parallel means to engage in discussion and negotiation between employees and employers.

Evidence of implementation should be maintained, e.g.:

- documents, records or other evidence that show how sites have informed their employees that they are free to bargain collectively, such as:
  - employee contract
  - employee handbook

- training records
- written policy
- displayed information on the site

- any collective bargaining agreements that are in place
- meeting minutes of collective bargaining negotiations.

Auditors should confirm:

- documents, records or other evidence allow for verifying that sites have informed their employees that they are free to bargain collectively;
- any collective bargaining agreements in place are being followed;
- employees' awareness and knowledge of their right to bargain collectively;

Useful Resources

N/A

Indicator:	Requirement:
3.6.3	The UoC shall not interfere with collective bargaining processes or the establishment, operation, or administration of trade unions or worker organisations.

How do I interpret this requirement?

- The UoC:
  - does not disrupt any employees looking to form or join an organisation
  - does not interfere in the election of representatives
  - allows representatives access to employees and workplaces during working hours
  - engages in meaningful negotiations when approached by worker organisations.
- Interference by employers can take many forms, such as making use of their positions of power and influence to:

- coerce or intimidate employees into not participating in workers' organisations or collective bargaining
- compromise the independence and effectiveness of these organisations and bargaining processes.

- An employee committee or union should make decisions independently from the management. For example:
  - representatives are not appointed or supervised by management when executing their union or employee committee duties
  - participation is voluntary
  - there is no limitation to the number of employee organisations that can be set up.
- Management should be willing to enter into dialogue with employee organisations.
- Engagement in meaningful negotiations with employee organisations means that the UoC bargains in good faith and does not engage in actions to slow, stop or limit the bargaining process.
- Employee organisations are allowed to hold meetings at the UoC, if that is what they choose to do, but management cannot ask them to do so.
- This indicator is applicable even where there may be no collective bargaining agreements or employee associations in place, because the option for employees to engage in these processes is always available, according to 3.6.1 and 3.6.2.

Evidence of implementation should be maintained, e.g.:

- documents related to the representative election process
- list of current representatives.

Auditors should confirm:

- Employee knowledge and awareness on:
  - whether they are allowed to join a trade union or worker association
  - whether they are allowed to engage in collective bargaining
  - how employee representatives were elected, and if any candidates were chosen by the management

- whether management interferes with the establishment, functioning and administration of employee organisations
- whether employee organisations' meetings can be held freely and without management interference.

Useful Resources

N/A

Indicator:	Requirement:
3.6.4	*Indicator applicability: Every UoC with collective bargaining agreements in place.* The UoC shall uphold any collective bargaining agreements developed.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if there are collective bargaining agreements in place. If there are no collective bargaining agreements in place, then this indicator should be marked N/A.

- A collective bargaining agreement is a labour contract usually set out between a union representing employees and management.
- It can set terms and conditions of employment, including:
  - wages
  - working hours
  - working conditions
  - grievance procedures
  - rights and responsibilities of the worker representatives and management.

Evidence of implementation should be maintained, e.g.:

- documented collective bargaining agreements and which employees are covered by them.

Auditors should confirm:

- employees' and managers' understanding of the right of collective bargaining
- any collective bargaining agreements in place are upheld.

Useful Resources

N/A

Criterion 3.7 – Transparent Contracts

Indicator:	Requirement:

3.7.1 The UoC shall ensure that all employees have received, understood and agreed upon, written information about their employment terms and conditions before starting employment and, where applicable, prior to migration. This information shall include, at least the following:

a) a description of the role and any responsibilities; and

b) the type of contract (e.g. permanent, fixed-term, contractor); and

c) working hours, including allowance for breaks, paid annual leave, allowance for days off on public holidays, and sick leave; and

d) wages, any agreed wage deductions (e.g. accommodation, meals), compensation for overtime, and loans and advances; and

e) social benefits (e.g. insurances); and

f) termination terms and conditions, notice period; and

g) relevant human rights and labour-related policies (see Indicator 3.1.1); and

h) information on labour rights (see Indicator 1.1.2).

How do I interpret this requirement?

- This indicator applies to all employees.
- Copies of contracts should be available on file in the language of the employee, and provisions should be made for cases where people have low literacy levels. For example:
  - a colleague verbally communicates the information.
- In the case of any changes to the contract during employment, the UoC should:
  - discuss the changes with the employee
  - ensure that the employee agrees with the changes
  - record the agreed upon changes
  - provide the employee with a copy of the changes.
- Examples of changes to terms and conditions can include instances where employees have:
  - been given a different role or been promoted

- had changes in their working conditions, for example their wages, working hours, or location.

- Contracts should clearly explain the UoC's commitments to human and labour rights (indicator 3.1.1) and any labour rights that relate to the employees' job (indicator 1.1.2). This helps employees understand both UoC's commitments and their own rights, and supports consistency between company policies and everyday practice.
- Migrant workers should have contracts that:
  - are written, agreed to, and signed at the time of hiring in the country of origin of the employee
  - state that the employer will pay for travel from the employee's country and repatriation, and what arrangements are made for that (information about fees and costs related to employment are outlined in Criterion 3.2)
  - do not violate the national laws of the host country, as well as other laws and regulations that apply to migrant employees in their country of origin.

Evidence of implementation should be maintained, e.g.:

- contracts and contract amendments
- evidence of the contract being explained to the employee in their language and in a way they understand
- contracts, Memorandum of Understanding or terms and conditions agreed between the UoC and the labour or recruitment agency.

Auditors should confirm:

- whether contracts meet national legal requirements for labour contracts;
- that contract terms and conditions match with working hour records and payroll and wage records and/or the Salary Matrix (see Criterion 3.8);
- employees' understanding of the terms and conditions of their contract;
- whether employees are in possession of a copy of their contract and documented changes;
- for migrant employees: whether they were required to pay recruitment fees, and any costs incurred for travel to the host country by assessing the process of recruitment. See also Criterion 3.2.

Useful Resources N/A

Indicator:	Requirement:

3.7.2 The UoC shall ensure that if family members are working on the site they are either subject to Indicator 3.7.1 or they receive compensation or benefits for work done that is proportional to the productivity or profit of the site.

How do I interpret this requirement?

- While the ASC Farm Standard requires that all employees working at the UoC are employed through contracts with agreed upon terms and conditions, and fair wages, ASC recognises that:
  - some sites are small businesses that are run with the support of close family members
  - where businesses are supported by family members, it is not always possible to contract and pay those family members in the usual practice outlined in the ASC Farm Standard.
- This indicator allows for small sites to receive help in operating the business from close family members in a more informal manner and in exchange for some compensation or benefits. These can include:
  - payment in money
  - payment in kind (exchange of goods or other services)
  - a share of the profits of the business.
- The compensation or benefits is proportional to the productivity or profit of the site, implies fair compensation for the work given.
- 'Family member' includes a spouse / partner, and is defined as first or second-degree blood relatives, or those adopted.
  - First-degree blood relative is someone's parent, sibling, or child.
  - Second-degree blood relative is someone's grandparent, grandchild, uncle or aunt, niece or nephew or cousin.:

Evidence of implementation should be maintained, e.g.:

- Agreement with the family member about work, working conditions, compensation and benefits.
- Evidence of first or second-degree blood relative of the owner or spouse of the owner.

Auditors should confirm:

- Everyone working at the uoc understands their role and how they are compensated.
- Everyone working at the uoc is fairly compensated for their work.
- Everyone working at the uoc is either an employee with a contract or a first or second-degree blood relative of the owner or spouse of the owner.

Useful Resources

N/A

Indicator:	Requirement:

3.7.3

Indicator applicability: Every UoC that uses recruitment agencies, employment agencies, or subcontractors

The UoC shall establish and implement a process for the screening and oversight of third parties that supply workers, to ensure that the rights of everyone who works at the UoC are respected. The process shall include:

- verification of legal compliance and any required licences or registrations; and
- communication of the UoC's expectations regarding workers' rights; and
- maintaining documentation on workers supplied to the UoC; and
- periodic review of the third party's practices with regards to workers' rights; and
- investigation and remediation of concerns related to third party workers' rights

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC uses recruitment agencies, employment agencies or subcontractors. If they do not use these kinds of agencies, then this indicator should be marked N/A.

- Workers may be supplied to UoC via third parties such as recruitment agencies, employment agencies, and subcontractors. While these arrangements are common and often legitimate, they can create additional risks for workers if there is inadequate screening of third parties or insufficient oversight of worker's recruitment, employment and working conditions. Risks may be greater where migrant, temporary, or seasonal workers are involved. Through these

business relationships, farms may become linked with labour rights violations, including but not limited to forced labour, discrimination, and unsafe working conditions.

- The UoC should establish and implement a process to screen and oversee third parties that supply workers to ensure they do not violate workers' rights. The process should be appropriate to the nature of the work, the number of workers involved, and the risks associated with the arrangement. It should include the steps described below.
- **Verification of legal compliance, licenses and registrations**
  - Before engaging a third party to supply workers, the UoC should verify that it operates in accordance with applicable laws, and is licensed by or registered with the relevant authority, where this is available.
    - Licenses and registrations differ per country. Examples include licensing for employment agencies by the Gangmasters & Labour Abuse Authority (GLAA) in the UK, or authorisation for employment agencies from the Labour Inspection Authority in Norway.
  - The UoC should review, at least annually or when circumstances change, whether legal compliance and required licenses and/or registrations remain valid.
- **Communication of expectations regarding workers' rights**
  - The UoC should set clear expectations that third parties respect the rights of workers supplied to the UoC in accordance with the UoC's human rights policy (indicator 3.1.1)
  - This may be communicated through contracts, agreements, codes of conduct, written instructions, or other documented means.
- **Maintaining documentation on workers supplied through third parties**
  - The UoC should maintain information on workers supplied through third parties to support oversight.
  - This should include workers' names, ages, and confirmation that workers are legally contracted.
- **Periodic review of the third party's practices**
  - The UoC should periodically review the third party's practices to verify that workers' rights are being respected in accordance with the expectation communicated by the UoC.
    - The review should take place at least annually, or more frequently in situations of elevated risk.

- Review may include worker interviews, site observations at the UoC, review of records, discussions with third parties supplying workers, and review of grievances.
    - Significant areas to focus on during worker interviews and site observations include working hours, rest breaks, interactions among workers and between workers and supervisors, access to PPE, freedom of movement, wages, housing conditions, workers' physical condition and emotional demeaner, and workers' ability to raise concerns.
- Particular attention should be paid to risks commonly associated with third-party labour arrangements, including recruitment fees, retention of identity documents, unlawful wage deductions, restrictions on movement, coercion, deception, and barriers to termination of employment.

- **Investigation and remediation of concerns**
    - Where concerns are identified, the UoC should investigate the matter and take reasonable steps to address it. Concerns may be discovered through worker complaints, audit findings, evidence of unlawful practices, or allegations of abuse by a third party.
    - Actions may include engagement with the third party, requesting corrective actions, enhanced monitoring, suspension of the arrangement, or referral to competent authorities where appropriate.
    - Workers supplied through third parties should have access to the UoC's grievance mechanism and be informed of how concerns can be raised.

Evidence of implementation should be maintained, e.g.:

- Information on workers supplied via third parties, including their names, ages and confirmation that they are legally contracted;
- copies of licenses and registrations, where applicable;
- contracts, agreements, or other documented arrangements with any recruitment agencies, employment agencies, and subcontractors;
- records on screening and monitoring activities (e.g. worker interview logs, records of observations, documents reviewed);
- records of any grievances, investigations, corrective actions, and other follow-up activities related to workers supplied through third parties.

Auditors should confirm:

- whether workers are supplied to the UoC through recruitment agencies, employment agencies, or subcontractors;
- the working and employment conditions of these workers, through worker interviews;
- that the UoC has implemented a process for screening and oversight of those third parties;
- that legal compliance and any required licenses or registrations have been verified;
- that information on workers supplied through third parties is maintained;
- that the UoC periodically reviews working and employment conditions of workers supplied through third parties, through worker interviews and document review;
- that concerns relating to workers' rights are investigated and addressed appropriately;
- that workers have access to the UoC's grievance mechanism and understand how to use it and what its purpose is.

Useful Resources

N/A

Indicator:	Requirement:

3.7.4 The UoC shall not engage in false-apprenticeships.

How do I interpret this requirement?

- The indicator prohibits the use of false-apprenticeships. These are sometimes used to avoid labour obligations, reduce labour costs, or deny workers their legal rights and protections.
- Apprenticeships may be legitimately used within employment relationships if they are:
  - legally permitted;
  - temporary and structured around a training or skills-development objective;
  - adequately documented, including duration and supervision arrangements; and
  - not used to avoid wages, benefits, social protections, or labour obligations.

Evidence of implementation should be maintained, e.g.:

- Apprenticeship agreement
- Contracts
- Training plans or records

Auditors should confirm:

- That any apprentices at the uoc are aware of the terms agreed in their apprenticeship agreement and that their work fits in the scope of that agreement;
- That apprenticeship agreements clearly describe the training objective, duration, supervision agreements, and conditions of employment, and that these are consistent with workplace practices; and
- That apprenticeship agreements are not repeatedly extended or used in place of regular employment.

Useful Resources

- ILO Quality Apprenticeships Recommendation

Indicator:	Requirement:
3.7.5	The UoC shall ensure that no employment arrangements are used to avoid obligations to employees under applicable national labour and social security laws, and social security for all employees is paid according to applicable legal requirements.

How do I interpret this requirement?

- Employment arrangements such as home working, labour-only contracting, subcontracting, and fixed-term contracts can be used legitimately. However, they should not be used to avoid obligations under applicable labour or social security laws.
- Employment arrangements should be appropriate for the nature of the work and not avoid any labour or social obligations. To this end, the UoC should:

- Employ workers directly for ongoing, routine activities that are necessary for the operation of the farm, unless there is a legitimate reason for using an alternative employment arrangement;
- Use-fixed term or temporary employment only for work that is seasonal, temporary or linked to specific period;
- Use subcontractors only for specialised services, independent services, or temporary activities; and
- Avoid repeatedly using fixed-term contracts for ongoing work.

- Temporary employees, such as day labourers, should only be hired for unanticipated peak work or seasonal work. For example, routine feeding is an ongoing task that is carried out by an employee. A day labourer could be hired to support a busy harvest period or to handle an unexpected feed delivery.
- Examples of services that may be subcontracted are fish transfer, veterinary treatment, diving, maintenance, harvest, slaughter, storage, transport of fish, cleaning, and catering.

Evidence of implementation should be maintained, e.g.:

- Contracts with permanent and temporary employees, subcontractors and labour providers.
- Documentation regarding social security.

Auditors should confirm:

- Social security contributions are paid according to national legal requirements;
- Employees understand their right to social security and how that applies to their contracts;
- Employment arrangements are not being used to avoid labour or social security obligations.

Useful Resources

N/A

Indicator:	Requirement:

3.7.6 The UoC shall report employee composition related data in accordance with the ASC Data Submission Procedure.

How do I interpret this requirement?

- This is a reporting requirement, not a disclosure requirement, which means that all data is held confidentially by ASC, who does not share it publicly.
- Companies should never publicly share personal employee data.
- The information collected through this reporting requirements will enable ASC to gain insights into employee composition, which will inform the future development of ASC's requirements related to employees.

How do I report to ASC?

Reporting is done in MyASC under the social data header. The following guidance explains how employees should be classified.

1. Determine the reporting period

- Report the workforce composition for the point in time during the last full calendar year when the farm had its highest number of employees.
    - For example, if your audit is in 2027, you should look back at the full year of 2026 and report the employee composition for the month where you had the highest number of employees.

2. Determine which employees to include

- Include all employees who were employed at that time, including seasonal and temporary employees. This should include:
    - all employees that are directly involved in operations at the certified site(s). This means anyone who works on-site or supports the site's core activities, even if this staff is shared between multiple sites.
    - any managerial/ administrative / financial staff who primarily support the certified site(s), even if they are based off-site (e.g., a regional manager or accountant serving only a few sites). As a general principle, include these employees if they spend roughly >25% of their working time on activities tied to the certified site(s). This can be a rough estimate.
- Do not include any subcontractors. Further guidance about these employees is below.

- For multi-site and group certification, add up all employees across all sites included in the UoC.
- Count each employee / position only once: If multiple individuals occupied the same position during the year, count that position only once.
- Use the best information available through employment/recruitment records, payroll systems, or worker self-identification. Where information is unavailable, make a reasonable determination based on available records.

3. Classify employees

- There are several pieces of information about your employees to submit to ASC for this requirement. These are listed below.

Employment status

Report on:

- Directly hired employees
- Employees hired through a recruitment agency
- Employment agency workers

Reporting tip: These workers can all be added up. The web form will ask you to indicate if this includes any employment agency workers (yes/no).

Do not report on:

- Subcontractors: These workers are employees of the service provider and not of the UoC. Subcontractors typically control how the work is performed, invoice for their services, and are responsible for their own taxes and social insurance. For example, a self-employed electrician contracted to repair farm equipment, a veterinarian contracted to do an animal health assessment, a travelling harvest team contracted to do the harvest, divers employed by a diving company, or cleaning staff employed by a cleaning company.

Employment contracts

Employment contract type refers to whether the employment relationship is intended to continue indefinitely or is limited to a defined period, task, or season. To determine this a simple question for decision could be "Does the current contract have an end date?".

- Permanent: An employee employed under a contract with no predetermined end date or a contract for multiple years that is likely to get extended. Permanent employees may be full-time or part-time.
- Seasonal / temporary: An employee employed under a contract with a predetermined end date or for a specific season, production cycle, project, task, or temporary business need. The

employment relationship is expected to end automatically when the contract expires, unless a new contract is agreed. This category includes both seasonal and temporary workers.

Reporting tip: Employees should be classified based on their current contract, even if they have worked for the UoC previously. An employee who returns every year for the harvest season should be reported as seasonal/temporary if each period of employment is covered by a separate fixed-term or seasonal contract.

Employment type

Employment type refers to the employee's normal working hours compared with the national legal full-time workweek, or the full-time workweek agreed upon at the UoC.

- Full-time: An employee whose normal weekly working hours without overtime are equal to the standard full-time workweek recognised at the UoC.
    - For example, national law defines full-time employment as 40 hours per week, but a collective bargaining agreement has set the standard full-time workweek to 36 hours per week, and the employee works 36 hours per week. Report this employee as full-time.
- Part-time: An employee whose normal weekly working hours are lower than the legal or nationally recognised full-time workweek as agreed at the UoC.

Reporting tip: Use the employee's normal or contracted hours, not occasional overtime hours. An employee who normally works part-time but occasionally works additional hours should still be reported as part-time.

Gender categories

Employees need to be reported on according to their self-identified gender, where legally permitted (where this is not the case report them as ‘other’).

- Female: A worker who self-identifies as female.
- Male: A worker who self-identifies as male.
- Other: A worker who self-identifies with another gender identity, or for countries where national laws do not permit the collection or reporting of gender information.

Good practice: Use the employee's self- identification whenever possible. Do not assume a person's gender based on appearance, name or official documents.

Migrant status

Migrant status refers to whether a worker has moved from their usual place of residence to take up employment. For the employee composition we recognise three types.

- Local (non-migrant): An employee who is employed in or near their usual place of residence and has not moved for employment.
    - For example: An employee who lives in the same community as the farm, or an employee who lives in a nearby town and has not relocated for the job.
- Same-country migrant: An employee who has moved from another region, province, state or area within the same country to work.
    - For example: An employee who has moved from northern Indonesia to a shrimp farm in southern Indonesia.
- International migrant: An employee who has moved from another country to work.

Reporting tip: The purpose of this classification is to understand the composition of the workforce, not to assess an employee's legal status, nationality, ethnicity, or length of service. Classify employees based on where they normally lived before moving for work, not on their nationality. For example, a foreign national who has permanently settled locally and has not moved for the current job may be considered local/non-migrant.

4. Complete the reporting form

1. Determine when in the last full calendar year, the UoC had the highest number of employees.
2. For that moment in time, count all the permanent employees (fig 1).
3. Determine how many of those are employed full-time and part-time (fig1).
4. Then, determine their gender and fill the table. The totals will be calculated automatically and can help you check whether you have filled the table correctly (fig 1).
5. For the same group of permanent employees determine their migrant status and fill the table (fig 1). The totals are again calculated automatically. The totals by gender should be the same as the totals by migrant status.
6. The remainder of the employees should then be seasonal/ temporary employees. Repeat steps 3-5 in the second set of tables for these employees (fig 2).
7. Finally, complete the two questions below the tables (fig 3):
    a. Were any of these workers hired by an employment agency? (should be included in the above) yes/no
    b. Did the UoC have any subcontracted workers on the UoC in the last full calendar year? (should not be included in the above) yes/no.

Figure 1. Steps 2-5

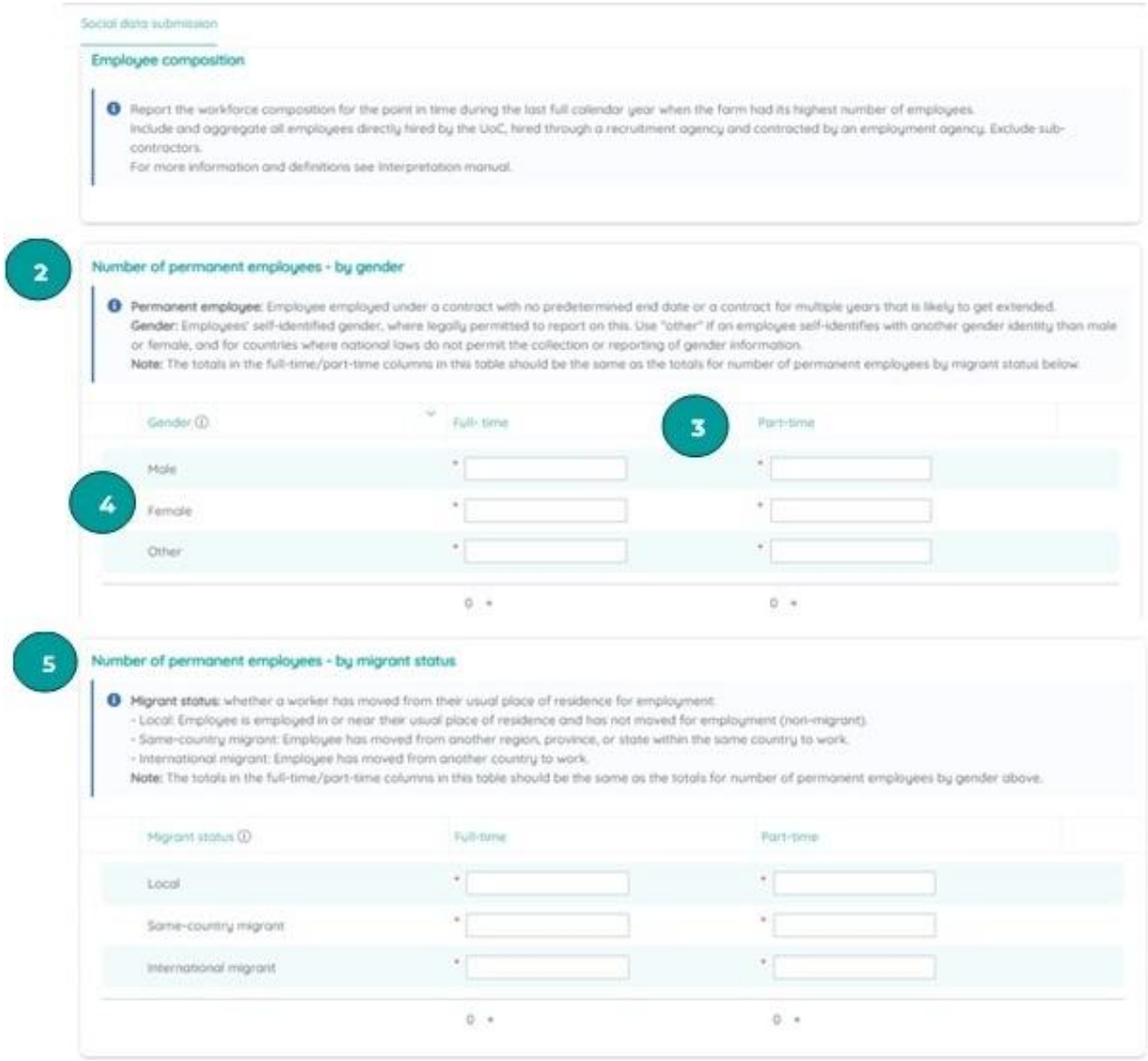


Figure 2. Step 6

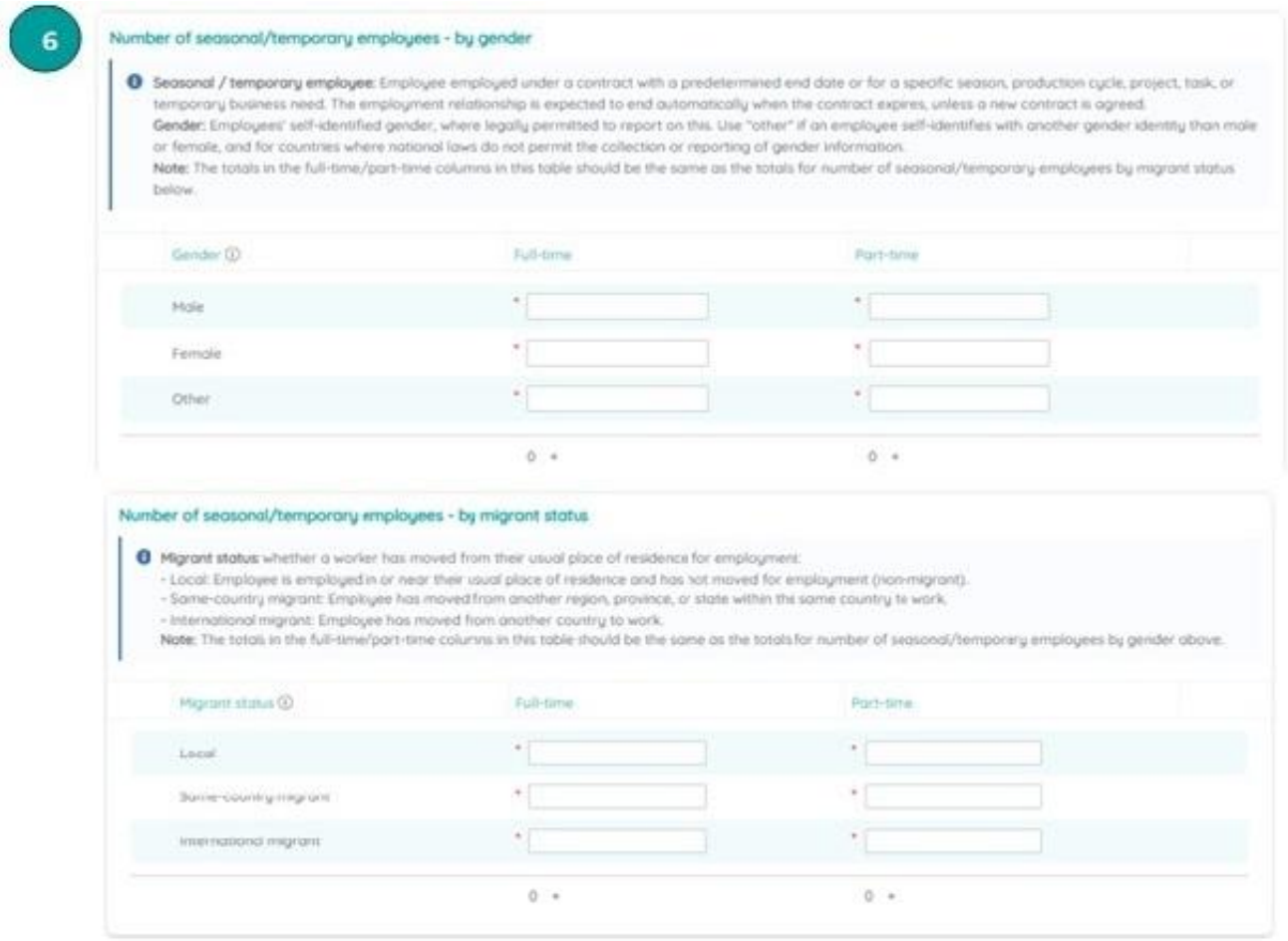


Figure 3. Step 7



Evidence of implementation should be maintained, e.g.:

- Confirmation of data uploaded to MyASC.

Auditors should confirm:

- that the totals data uploaded to MyASC is consistent with results of the wage gap analysis.

Useful Resources N/A

Criterion 3.8 – Wages

Indicator:	Requirement:
3.8.1	The UoC shall set wages, before overtime and bonuses, at or above the legal minimum wage. An exception applies where a minimum wage has not been established by applicable law, in which case the UoC shall calculate wages in consultation with employees or their representative organisations.

How do I interpret this requirement?

- The following countries do not have a statutory minimum wage applicable to aquaculture:
  - Denmark
  - Finland
  - Italy
  - Norway
  - Sweden
  - Iceland
  - Singapore
  - Tonga
  - Tuvalu
  - North Korea
  - South Sudan
  - Brunei
  - Zimbabwe
  - Somalia
- In these countries wages should be negotiated through collective bargaining or other consultation with employees and their representative worker organisations.
  - Further guidance on collective bargaining and worker organisations can be found in Criterion 3.6.
- In some countries, statutory minimum wages vary by age, job category, or time in employment. The UoC should apply these differentiated minimum wages.

- When employees are paid on a piece-rate or production quota basis, their earnings must be at least equivalent to the minimum wage based on hours worked.
- In-kind benefits provided by the UoC should not be used as a way to pay less than the legal minimum wage to any employee.
- In-kind benefits can include:
  - housing
  - subsidised rations, food, meals
  - transport
  - utilities such as water and electricity, etc.
- Some of these in-kind benefits can be included in the living wage calculation, as described in Appendix 11: Methodology for Wage Measurement.

Evidence of implementation should be maintained, e.g.:

- employee contracts
- payslips
- working hours records
- payment transaction records
- any collective bargaining agreements that are in place.

Auditors should confirm:

- national legal requirements on minimum wage;
- relevant collective bargaining agreements on wages in the sector (recommended prior to audit visit);
- remuneration for any production quota or piece-rate workers; and
- that no in-kind benefits have been paid in place of the legal minimum wage.

Useful Resources

- Regularly updated list of minimum wages by country: https://wageindicator.org/salary/minimum-wage/minimum-wages-per-country

Indicator:	Requirement:

3.8.2 The UoC shall annually identify any living wage gap, following the method outlined in **Appendix 11**.

How do I interpret this requirement?

- A **living wage** is: 'the remuneration (wages, bonuses and benefits) received for a standard workweek by a worker in a particular place sufficient to afford a decent standard of living for the worker and their family. Elements of a decent standard of living include food, water, housing, education, health care, transportation, clothing, and other essential needs including provision for unexpected events.'[63]
    - A living wage is different to the national minimum wage: it reflects local costs of living, is adjusted yearly for inflation, and is voluntary rather than required by law.
- A **living wage estimate** is the monetary amount a worker in a specific location needs to earn to maintain a decent standard of living. Living wage estimates are calculated by research organisations, such as the Anker Research Institute (ARI) and Wage Indicator Foundation, based on local costs.
    - The UoC should use an ASC-approved living wage estimate, following the 'How to access living wage information' guidance document available via the ASC Programme Centre. These estimates have been assessed on their methodological rigour and transparency.
    - The UoC should never calculate its own living wage estimate for this indicator.
- A **living wage gap** is the difference between employee remuneration and the relevant living wage estimate.
- The UoC should, following the method described in Appendix 11:
    - Use an ASC-approved living wage estimate, following the 'How to access living wage information' guidance document available via the ASC Programme Centre, suitable for their location and payroll year;
    - Calculate total employee remuneration (including any wages, bonuses, and allowable in-kind benefits received by employees); and
    - Compare this remuneration to the living wage estimate to determine whether there is a living wage gap.

[63] Global Living Wage Coalition: https://www.globallivingwage.org/

- Appendix 11 outlines the full calculation that the UoC should use to identify any living wage gap, based on the methodology developed by the Anker Research Institute.
- ASC strongly recommends the use of a tool called the Salary Matrix, developed by IDH, for this calculation. This tool helps to simplify and clarify the process.
    - Guidance is embedded in the tool and available via the ASC Programme Centre.
- Through this calculation, the UoC should be able to:
    - report to ASC, required by Indicator 3.8.3
    - develop the wage improvement plan required by Indicator 3.8.4

ASC's requirements on living wage are focused on helping the UoC assess whether or not they are paying a living wage to employees and identify any living wage gap. These requirements do not require the UoC to close any gaps between current wages and the living wage or immediately start paying a living wage.

Simplified assessment where guaranteed base wage exceeds the living wage estimate

Where the guaranteed base wage of an employee category meets or exceeds the relevant living wage estimate, a full living wage gap calculation is not required. Instead, the UoC can apply a simplified assessment to confirm the living wage gap is 0% by following the steps below.

1. Identify the guaranteed base wage:
   Identify the guaranteed gross monthly base wage (excluding any bonuses, overtime pay, allowances, or other extras) for each employee category. Start with the employees with the lowest wage.
2. Compare with the living wage estimate:
   Compare the guaranteed base wage to the applicable living wage estimate using a like-for-like comparison (gross monthly remuneration, based on standard working time, same reference year).
    a. If the guaranteed base wage meets or exceeds the living wage estimate:
        i. Living wage gap = 0%
        ii. No further remuneration calculation is required for those employees.
    b. If the guaranteed base wage is below the living wage estimate:
        i. Complete the full living wage gap calculation for those employees.

Evidence of implementation should be maintained, e.g.:

- completed Salary Matrix or similar wage measurement analysis calculation
- employee contracts
- working hour logs
- payslips
- payment transaction records
- any comparison between the living wage estimate and guaranteed base wages to support a simplified assessment.

Auditors should confirm:

- the accuracy and completeness of the living wage gap calculation;
- what bonus payments, and in-kind benefits have been paid, through employee and management interviews and document review;
- the value and benefit of in-kind benefits recorded in the wage measurement analysis, through employee interviews;
- calculations used in calculating in kind-benefits used for wage calculation, including document review, through management interviews;
- wage payments; and
- any comparison between the living wage estimate and guaranteed base wages to support a simplified assessment.

Useful Resources

- Wage measurement tool: IDH Salary Matrix
- ASC training materials, including videos, available via the ASC Programme Centre
- 'Living Wage Benchmarks' guidance document available via the ASC Programme Centre
- Living Wages Around the World, Manual for Measurement by Richard Anker and Martha Anker, Chapter 15 Comparing Prevailing Wages to a Living Wage: https://www.elgaronline.com/monobook-oa/9781786431455/9781786431455.xml

Indicator:	Requirement:

3.8.3 The UoC shall report living wage related data, including the living wage gap, in accordance with the ASC Data Submission Procedure.

How do I interpret this requirement?

- This is a reporting requirement, not a disclosure requirement, which means that all data is held confidentially by ASC, who does not share it publicly.
- Companies should never publicly share personal employee data.
- Wage gap data is generated by the UoC through their living wage gap calculation (Indicator 3.8.2) and is uploaded by the UoC to MyASC on an annual basis.
- When the site identifies no living wage gap for all employees, it should report:
  - Average living wage gap: 0%
  - Employees below living wage: 0% of the workforce
- The information collected through wage gap reporting will enable ASC to:
  - gain insights into national and regional wage gaps, which will inform the future development of ASC's living wage requirements
  - foster open discussions about the challenges of paying a living wage
  - discuss the role of collaboration and shared responsibility across the supply chain in enabling the payment of a living wage
  - develop strategies to raise wages and enhance benefits over time.

Evidence of implementation should be maintained, e.g.:

- Confirmation of data uploaded to MyASC.

Auditors should confirm:

- That data uploaded to MyASC is consistent with results of the wage gap analysis.

Useful Resources

- Living Wage Data Reporting Template

Indicator:	Requirement:

3.8.4

Indicator applicability: Every UoC that has identified a living wage gap

The UoC shall, where a living wage gap has been identified (see Indicator 3.8.2), develop and implement a wage improvement plan towards payment of a living wage.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC has identified a living wage gap. Where no living wage gap has been identified, then this indicator should be marked N/A.

- The wage improvement plan should:
  - list all categories of employees who are paid below a living wage
  - include targets and timelines for improvements for all categories of employees who are not receiving a living wage
  - be developed for a three-year period
  - include reporting on progress towards the previous year's goal and where goals have not been met, a justification should be provided.
- UoC's are expected to set realistic targets for wage improvements and meet these. They are not expected to fully close any living wage gap within the three-year planning period.
- A wage improvement plan template has been developed to support the UoC's conformance with this Indicator.
  - The UoC may also choose to develop their own wage improvement plan format, as long as it includes all of the elements listed above.

Evidence of implementation should be maintained, e.g.:

- Completed wage improvement plan.

Auditors should confirm:

- the presence of the completed wage improvement plan including reporting towards previous year's goal;

- that the plan provides a clear rationale and explanation where no progress has been made towards closing any living wage gap.

Useful Resources

- ASC's Wage Improvement Plan template
- IDH Living Wage Action Guide: offers guidance on various interventions that can help close living wage gaps: https://livingwageguide.idhtrade.org/

Indicator:	Requirement:
3.8.5	The UoC shall pay wages in full directly to employees in **legal tender** or into a bank account in their name at regular intervals, at least monthly. Wages shall not be delayed, deferred or in any way withheld.

How do I interpret this requirement?

- Legal tender does not include:
  - notes which banks no longer exchange
  - notes which are not accepted (for example, too small)
  - currency which is unusable due to inflation
  - in-kind benefits (food, housing, etc) of any kind.
- There are situations where withholding salary, property or benefits are legally required, and so allowed under this indicator. For example:
  - salary withholdings, as required by the government. For example, part of a salary is sometimes withheld by a government for:
    - statutory pensions
    - health insurance
    - taxes.
  - a government can sometimes require the withholding of salary to pay overdue child-care support costs to another parent or pay overdue taxes
  - salary deductions, as defined in a contract or collective bargaining agreement, that are agreed by both parties. For example, an agreed voluntary deduction for housing costs could be allowable.

- bonuses, which are considered optional and additional to the agreed salary and benefits. However, if clearly defined performance targets related to a bonus payment, as defined in a contract, have been achieved then the bonus cannot be withheld.

Evidence of implementation should be maintained, e.g.:

- Employee contracts.
- Payslips.
- Payment transactions.

Auditors should confirm:

- direct, regular, and accurate payment to employees through records review and interviews with employees and management;
- if there are any instances when wages were delayed, deferred or withheld in the past and why;
  - employees understand the process for raising grievances if wages are delayed or inaccurate;
  - when foreign migrant employees are employed, apart from legally required deductions, no other deductions should be made from their wages before payment, for example:
    - recruitment or agency fees
    - cost of airfare
    - employment visas
    - any fees or costs incurred in the recruitment process for employees to secure employment or placement, regardless of the manner, timing or location of their imposition or collection[64].

Useful Resources

- General principles and operational guidelines for fair recruitment and definition of recruitment fees and related costs: https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_protect/@protrav/@migrant/documents/publication/wcms_536755.pdf

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[64] https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_protect/@protrav/@migrant/documents/publication/wcms_536755.pd

Indicator:	Requirement:

3.8.6

The UoC shall document wage payment and receipt by all employees.

Documentation shall be understandable and made available to the employees and shall include information on at least the following:

a. wages; and

b. advances; and

c. loans; and

d. hours worked including overtime; and

e. details of any withholdings.

How do I interpret this requirement?

- Wage payment can be documented in several ways, often through a payslip including all wage information. This can be given to the employee:
  - electronically
  - through a printed copy
  - on or before the payday.
- Loans provided by an employer can be an important source of funds for employees in some places.
- Clarity of loan calculations and repayment are particularly important, as loans can be an element driving forced labour if employees are not able to repay within a reasonable amount of time based on their wages.
- If loan interest rates are charged by the UoC, they should be:
  - at or below bank rates
  - included in receipt of information on advances, loans, hours worked, pay and the calculation of any deductions.
- For each payment cycle, the UoC should provide a written pay record (such as a payslip) to each employee detailing the following:
  - employee name
  - ID/roll/employee number

- month/week/pay period
- number of regular hours worked
- number of overtime hours worked
- mandatory deductions towards social security, health insurance and taxes, etc.
- deductions towards repayment of advances or loans taken by the employee (see also Indicator 3.2.9).

- The pay record should:
  - be provided in paper or digital form.
  - be provided in a language and format easily understandable to employees.
  - be countersigned by employees unless the payment is traceable by bank transfer.
- It is particularly important that employees understand the calculation of hourly premium wages for overtime work.
- Employees should be able to raise any issues they may have related to doubts on calculations on wages, including overtime wages. The UoC should communicate a clear process on how employees can raise such issues.

Evidence of implementation should be maintained, e.g.:

- Employee contracts.
- Payslips.
- Any loan agreements in place.
- Working hours records.
- Documented wage information, including advances or any withholdings.

Auditors should confirm:

- Records of wage payments.
- Accuracy of wage payments.
- Employees' access to wage information through employee interviews.

Useful Resources

N/A

Indicator:	Requirement:

3.8.7 The UoC shall ensure that employees are entitled to maternity leave of a minimum of 14 weeks that includes a guarantee of return to the job.

How do I interpret this requirement?

- While this indicator requires that employees are allowed at least 14 weeks maternity leave, they are not required to use the full 14 weeks of maternity leave and may return to work earlier if they choose.
- Many countries have legal requirements for the provision of maternity protection for women employees. These typically include:
  - maternity leave
  - cash benefits
  - employment security, which includes a return to the same or a similar position after taking maternity leave.
- This requirement extends some or all of these benefits to employees at the UoC.
- Some countries also have similar legal requirements for the provision of paternity protection for male employees.
- Maternity leave can include both pregnancy leave and leave following the birth of the child.

Evidence of implementation should be maintained, e.g.:

- Written confirmation (either in contracts or a company policy or information document) that maternity provisions have been included that meet the requirements of local legislation.
- Evidence of maternity leave being paid, where national law requires.

Auditors should confirm:

- employees' understanding of maternity or paternity leave rights;
- employees who have taken maternity/paternity benefits have rejoined work at the same or similar position without a reduction in wages;
- the UoC does not discriminate in hiring between genders so that they can avoid being obligated to pay maternity (or paternity) benefits to employees, see ASC Farm Standard Criterion 3.4 (Discrimination).

Useful Resources

- International Labour Organization (ILO) V. Maternity Protection Convention, 2000 (No. 183)

Criterion 3.9 – Working Hours

Throughout this criterion, when we refer to 'week', it is a reference to a full 7-day calendar week.

Indicator:	Requirement:
3.9.1	The UoC shall ensure that working hours comply with applicable legal requirements and any collective bargaining agreements in place on premium rates, working hours, shift patterns, breaks, daily rest, weekly rest and annual leave.

How do I interpret this requirement?

- National legal requirements on working hours, premium rates, rest times, shift patterns and annual leave can vary according to the country where the UoC is located.
- National legal requirements should always form the minimum requirement for the UoC.
- Collective bargaining:
  - is a voluntary negotiation between employers and organisations of employees to establish the terms and conditions of employment by means of a written collective bargaining agreement (CBA)
  - typically covers wages, working hours and working conditions.
- In the event that national legal requirements, collective bargaining agreements and the ASC Farm Standard differ, the strictest rule always applies.
- Annual leave:
  - is the longest period of rest available to employees
  - allows physical and mental recuperation, and a break from the workplace
  - is paid with normal wages or with additional holiday pay on top of the normal wage (e.g. 13th month)
  - can be taken in days or weeks, with employees being allowed at least a 2-week block, as suggested by ILO standards.
- Laws in many nations set fixed monthly and yearly minimum leave days.
- ILO Convention No. 132 (Holidays with Pay Convention, 1970) specifies that annual leave is:
  - 3 weeks of leave for 1 year of service

- typically accrued monthly
- calculated pro-rata to their contracted working hours,

- ILO Convention No. 146 (Seafarers' Annual Leave with Pay Convention, 1976) can apply in aquaculture when vessels used by the site and subcontractors travel between sites in open water. This convention specifies 30 days of annual leave for 1 year of service.
- Annual leave days are not the same as public holidays, which are set by governments for cultural or historical reasons, and are not counted as part of annual leave days.

Evidence of implementation should be maintained, e.g.:

- Any written collective bargaining agreements that are in place.
- Information about national legal requirements regarding premium rates, working hours, shift patterns, rest breaks and annual leave.

Auditors should confirm:

- employees understand that they have the right to engage in collective bargaining about their terms and conditions;
- employees have been provided the opportunity to engage in collective bargaining;
- any collective bargaining agreements in place meet national legal requirements or the ASC Farm Standard, whichever is stricter, at a minimum.

Useful Resources

- https://ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_491374.pdf

Indicator:	Requirement:

3.9.2 The UoC shall maintain records of the hours worked by every employee.

How do I interpret this requirement?

- The UoC's working hours recording system:
  - can help the UoC to protect employees against excessive working hours
  - is accessible to employees to verify the record of their hours
  - may include the use of:
    - time clocks with punch cards
    - digital recording systems
    - recording hours manually
    - or other systems.
- The records should indicate
  - the start and finish time each day of the week
  - cumulatively add up to the total hours of regular work for the week
  - any overtime hours worked.

Evidence of implementation should be maintained, e.g.:

- working hours records, which include:
  - start and finish time
  - cumulative working hours
  - any overtime hours worked.
- payslips
- employee contracts.

Auditors should confirm:

- employees are aware that their working hours are being recorded;
- employees are able to access their working hours records;
- employees are able to confirm the accuracy of the working hours records;

- pay slips, employee contracts and working hours records are all aligned.

Useful Resources

N/A

Indicator:	Requirement:
3.9.3	*Indicator applicability: Every UoC employing people aged 18 and above* The UoC shall ensure that normal working hours, excluding overtime, do not exceed 8 hours per day and 48 hours in a week. An exception applies where the operations of the UoC require a different working pattern, in which case the UoC may use averaging of working hours if permitted by applicable legal requirements, calculated over a maximum 17-week reference period[65]. When more than 48 hours are worked in a week as a result of averaging, the UoC shall ensure that the following conditions are met: a. it is in line with applicable legal requirements; and b. it is in line with collective bargaining agreements; and c. terms are clearly set out and agreed to by employees in their contracts; and d. appropriate safeguards are put in place to protect the employee's health and safety.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC employs people aged 18 and above. If there are no employees aged 18 and above, then this indicator should be marked N/A.

- The normal workday is a maximum of 8 hours, excluding breaks, and the normal work week is a maximum of 48 hours.
- Where collective bargaining agreements, industry standards or national law require a shorter day or week, this applies.
- Where collective bargaining and national law allows, the UoC can employ people to work in shift work:

[65] https://www.gov.uk/maximum-weekly-working-hours

- They may choose to work more than eight hours per day and more than 48 hours in one week, if the number of hours averaged over a period of 17 weeks or less does not exceed a normal workday and normal work week.
- Taking into account the daily consecutive rest requirement (3.9.8), employees can never work more than 13 hours within a 24-hour period.
- Taking into account the weekly consecutive rest requirement (3.9.9), employees can never work more than 12 days in a row, if local law allows.

Working hours and shift work – compliant averaging examples

On / off shifts

In this example, employees work in a shift pattern of 12 days of work followed by 9 days of no work.

Period	Days / weeks	Ordinary hours per day / week	Total hours
On	12 days	12 hours / day	144 hours
Off	9 days	0 hours / day	0 hours
Total	3 weeks (21 days)		144 hours
Average per week	144 hours / 3 weeks = 48 hours per week		

Peak / low shifts

In this example, employees work in a shift pattern with peak periods and low periods.

Period	Days / weeks	Ordinary hours per day / week	Total hours
Peak	10 weeks	60 hours / week	600 hours
Low	7 weeks	30 hours / week	210 hours
Total	17 weeks		810 hours
Average per week	810 hours / 17 weeks = 47.6 hours per week		

- Any hours worked in excess of 8 hours per day, or the agreed shift pattern are considered overtime hours and should conform with indicators 3.9.4, 3.9.5, 3.9.6.
- Long working hours can mean that employees can get fatigued, which can result in accidents or mistakes. Appropriate safeguards must be put place to protect employees' health and safety. These can include:
    - a risk assessment looking specifically at the risk of fatigue
    - adequate or extra rest breaks and places for employees to rest during long shifts
    - enough food and drink available for employees to ensure that they are not hungry
    - avoiding employees who have worked long hours of overtime conducting hazardous work (for example, operating heavy machinery)
    - ensuring that dark areas are well lit
    - ensuring that, where possible, employees are not working alone for long hours.

- The UoC should recognise that employees could be working two jobs which, whilst outside the scope of the ASC Farm Standard, is still a risk to their health and safety, and consideration should be given to fatigue caused by excessive working hours.

Evidence of implementation should be maintained, e.g.:

- employee contracts
- payslips
- working hours records
- health and safety risk assessment.

Auditors should confirm:

- any different shift patterns have been entered into voluntarily by employees;
- the UoC understands the risk inherent in long working hours, and fatigue and appropriate mitigations are being implemented.

Useful Resources

N/A

Indicator:	Requirement:

3.9.4 The UoC shall ensure that overtime hours:

a. are voluntary; and

b. are not requested regularly; and

c. have appropriate safeguards in place to protect the employee's health and safety.

How do I interpret this requirement?

- Overtime should not occur regularly but under exceptional circumstances, for example, overtime can be requested:
  - for unexpected peak production times;
  - if staff are absent and others must cover their work.
- The UoC should plan work in such a way to minimise the risk of regularly requesting overtime. If the UoC continues to need the same jobs done in overtime repeatedly, this is an indication that the UoC may need to review resources, plan work differently or hire additional employees.
- Any overtime is voluntary, meaning it can only take place if the employee consents to extra work hours, and is not discriminated against or penalised for refusing overtime.
- Health and safety hazards related to excessive overtime can be avoided by implementing a clear overtime policy that:
  - limits excessive overtime
  - ensures that overtime requirements are announced in advance when possible
  - ensures that overtime is voluntary
  - rotates schedules so that overtime is not always assigned to the same employees
  - ensures that health and safety training shows how to recognise and manage signs of fatigue and stress.
- The UoC should allow regular rest breaks during overtime shifts.
- The UoC can maintain open and transparent communication channels with employees to encourage them to provide feedback about their work conditions and overtime hours, and use this input to adjust schedules.
- Appropriate safeguards in place to protect employees' health and safety can include:

- a risk assessment looking specifically at the risk of fatigue
- adequate or extra rest breaks and places for employees to rest during long shifts
- enough food and drink available for employees to ensure that they are not hungry
- avoiding employees who have worked long hours of overtime conducting hazardous work (for example, operating heavy machinery)
- ensuring that dark areas are well lit
- ensuring that, where possible, employees are not working alone for long hours.

Evidence of implementation should be maintained, e.g.:

- health and safety risk assessment
- contracts
- working hours records.

Auditors should confirm:

- employees understand that overtime hours are voluntary;
- management understand the risks in working long hours and are well prepared to mitigate those risks;
- regular activities are carried out in regular working hours and that overtime is used for exceptional circumstances.

Useful Resources

N/A

Indicator:	Requirement:
3.9.5	The UoC shall ensure that total working hours, including normal and overtime hours, do not exceed 60 hours in a week.

How do I interpret this requirement?

- Overtime is any additional hours spent working beyond normal working hours.

- This requirement does not allow these overtime hours to exceed more than 12 per week.

Evidence of implementation should be maintained, e.g.:

- contracts
- working hours records.

Auditors should confirm:

- employees understand how much overtime they are allowed to work.

Useful Resources

N/A

Indicator:	Requirement:
3.9.6	The UoC shall ensure that overtime hours are paid at a premium rate of at least 125%[66] of the agreed wages, or as defined by applicable legal requirements or any collective bargaining agreements in place, whichever is higher.

How do I interpret this requirement?

- For overtime hours, a minimum of 125% of the agreed wage is paid to employees (i.e. the agreed wage plus a 25% surcharge).
- Overtime work often involves sacrifices from employees, such as time away from family and personal life, and this additional effort needs to be rewarded.
- Where collective bargaining agreements or applicable law include a premium rate that is below 125%, the ASC minimum of 125% applies.
- The premium rate should be:
  - documented in payslips
  - documented in the employee contract
  - clearly understood by all employees.

[66] https://normlex.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C030

Evidence of implementation should be maintained, e.g.:

- contracts
- working hours records
- payslips.

Auditors should confirm:

- employees understand that overtime hours are paid at a premium rate;
- employees understand the difference between regular hours and overtime hours;
- if the bar of 'exceptional circumstances' is being used to determine overtime requirements.

Useful Resources

N/A

Indicator:	Requirement:

3.9.7

Indicator applicability: Every UoC employing people aged 18 and above

The UoC shall ensure that all employees are granted breaks during work shifts. Where this is defined by applicable legal requirements or any collective bargaining agreements in place, these shall be followed.

How do I interpret this requirement?

> **Indicator applicability:** This indicator is only applicable if the UoC employs people aged 18 and above. If there are no employees aged 18 and above, then this indicator should be marked N/A.

- The amount, length and frequency of rest breaks that employees are entitled to can be specified by collective bargaining agreements in place, and national laws.
- The UoC should ensure that rest breaks are clearly agreed upon and set out for employees.
- Rest breaks:
  - provide essential rest during the workday
  - help reduce fatigue and the risk of accidents or errors

- may accommodate personal needs, like restroom or prayer breaks.

- Ensuring clean and hygienic facilities for breaks is vital in workplaces with potential hygiene risks due to factors like chemicals, noise, or pollutants, where employees cannot leave the premises during breaks.
- Management should consider climate conditions when they plan breaks and rest times. In very hot temperatures, employees will need:
  - more frequent breaks,
  - breaks taken in the shade where possible
  - access to drinking water.
- An employee may only be asked to work during rest time if they agree to work during their rest time, and the rest time is made up at a different time.
- Standby time and on-call time are not considered rest time (see 3.9.7 for further information on standby and on-call time).

Evidence of implementation should be maintained, e.g.:

- contracts
- any collective bargaining agreements that are in place.

Auditors should confirm:

- employees understand the pattern of rest breaks that they are entitled to;
- rest breaks are adequate for the needs of the employees in their context.

Useful Resources

N/A

Indicator:	Requirement:

3.9.8

Indicator applicability: Every UoC employing people aged 18 and above

The UoC shall ensure that all employees are granted at least 11 consecutive hours of rest within a 24-hour period.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC employs people aged 18 and above. If there are no employees aged 18 and above, then this indicator should be marked N/A.

- Rest for a period of 11 consecutive hours within a 24-hour period ensures that employees have an adequate amount of time for both sleep and personal free time.
- All employees, regardless of their shift pattern, require this rest.
- Taking into account consecutive rest time, the maximum working day, including any overtime, is 13 hours or the applicable legal limit, whichever is lower.
- Standby time and on-call time are not considered rest time.
- Standby time means the employee is required to remain available to conduct tasks immediately, even if they are not actively working. Standby hours count as working hours and must be fully compensated.
    - Examples of standby time include time spent at the UoC waiting for the arrival of a feed or waiting between feeding times.
- On-call time means the employee must be reachable and available during a defined period, but is not required to work unless called upon. On-call hours are not counted as working hours but should be compensated in some way.
    - An example of on-call time is an employee who is at home overnight but available to be called to the site in an emergency.
- Employees residing on site may be on standby, on call, and off duty depending on the restrictions placed on them and whether they are required to remain available for work. These employees are:
    - On standby when they are required to remain available to perform tasks immediately if needed and their ability to use the time for their own purposes is substantially restricted;

- On call when they are not required to respond immediately but must remain reachable and available if called upon; and
- Off duty when they are not required to be available for work and are free to use their time for their own purposes.

Evidence of implementation should be maintained, e.g.:

- Contracts.
- Any collective bargaining agreements that are in place.
- Working hours records.

Auditors should confirm:

- Employees understand the rest time that they are entitled to.

Useful Resources

N/A

Indicator:	Requirement:
3.9.9	*Indicator applicability: Every UoC employing people aged 18 and above* The UoC shall ensure that all employees are granted at least 24 consecutive hours of rest within a 7-day period[67], or at least two periods of 24 consecutive hours of rest within a 14-day period[68] if allowed by applicable law.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC employs people aged 18 and above. If there are no employees aged 18 and above, then this indicator should be marked N/A.

[67] https://normlex.ilo.org/dyn/normlex/en/f?p=1000:12100:::12100:P12100_INSTRUMENT_ID:312159
[68] https://www.ethicaltrade.org/eti-base-code/6-working-hours-are-not-excessive

- Employees shall receive at least 24 consecutive hours of rest within every 7-day period. Where permitted by applicable law or a collective bargaining agreement, this may instead be provided as two periods of at least 24 consecutive hours of rest within a 14-day period.
- The ILO's 1921 Weekly Rest Convention (No. 14) mandates a 24 consecutive -hour weekly rest period (within a 7-day period).
- Where the UoC may be located more remotely or where shift patterns may require a longer number of consecutive days of work, 48-hours rest can be taken within a 14-day period, if allowed by applicable law and collective bargaining agreements. Where the 14-day option is used, the two 24-hour rest periods do not need to be taken on consecutive days.
- The maximum number of consecutive workdays therefore is 12 or the applicable legal limit, whichever is lower.
- Where there is a high number of consecutive workdays, the UoC should ensure that there are adequate safeguards for employees' health and safety, as per Indicator 3.9.3.

Weekly rest periods – conforming and non-conforming examples

Conforming examples include:

- Employees work six consecutive days and then receive one full day off.
- Where allowed by law and collective bargaining agreements, employees receive two separate full days of rest within a 14-day period.
- Where allowed by law and collective bargaining agreements, employees work 12 consecutive days followed by two days off.

Non-conforming examples include:

- Employees work more than 12 consecutive days and then receive time off.
- The UoC uses a 14-day rest pattern where national law required weekly rest.
- A scheduled rest period is interrupted by required work, so the employee does not receive 24 consecutive hours of rest.

Evidence of implementation should be maintained, e.g.:

- Contracts.
- Any collective bargaining agreements that are in place.
- Working hours records.

Auditors should confirm:

- Employees understand the rest time that they are entitled to.

Useful Resources

N/A

Indicator:	Requirement:
3.9.10	*Indicator applicability: Every UoC with employees who are pregnant or breastfeeding* The UoC shall ensure that additional breaks are granted for employees who are pregnant or breastfeeding. These breaks shall be counted as working time and appropriate facilities shall be provided.

How do I interpret this requirement?

> **Indicator applicability:** This indicator is only applicable if the UoC has any employees who are pregnant or breastfeeding. If there are no employees in this category, then this indicator should be marked N/A.

- According to ILO, the lack of support at the workplace is one of the main reasons that women stop breastfeeding before the recommended time[69].
- Employers can support breastfeeding women by providing:
  - ample time away from work activities
  - a comfortable, private location to express breast milk
  - access to a fridge to store it
  - a clean and safe environment (other than a bathroom).

[69] https://www.ilo.org/global/about-the-ilo/newsroom/comment-analysis/WCMS_218710/lang--en/index.htm

Evidence of implementation should be maintained, e.g.:

- policy, for example addressing new and expectant mothers
- health and safety risk assessment
- contracts
- working hours records.

Auditors should confirm:

- entitlement to paid nursing breaks in the country/region where the UoC is located;
- confirm that a location for breastfeeding mothers is suitable;
- confirm that the relevant employees understand these requirements.

Useful Resources

- https://www.ilo.org/global/about-the-ilo/newsroom/comment-analysis/WCMS_218710/lang--en/index.htm
- Ontario, Canada Public Health Association recommendations for creating a breastfeeding friendly workplace: https://www.opha.on.ca/OPHA/media/Resources/Resource%20Documents/BreastfeedingFriendlyWorkplace-Sep08.pdf
- Region of Waterloo, Canada recommendations for creating a breastfeeding friendly workplace: https://www.regionofwaterloo.ca/en/doing-business/resources/Documents/Breastfeeding_Friendly_Workplace_Toolkit.PDF

Indicator:	Requirement:

3.9.11 The UoC shall ensure that all employees are granted paid leave as defined by applicable legal requirements or any collective bargaining agreements in place. An exception applies where paid leave has not been defined by applicable law or a collective bargaining agreement, in which case the UoC shall determine paid leave in consultation with employees or their representative organisations.

How do I interpret this requirement?

- Paid leave can include:
  - public holidays
  - annual leave
  - maternity/paternity leave
  - sick leave.
- Legal requirements or collective bargaining agreements often define minimum leave entitlements (e.g. number of days per year). These should be met a minimum.
- Where paid leave is not defined by law or a collective bargaining agreement, the UoC should engage in consultation with employees or their representative organisations to agree on paid leave entitlements.
- Paid leave is paid with normal wages or with additional holiday pay (e.g. 13th month).
- ILO Convention No. 132 (Holidays with Pay Convention, 1970) specifies that annual leave is:
  - 3 weeks of leave for 1 year of service,
  - typically accrued monthly, and
  - calculated pro-rata to their contracted working hours.
- ILO Convention No. 146 (Seafarers' Annual Leave with Pay Convention, 1976) can apply in aquaculture when vessels used by the site and subcontractors travel between sites in open water. This convention specifies 30 days of annual leave for 1 year of service.

Evidence of implementation should be maintained, e.g.:

- contracts
- collective bargaining agreements

- working hours records.

Auditors should confirm:

- employees understand their entitlement to paid leave;
- employees do not feel discriminated against when they take annual leave.

Useful Resources

N/A

Criterion 3.10 – Disciplinary Practices

Indicator:	Requirement:
3.10.1	The UoC shall have a written disciplinary policy with the intent of setting out the process to respond to breaches of company rules. The policy shall define clear levels of escalation and shall ensure that the employee's dignity is upheld at all times.

How do I interpret this requirement?

- The written policy should:
  - outline the process for when employees break any rules of the UoC, detailing what behaviour may trigger disciplinary action, and the corresponding action to be taken.
  - adhere to local legislation and any collective bargaining agreements in place, particularly regarding cases of potential dismissal
  - list who is responsible for decision-making at different levels
  - outline how employees are rewarded for good work and encouraged to improve
  - be accessible and understandable to all employees
  - be integrated in company processes through training for supervisors and managers, including how to communicate effectively, and carry out any responses in a fair and respectful manner.
- Suspension can sometimes be used as a disciplinary action. This period of suspension should always be paid unless:
  - suspension for a time is offered to the employee as an alternative to dismissal, this period could be unpaid as long as:
    - the employee has agreed accept this
    - it is not enacted after the event as deduction from wages.

Table 7. Examples of levels of escalation in disciplinary procedures (adapted from SA8000):

Type of infraction	Example of infraction	Example disciplinary action progression / escalation plan / procedure
Minor	Isolated incident of tardiness or minor production errors	1. Oral warning to employee that his/her conduct or level of performance is unacceptable. 2. If unsatisfactory performance or conduct continues or becomes more serious, a written warning identifying the details of the infraction that led to the warning. May contain a request for corrective action, a timeline for correction, and the consequences if not complied with. 3. If the employee fails to improve, a final written warning that documents the continued misconduct or poor performance and explains the consequences of further failure to improve, such as possible suspension or even dismissal. 4. 4. As a last resort, the employee may be suspended, demoted, or dismissed. The employee is given the opportunity to appeal the decision before such action is taken.
Major	Repeated incidents of tardiness or minor production errors Isolated major production error	1. A written warning to the employee identifying the details of the infraction that led to the warning. May contain a request for corrective action, a timeline for correction, and the consequences if not complied with. 2. If the employee fails to improve, a final written warning that documents the continued misconduct or poor performance and explains the consequences of further failure to improve, such as possible suspension or even dismissal. 3. 3. As a last resort, the employee may be suspended, demoted, or dismissed. The employee is given the opportunity to appeal the decision before such action is taken.
Gross misconduct	○ Theft or fraud ○ Physical violence or bullying ○ Deliberate and serious damage to property ○ Serious incapability at work brought on by alcohol or illegal drugs ○ - Causing loss, damage, or injury through serious negligence	1. The employee may be suspended from work on full pay, while the alleged offence is investigated. 2. 2. If, on completion of the investigation and the full disciplinary procedure, the organisation is satisfied that gross misconduct has occurred, the result could be summary dismissal without notice or payment in lieu of notice. However, the employee is given the opportunity to appeal the decision before such action is taken.

Evidence of implementation should be maintained, e.g.:

- written disciplinary policy
- training records
- records of any disciplinary process.

Auditors should confirm:

- the disciplinary policy complies with the ASC Farm Standard's intention;
- employees are aware of the disciplinary policy;
- employees confirm that the company adheres to their policy and actions are fair;
- there are no monetary deductions imposed during the process.

Useful Resources

- ACAS statutory Code of Practice on discipline and grievance procedures: https://www.acas.org.uk/acas-code-of-practice-for-disciplinary-and-grievance-procedures/html
- Auditors can consult with and seek information from competent authorities and interested parties. For example, local worker welfare organisations, NGOs, labour lawyers and civil society.

Indicator:	Requirement:
3.10.2	The UoC shall ensure that all employees are aware of, and understand, the disciplinary policy.

How do I interpret this requirement?

- The UoC can inform employees about the disciplinary policy by:
  - including it in the employee contract or staff handbook
  - distributing the written policy to employees in languages they understand
  - including the disciplinary policy in orientation or ongoing training.

Evidence of implementation should be maintained, e.g.:

- written disciplinary policy
- training records
- employee handbook.

Auditors should confirm:

- training records and employee handbook;
- employees understand the disciplinary policy
- how employees were trained on the disciplinary policy.

Useful Resources

N/A

Indicator:	Requirement:
3.10.3	The UoC shall maintain records of responses to breaches of company rules.

How do I interpret this requirement?

- These records should include:
  - the observed misconduct by the employee
  - the actions taken by the employer, including copies of written notices, withholding of bonuses, suspensions, demotions or dismissals, if applicable.
  - the investigation carried out
  - the appeals process by the employee, if applicable
  - who was involved in or witnessed each of these steps.

Evidence of implementation should be maintained, e.g.:

- Written disciplinary policy.
- Records of any disciplinary procedures.

Auditors should confirm:

- Records of any investigations, actions and responses.

Useful Resources N/A

Indicator:	Requirement:

3.10.4 The UoC shall not deduct from wages or benefits as part of any response to breaches of company rules.

How do I interpret this requirement?

- A person's livelihood and ability to feed and provide for themselves and their families should not be impacted by a disciplinary action at work.
- Wages cannot be withheld for disciplinary action from any:
  - regular wages
  - payments for overtime
  - other benefits such as fixed year-end bonuses.
- Non-fixed bonuses that are determined based on performance are not considered a benefit.
- This indicator applies even if local laws or regulations allow monetary fines to be imposed as part of disciplinary procedures.
- Suspension can sometimes be used as a disciplinary action. This period of suspension should always be paid unless:
  - suspension for a time is offered to the employee as an alternative to dismissal, this period could be unpaid as long as:
    - the employee has agreed to accept this
    - it is not enacted after the event as deduction from wages.

Evidence of implementation should be maintained, e.g.:

- Written disciplinary policy.
- Payroll documentation to verify if they are deductions other than legally mandated deductions (for example, taxes and employees' contributions towards social security or health insurance).

Auditors should confirm:

- if there have been any fines, as they are not always reflected on pay records;
- if there are any specific methods of discipline for production targets not being met or for quality issues;

- any fines that employees have had to pay (for example, for coming late to work, excessive use of toilets, being absent or sick etc.).

Useful Resources

N/A

Criterion 3.11 – Employee Accommodation

Indicator:	Requirement:

3.11.1

Indicator applicability: Every UoC that provides accommodation

The UoC shall ensure that any accommodation provided for employees or their family:

a) is according to applicable legal requirements; and

b) has adequate safety provisions; and

c) is regularly maintained and kept in good working order; and

d) is clean and hygienic; and

e) allows for adequate privacy, including separation by gender if required; and

f) meets the basic needs of the employees and their families; and

g) is sufficient for the number of people using them.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC provides accommodation for employees (and their families). If no accommodation is provided, then this indicator should be marked N/A.

- Employee accommodation refers to accommodation that is provided for employees, by the UoC. It does not refer to any accommodation that is owned by the UoC but is privately rented by employees through an arrangement that is separate to their employment.
- When accommodation is privately rented through an arrangement separate to their employment, this accommodation is not within the scope of the audit.
- On-site accommodation is typically offered by workplaces:
  - in remote locations
  - when local housing supplies are otherwise very limited.
- On-site accommodation can mean that there is a higher risk of forced and child labour because:
  - employees and their families living in on-site accommodation can be less integrated into a local community

- their presence on site can mean they are asked to work more hours than their contracts specify
- high rental costs relative to employee income mean that employees can incur debt.

- The UoC is not required to provide accommodation for its employees.
- Employees are not required to reside in employer-provided accommodation.
- The UoC monitors and ensures the quality, safety and maintenance of housing that is provided, regardless of whether it owns, leases or contracts the facility.
- Facilities should:
  - be built to withstand recurring extreme weather conditions
  - be located in a non-hazardous location, with adequate drainage, pest control and hygiene procedures in place
  - have fire safety and other emergency response measures in place, for example:
    - marked safety exits
    - emergency escape routes
    - assembly points
    - firefighting equipment, which is maintained annually or when required
  - include separate accommodations by gender that ensure adequate privacy, for example:
    - locking doors when both genders are present
    - an individual bed for each employee in shared dormitories
    - an individual storage space for each employee in shared dormitories, including lockable storage space for personal or valuable items
  - ensure that families with children have separate rooms from employees who are not members of that family
  - ensure that children live with their parents
  - provide separate spaces for sleeping and social life
  - provide a separate, well-ventilated canteen or space for cooking and eating.

Evidence of implementation should be maintained, e.g.:

- records of scheduled housekeeping such as cleaning of common areas like toilets, shower stalls, corridors and garbage disposal
- records of maintenance, for example, fire alarm service, extinguisher service, emergency lighting service, gas, electrical, etc.

Auditors should confirm:

- by conducting a walkthrough of the accommodation, that all provisions of this Indicator are being met;
- what employees report about the living conditions in the accommodation.

Useful Resources

- ILO guidance on worker's housing: wcms_116344.pdf (ilo.org)

Indicator:	Requirement:

3.11.2

Indicator applicability: Every UoC that provides accommodation

The UoC shall ensure that any rent for accommodation is reasonable and is in line with average local rental rates.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC provides accommodation for employees (and their families). If no accommodation is provided, then this indicator should be marked N/A.

- Rates are 'reasonable' when:
  - below or comparable to similar accommodation available on the market
  - not more than a reasonable proportion of the employee's income.
- Where an employee or employee and their family plans to live in employer-provided accommodation:
  - the level of rent is a part of the contracting agreement
  - the site is able to provide a calculation and rationale for the level of rent.
- If an employee lives in employer-provided accommodation and has an early termination of their contract (for example, due to gross misconduct), they should be entitled to a reasonable period of time to vacate the premises.

Evidence of implementation should be maintained, e.g.:

- Records of rental agreements and payments.
- Employee contracts.
- Payslips.

Auditors should confirm:

- the costs of any accommodation;
- average local rental rates;
- any additional charges for the provision of water and electricity, which should not be more than what employees would have to pay if they stayed outside the employer-provided accommodation.

Useful Resources

N/A

Indicator:	Requirement:

3.11.3

Indicator applicability: Every UoC that provides accommodation

The UoC shall provide access to appropriate sanitary facilities that:

a) are clean and hygienic; and

b) include adequate privacy measures; and

c) include separation by gender if required; and

d) are sufficient for the number of people using them.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC provides accommodation for employees (and their families). If no accommodation is provided, then this indicator should be marked N/A.

- Appropriate sanitary facilities:

- are located within or in close proximity (i.e. less than 60 metres) to the dormitory or housing facilities
- are dry and warm
- have a source of ventilation (e.g. window or fan)
- have adequate lighting
- have doors that close and lock for privacy
- are separated for men and women except in family accommodation
- are constructed of hard materials that are easy to clean
- include at least one of the following:
  - pit latrines
  - flush toilets
  - urinals
- have taps and running water
- have facilities for the safe disposal of sanitary products.

o Waste and wastewater are disposed of in accordance with Criterion 2.12.

Evidence of implementation should be maintained, e.g.:

o records of scheduled housekeeping such as cleaning of common areas like toilets, shower stalls, corridors and garbage disposal.

Auditors should confirm:

o through a walkthrough of the sanitary facilities that all provisions of this Indicator are met;

o what employees report on the quality of drinking water, maintenance of sanitary equipment like taps and toilet flushing systems.

Useful Resources

N/A

Indicator:	Requirement:

3.11.4

Indicator applicability: Every UoC that provides accommodation

The UoC shall arrange for an annual meeting with employees or their representatives to discuss any reasonable improvements required to accommodation. The UoC shall maintain records of these meetings and shall take actions where necessary.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC provides accommodation for employees (and their families). If no accommodation is provided, then this indicator should be marked N/A.

- Employees can use this meeting to:
  - make suggestions on improvements to ensure accommodation meets requirements related to safety, hygiene, privacy, sanitary facilities, and rates.
  - highlight any maintenance issues that need to be addressed.
- Any agreed improvements are acted upon by the UoC.

Evidence of implementation should be maintained, e.g.:

- records of meetings held between the UoC management employee representatives.

Auditors should confirm:

- if any issues have been brought to the notice of management and how they have been resolved;
- the process of raising grievances about living conditions.

Useful Resources

N/A

Indicator:	Requirement:

3.11.5

Indicator applicability: Every UoC that has employees working in remote locations

The UoC shall ensure that all employees working in remote locations have access to a free, private, real-time communication link to communicate externally.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if the UoC has employees working in remote locations. If no employees are working in remote locations, then this indicator should be marked N/A.

- A remote location can be defined as somewhere where employees live on site, permanently or temporarily, and cannot go home at the end of each day due to distance to travel.
- Having access to outside communication is important for employees to:
  - protect their mental wellbeing
  - have an opportunity to raise any issues that occur on site.
- Employees can use this communication link to communicate with:
  - family and friends
  - any independent organisation that they may be aware of (either through information from the UoC or other sources) who can support them.
- This communication can happen through:
  - an employee's own mobile phone
  - a telephone provided by the UoC
  - WiFi provided by the UoC for employees.
- This line of communication is available 24 hours a day.
- Outside an employee's working hours there are no restrictions on when employees are able to connect with people outside the UoC.

Evidence of implementation should be maintained, e.g.:

- Information about the availability of an outside communication link.
- Evidence that the communication link is working.

Auditors should confirm:

- that lines of communication are actually working;
- the availability of these lines of communication for employees.

Useful Resources

N/A

Criterion 3.12 – Grievance Mechanisms

Indicator:	Requirement:
3.12.1	The UoC shall, when concerns arise, engage in dialogue with employees or their representatives, with the intent of avoiding an escalation to a grievance. The UoC shall ensure that employees understand how to engage in this dialogue.

How do I interpret this requirement?

- The UoC proactively implements a dialogue system that:
  - allows for open participation of all employees
  - is easily accessible to employees on a regular basis
  - provides options for anonymous feedback.
- Mechanisms for employees to provide feedback and engagement with management could include:
  - dialogue between management and employees
  - engagement with elected employee or union representatives
  - employee meetings or assemblies to solicit feedback
  - employee committees
  - suggestion box that is safely accessible for employees
  - access to an online feedback form or dedicated email address or phone number
  - employee surveys.
- Issues raised during this process may include suggestions for improvement or highlight negative impacts on employees from the UoC's activities. Examples can include:
  - operational inefficiencies such as inadequately maintained machinery that may impact efficiency and could cause health risks
  - employee rights such as female employees are paid less than male employees with similar jobs
  - harassment, such as an employee is pressured to begin a romantic or sexual relationship with a supervisor (whether this occurs during or outside work hours and work location)

- working conditions, such as:
  - employees are frequently asked to work excessive overtime hours
  - employees are not properly compensated for their work.

Evidence of implementation should be maintained, e.g.:

- Documentation on the mechanisms available.
- Meeting minutes.
- Records of actions taken to address issues.

Auditors should confirm:

- how the mechanisms for reporting any issues are communicated to the employees;
- what the procedures are to facilitate dialogue;
- employees' awareness of any processes to raise or discuss concerns with managers;
- how and how often issues can be communicated to the management;
- the system for reviewing and addressing any issues.

Useful Resources

N/A

Indicator:	Requirement:
3.12.2	The UoC shall have an employee grievance mechanism which is accessible, fair and applicable to all employees.

How do I interpret this requirement?

- A grievance mechanism is a formal complaint process that can be used by employees to resolve a grievance.
- Based on UN Guiding Principle No. 31, and effective a grievance mechanism must:
  - engender trust among participants

- be transparent: ensure that users are given clear information about what is happening
- be fair: ensure that users have access to sources of information and expertise necessary to engage in a grievance process
- be predictable: ensure that users understand the process, how long it takes and what the outcomes can be
- be accessible: ensure that users have been informed about it and can use it, and that it is in a language that they understand
- be rights-based: ensure that outcomes and remedies are compatible with international human rights
- be based on dialogue and engagement, ensuring that stakeholders are consulted and included in the process
- be a source for continuous learning, analysing individual complaints to help prevent other grievances.

- Mechanisms for submitting grievances are best determined together with employee representatives and can include:
  - in-person meetings
  - dedicated telephone numbers
  - email addresses
  - instant messaging or other online submission mechanisms
  - letters or written notes
  - a suggestion box
  - via employee representatives, trade unions, and worker associations
  - worker voice tools to conduct anonymous worker surveys.
- For a grievance mechanism to be accessible for employees they must understand:
  - their labour rights (Criterion 3.1)
  - rights related to other workplace issues, such as health and safety regulations (Criterion 3.5)
  - how the grievance mechanism functions and what kinds of issues may be brought to the grievance mechanism (see also 3.12.3).
- Foreign migrant workers may be given the option to raise issues:
  - internally with the UoC using the same channels open to other employees

- with the local Consular Office of the Labour Attaché for their country in the country where the UoC is located
- websites or Facebook pages of the Consulate or Embassy where migrant workers can raise grievances.

- An effective grievance process will incorporate elements of the following steps at a minimum (adapted from Rainforest Alliance's Grievance Guidance):
  - **Step 1**: Receive and acknowledge grievance complaint
  - **Step 2:** Take immediate action on human rights or hazardous issues (see Appendix 10 for the Remediation Procedure)
  - **Step 3:** Review the grievance complaint to check if it is admissible.
    - if it is inadmissible, this is communicated along with the reason, to the person who brought the grievance.
    - an inadmissible complaint is one that is unrelated to the activities or location of the UoC.
  - **Step 4:** Investigate the grievance complaint to establish what happened, maintaining confidentiality.
    - for complex issues or where there are conflicts of interest, external experts may be brought in to support.
  - **Step 5:** Communicate findings to the person who brought the grievance.
  - **Step 6:** Agree on a remediation plan with the person who brought the grievance.
    - for complex issues, external arbitration and external remediation support including NGOs or rights experts may be brought in.
  - **Step 7:** Provide an opportunity for an appeals process, if agreement cannot be reached.
  - **Step 8:** Implement and monitor the remediation plan.
  - **Step 9:** Communicate the progress of the remediation to the person who brought the grievance and to any relevant stakeholders when confidentiality is not a concern.
  - **Step 10:** Engage in continuous improvement.

Example grievance	Example resolution
My wages are always paid 4 or 5 days late, sometimes even more than a week late. This makes it difficult to plan when to pay my bills and how to manage my finances.	1. Member of staff hearing the grievance ensures that the employee understands that their complaint is confidential. 2. Ensure that the employee has received their latest wages. 3. Interview other employees to understand if anyone else is experiencing the same issue. 4. Examination of the wage payment system to understand why there are delays. 5. Any changes necessary are implemented. 6. Next month, the member of staff who is working on the grievance checks with the employee about the date they received their wages.
I keep being asked to go out onto the feed barge without being provided with a lifejacket.	1. Member of staff hearing the grievance ensures that the employee understands that their complaint is confidential. 2. Interview other employees to understand if anyone else is experiencing the same issue. 3. Check the availability of life jackets and ensure that there is a sufficient number available, that they are in good working condition and that they are kept in an accessible location. 4. Add some signs to remind workers and management that life jackets are essential for going onto the feed barge. 5. Follow up with the employee after a few weeks to find out if the situation has improved.

- The UoC can seek external support from local labour organisations, worker associations, trade unions or NGOs for the development of the grievance mechanism.
- Sometimes there may be a situation at a multi-site UoC where a grievance cannot be traced to one particular site. In this case, the UoC should look into the issue at all of their sites and make any necessary changes to ensure that this is not a problem at any site.

Evidence of implementation should be maintained, e.g.:

- grievance policy or procedure
- employee survey results
- employee notices and notice boards
- employee handbook
- records from grievance procedures and their outcomes
- meeting minutes.

Auditors should confirm:

- whether the grievance procedure provides employees with clearly written and understandable instructions on how to report grievances using different methods that involve formal, informal and anonymous reporting;
- whether the grievance procedure applies to and is accessible to all employees, including full-time, permanent, contract, seasonal, migrant (domestic and foreign) and temporary employees.

Useful Resources

- Rainforest Alliance's Grievance Guidance: https://www.rainforest-alliance.org/business/resource-item/guidance-e-grievance-mechanism/
- SHIFT Project is a non-profit consultancy focused on human rights Due Diligence based on the UN Guiding Principles for Business and Human rights. They have published two guidance documents on grievance mechanisms with clear definitions, both for community and employee-focused grievance. https://shiftproject.org/wp-content/uploads/2020/02/191210_publication_grievance-mechanism.pdf
- https://shiftproject.org/wp-content/uploads/2014/05/Shift_remediationUNGPs_2014.pdf
- The Global Compact Network Netherlands, Oxfam and Shift also developed a 'Doing Business With Respect for Human Rights' guide for companies to translate expectations in the UN Guiding Principles on Business and Human Rights into concrete action, with a chapter on Remediation and Grievance: https://www.businessrespecthumanrights.org/en/page/349/remediation-and-grievance-mechanisms
- https://www.ihrb.org/uploads/reports/EC-Guide_OG-12_Part-3_Section-VI.pdf

Indicator:	Requirement:

3.12.3 The UoC shall ensure that all employees are trained on the employee grievance mechanism.

How do I interpret this requirement?

- Training on the grievance mechanism is provided to all employees. This can take place:
  - as part of the induction process
  - at the start of each production cycle.
- Awareness of this mechanism is essential for all employees and important for a positive environment in the workplace.
- The UoC can communicate the grievance mechanism to employees through a variety of ways, including:
  - induction training and other ongoing training
  - information posted in public areas of the UoC
  - distributing it to employees in flyers, via text messages, instant messaging, emails or other private forms of communication
  - discussing it in employee meetings and assemblies
  - including it in employment contracts or the employee handbook.

Evidence of implementation should be maintained, e.g.:

- Grievance policy or procedure.
- Employee handbook.
- Training materials or distributed materials.
- Meeting minutes.

Auditors should confirm:

- Employees' understanding of how to raise issues and how they were made aware of the grievance mechanisms.

Useful Resources N/A

Indicator:	Requirement:

3.12.4 The UoC shall have a community grievance mechanism that is proactively communicated, accessible, fair and applicable to Indigenous and tribal peoples, and local communities.

How do I interpret this requirement?

- For the grievance mechanism for communities, the guidance under Indicator 3.12.2 for employees also applies.
- A community grievance mechanism is a simple, trusted and dedicated system where Indigenous peoples, tribal communities, and local residents can safely report concerns about the farm, and receive a fair, timely response.

Note: Does the farm never receive any complaints? That may mean people don't trust or know about the system yet. Keep revising it and promoting it.

To achieve this, UoCs can:

1. Proactively communicate it

- Post large signs in local languages at:
  - the farm entrance
  - nearest market, dock, or community centre

  Example message for posters: *"If our farm affects your water, fishing, or livelihood, tell us. Drop a note in the box at our gate, call [free number], or talk to [name]. If you choose to provide contact information, we will give you an initial response within 10 days."*
- Printed materials
- Inform representatives: for example, local community representatives, community leaders and relevant community organisations
- Announce it at:
  - Village meetings
  - Fishing cooperative gatherings
  - Local radio or loudspeaker broadcasts
  - Local publications

- Train all staff to explain the mechanism in 1 minute or less.
- Appoint a local liaison (someone known and trusted in the community).

2. Make it accessible

a. Offer several channels to submit grievances, for example, at least 3 of these:

- Complaint box: Locked box at farm gate, emptied weekly
- Email address or online form: An email address clearly shown on the company's website, or a link to a webform that can be filled. Ensure
- Dedicated phone number/ SMS hotline
- In-person: Weekly "office hours" at community centre
- Paper form: Simple form at local shop or leader's house
- Letters / written notes
- Village meeting: Collect concerns at gatherings.
- Via community leaders and representatives, or community organisations.

b. Remove barriers:

- Language: Translate everything into local languages/dialects. Use pictures or graphics.
- Literacy: Allow oral complaints.
- Distance: If your farm is remote, place a complaint box in the nearest village.
- Digital divide: Never rely only on online forms.

c. Give special consideration to reaching vulnerable groups within the population, as they are:

- most likely to be impacted
- unlikely to be comfortable with raising issues to the company.

d. Consider bringing in an external advisor to design the grievance mechanism, such as a local NGO or community leader.

3. Make it fair

a. Implement a no-Retaliation Policy (Mandatory)

- Write it down in local languages:

"No one will be fired, harassed, demoted, or excluded from benefits for reporting a concern about [Farm Name]. This applies to workers, local residents, fishers, and Indigenous/tribal peoples."

- Post it publicly (farm gate, community centre, market).

- Train all managers: Retaliation towards anyone that submits a complaint should result in immediate disciplinary action.
- Create a rapid response team: Investigate retaliation claims within 48 hours.

b. Fair process

- Acknowledge: Respond to complainant within 10 days (even just to confirm receipt).
- Investigate: Talk to both sides, visit the site, collect evidence.
- Decide: Make a decision within 90 days (explain if it takes longer).
- Act: Fix the problem and provide remedy.
- Follow up: Check if the complainant is satisfied.

c. Where needed bring in an independent reviewer:

- Respected local elder
- NGO
- Mediator

d. Transparency and accountability

- Post a simple flowchart of the process at your farm.
- Keep a record of all complaints and their resolution.
- Share anonymous summaries of complaints and resolutions at community meetings.
- Allow appeals: If the complainant disagrees, let them request a review by a different person.

4. Make it work for all communities (see also 3.13)

- Identify the key stakeholders that may want to use the community grievance mechanisms: conduct a stakeholder mapping and engagement process and engage them in the design of the grievance mechanisms.
- Meet with community leaders to ask: *"How should we handle concerns from your community?"*
- Respect customs:
    - Some may prefer to report through a chief or elder (not directly).
    - Some may need group meetings instead of individual complaints.
- Cover specific concerns:
    - Traditional fishing rights or sacred sites
    - Access to clean water or land
    - Fair employment or benefit-sharing

- Adapt methods:
    - Use oral reporting if writing is not their tradition.
    - Hold meetings in a neutral location (not your farm office).
- Proactively check in: Visit Indigenous/Tribal/ local communities to ask: *"Are there any issues we should know about?"*

5. Proactively try to prevent complaints from arising

Complaints may be related to a lack of understanding about the farms processes. Consider providing more transparency to address these concerns. For example:

- Water complaints? Offer to test water quality together with the complainant.
- Fishing access issues? Map traditional routes and adjust operations if needed.
- Indigenous concerns? Involve their leaders in monthly monitoring (e.g., water quality checks).
- Language barriers? Hire a part-time translator or work with a local teacher.

6. Avoid common mistakes

- Not making the system known (enough)
- Only having one system for reporting complaints. Different people may need different approaches.
- No follow-up: Always close the loop with the complainant.
- Ignoring "small" complaints: Minor issues can signal bigger problems.
- Retaliating (even unintentionally).

Evidence of implementation should be maintained, e.g.:

- Materials used to inform communities of the grievance mechanisms.
- Minutes of meetings where grievance mechanisms are discussed.

Auditors should confirm:

- community representatives (including Indigenous people's representatives where applicable) understand:
- how they can raise concerns and grievances with the UoC;
- who their point of contact at the UoC is;

- how the grievance mechanism was communicated to communities;
- when discussions were had between UoC management and communities;
- when grievances were raised in the past and how they were resolved.

Useful Resources

N/A

Indicator:	Requirement:
3.12.5	The UoC shall ensure the grievance mechanisms in Indicators 3.12.2 and 3.12.4 include provisions for non-retaliation.

How do I interpret this requirement?

- This indicator is applicable for both the employee grievance mechanism and the community grievance mechanism.
- Non-retaliation means that no action can be taken by the UoC against a person or an entity bringing a grievance that has been raise in good faith.
- If retaliation occurs, this means that the grievance mechanism is inadequate.
- This protection against retaliation applies to those bringing grievances and to whistleblowers.
- ILO defines whistleblowing as: 'the reporting by employees or former employees of illegal, irregular, dangerous or unethical practices by employers'[70].
- Examples of retaliation in the workplace can include:
  - direct consequences, such as:
    - firing
    - demotion
    - salary reduction
    - reduced hours
  - more subtle consequences, such as:
    - reassignment to work that causes personal hardship

[70] https://www.ilo.org/media/406736/download

    - exclusion from key meetings and group events
    - threats
    - harassment
    - bullying
  - indirect consequences, such as encouraging shunning, harassment or bullying by other staff members.
- Examples of retaliation for a community member or Indigenous or tribal person can include:
  - direct actions
  - indirect actions through others
  - threats
  - harassment
  - damage to a person or property.
- Ways to protect employees and communities from retaliation can include:
  - having clear grievance processes and policies that include accountability (see 3.12.2)
  - raising a confidential grievance (see also 3.12.9)
  - raising an anonymous grievance through a hotline or similar, where the identity of the person bringing the grievance is never known:
    - in this case, remediation is likely to affect a wider population and is not tied to a specific individual

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Evidence of implementation should be maintained, e.g.:

- Grievance policy or procedure, including provision for confidentiality.
- Records of grievance processes.

Auditors should confirm:

- Policies and provisions for non-retaliation with employee and community representatives.

Useful Resources

N/A

Indicator:	Requirement:

3.12.6 The UoC shall ensure that:

a) grievances are acknowledged within 10 days from submission; and

b) grievances are resolved within 90 days from submission.

Where resolution is not possible within 90 days, justification and an alternative timeline shall be provided to relevant parties.

How do I interpret this requirement?

- The UoC follows the procedure to address grievances, beginning with acknowledging the receipt of the grievance within 10 days from submission.
- The UoC develops a clear action plan to resolve the grievance within 90 days from submission.
- Urgent concerns should be addressed sooner. For example:
  - If the grievance relates to a workplace hazard related to equipment that could harm an employee, that equipment must be removed from operation and repaired immediately.
  - If the UoC suspects that the person making the claim or other people may be at risk, and if the case involves human rights, including potential cases of child labour or forced labour, the UoC follows Appendix 16 (Remediation Protocol).
- Full remediation of the issue may take place over a longer timeframe when required by the circumstance. For example:
  - until the child has reached school-leaving and working age.
- Simple grievances may not require a 90-day timeframe.
- Where grievances are submitted anonymously, it may not be possible to acknowledge receipt directly. However, communicating changes that have been made in response to grievances can demonstrate that the concerns have been heard and acted upon.

Evidence of implementation should be maintained, e.g.:

- Records of grievance processes.
- Any emails or documentation sent to the person submitting the grievance.

Auditors should confirm:

- The timeframe in which grievances are resolved from grievance records, confirmation of receipt of submission of a grievance, and interviews with employees.

Useful Resources

N/A

Indicator:	Requirement:
3.12.7	The UoC shall maintain written records of all grievances, responses and resolutions.

How do I interpret this requirement?

- The system used to track grievances, responses, communication and remedy should include:
  - the name of the person (if known) who brought the grievance
  - the date it was submitted
  - the person or department against whom the grievance was made
  - the category of the grievance
  - dates and the results of internal investigations carried out
  - the outcome of the investigation
  - dates when a response was provided to the person (if known) who brought the grievance.

Evidence of implementation should be maintained, e.g.:

- Records of grievance processes.

Auditors should confirm:

- Records of grievance processes are complete.

Useful Resources

N/A

Indicator:	Requirement:

3.12.8 The UoC shall ensure that employees are engaged in the implementation and maintenance of the grievance mechanism.

How do I interpret this requirement?

- Employees can be freely chosen or elected by their peers to be engaged in the implementation and maintenance of the grievance mechanism without interference from management.
- Employee engagement does not necessarily mean that employees are involved in the processing of each grievance, but that they are involved and engaged in the overall maintenance and implementation of the grievance mechanism. This can include participating in the:
  - design and planning of how the mechanism will work
  - decisions about how employees can submit grievances (employees will be best placed to decide what works for them)
  - decisions about who may be involved in the grievance resolution
  - periodic checks on timelines of grievances
  - conversations with their colleagues about how confident they feel in the grievance mechanism and if there are any changes they would like to propose
  - actual grievance process where appropriate and if required.
- Employees may choose to be engaged more informally, or they may decide to have formal employee representation.
- The UoC staff may wish to have an employee committee to support the grievance mechanism. In this case, the committee:
  - can vary in size depending on the size of the UoC
  - should include representation for diverse groups and consider the needs of vulnerable groups. For example:
    - ensuring a representative number of men and women
    - ensuring that migrant employees are included
  - if the UoC is unionised, a member of the Trade Union should be included.

- Employee representatives should:
  - have been trained and are knowledgeable about the business and common grievances that occur
  - understand human rights issues including labour rights, community rights, and Indigenous peoples' rights, as applicable
  - be seen as accessible and impartial
  - have appropriate skills and authority level to investigate and resolve grievances, and where appropriate, facilitate dialogue, remedy and identify areas of improvement
  - be protected from any reprisals, particularly where they are involved in sensitive issues.
- The same employee representation may also take on the role of supporting the implementation of the human rights policy (see indicator 3.1.3).
- Employees may accompany one another through a grievance process, in the role of a companion.

Evidence of implementation should be maintained, e.g.:

- evidence of training for employee representatives on the relevant topics
- clearly documented roles and authority levels needed for employee representatives
- job descriptions for employee representatives
- records of employee representative selection process
- minutes of any committee meetings.

Auditors should confirm:

- that employees feel represented by the employee representatives;
- how employee representatives feel the system is working in practice.

Useful Resources

N/A

Indicator:	Requirement:

3.12.9 The UoC shall ensure that grievance mechanisms are confidential, and information is only shared where necessary to investigate the grievance.

How do I interpret this requirement?

- If a confidential grievance process has been requested, anyone managing the grievance process receives, processes, files and monitors records with particular attention to ensuring that the identity of the person raising the claim is kept confidential and not in any public documentation.
- Sometimes there may be a situation where in order to properly investigate and understand the grievance, the UoC has to share some information about the grievance. If this is the case:
  - the person bringing the grievance should be informed,
  - the information should be shared sensitively and only to those who need to know it.

Evidence of implementation should be maintained, e.g.:

- Grievance policy with provisions for confidential procedures.
- Records of grievance processes.

Auditors should confirm:

- employees understand that the grievance processes are confidential;
- those processing grievances understand how to keep the process confidential.

Useful Resources

N/A

Criterion 3.13 – Community Engagement

The overall purpose of Criterion 3.13 is to ensure that farms commit to responsible and ethical land and resource management and respect the rights and wellbeing of Indigenous and Tribal Peoples, and local communities. Communities may have lived for centuries in an area, and the natural resources may hold cultural or religious significance, and/or provide them with food security and/or economic benefits. These areas, besides land, could also include lakes, rivers, streams, mangroves, and marine areas.

Summary of indicator: The table below summarises the indicators in this criterion and suggested actions of how farms should conform with the requirements. More detailed guidance per indicators is provided below the table.

Indicator	Intent	What farms should do
3.13.1 The UoC shall identify any Indigenous and Tribal Peoples and local communities that: a. have legal and/or customary rights in the area of its operations; or b. may be affected by its operations.	Identify and be aware of all Indigenous, Tribal and local communities that may be impacted by the farm.	- Identify rightsholders and stakeholders and their physical locations.
3.13.2 The UoC shall demonstrate it has obtained ownership or usage rights from Indigenous and Tribal Peoples, and local communities, where they hold legal or formally recognised customary rights.	Ensure transparent and respectful land/water use.	- Document land titles, leases, or customary agreements. - Resolve any land / water conflicts
3.13.3 The UoC shall proactively and continuously engage with Indigenous and Tribal Peoples and local communities, to promote a positive relationship and to support the identification of potential negative impacts.	Foster open communication and address concerns early. Include Indigenous / community knowledge into impact identification.	- Engage with communities. - Hold regular community meetings. - Establish a transparent grievance mechanism. - Maintain open channels for feedback and dialogue.
3.13.4 The UoC shall identify, avoid, and mitigate potential negative impacts of its activities on all surrounding Indigenous, Tribal and local communities, including:	Identify and address potential impacts from farm activities. Protect access to sites of special	- Identify and map significant sites with community input. - Document legal or customary rights.

Indicator	Intent	What farms should do
a. Impacts on access to sites of cultural, ecological, economic, religious, or spiritual significance, to which they have legal or customary rights; and b. Environmental and physical impacts; and c. Livelihood impacts; and d. Other cultural and spiritual impacts; and e. Indirect impacts on distant communities.	cultural, ecological, economic, religious, or spiritual significance.	- Conduct social impact assessments with community involvement. - Develop and implement mitigation plans. - Monitor impacts continuously.
3.13.5 The UoC shall, where possible, source goods, services, and employment from Indigenous and Tribal Peoples and local communities.	Ensure communities benefit economically from the farm.	- Prioritise local procurement and hiring. - Develop partnerships for job creation and revenue-sharing.

Indicator:	Requirement:
3.13.1	The UoC shall identify any Indigenous and Tribal Peoples and local communities that: a. have legal and/or customary rights in the area of its operations; or b. may be affected by its operations.

How do I interpret this requirement?

- It is the responsibility of the UoC to identify any Indigenous and Tribal Peoples and local communities in the area of its operations and map the areas important to them. This includes mapping**:**
  - any Indigenous and Tribal Peoples and local communities that have legal or customary rights. Indigenous territories are lands and waters traditionally owned, occupied, used, or claimed by Indigenous peoples, whether legally recognised, under dispute, or customarily used. A farm is considered to affect Indigenous territories if it overlaps with, borders, or impacts these areas, regardless of formal state recognition.
  - any culturally, ecologically, or economically significant sites. These are sites that hold unique value to communities, such as sacred groves, burial sites, ceremonial grounds and

buildings, structures or natural features with religious or spiritual meaning, wetlands, mangroves, spawning grounds for fish, fishing zones, agricultural lands, forest products.

- any other type of communities located near the farm
- any communities that share resources (e.g., water, land) with the farm or that provide local workers.
- any communities that share infrastructure with the farm (e.g. roads)

- The physical proximity of a community is only part of the consideration as more distant communities can also be impacted. Even if a farm is outside formal boundaries, it may border Indigenous lands or waters, affect watersheds, forests, or resources relied on by Indigenous communities, or restrict or disrupt access routes, sacred sites, or cultural practices.
- UoCs could consider getting support from an external consultant or local NGO in this process.
- Note: This requirement is not about whether these communities are actually impacted by the operations of the UoC but whether there is a risk of that potentially occurring.

Possible sources to check to support this mapping process:

1. **Official legal recognition**
    - National or subnational government maps of Indigenous reserves, titled lands, or communal territories.
    - Registries of land tenure rights (land title offices, cadastral systems).
    - Court rulings or administrative decisions recognizing Indigenous land rights.
2. **Ongoing claims or disputes**
    - Filed claims in national courts, land commissions, or Indigenous affairs agencies.
    - Complaints or petitions filed with international bodies (e.g., Inter-American Court of Human Rights, UN Special Rapporteur on the Rights of Indigenous Peoples).
    - Reports of active land conflicts or disputes documented by national human rights commissions, ombudsman offices, or NGOs.
3. **Community and customary use**
    - Ethnographic studies, historical records, or maps showing traditional or customary use (hunting, fishing, sacred sites, seasonal use).
    - Statements from Indigenous councils, community assemblies, or representative organizations about land use or cultural ties.

- Free, Prior, and Informed Consent (FPIC) processes documented by companies or governments.

4. **Independent data sources**

   - Databases such as LandMark (Global Platform of Indigenous and Community Lands): https://www.landmarkmap.org/map
   - Regional mapping initiatives (e.g., RAISG in the Amazon, Indigenous mapping collectives).
   - International NGO and academic reports (e.g., Cultural Survival, Forest Peoples Programme).

Evidence of implementation should be maintained, e.g.:

- Evidence of the process and results of mapping of rightsholders and other stakeholders.

Auditors should confirm:

- That the process of mapping Indigenous and Tribal Peoples and local communities has been carried out properly and thoroughly and has identified the key rightsholders.

Useful Resources

N/A

Indicator:	Requirement:

3.13.2

Indicator applicability: Every UoC that has identified its operations may affect Indigenous and Tribal Peoples and local communities

The UoC shall demonstrate it has obtained ownership or usage rights from Indigenous and Tribal Peoples, and local communities, where they hold legal or formally recognised customary rights.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if in 3.13.1 any Indigenous and Tribal Peoples and local communities have been identified that may be affected by the UoC's operations. If no communities have been identified, then this indicator should be marked N/A.

- Customary rights are unwritten, traditional rules and practices that govern resource use, and social relations within a community. They are orally transmitted, culturally embedded, and enforced through community norms rather than formal legal systems. These rights, such as land tenure, inheritance, or natural resource management, are socially binding for those who recognise them, though their legal validity depends on national or international recognition (e.g., constitutions, treaties like ILO 169 or UNDRIP). Recognition of customary rights varies widely by country, ranging from full constitutional protection to no formal acknowledgment.
- The UoC should:
  - identify how customary rights are recognised in its national system.
  - based on 3.13.1, assesses where whether there are any customary rights of Indigenous and Tribal Peoples and local communities over land and resources.
  - ensures land titles and deeds are in place and that it follows applicable legislation
  - where required by national law, (and this can be applied anywhere as a good practice) the UoC obtains Free, Prior, and Informed Consent (FPIC) from Indigenous and tribal communities before undertaking any activities that may impact significant sites or resources.

Note: this also includes all legal licenses and permits to use land and water, however these are covered under Indicator 1.1.1.

Evidence of implementation should be maintained, e.g.:

- local legislation related to legal or customary rights of Indigenous and tribal people to water
- leaseholds and other use right documentation
- agreements with communities, including FPIC agreements with Indigenous communities, where applicable.

Auditors should confirm:

- the UoC has all appropriate land titles, deeds and licences in place;
- whether there are any past or ongoing conflicts between the community and the UoC about the UoC's use of resources.

Useful Resources

- Cuskelly, Katrina. (2011). *Customs and Constitutions: State recognition of customary law around the world*. IUCN, Bangkok, Thailand. https://portals.iucn.org/library/efiles/documents/2011-101.pdf

Indicator:	Requirement:
3.13.3	*Indicator applicability: Every UoC that has identified its operations may affect Indigenous and Tribal Peoples and local communities* The UoC shall proactively and continuously engage with Indigenous and Tribal Peoples and local communities, to promote a positive relationship and to support the identification of potential negative impacts.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if in 3.13.1 any Indigenous and Tribal Peoples and local communities have been identified that may be affected by the UoC's operations. If no communities have been identified, then this indicator should be marked N/A.

- The UoC should engage proactively and regularly for consultation and collaboration and impact identification:

- Hold regular meetings, share information in accessible formats, and seek feedback.
- Initiate a genuine and ongoing engagement and dialogue process with these stakeholders. This includes establishing and maintaining open lines of communication to understand their needs, concerns, and aspirations.
- Engage communities to conduct thorough joint impact assessments to understand the potential cultural, and socio-economic consequences of site operations on significant sites.

- The frequency of engagement will depend on the context but at a minimum, the UoC should engage annually. Hold formal meetings to update communities on farm activities and gather feedback.
- When needed, the UoC should schedule additional ad hoc meetings if concerns arise or before operational changes occur, such as if:
    - operations expand;
    - new risks emerge;
    - communities raise concerns; or
    - before or during high-risk activities (e.g., water discharge, land clearing).
- Maintain open channels (e.g., hotlines, community liaisons) for ongoing dialogue and a robust, transparent and responsive grievance mechanism (see also 3.12).
- Implementing this requirement means that there is a need to have employees with the required competencies to conduct community engagement.
- What should a farm do if nearby communities are unwilling to engage? Or are unwilling to leave a record of their attendance?
    - Respect autonomy: do not force engagement. Instead, document your attempts (e.g., meeting invitations, letters, public notices) and the reasons for non-participation (e.g., cultural protocols, distrust).
    - Use alternative channels, including indirect methods like community liaisons, local NGOs, or professional mediators to facilitate dialogue.
    - Adapt engagement methods to local customs (e.g., oral agreements, third-party witnesses) if written records are refused. Document these adaptations in your records. Indicate who in the community might be able to confirm such verbal agreements to an auditor.
    - Accept that trust is built over time. Do not give up after one failed attempt.

Evidence of implementation should be maintained, e.g.:

- Meeting records: Signed attendance sheets, meeting minutes of meetings with community representatives, or audio/video recordings (with consent).
- Grievance logs: Documented complaints and resolutions. Review the grievance procedure, and if this information is easily understandable and accessible, information from grievances raised by community members (see 3.12.4), their nature and how they have been resolved.
- Communication materials: Brochures, posters, or digital updates the farm has shared with communities about its operations.
- Letters or statements from community leaders confirming engagement, including interviews.

Auditors should confirm:

- which communities may be impacted by the operations of the UoC and if they are Indigenous communities or not;
- if the stakeholders engaged include diverse groups representing different segments of the community; and
- whether farms are making genuine and continuous efforts to maintain or establish good relationships with communities that may be affected.

Interview community representatives and other stakeholders: Speak with community representatives to verify impact assessment and mitigation. Ensure that for the interview respondents are selected that are truly representative of the community; these may not necessarily be the ones that interact (most) with the farm. Ask them open ended questions about how they engage with the farm.

Useful Resources

- Meaningful Stakeholder Engagement: Practical guidance for companies in the agriculture and food manufacturing sector (2026) https://policy-practice.oxfam.org/resources/policy-practice-oxfam-org-resources-meaningful-stakeholder-engagement-practical-guidance-for-companies-in-the-agric-621800/
- WWF Chile (2017) Certificación ASC en Chile: Caja de orientaciones y herramientas para empresas salmoneras en su relacionamiento responsable con comunidades (Spanish version only). https://d2ouvy59p0dg6k.cloudfront.net/downloads/libro_final.pdf
- IFC stakeholder engagement handbook: https://www.ifc.org/en/insights-reports/2000/publications-handbook-stakeholderengagement--wci--1319577185063
- Guide to social impact assessment: https://www.eianz.org/document/item/5876

- World Resources Institute "Breaking Ground: Engaging communities in extractive and infrastructure projects": https://www.wri.org/research/breaking-ground

Indicator:	Requirement:

3.13.4 *Indicator applicability: Every UoC that has identified its operations may affect Indigenous and Tribal Peoples and local communities*

The UoC shall identify, avoid, and mitigate potential negative impacts of its activities on Indigenous and Tribal Peoples and local communities, including:

a. impacts on access to sites of cultural, ecological, economic, religious, or spiritual significance, to which they have legal or customary rights; and

b. environmental and physical impacts; and

c. livelihood impacts; and

d. other cultural and spiritual impacts; and

e. indirect impacts on distant communities.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if in 3.13.1 any Indigenous and Tribal Peoples and local communities have been identified that may be affected by the UoC's operations. If no communities have been identified, then this indicator should be marked N/A.

- The operations of a UoC can have many kinds of impacts on surrounding communities. These could include (but may not be limited to):
  - Impacts on access to sites of cultural, ecological, economic, religious, or spiritual significance, to which they have legal or customary rights;
  - Environmental and physical impacts, such as noise, light, pollution, dirt and dust, water quality degradation, waste management issues, increased traffic, damage to roads, and restrictions on community movement.
  - Livelihood impacts, such as disruptions to fisheries and other economic activities
  - Other cultural and spiritual impacts, such as effects on cultural or spiritual practices, values, or heritage beyond site access.

- Indirect impacts on distant communities, such as disruptions to distant communities, e.g. due to heavier traffic.

- It is the responsibility of the UoC to:

1. Assess its impacts:

- assess which communities could potentially be affected by its operations (see 3.13.1);
- engage with community leaders and elders and other community members to identify potential impacts (see 3.13.3).
- understand and document which resources are vital to the communities through engagement and reviewing local land-use plans, historical records, or environmental impact assessments.

Note: If an adequate and up-to-date social impact assessment that has involved communities has already been carried out for another purpose, there is no need to carry out another one. In some cases, the assessment will need to be complemented. A recommended process to fulfil this requirement could involve the following steps:

2. Develop, implement and monitor a mitigation plan:

- Jointly with affected communities develop a mitigation plan that is based on the joint impact assessments, to eliminate adverse effects on significant sites, in consultation with affected communities
- Implement this plan. This means that relevant employees should be made aware of this plan and have the skills to implement it. Train them about the cultural, historical, and ecological significance of the land and water resources in the area to foster a deeper understanding and respect for these resources and train them about the mitigation plan.
- Monitor implementation and effectiveness of the plan.

Evidence of implementation should be maintained, e.g.:

- Impact assessment reports: Up-to-date reports showing community input and mitigation actions.
- Mitigation plans.
- Communication materials: Brochures, posters, or digital updates the farm has shared with communities about its operations.

- Grievance logs: Documented complaints and resolutions. Review the grievance procedure, and if this information is easily understandable and accessible, information from grievances raised by community members (see 3.12.4), their nature and how they have been resolved.

Auditors should confirm:

- that the assessments were conducted in good faith and include all significant sites that the UoC may have an impact on, or where this is not possible seek input from local NGOs or other organisations.
- the mitigation plan is being implemented, and communities are aware of it;
- communities understand how to access the UoC's community grievance mechanism;
- whether there are any conflicts about the use of resources by the UoC or if the UoC has restricted access to sites of religious or spiritual significance for Indigenous people;
- whether there are any other negative impacts they experience from the UoC.
- Process for auditors to verify:
    - Preparation: Collect information on the existence of communities near the farm and if these are Indigenous communities or not, review farm website to assess if a contact for grievances and a grievance procedure is available and easily accessible, review local legislation related to legal or customary rights of Indigenous and tribal people over and or water.
    - Review documentation: Check records of community engagement, grievance logs, and impact assessments.
    - Interview community representatives and other stakeholders: Speak with community representatives to verify impact assessment and mitigation. Ensure that for the interview respondents are selected that are truly representative of the community; these may not necessarily be the ones that interact (most) with the farm. Ask them open ended questions about impacts.
    - Site visits: Observe farm-community interactions and access to significant sites

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Useful resources:

- WWF Chile (2017) Certificación ASC en Chile: Caja de orientaciones y herramientas para empresas salmoneras en su relacionamiento responsable con comunidades (Spanish version only). https://d2ouvy59p0dg6k.cloudfront.net/downloads/libro_final.pdf
- IFC stakeholder engagement handbook: https://www.ifc.org/en/insights-reports/2000/publications-handbook-stakeholderengagement--wci--1319577185063

- Guide to social impact assessment: https://www.eianz.org/document/item/5876
- World Resources Institute "Breaking Ground: Engaging communities in extractive and infrastructure projects": https://www.wri.org/research/breaking-ground
- Guidance for Free Prior and Informed Consent (but also useful for community engagement more generally):
  - Accountability framework guidance on FPIC: https://accountability-framework.org/fileadmin/uploads/afi/Documents/Operational_Guidance/OG_FPIC-2020-5.pdf
  - FPIC-360°: https://fpic360.org/
  - World Resources Institute "Development without conflict: The business case for community consent": https://www.wri.org/research/development-without-conflict
  - Oxfam "Guide to Free Prior and Informed Consent": https://www.culturalsurvival.org/sites/default/files/guidetofreepriorinformedconsent_0.pdf

Indicator:	Requirement:

3.13.5

Indicator applicability: Every UoC that has identified its operations may affect Indigenous and Tribal Peoples and local communities

The UoC shall, where possible, source goods, services, and employment from Indigenous and Tribal Peoples and local communities.

How do I interpret this requirement?

Indicator applicability: This indicator is only applicable if in 3.13.1 any Indigenous and Tribal Peoples and local communities have been identified that may be affected by the UoC's operations. If no communities have been identified, then this indicator should be marked N/A.

- Ensuring that the community benefits economically from the UoC can:
  - improve wellbeing
  - foster positive relationships between the UoC and the communities.

- The UoC can develop partnerships and agreements that ensure that nearby communities benefit economically from site operations. This may include:
  - job opportunities
  - sourcing goods from the community, for example:
    - food for the canteen
    - machinery needed for running the site
    - feed.
  - sourcing services from the community, for example:
    - cleaning company
    - diving company
    - security guard provider.
  - revenue-sharing
  - infrastructure development, for example:
    - the improvement of roads
    - connections to other services for the community, such as internet access.
- Actions that the site can take include:
  - local posting of jobs and active recruitment in neighbouring communities,
  - partnerships with local businesses for the delivery of goods and/or services, such as catering.

Evidence of implementation should be maintained, e.g.:

- Jobs advertisements and recruitment processes.
- Employee records to assess where the workforce has come from.
- Sourcing policy.
- Agreements with local businesses.

Auditors should confirm:

- how jobs are advertised and goods are sourced;
- the share of locally recruited employees and locally sourced goods and services;
- the reasoning for recruiting employees or sourcing goods and services from elsewhere.

Useful Resources N/A



Principle 4

The aquaculture industry upholds responsible animal health and welfare practices



Criterion 4.1 – Fish (Including Cleaner Fish)

4.1.1 - Fish - Health and Welfare

Indicator:	Requirement:
4.1.1.1	The UoC shall ensure that all relevant employees are trained on general aquatic animal health and welfare awareness, including biosecurity, according to **Appendix 12 (12.2, Table 1)**.
4.1.1.2	The UoC shall ensure that any person involved in aquatic animal husbandry and handling activities is trained on aquatic animal health and welfare, according to **Appendix 12 (12.2, Table 1)**.
4.1.1.3	The UoC shall ensure that the content of the training in Indicators 4.1.1.1 and 4.1.1.2 is updated as necessary, and is approved by a **registered veterinarian** or **aquatic animal health professional**.

How do I interpret this requirement?

- For each employee:
  - The level of training should be appropriate to their role:
    - For all relevant employees: a basic level of awareness of biosecurity, fish health and welfare is required.
    - For any person involved in husbandry, handling, and slaughter operations: a more advanced level of training on fish health and welfare, disease identification, handling and slaughter practices is required on an annual basis.
  - Evidence of training participation must be maintained:
    - Certificates of attendance.
    - Certificates of competency.
- The trainer should be competent in the topic of aquatic animal health and welfare and the competence should be demonstrable, e.g.:
  - Curriculum Vitae.
  - Records of qualifications.
  - Work experience.

- Best practices on the implementation of the training content should be visible during the audit.
  - Employees should demonstrate adequate knowledge of that content at interviews.

Evidence of implementation should be maintained, e.g.:

- A list of employees and subcontracted personnel involved in aquatic animal husbandry and handling operations.
- Records:
  - Training.
  - Trainer's competence.
  - Certificates of competency.

Auditors should confirm:

- Employees received the required level of training for their roles by cross-checking employees and subcontracted personnel lists with:
  - Training records.
  - Certificates of competency.
  - Trainer's competence.
  - Revision of training resources/contents.
- Adequate level of personnel knowledge of the training content should be verified by:
  - Interviews.
  - Observation of real operations during handling and slaughter of fish.

Useful Resources

- World Organisation for Animal Health (2024) – Competency and Curriculum Guidelines for Community Animal Health Workers. Paris, 39 pp. (https://doi.org/10.20506/woah.3535).
- One Health & Development Initiative (2025) Fish Welfare Training Guides. Africa Fish and Aquaculture Welfare Program

Indicator:	Requirement:

4.1.1.4 The UoC shall implement a vaccination plan that:

a. considers the relevant diseases and vaccine availability; and

b. includes justification for vaccine selection; and

c. is approved by a registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- The vaccination plan should consider:
  - Local regulations.
  - Relevant diseases for the species in the country, based on scientific literature and publicly available information.
  - Commercially licensed vaccines registered for the species being farmed, autogenous vaccines produced by a licensed producer or locally regulated vaccines.
    - Commercially licensed vaccines are recognised by the relevant country authorities to ensure quality control, safety and efficacy.
    - Autogenous vaccines are custom vaccines produced from pathogens isolated directly from affected sites on which the vaccines are subsequently deployed under a minor use or restricted permit by a licenced producer.
    - In some cases, a local regulator will provide a vaccine that is to be used in that region.

Evidence of implementation should be maintained, e.g.:

- Local regulations.
- List of relevant diseases for the species in the country and available vaccines.
- Vaccine registration.
- Vaccine purchase invoices.
- Vaccination records.

Auditors should confirm:

- The vaccination plan in place is overseen and signed off by a veterinarian or aquatic animal health professional and includes a list of relevant diseases for the country and the vaccines available.
    - The information should be cross-checked with local regulations and records.

Useful Resources

- Domínguez-Odio, A; Rodríguez Martínez, E; Leonardo Cala Delgado, D. (2024) Commercial vaccines used in poultry, cattle, and aquaculture: a multidirectional comparison. Frontiers In Veterinary Science.
- Yang, Du; Xioman, Hu; Liang, Miao; Jiong, Chen (2022) "Current status and development prospects of aquatic vaccines" Frontiers in Immunology.
- World Organisation for Animal Health (2021) Tackling Disease Outbreaks. WOAH Article.
- Mondal H, Thomas J. (2022) "A review on the recent advances and application of vaccines against fish pathogens in aquaculture". Aquaculture International.

Indicator:	Requirement:
4.1.1.5	*Indicator applicability: cod and marine salmonids in cages* The UoC shall only stock a single **cohort** of fish per site.

How do I interpret this requirement?

- A cohort is a group of aquatic animals of the same species and age managed together during a specific stage of their life cycle.
- Cohorts are often used in aquaculture to standardise feeding, monitoring, and health management practices; ensuring uniformity in growth and development rates among the group.
- Therefore, there can be different stock types within the farm, and these can still be a single cohort as they are the same species and age cluster.
- Gaps of up to six months between stocking inputs are acceptable as long as:

- The smolts are derived from the same stripping.
- There is a period when the site is fully fallow after harvest, in accordance with regulatory requirements.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Purchase.
  - Transportation.
  - Delivery.
  - Stocking.
  - Fallowing.
  - Production (fish size).

Auditors should confirm:

- The size of the fish matches that of a single year class by observing the stock.
  - The observation should be cross-checked with records.

Useful Resources

N/A

Indicator:	Requirement:
4.1.1.6	The UoC shall calculate mortality rate and real percentage mortality, according to **Appendix 12 (12.6.1)**, and shall adhere to species-specific mortality limits, according to **Appendix 2 (2.3)**[71].

How do I interpret this requirement?

- Mortality limit calculations are explained in Appendix 12 (12.6.1). These should be checked against the mortality limits in Appendix 2.
- If there are no species- specific metric listed, then there is no metric which applies and the species is exempt.
- If there is a cull (for example due to a highly contagious disease), this is not included in the mortality calculation.

Indicator:	Requirement:
4.1.1.7	The UoC shall only stock batches of fish that have been **tested** prior to stocking and are free from diseases of regional concern.

How do I interpret this requirement?

- Testing should be relevant to:
  - The species.
  - The production system.
  - The scale of production.
  - The local regulations.
    - For example:
      - *Gyrodactylus salaris* for Atlantic salmon in Norway.

[71] An exemption applies where there is no species-specific metric listed in Appendix 2.

        - Tilapia lake virus (TiLV) for tilapia in Asia.
        - Viral hemorrhagic septicemia (VHS) in freshwater fish.
- Testing may consist of:
    - Clinical examination of the fish.
    - Laboratory tests:
        - Bacteriology.
        - Molecular biology (e.g. PCR).
        - Histopathology.
        - Virology (e.g. cell culture).
- The designated veterinarian or aquatic animal health professional should determine:
    - The diseases to include in the testing, based on local regulations, scientific literature and/or publicly available information (see interpretation for Indicator 4.1.1.4).
    - The sample size, based on local regulations and/or technical judgement.
    - If testing in internal laboratory or external laboratory is necessary.
- Compulsory governmental testing programme results are acceptable for demonstrating conformance with this requirement.
- Where the UoC stocks batches of fish supplied by another site located within the same waterbody, the testing required by the indicator should be conducted before the fish are stocked at the supplier site. In such cases, the fish do not need to be re-tested before being stocked at the UoC. The test results should be provided to the UoC.

Evidence of implementation should be maintained, e.g.:

- List of relevant diseases for the species in the country (see interpretation for Indicator 4.1.1.4).
- Testing results written report or document that includes as a minimum:
    - The batch of fish tested.
    - The site of the test.
    - The pathogen tested.
    - The results of the test.
- Records
    - Purchase.

- Transportation.
- Delivery.
- Stocking.

Auditors should confirm:

- Every batch of fish has been tested by cross-checking the list of relevant diseases for the species in the country with the testing result's written report or document and records.

Useful Resources

- World Organisation for Animal Health (2024) Aquatic Animal Health Code. Chapter 1.3. Diseases listed by WOAH.
- Council Regulation (2016) Transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law'). Official Journal

Indicator:	Requirement:
4.1.1.8	The UoC shall ensure that a registered veterinarian or aquatic animal health professional periodically visits the site to perform routine checks. Checks shall be carried out at least annually for all fish species and quarterly for salmon, as well as reactively in cases of fish health or welfare concerns.

How do I interpret this requirement?

- Regular veterinarian or aquatic animal health professional visits may fall into two categories:
  - Routine: Performed on a regular basis to monitor the health and welfare of the farmed fish.
  - Reactive: Performed in response to deterioration of, or concerns about, the health or welfare status of the farmed fish.
    - Sites should be prepared to provide the veterinarian or aquatic animal health professional with detailed information about the observed symptoms, recent changes in behaviour, morphology, water quality or mortality and any relevant history of disease or treatments.

- The site should use reactive health visits to address immediate health or welfare concerns, diagnose underlying causes of problems, and implement targeted interventions to mitigate risks and prevent further spread of disease.

- For routine visits, preparation is recommended to ensure a meaningful outcome from the veterinarian or aquatic animal health professional. Below are some practical considerations:
  - Visit scheduling: Ensure key employees are available during the visit to provide relevant required information and to facilitate adequate follow-up.
    - Designate a senior member of the employees to serve as the primary point of contact for the veterinarian or aquatic animal health professional during the visit.
    - This individual can help coordinate the activity, ensure relevant information is available, assist during the visit and ensure follow-up.
  - Gather and organise relevant information:
    - Compile relevant information about the operations, including:
      - Species being cultured,
      - Production systems,
      - Stocking densities,
      - Recent health history, including treatments, water quality monitoring results,
      - Behaviour data,
      - Morphology and mortalities data,
      - Feeding plan,
      - Any previous veterinary reports,
      - Details of any ongoing issue.
    - Having this information readily accessible will facilitate discussion and decision-making during the visit.
  - Prepare the UoC for the visit: Ensure the UoC is prepared for the visit and for providing full access to all relevant areas to the veterinarian or aquatic animal health professional.
    - Address any maintenance issues, clean tanks or ponds as needed and ensure clear access to all relevant areas of the facility.
    - Ensure handling and other equipment that may be needed during the visit, such as nets, containers and sampling equipment is available and in good working condition.
    - Make sure employees are aware of the visit and its objectives and encourage them to proactively participate in it.

- During the visit: Ensure relevant information is discussed with the veterinarian or aquatic animal health professional and that the visit includes all relevant areas within the UoC.
- After the visit: Follow up on any recommendations or actions discussed during the visit.
  - Implement any necessary revisions or changes to management practices, treatment protocols, or facility conditions based on the veterinarian or aquatic animal health professional's feedback and any sample or testing results.
- Continuous improvement: Use the insights gained from the veterinarian or aquatic animal health professional visit to identify opportunities for continuous improvement in health and welfare management.

Evidence of implementation should be maintained, e.g.:

- Health reports.
- Testing results.
- Records:
  - Veterinarian or aquatic animal health professional qualifications.
  - Veterinarian or aquatic animal health professional visit.
  - Recommendations or actions discussed during the visit.

Auditors should confirm:

- The qualifications of the veterinarian or aquatic animal health professional and cross-check the frequency of visits with records.
- Existence of health reports and testing results.

Useful Resources

- FAO eLearning Academy (2024) Emergency preparedness for aquatic disease outbreaks. Online course

Indicator:	Requirement:

4.1.1.9 *Indicator applicability: every UoC using feed*

The UoC shall develop and implement a feeding plan that includes at least the following:

a. time and frequency of feeding; and

b. feed rations; and

c. feeding methods; and

d. different environmental conditions; and

e. prevention of the use of feed which has expired, spoiled or shows signs of excessive leakage; and

f. feed types for the nutritional needs and life stages of the species.

An exception applies to (f) when such feeds are not available, in which case the UoC shall use feed suitable for aquatic animals with similar nutritional needs.

How do I interpret this requirement?

- The feeding plan:
  - Outlines the site's feeding strategy.
  - As a minimum, it must include the following parameters:
    - Time and frequency, e.g. at daybreak and early afternoon.
    - Feed rations, e.g. feed type and daily amount.
    - Feeding adaptation to fit different life stages, e.g. transfer diets for Atlantic salmon smolts recently transferred to saltwater.
    - Feeding adaptation to fit different ambient conditions, e.g. stop feeding during algae blooms or use functional feeds when facing specific health issues.
  - Should include considerations to guarantee the good working order of mechanical equipment used to deliver feed, e.g. scheduled maintenance checks of automatic feeders.
  - Feeding methods are a dietary enrichment that should be considered under the feeding plan.
  - Feeding methods should be defined to include enrichment-based feed strategies, for example:
    - Temporal feeding variation.

- Spatial feeding distribution.
- Demand- feeding mechanisms.

- The UoC should document the rationale for changes in the feeding plan to better inform management decisions.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Purchase.
  - Transportation.
  - Delivery.
  - Stocking.
  - Maintenance which affected feeding.
  - Any environmental or health issues which affected feeding.
  - Feeding periods (time and frequency).
  - Feeding rations.
- Employees should demonstrate adequate knowledge of the feeding plan.

Auditors should confirm:

- Feeding plan includes the minimum required parameters and is implemented:
  - Implementation can be confirmed by cross-checking the plan with records, information from employee interviews and observations.
- Status of feed and feed storage:
  - Labels showing the different feeds
  - No leakage from food.
- Feeding plan can be confirmed by employee interviews and observations.

Useful Resources

- The International Aquaculture Feed Formulation Database.
- Hasan, M.R, New, M.B. eds. (2013) On-farm feeding and feed management In aquaculture. FAO Fisheries and Aquaculture Technical Paper No. 583. Rome, FAO. 67pp.

- Alevra, A., Llorente Manzanares, M., Mente, E., Xandri Royo, P.M., (2025) Good husbandry practices for aquaculture, Publications Office of the European Union.

Indicator:	Requirement:
4.1.1.10	The UoC shall develop, implement and maintain a site-specific Health and Welfare Management Plan (HWMP), approved by a registered veterinarian, with the intention of preventing disease outbreaks, and ensuring the good health and welfare of farmed fish. The HWMP shall include all of the following: a. disease monitoring; and b. response, including quarantine, treatment, and humane culling; and c. mechanisms to report to relevant authorities where required; and d. biosecurity risks; and e. predation risks. The HWMP shall be reviewed: f. at least annually for sites with cycles under one year or using continuous production methods; or g. after each cycle for sites with longer cycles or all-in-all-out production methods. Where the review determines that changes are required, the HWMP shall be revised.

How do I interpret this requirement?

- The Health and Welfare Management Plan (HWMP):
  - Supports the development and implementation of preventive, rather than remedial, actions that ensure good fish health and welfare.
  - Must be developed by the UoC in collaboration with a veterinarian who approves it.
- For developing and establishing a site-specific disease monitoring, response and reporting mechanism within the plan, the UoC should consider:
  - Developing standardised health and welfare monitoring protocol:
    - This may involve conducting visual inspections, monitoring Operational Welfare Indicators (OWIs) and performing diagnostic tests for pathogens.
  - Producing and maintaining detailed records.

- Including records of health observations, diagnostic test results, treatments administered, mortalities, and other relevant data.
- It is recommended to use a centralised database or electronic system for efficient data management and retrieval.

- Implementing an early detection system.
  - To detect signs of disease outbreaks or abnormal health conditions promptly.
    - This could include environmental monitoring tools.
- Establishing response protocols for responding to disease outbreaks or health emergencies.
  - Outlining procedures for:
    - Isolating affected individuals or populations.
    - Implementing strategies for treatments or others (e.g. culling affected batches of fish [see interpretation for Indicator 4.1.1.10.4]).
    - Notifying relevant stakeholders, including other sites in the vicinity and the authorities.
- Establishing communication channels.
  - Effective communication channels should be implemented for reporting health-related issues both internally within the facility and externally to relevant authorities (e.g., WOAH-notifiable diseases) or stakeholders.
    - Employees should understand their roles and responsibilities in reporting and responding to disease events.
- Maintaining a readily accessible notification list.
  - Including contact names numbers and emails for key employees and other relevant stakeholders.
  - The list should be kept up to date to ensure quick and efficient communication during emergencies (see interpretation for Indicator 4.1.2.3).

- For developing a site-specific biosecurity mechanism within the plan, the UoC should consider:
  - Determining the objectives and scope of the biosecurity mechanism.
  - Identifying relevant regulatory requirements.
  - Gathering information about the site, including an up-to-date layout of buildings and production units identifying the possible movements of animals, animal products, animal waste, water, feed and equipment, material or vectors.

- Identifying potential transmission pathways into, within and from the site.
- Carrying out a risk analysis to identify and evaluate disease threats and ensure that the plan addresses them.
    - A risk analysis can be carried out either on the whole operation or only partially, e.g. disease transmission during transportation.
        - This will depend on the objectives of the biosecurity mechanism.
- Identifying mitigation measures and assessing their effectiveness and their management requirements.
- Establishing emergency procedures in the event of a biosecurity failure.
- Defining internal and external communication procedures, roles, and responsibilities.
- Creating a monitoring and internal audit schedule.
- Carrying out performance evaluations.
- Developing the necessary Standard Operating Procedure (SOP) to support the implementation of the mitigation measures and the biosecurity mechanism.
- Training employees in the different elements of the biosecurity mechanism.
- Maintaining a record-keeping system that provides evidence of compliance with the biosecurity mechanism.

o Predators can directly kill or can cause changes in behaviour and physiology allocation due to stress and/or escape responses.

o For developing predator control measures within the plan, the UoC should consider:

- Identifying potential predators.
    - Create a list of the predators that are present in the area and that may interact with the UoC.
        - Predators may include birds, mammals, reptiles, and other aquatic species known to prey on fish.
- Assessing the risk of predation.
    - Evaluate the risk posed by each predator species identified based on factors such as proximity to the site, population size, means of accessing the site, likelihood of predation, etc.
- Implementing predator control measures.
    - Develop and implement predator control measures tailored to the specific risks identified. This may include:

        - Physical barriers such as nets, fences, or screens to prevent access to fish tanks or ponds.
        - Scare tactics such as visual deterrents to discourage predators from approaching the facility.
    - Implementing ongoing monitoring and surveillance.
        - To detect predator activity and intervene as needed.
    - Regular reviewing and revision.
        - Based on the outcome of the ongoing monitoring and surveillance.
        - Adjustments to the measures should be made when the results of monitoring indicate the need to optimise protection for fish and the containment system.
    - Collaborating with local authorities or local wildlife agencies to address predator issues in the surrounding area.
- A periodic review and, if necessary, a revision of the HWMP should be conducted in response to changes in farming activities or external factors or as directed by the veterinarian or aquatic animal health professional.
    - As a minimum, the review should occur annually in cases of production cycles shorter than one year or using continuous stocking/cropping methods, or following each production cycle, in the case of UoCs with production cycles longer than one year or using all-in-all-out stocking/cropping methods.
    - The UoC should develop feedback mechanisms to inform the review, e.g. proactively seeking feedback from employees and subcontracted personnel, such as the vaccination team, on the operationalisation of the site-specific biosecurity mechanism.
    - For a single producer overseeing multiple UoCs in a shared waterbody, a unified HWMP that incorporates site-specific details is acceptable; however, for larger companies managing multiple UoCs in one country, while common plans may apply, it is crucial to ensure HWMP adaptation to individual site circumstances, particularly in aspects like biosecurity measures, disease surveillance programs, and monitoring systems.

Evidence of implementation should be maintained, e.g.:

- The HWMP includes considerations for:
    - Site-specific disease monitoring, responses and reporting requirements.
        - Specific considerations should be given to reporting WOAH-notifiable diseases (see interpretation for Indicator 4.1.1.11).

- Site-specific biosecurity mechanism.
- Predators control measures.
- Veterinarian or aquatic animal health professional sign-off.
- Reviews and revisions.

Auditors should confirm:

- The HWMP includes the required five minimum considerations above and all relevant records associated with the HWMP implementation.
- Employees are:
  - Familiarised with the HWMP and the feedback mechanisms for its review by conducting employee interviews and observations.
  - Trained on the site-specific biosecurity mechanism by reviewing employees' training records, conducting employees' interviews and observations.

Useful Resources

- ASC (2026) How to Write a Health and Welfare Management Plan. 24pp
- Aquatic Vets (2026) An example of a Health and Welfare Management Plan Focusing on Mediterranean Species. 40pp
- World Organisation for Animal Health (2024) Aquatic Animal Health Code - World Organisation for Animal Health.
- World Organisation for Animal Health (2023) Assessment and listing of emerging diseases - WOAH Bulletin
- Scottish Finfish Aquaculture (2023) Code of Good Practice for Scottish Finfish Aquaculture.
- The Fish Site (2005) The benefits of a veterinary health plan.
- Alevra, A., Llorente Manzanares, M., Mente, E., Xandri Royo, P.M., (2025) Good husbandry practices for aquaculture, Publications Office of the European Union.
- APROMAR (2022) A guide on fish welfare in Spanish aquaculture - Volume 1: Concepts and generalities. Spanish Aquaculture Business Association. 36 pp.
- APROMAR (2024) A guide on fish welfare in Spanish aquaculture- Volume 2: Welfare of European sea bass. Spanish Aquaculture Business Association. 49 pp.

- APROMAR (2024) A guide on fish welfare in Spanish aquaculture - Volume 3: Welfare of gilthead sea bream. Spanish Aquaculture Business Association. 49 pp. PerfromFISH (2021) Best therapeutics practices for Mediterranean farmed fish. Report 151pp.
- APROMAR (2025) A Guide on Fish Welfare in Spanish Aquaculture – Volume 5: Welfare
- of turbot. Spanish Aquaculture Business Association. 53 pp
- IFA Aquaculture (2017) The farmed salmonid health handbook. 21pp.

Comment box

In V1.1 of the ASC Farm Standard, there is no specific requirement for Environmental Enrichment, however this may be considered for inclusion as a standalone requirement in the future. It is recommended that the UoC investigates what will work for their system. Further information on environmental enrichment is outlined in the interpretation for Indicator 4.1.1.10.7 and Appendix 1 to this Interpretation Manual.

Indicator:	Requirement:
4.1.1.10.1	*Indicator applicability: every UoC using feed* The UoC shall ensure the HWMP includes a water quality monitoring process according to **Appendix 12 (12.3, Table 2).**

How do I interpret this requirement?

- Maintaining good water quality is a critical factor when culturing any aquatic organism. Concentrations of substances within the water system that rise above or fall below specific levels can be harmful to aquatic animal populations.
- Concerning health and welfare, water quality has a dual role as both a cause and a consequence of poor health and welfare:
  - Poor water quality can cause health and welfare hazards, e.g. heavy metals derived from forest runoff in a flow-through system or leaking from equipment in a RAS.
  - Poor water quality can also result from poor husbandry practices, e.g. excessive stocking density causing deterioration of water quality, particularly in closed and semi-closed systems.

- Farmed aquatic animals continuously interact with their surrounding environment, meaning that changes in water quality can directly influence physiological stress, immune function, disease susceptibility, behaviour and mortality. Poor water quality conditions may result from farm-related activities including excessive nutrient loading, inadequate waste management, high stocking densities, feeding practices, limited water exchange or insufficient system maintenance.
- While Table 2 of Appendix 12 specifies the water quality parameters that should be included in the monitoring process, additional parameters may be considered based on site-specific requirements. Conformance with maximum and minimum thresholds, customised to the species and environmental conditions, should be incorporated into the monitoring process. Parameters identified as requiring risk assessment will be determined by:
    - Site history and detailed records of water quality
    - Previous monitoring results
    - Species sensitivity
    - Environmental conditions, including harmful algal blooms, biological changes, and pathogen and disease-related risks
- Water flow should also be assessed at site level as part of the Health and Welfare Risk Assessment. This is distinct from Indicator 2.6.16, which is a broader environmental waterbody monitoring exercise. At site level, insufficient flow can lead to reduced oxygen availability and accumulation of metabolic waste products, while excessive flow can cause chronic stress and unnecessary energy expenditure. Flow should be assessed in relation to species-specific requirements, stocking density and system type.
- Note: Water quality does not need to be checked during movement of fish within the same site.
- The following water quality parameters are considered key risk factors as they represent environmental conditions that directly affect aquatic animal physiology:
    - Temperature: Influences metabolic demand, oxygen availability, immune function and pathogen dynamics. Rapid changes or exposure outside species-specific tolerance ranges increase physiological stress and reduce disease resilience.
    - Dissolved oxygen: Fundamental for metabolism, feeding activity, growth and stress tolerance. Reduced levels cause physiological stress, altered behaviour, reduced feed intake and increased mortality risk, particularly combined with high biomass or elevated temperature.

- Turbidity and suspended solids: Elevated levels may interfere with feeding, respiration and gill function, depending on species and system type.
- Carbon dioxide: Elevated CO_2 can cause reduced growth, changes in swimming behaviour, homeostatic disturbances and kidney damage.
- pH and chemical stability: Changes in pH affect physiological processes and alter the toxicity of compounds such as ammonia. Fluctuations may indicate environmental instability and increase welfare risks.
- Salinity: Interrelated with other water quality parameters and can affect the toxicity of those parameters.
- Ammonia, nitrite and other nitrogen compounds: Accumulation from feed inputs and waste can impair physiological function, damage sensitive tissues and increase disease susceptibility.
- Hydrogen sulphide and anaerobic conditions: Organic enrichment and sediment accumulation can generate oxygen-depleted zones and toxic compounds that negatively affect aquatic animal health.

o A risk-based approach is necessary to identify conditions that may increase the likelihood of poor aquatic animal health and welfare outcomes before adverse impacts occur. The purpose of including water quality within the Health and Welfare Risk Assessment is to ensure farms identify site-specific hazards, evaluate their likelihood and severity, and implement appropriate management actions. A risk assessment procedure is outlined in Appendix 3 (3.2), with further detail on water quality risk assessment in the risk example below:

Risk Example — Heavy Metals in freshwater RAS, rainbow trout (*Oncorhynchus mykiss*) farm

Step 1 – Identify the risk

The risk is an accumulation of heavy metals (Zn, Fe, Cu, Cr, Mn, Ni, As, Cd, Pb) in RAS water.

The levels of heavy metals could affect trout health/welfare.

RAS reuse of water/ low flow rate could increase the risk.

Step 2 – Assess the risk level

The likelihood and severity are scored against the evidence and risk drivers identified for this specific site, then plotted on the 3×3 matrix (See Appendix 3 Table 1).

Information sourced from two published papers-

- Yusoff FM, Umi WAD, Ramli NM and Harun R (2024). Water quality management in aquaculture. Cambridge Prisms: Water, 2, e8, 1–22 https://doi.org/10.1017/wat.2024.6
- Simionov, I. et al (2019) Heavy Metals Presence in Aquaculture Ecosystems. Proceedings of the 34th International Business Information Management Association

Conference. https://www.researchgate.net/publication/338623488_Heavy_Metals_Presence_in_Aquaculture_Ecosystems

Likelihood drivers: RAS systems with low water exchange concentrate metals.

Likelihood is therefore driven by:

- how low the site's actual exchange rate is,
- the metal content of source/make-up water,
- the metal content and additive load of the compound feed, and
- the age/material of tanks, pipework, and fittings.

Severity drivers: trout muscle/liver bioaccumulation of heavy metals.

Severity is therefore driven by:

- chronic, low-grade exposure
- trout's specific sensitivity (salmonids are generally less tolerant of metal stress than some warmwater species) and by
- whether any single metal (e.g. Cu, often used in tank coatings or as a parasiticide) is dosed directly into the system.

For this example:

- Site with a moderate exchange rate,
- No previous history of source-water heavy metal testing,
    - → Likelihood: Medium.
- Chronic sub-lethal accumulation rather than acute mortality risk,
- Plausible welfare/growth and product-quality consequences
    - → Severity: Medium.
- Medium likelihood × Medium severity = Medium Risk.

Step 3 – Implement control measures

Because the result is Medium, control measures are required, with a target of reducing to Low within 12–18 months.

Plausible measures:

- Carry out heavy metal testing of source/make-up water and system water;
    - Establish base line levels for heavy metals for the site;
    - Review against literature to establish if any results are high;
    - If results show high levels;

- Carry out investigation to establish why; and
- Carry out corrective action; and
- Repeat testing.

- If results show acceptable levels;
  - You have now reduced risk Likelihood to Low; and
  - Can establish a reduced testing schedule for heavy metals.

- Review feed specification for metal contaminant limits; and
- Increase water exchange rate where feasible.

Step 4 – Monitor control measures

Track system water metals concentrations against the established baseline and trend over time; verify feed supplier contaminant certificates; inspect tank/pipework condition on a defined schedule.

Step 5 – Review

Review at minimum: when the 12–18-month timeline expires, if monitoring shows an upward trend, or if there's a system change (e.g. exchange rate reduced further, new feed supplier, infrastructure replacement).

Table 8: Water Quality Monitoring for Nile tilapia (*Oreochromis niloticus*) based on Pedrazzani, A.S., Quintiliano, M.H., Bolfe, F., Sans de Oliveira, E.C. & Molento, C.F.M. (2020) Tilapia On-Farm Welfare Assessment Protocol for Semi-intensive Production Systems Frontiers in Veterinary Science and Bregnballe, J. 2022. and A guide to recirculation aquaculture – An introduction to the new environmentally friendly and highly productive closed fish farming systems. Rome. FAO and Eurofish International Organisation.

	Nile Tilapia	Acceptable	Warning Levels	Unacceptable Levels
Daily	Temperature (degrees Celsius)	25-32	20-24 or 33-37	≤19 or ≥38
	Oxygen Saturation (%)	70-95	40-69	≤39 or >95
	pH	6.0-8.5	5.5-5.9 or 8.6-8.9	≤5.4 or ≥9
Bi-weekly	Carbon dioxide (mg/l)	10-15	16-19	20
	Ammonia (NH3; mg/L)	0.000-0.050	0.051-0.100	≥0.110

	Nitrite (mg/l)	0.00-0.50	0.51-1.00	≥1.01
	Nitrate (mg/l)	0.0-0.3	0.31-0.5	>5
Risk assessed	Turbidity (cm)	25-40	41-65	<25 or >65
	Hydrogen sulphide	0.0-0.3	0.31-0.5	>5

Table 9: Water Quality Monitoring for yellowtail kingfish (*Seriola lalandi*) In a marine recirculating aquaculture system (RAS) with artificial seawater based on J. Orellana, U. Waller, B. Wecker, (2014) Culture of yellowtail kingfish (Seriola lalandi) in a marine recirculating aquaculture system (RAS) with artificial seawater. Aquacultural Engineering and FAO (2022) A guide to recirculation aquaculture – An introduction to the new environmentally friendly and highly productive closed fish farming systems. Rome. FAO and Eurofish International Organisation.

RAS culture of Yellowtail Kingfish		**Acceptable**	**Warning Levels**	**Unacceptable Levels**
Daily	Temperature (degrees Celsius)	21 - 24	19 - 21, 24.1 - 26	below 19, above 26
	Oxygen saturation (%)	96 - 105	90 - 95, 106 to 115	under 90, over 115
	Salinity (‰)	31 - 33	28 - 30, 33- 35	under 28, over 35
	Turbidity (nephelometric turbidity units)	1	2 to 5	over 5
	Carbon dioxide (mg/l)	8.0 - 8.5	5.8 - 8.0, 8.51 - 10.8	below 5.7, above 10.81
	pH	7.5	7.3 - 7.4, 7.6 - 7.8	below 7.3, above 7.8
	Ammonia (mg/l)	<0.01	0.020-0.024	>0.025
	Nitrite (mg/l)	0.01-0.2	under 0.5	over 0.5
	Nitrate (mg/l)	under 40	40 - 60	over 60
Risk assessed	Hydrogen sulphide (µg)	1-4	5	>5

Evidence of implementation should be maintained, e.g.:

- The water quality monitoring process, that incorporates the minimum elements required, (i.e. all required individual parameters at the necessary frequencies) included in the HWMP.
- Records confirming the monitoring of the required parameters and their conformance with maximum and minimum thresholds.
- Employees should demonstrate awareness of the established water quality monitoring process.

Auditors should confirm:

- The water quality monitoring process included in the HWMP incorporates the minimum required elements and is implemented.
    - Implementation can be verified by cross-checking the process with records, information from employee interviews and observations.

Useful Resources

- The Fish Site (2015) How to achieve good water quality management in aquaculture.
- Prema D, Jenni B, Reena V Joseph, Vysakhan P, Prajitha K and Kripa V (2020) Water Quality Management In Aquaculture. CMFRI
- EU Platform on Animal Welfare Own Initiative Group on Fish (2020) Guidelines on Water Quality and Handling for the Welfare of Farmed Vertebrate Fish.
- FAO (2022) A guide to recirculation aquaculture – An introduction to the new environmentally friendly and highly productive closed fish farming systems. Rome. FAO and Eurofish International Organisation.
- Baxter (2010) Gelatinous Zooplankton in Irish Waters. 6pp.
- Pedrazzani, A.S., Quintiliano, M.H., Bolfe, F., Sans de Oliveira, E.C. & Molento, C.F.M. (2020) Frontiers in Veterinary Science and Bregnballe, J. 2022.
- J. Orellana, U. Waller, B. Wecker, (2014) Aquacultural Engineering.

Indicator:	Requirement:

4.1.1.10.2

Indicator applicability: every UoC using feed

The UoC shall ensure[72] the HWMP includes a morphological monitoring process for live fish.

Monitoring shall be conducted at least once a month coinciding with any fish handling activity, and shall include at least the following scoring parameters:

a. eye damage
b. operculum damage
c. skin damage
d. fin damage
e. deformities
f. change of colouration
g. emaciation

An exception applies where deviation from monitoring frequency and/or scoring parameters is justified by any of the following reasons:

h. there is no handling of the fish during the month; or
i. fish are undergoing a disease event and/or being treated; or
j. a documented risk assessment is present which demonstrates that the monitoring frequency and/or one or more scoring parameter is not relevant to the species

In which case monitoring shall be conducted using cameras or from the side of the culture unit for as many parameters as possible. The reason for any deviation shall be recorded.

How do I interpret this requirement?

- Morphological scoring is frequently used as an immediate indicator of welfare.
  - However, changes in morphology may have a variety of causes and therefore should be further analysed before drawing conclusions.

[72] An exemption applies immediately after smolting and stocking, or under environmental conditions that affect the welfare of the fish or the health and safety of employees. The reason for the exemption shall be recorded.

- Examples that may be considered as references to develop a morphological scoring are provided in Table 10.
- Some sites may have genetic testing or other diagnostic tests which are more detailed than these indicators. They are meeting the intent of the indicator.
- The K factor is based primarily on the degree of nourishment and sexual maturity. The K factor does not include all the requested parameters and cannot be used to show compliance to this Indicator.
- The UoC can create a risk assessment or provide rationale that outlines why one or more parameters are not relevant for that species – for example colouration, they do not have to check for these parameters monthly.
- If handling is being carried out (e.g. sea lice checks) then each of the required morphological parameters should be scored individually. This means each parameter receives its own score and its own assessment status (see Indicator 4.1.1.10.5), recorded at the required frequency.
- It is up to the UoC to determine the sample size, however Centre for Aquaculture Progress (CAP) https://centreforaquacultureprogress.org/ suggest:
  - Cage size< 20,000 Recommended minimum sample 30
  - Cage size 20,000–100,000 Recommended minimum sample 50
  - Cage size ≥ 100,000 Recommended minimum sample 100
- If no handling is carried out, assessment from the side of the culture unit will still provide detailed information that can be used for trend analysis.
- CAP also recommend sampling each cage at the site. The number of cages assessed may be reduced over time if consistent results and strong correlations are observed across cages, and cages are assessed on a rotating basis.

Evidence of implementation should be maintained, e.g.:

- The morphological scoring monitoring process, that incorporates the minimum elements required, included in the HWMP.
- If applicable, a risk assessment or rationale that outlines why one or more parameters are not relevant for that species.
- Records that confirm the monitoring of the morphological scoring.
- Employees should demonstrate awareness of the established morphological scoring monitoring process.

Auditors should confirm:

- The morphological monitoring process included in the HWMP incorporates the minimum required elements and it is implemented.
    - Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.
- If applicable, a risk assessment or rationale that outlines why one or more parameters are not relevant for that species.
- If using camera technology, the assessment has been validated against traditional assessments.

Useful Resources

- Noble, C., Gismervik, K., Iversen, M. H., Kolarevic, J., Nilsson, J., Stien, L. H. & Turnbull, J. F. (Eds.) (2018) Welfare Indicators for farmed Atlantic salmon – tools for assessing fish welfare. 351pp.
- Noble, C., Gismervik, K., Iversen, M. H., Kolarevic, J., Nilsson, J., Stien, L. H. & Turnbull, J. F. (Eds.) (2020). Welfare Indicators for farmed rainbow trout: tools for assessing fish welfare 310 pp.
- Pavlidis, M., Samaras, A., Papaharisis, L., (2024). Welfare assessment study for European sea bass. University of Crete.
- Meyer, B., Emam, W. 2024. An overview of operational welfare indicators for farmed Nile tilapia (*Oreochromis niloticus*). Ethical Seafood Research, Glasgow, United Kingdom. DOI: 10.17605/OSF.IO/MGF7E
- Barrento, S., Pedrazzani, A., Molento, C., & Quintiliano, M. (2023). Tilapia welfare indicators [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/
- Nilsson et al (2025) A standardised, operational welfare monitoring protocol for Atlantic salmon held in sea cages. Laksvel
- Taylor et al (2017) Gill Scoring Guide for Amoebic Gill Disease. 37pp.

Indicator:	Requirement:
4.1.1.10.3	*Indicator applicability: every UoC using feed* The UoC shall ensure the HWMP includes a feeding monitoring process for live fish in accordance with the time and frequency established in the feeding plan (see Indicator 4.1.1.9 a).

How do I interpret this requirement?

- Monitoring behaviours, such as feeding, can be used as an immediate indicator of welfare.
- Active feeding with minimal waste can indicate a healthy population with appropriate feed management.
- Feed motivation can be reduced by stressors, which can lead to reduced feed intake and growth.
- Reduced feeding can also indicate disease or poor water quality.
- However, changes in behaviour may have a variety of causes and therefore should be further analysed before drawing conclusions.
- Feeding can be carried out manually or via automated feeders.
- Automated/technological feeding should:
    - Monitor satiation and feeding in real time (e.g. uneaten pellet detection via underwater camera or sensor-based technology);
    - Respond automatically to welfare-relevant thresholds (e.g. automatic feed cessation when environmental or behavioural parameters fall outside welfare-safe ranges); and
    - Demonstrate continuous compliance with the intent of this indicator.
        - System parameters and calibration records
        - Defined welfare-relevant thresholds and trigger responses
        - Performance data (e.g. FCR, feed waste metrics)
- Identify behaviours that are relevant for the species and the life stage being farmed.

Evidence of implementation should be maintained, e.g.:

- The behavioural monitoring process, that incorporates the minimum elements required, included in the HWMP.

- Records that confirm the monitoring of feeding.
- Employees should demonstrate awareness of the established behavioural monitoring process.

Auditors should confirm:

- The feeding monitoring process is implemented.
- Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.

Useful Resources

- Noble, C., Gismervik, K., Iversen, M. H., Kolarevic, J., Nilsson, J., Stien, L. H. & Turnbull, J. F. (Eds.) (2018) Welfare Indicators for farmed Atlantic salmon – tools for assessing fish welfare. Handbook 351pp.
- Pavlidis, M., Samaras, A., Papaharisis, L., (2024). Welfare assessment study for European sea bass. University of Crete.
- PerformFISH (2024) Methodology for assessing welfare in Mediterranean Marine Fish Farming Sector. Report 23pp.
- PerformFISH (2021) Set of KPIs for Mediterranean Marine Fish Farming Sector. Report 142pp.
- Barrento, S., Pedrazzani, A., Molento, C., & Quintiliano, M. (2023). Tilapia welfare indicators [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/

Indicator:	Requirement:
4.1.1.10.4	*Indicator applicability: every UoC using feed* The UoC shall ensure the HWMP includes a mortality monitoring process which includes at least the following: a) daily monitoring and recording of mortalities; and b) removal of mortalities at least every two days; and c) classification of all recovered mortalities and a post-mortem analysis for each mortality event; and d) investigation of mortality events which remain unexplained or unattributed to fish health reasons; and

e) daily collection of moribund fish and culling according to Criterion 4.1.3.

Where any of the listed items above are not possible, the UoC shall record the reason.

How do I interpret this requirement?

- Monitoring for mortality is a visual observation of whether there is mortality at the site, e.g. observations of the bottom of the pens with cameras; observations by divers or from the surface.
- Possible causes that could justify no daily monitoring or less than every second day removal of mortality are severe bad weather, or a major equipment failure not related to poor maintenance.
- Mortality stems from diverse factors that appear linked to suffering, particularly during disease outbreaks and critical development or production phases.
- Scrutiny of mortality records and cause determination is essential for preventing further avoidable deaths and improving overall fish health and welfare in aquaculture.
- Mortality monitoring thresholds should be established as these will identify when the level of mortalities can be classified as a mortality event.
- The number of fish examined should be sufficient to support a confident clinical diagnosis, as determined by the designated veterinarian or aquatic animal health professional.
    - For acute mortality events with consistent clinical signs: a minimum of 5–10 recently dead or moribund fish is typically sufficient for initial diagnosis
- For chronic or unexplained mortality with variable presentation: a larger sample may be warranted, as directed by the veterinarian
- If on-site diagnosis is inconclusive, off-site laboratory diagnosis is required.
    - Where laboratory analysis is required (histopathology, bacteriology, virology): sample numbers should follow the diagnostic laboratory's guidelines.
- The UoC should develop a procedure (i.e. SOP) to describe moribund collection and culling operations.
    - Employees should be trained on this procedure.
- Moribund fish should be collected using appropriate equipment to prevent further injuries and stress, e.g. hand net according to fish size.
    - The number of moribund fish should be included in the mortality monitoring.
    - Collected moribund fish should be humanely slaughtered as per Criterion 4.1.3.
- Possible causes that could justify no collection of moribund fish include severe bad weather or a major equipment failure not related to poor maintenance.

- Possible causes of several moribund fish should be investigated.

Evidence of implementation should be maintained, e.g.:

- Mortality monitoring.
- Mortality removal.
- The mortality monitoring process, that incorporates the minimum elements required, as well as what they consider a mortality event, included in the HWMP.
- Records that confirm the monitoring of the mortality including the results of post-mortem analysis and the rationale for determining the sample size required for statistical analysis.
- Employees should demonstrate awareness of the established mortality removal and monitoring process.

Auditors should confirm:

- The mortality monitoring process included in the HWMP incorporates the minimum required elements, is implemented and threshold levels to determine mortality events.
    - Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.
- Moribunds are collected daily and culled following responsible stunning and killing according to Criterion 4.1.3.
    - Implementation can be confirmed by cross-checking the frequency of collection and culling methods with records, information from employee interviews and observations.

Useful Resources

- TCRS Learning Centre. Humane Euthanasia**.**
- Aunsmo, A., Persso, D., Stormoen, M., Romstad, S., Jamtøy, O., Johan Midtlyng, P. (2023) Real-time monitoring of cause-specific mortality- and losses in industrial salmon farming. Aquaculture.
- Muniesa, A., Basurco, B., Aguilera, C., Furones, D., Reverté, C., Sanjuan-Vilaplana, S., Dverdal Jansen, M., Brun, E. & Tavornpanich, S. (2020) Mapping the knowledge of the main diseases affecting sea bass and sea bream in Mediterranean. Transboundary & Emerging Diseases.
- Oliveira, V., Dean, K., Qviller, L., Kirkeby, C. & Bang Jensen, B. (2021) Factors associated with baseline mortality in Norwegian Atlantic salmon farming. Nature. Scientific Reports.

- Muniesa, A., Furones, D., Rodgers C., & Basurco, B. (2022) An assessment of disease occurrence and mortality in marine fish farming in Spain. Aquaculture Reports.
- Zornu, J., Tavornpanich, S., Brun, E., van Zwieten, P., van de Leemput, I., Appenteng, P., Anchirinah, J. & Sewornu Cudjoe, K. (2023) Understanding tilapia mortalities and fish health management in Lake Volta: a systematic approach. Frontiers In Sustainable Food Systems.
- Zaman Sajid, A., Gamperl, K., Parrish, C.C., et AL., (2024) An aquaculture risk model to understand the causes and consequences of Atlantic Salmon mass mortality events: A review. Reviews In Aquaculture.

Indicator:	Requirement:

4.1.1.10.5 *Indicator applicability: every UoC using feed*

The UoC shall ensure the HWMP includes a system to identify acceptable, warning, and unacceptable levels of health or welfare for:

a. water quality (Indicator 4.1.1.10.1); and

b. morphology (Indicator 4.1.1.10.2); and

c. feeding (Indicator 4.1.1.10.3); and

d. mortality (Indicator 4.1.1.10.4).

Where levels are warning or unacceptable, the UoC shall, where possible, increase monitoring and implement corrective actions to restore levels to acceptable.

How do I interpret this requirement?

- The assessment system should be tailored to accommodate the species being farmed, their life stage, the UoC's monitoring procedures and if any automation is involved (for example in feeding).
- An example of an assessment system, is a traffic light system, using three levels to classify the welfare status of each indicator is suggested in this guidance. These definitions should be understood from the perspective of welfare outcomes for the aquatic animal, not from a production or market perspective:
  - Acceptable (green): No welfare concerns, or only minor deviations with little assumed impact.

- Warning (amber): A clear welfare concern that requires increased monitoring and corrective action when possible
- Unacceptable (red): A severe welfare concern with assumed large consequences for the aquatic animal. Immediate corrective action is required.

- Where an established welfare assessment protocol exists for the species being farmed, the UoC should use it as the basis for their assessment system. The following table lists protocols that can be used to meet the requirements of this Indicator; the UoC may need to supplement where a protocol does not cover all required indicators.
- Where the UoC chooses not to use a recommended protocol (e.g. because a recommended protocol does not exist for their species) the UoC should develop their own scoring system using a recommended protocol as a structural template.
- Thresholds should be based on published scientific literature, the recommendation of a veterinarian or aquatic animal health professional, and/or the ASC water quality reference table. The rationale for chosen thresholds should be documented.
- **Table 10:** ASC's recommended welfare assessment protocols, to be updated over time.

Species	Protocol	Suggested assessment mapping	Missing indicators
Atlantic salmon	Laksvel— A standardised, operational welfare monitoring protocol for Atlantic salmon held in sea cages (Institute of Marine Research, 2025)	Acceptable = Levels 0 or 1 Warning = Level 2 Unacceptable = Level 3	Change of colouration Turbidity Carbon dioxide pH Salinity Ammonia/nitrite/nitrate Metals Water flow/velocity Hydrogen sulphide
European Sea Bass	European Sea Bass Operational Welfare Indicators (OWI) Protocol (Centre for Aquaculture Progress, 2026)	Acceptable = Level 0 or 1 Warning = Level 2 Unacceptable = Level 3	None.
Gilthead Sea Bream	Gilthead Sea Bream Operational Welfare Indicators (OWI) Protocol (Centre for Aquaculture Progress, 2026)	Acceptable = Level 0 or 1 Warning = Level 2 Unacceptable = Level 3	None.
Lumpfish	Development, validation and testing of an Operational Welfare Score Index for farmed lumpfish *Cyclopterus lumpus L* (Gutierrez Rabadan et al., 2021)	Acceptable = 0 points Warning = 1 point Unacceptable = 2 points	All water quality indicators Feeding Mortality Operculum damage Deformities Change of colouration
Nile tilapia	Tilapia: Welfare Indicator Scorecards (FAI Academy, 2025) (must enrol into the online course to access the document)	Acceptable = Score 1 Warning = Score 2 Unacceptable = Score 3	Change of colouration Emaciation Nitrate Salinity Water flow/velocity Metals Hydrogen sulphide
Rainbow trout	Rainbow Trout Operational Welfare Indicators (OWI) Protocol (Centre for Aquaculture Progress, 2026)	Acceptable = Level 0 or 1 Warning = Level 2 Unacceptable = Level 3	None.
Pikeperch	MyFishCheck: A Model to Assess Fish Welfare in Aquaculture (Tschirren et al., 2020)	Farm management (A1): Acceptable = Score 0 Warning = Score 1 Unacceptable = Score 2 Water quality (A2): Acceptable = Optimum or within target range	Turbidity Carbon dioxide Salinity Metals Hydrogen sulphide

		Warning = Within tolerance range Unacceptable = Outside tolerance range Behaviour (A3/A4): Acceptable = Scores 0 or 1 Warning = Scores 2 or 3 Unacceptable = Scores 4 or 5 External/internal appearance (A5-A7): Acceptable = Scores 0 or 1 Warning = Score 2 Unacceptable = Score 3	

Example of applying the assessment system

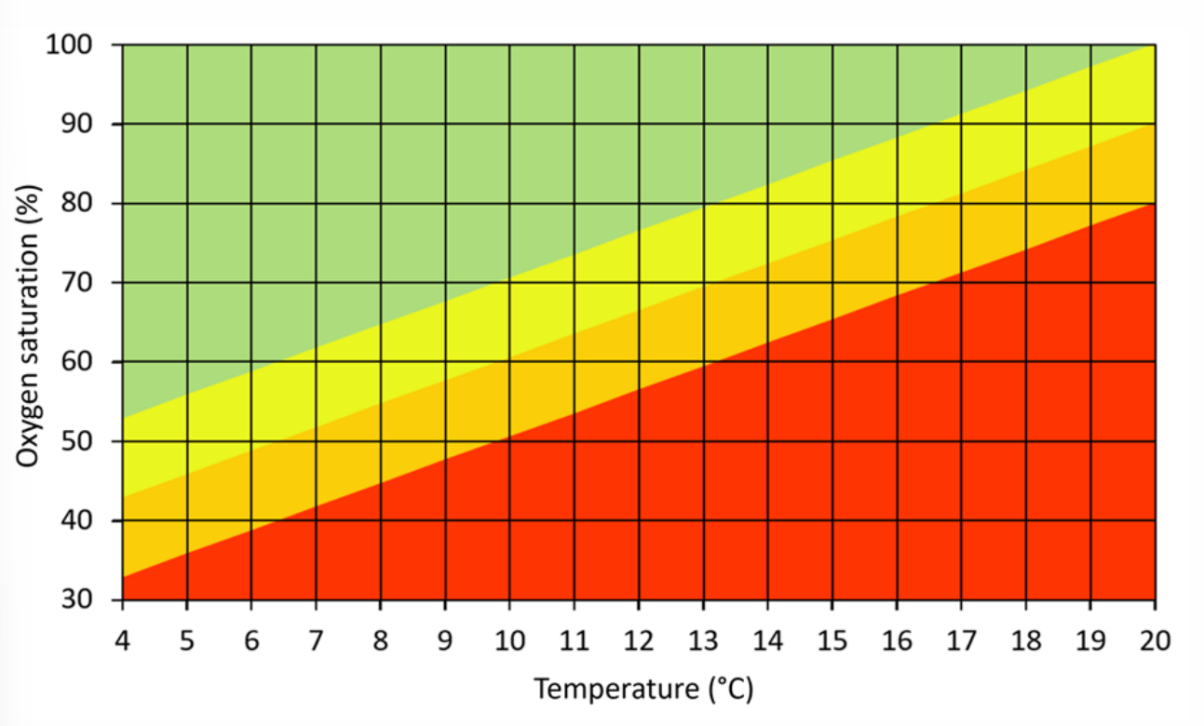
The assessment system should cover all four indicator categories and all required individual indicators within each category. Each indicator should receive its own assessment status (e.g. each morphological parameter is scored individually).

The following examples demonstrate how a recommended protocol can be used to apply the assessment system across all four indicator categories. For consistency, this example uses a single protocol (Laksvel, for Atlantic salmon) throughout.

Water quality indicators

Table 11: Temperature and dissolved oxygen scoring for Atlantic salmon (*Salmo salar*) raised in sea cages, based on Nilsson et al., (2025), Laksvel, mapped to ASC scoring levels of acceptable, warning, unacceptable.

	Acceptable	**Warning**	**Unacceptable**
Temperature	7–17°C	17–19°C OR 2–7°C	> 19°C OR < 2°C
Dissolved oxygen	Green and yellow sections in graph below	Orange section in graph below	Red section in graph below



Morphological indicators

Table 12: Eye damage, operculum damage, and fin damage scoring for Atlantic salmon (*Salmo salar*) raised in sea cages, based on Nilsson et al., (2025), Laksvel, mapped to ASC scoring levels of acceptable, warning, unacceptable.

	Acceptable	Warning	Unacceptable
Eye damage	No bleeding OR A minor bleeding	Clear bleeding or other injury	Major injury, eye probably blind
Operculum damage	No shortening OR Somewhat shortened, some gill tissue visible	Clearly shortened, gills partly visible	Much shortened, most of the gills visible
Fin damage	No injuries OR Minor injuries	Clear injuries	Severe injuries

Behavioural indicators

Table 13: Feeding scoring for Atlantic salmon (*Salmo salar*) raised in sea cages, based on Nilsson et al., (2025), Laksvel, mapped to ASC scoring levels of acceptable, warning, unacceptable.

	Acceptable	Warning	Unacceptable
Feeding	The fish have been very motivated to feed over the past week and have eaten at least as much as expected based on fish size and temperature OR The fish have shown somewhat weaker feeding motivation than normal over the past week and have eaten somewhat less than expected based on fish size and temperature	The fish have shown clearly weaker feeding motivation than normal over the past week and have eaten markedly less than expected based on fish size and temperature	The fish have shown little interest in the feed over the past week and are eating very little

Mortality classification

A mortality classification system that adjusts to the species, the life stage and the farming context (e.g. the geography or farming system where fish are reared) should be developed. Staff are to be trained in the mortalities classification. The UoC is recommended to follow the structure and groupings detailed in Aunsmo et al. (2023) which have also been adopted by the Norwegian Veterinary Institute.

Aunsmo et al. (2023) provide a three-level method to register and report mortality, with level 1 being overarching main categories (e.g. infectious diseases, physiological causes), level 2 being subcategories (e.g. bacterial disease, smoltification), and level 3 providing more detailed information (e.g. failure of oxygen supply, salmon lice). As this classification system has been developed for Atlantic salmon, where a UoC produces a different species, it is encouraged to add species-specific classifications where they are missing.

At a minimum, the UoC is recommended to record mortality against the level 1 categories, as set out below. The UoC is encouraged to also record at levels 2 and 3. The full list of causes and their codes can be found here.

Level 1 classification:

A: Infectious diseases

B: Environmental impacts

C: Injuries (trauma)

D: Physiological causes

E: Other causes

F: Unknown cause

The UoC is encouraged to add further level 2/3 codes as needed.

Mortality indicators

Mortality thresholds should primarily reflect welfare outcomes for the species and life stage being farmed, based on a recommended welfare assessment protocol (see above), published scientific literature, or the recommendation of a veterinarian or aquatic animal health professional.

Historic mortality trends and industry data may be used as supplementary context only, and should not serve as the sole basis for thresholds, as this risks normalising poor welfare outcomes rather than measuring welfare against what is achievable.

It is recommended to consider mortality levels on a daily, weekly, monthly, and annual basis, as well as at a production cycle basis.

Mortality thresholds should be based on fish numbers, and it is recommended that they are also expressed as biomass thresholds.

The use of both metrics is considered complementary.

Using biomass on its own is discouraged, as small biomasses might lead to inaccurate assessments when fish are small.

Table 14: Mortality for Atlantic salmon (*Salmo salar*) raised in sea cages, based on Nilsson et al., (2025), Laksvel, which have been derived from Norwegian production data baselines. The levels have been mapped to ASC scoring levels of acceptable, warning, unacceptable, with the annual mortality rates based on the daily mortality scoring provided.

	Acceptable	Warning	Unacceptable
Daily mortality	0.0–0.025%	0.025–0.07%	>0.07%
Weekly mortality	0.0–0.17%	0.17–0.49%	>0.49%
Monthly mortality	0.0–0.7%	0.7–2%	>2%
Annual mortality	0.0–8.7%	8.7–22.5%	>22.5%

How welfare data should be collected and recorded

Table 15: Example daily water quality monitoring for Atlantic salmon in sea cages

Indicator	Measured value	Assessment
Temperature	14°C	Acceptable
Dissolved Oxygen	70%	Warning
Turbidity	10m secchi disc depth	Acceptable

Table 16: Example daily feeding monitoring for Atlantic salmon in sea cages

Indicator	Notes	Assessment
Feeding	20% of fish showed less interest in feeding	Warning

Table 17: Example monthly morphological assessment for Atlantic salmon in sea cages (1 = Acceptable, 2 = Warning, 3 = Unacceptable)

Fish #	Eye	Operculum	Skin	Fin	Deformity	Colour	Emaciation
1	1	1	3	1	1	1	1
2	1	1	1	2	1	1	1
3	1	1	2	1	3	1	1
...	...	...	...	...	...	...	...
30	2	2	1	1	1	1	2

Table 18: Example summary monthly morphological assessment for Atlantic salmon in sea cages (Columns: Indicator names, Rows: Indicator scores; with 1 = Acceptable, 2 = Warning, 3 = Unacceptable, Cells: Count of samples with given indicator name and score)

Indicator score	Eye	Operculum	Skin	Fin	Deformity	Colour	Emaciation
1	26	27	24	18	27	28	28

2	3	3	4	7	2	2	1
3	1	0	2	5	1	0	1

Table 19: Example summary daily mortality assessment for Atlantic salmon in sea cages

Mortality classification (Level 1)	Number of fish
Infectious diseases	8
Environmental impacts	0
Injuries (trauma)	3
Physiological causes	0
Other causes	0
Unknown cause	4
Total mortalities	15
Total population	120,000
Daily mortality rate	0.0125%
Final Assessment	Acceptable

Table 20: Example detailed daily mortality assessment for Atlantic salmon in sea cages (based on three-tier AquaCloud classification, translated from Norwegian into English)

Fish #	Level 1	Level 2	Level 3
1	Infectious diseases	Viral disease	CMS
2	Injuries (trauma)	Handling damage	Crowding
3	Infectious diseases	Bacterial disease	BKD
4	Infectious diseases	Viral disease	CMS
...			
15	Unknown cause	Syndromes without known cause of death	Pinhead unknown cause
Total mortalities	15		
Total population	120,000		
Daily mortality rate	0.0125%		
Final Assessment	Acceptable		

Evidence of implementation should be maintained, e.g.:

- The assessment system for the required OWIs identifies ranges of acceptable, warning, and unacceptable levels of health or welfare, included in the HWMP.

- Records that confirm assessment at the required frequency and resolution, e.g. 1-recording for each indicator for each fish sampled for morphological indicators each month, 2- scores for each necessary water quality parameters daily, 3- scores for feeding behaviour daily.
- Records that confirm the increased monitoring and associated short-term corrective measures in case of warning or unacceptable results as soon as reasonably possible.
- Rationale for the grading of the OWIs (e.g. based on scientific literature available or the recommendation of a veterinarian or aquatic animal health professional).
- The assessment system is to be reviewed as the site learns more about its operational welfare indicators. This review can be carried out at the end of every production cycle
- Employees should demonstrate awareness of the established assessment system.

Auditors should confirm:

- A recommended welfare assessment protocol is being used, or sufficient rationale has been documented for an alternative approach.
- The assessment included in the HWMP incorporates the minimum required elements (i.e. scoring each indicator individually) and it is implemented at the necessary frequency.
- Implementation can be verified by cross-checking the system with relevant records, information from employee interviews and observations.
- Where warning or unacceptable results have been found, an investigation has been carried out which may result in increased monitoring or corrective actions.
- Where the audit coincides with a scheduled welfare assessment, the auditor should observe the assessment process to verify it is being applied as described.

Useful Resources

- Nilsson, J., Gismervik, K., Nielsen, K. V., Iversen, M. H., Noble, C., Kolarevic, J., Frotjold, H., Nilsen, K., Wilkinson, E., Klakegg, B., Hauge, H.S., Sæther, P.A., Kristiansen, T., Stien, L. H. (2025). Laksvel — A standardised, operational welfare monitoring protocol for Atlantic salmon held in sea cages. Institute of Marine Research.
- Centre for Aquaculture Progress (2026). European Sea Bass Operational Welfare Indicators (OWI) Protocol.
- Centre for Aquaculture Progress (2026). Gilthead Sea Bream Operational Welfare Indicators (OWI) Protocol.
- Guiterrez Rabadan, C., Spreadbury, C., Consuegra, S., Garcia de Leaniz, C. (2021). Development, validation and testing of an Operational Welfare Score Index for farmed lumpfish *Cyclopterus lumpus* L. Aquaculture.
- FAI Academy. (2025). Tilapia: Welfare Indicator Scorecards 16pp.

- Centre for Aquaculture Progress (2026). Rainbow Trout Operational Welfare Indicators (OWI) Protocol.
- Tschirren, L., Bachmann, D., Güler, A. C., Blaser, O., Rhyner, N., Seitz, A., Zbinden, E., Wahli, T., Segner, H., Refardt, D. (2021) MyFishCheck: A Model to Assess Fish Welfare in Aquaculture.
- Noble, C., Gismervik, K., Iversen, M. H., Kolarevic, J., Nilsson, J., Stien, L. H. & Turnbull, J. F. (Eds.) (2018). Welfare Indicators for farmed Atlantic salmon: tools for assessing fish welfare. Handbook 351pp.
- Martins, C. I. M., Galhardo, L., Noble, C., Damsgård, B., Spedicato, M.T., Zupa, W., Beauchaud, M., Kulczykowska, E., Massabuau, J.C., Carter, T., Rey Planellas, S., & Kristiansen, T. (2011) Behavioural indicators of welfare in farmed fish. Fish Physiology and Biochemistry.
- Pedrazzani, A.S., Quintiliano, M.H., Bolfe, F., Sans de Oliveira, E.C. & Molento, C.F.M. (2020) Tilapia On-Farm Welfare Assessment Protocol for Semi-intensive Production Systems Frontiers in Veterinary Science

Indicator:	Requirement:
4.1.1.10.6	*Indicator applicability: every UoC using feed* The UoC shall ensure the HWMP includes trend analysis to determine changes in health and welfare over time. This analysis shall consider drivers of the trends, and shall be based on the data analysed in Indicator 4.1.1.10.5 and feedback from the processing plant where relevant.

How do I interpret this requirement?

- The analysis of OWIs data over time, as well as information gathered from the mortality classification and post-mortem analysis and the feedback from the processing plant:
  - Allows for the identification of trends that provide insights into factors influencing health, welfare and mortality events.
    - Regular reviews of trends, such as monthly and at least annually or at the end of the production cycle, are recommended.
  - Inform decision-making to improve overall production.
    - The veterinarian or aquatic animal health professional should assist the UoC with the trends analysis and drawing conclusions to build effective corrective measures for improving health or welfare over time.

- Feedback from the processing plant can, for example, disclose the presence of recurring trends like skin wounds or deformities.
    - Sharing observations and feedback with the UoC enables prompt and thorough investigations.

Evidence of implementation should be maintained, e.g.:

- The mechanism or trend analysis included in the HWMP.
- Records that confirm trend analysis has been conducted include as a minimum:
    - Mortality classification.
    - Post-mortem analysis.
    - Feedback from the processing plant.

Auditors should confirm:

- The trend analysis mechanism included in the HWMP incorporates the minimum required elements and its outcome is implemented:
    - Implementation can be verified by cross-checking the mechanism with relevant records, information from employee interviews and observations.

Useful Resources

- Aunsmo, A., Persson, D., Stormoen, M., Romstad, S., Jamtøy, O., & Johan Midtlyng, P. (2023) Real-time monitoring of cause-specific mortality- and losses in industrial salmon farming. Aquaculture

Indicator:	Requirement:

4.1.1.10.7

Indicator applicability: every UoC using feed

The UoC shall ensure the HWMP includes a mortality reduction plan which defines annual targets for both total and unexplained mortalities by considering the results of the trend analysis in Indicator 4.1.1.10.6, and shall implement appropriate actions to meet the annual targets.

How do I interpret this requirement?

- The mortality reduction plan should address the various factors contributing to fish mortality.
- When building the mortality reduction plan, the UoC should consider:
  - Current mortality rates and causes, including unexplained mortality.
  - Set achievable goals and objectives.
  - Identify priority areas for intervention according to the goals and objectives.
  - Develop strategies addressing priority areas for intervention.
  - Monitor and evaluate progress regularly.
  - Provide employees with training.
  - Foster a culture of continuous improvement.
  - Collaborate with industry experts for knowledge sharing.
  - Seek health professionals' involvement in developing the reduction plan.
- Special attention should be given to unexplained mortalities which may indicate underlying health issues or poor management practices
  - Identifying and addressing the root causes of unexplained mortalities is essential for improving overall management practices and reducing mortality rates.
- In addition, consistent, clear downward trends in OWIs indicate declining health or welfare.
  - Examples of such trends include a consistent increase in overall morphological scoring, repeated observations of abnormal behaviour, deteriorating water quality with one or more parameters that are outside of the acceptable ranges, or increasing mortality.
  - Some UoC may have a fish health programme which would potentially address/ go beyond the intent of this indicator.
  - If a baseline mortality is reached, the annual targets should transition from year-on-year reduction to maintenance targets focusing on consistency and stability.

- If a declining trend is observed, then the UoC should assess the situation and investigate the causes behind the trends.
    - One or multiple issues may be causing the decline, including those of infectious or non-infectious origin.
    - In many cases, poor or inadequate husbandry practices can predispose aquatic animals to succumb to infectious diseases.
    - Also, when declining trends are observed, the UoC should review and implement appropriate actions across at least the following husbandry practices:
        - Stocking densities.
        - The feeding plan.
        - Water quality.
        - Handling practices.
        - Enclosure characteristics.
        - Environmental enrichment.
- Environmental enrichment refers to deliberate modifications to the rearing environment designed to promote species-appropriate behaviour, reduce chronic stress, and support the physical and psychological wellbeing of farmed fish. It is recommended that enrichment provisions are incorporated into the HWMP as a proactive welfare management component, planned and documented as part of routine welfare management rather than applied solely in response to declining welfare indicators.
- Enrichment provisions are organised into two types:
    - **Type A** provisions include dietary and physical enrichments. These provisions represent the baseline welfare standard and minimum expected provision within the HWMP.
    - **Type B** provisions include sensory and occupational enrichment. These provisions build on the Type A baseline and represent enhanced welfare provision.
- The HWMP should document at least one valid Type A provision and at least one valid Type B provision. The full valid provision criteria, assessment framework, enrichment provision reference table, and HWMP documentation framework are provided in Appendix 1 to this Interpretation Manual.
- The UoC should select provisions appropriate to the species, production system, and life stage, in consultation with the designated veterinarian or Aquatic Animal Health Professional.

- Tables 21-23 provide illustrative examples of enrichment provision across assessment tiers for reference when developing and implementing environmental enrichment within the HWMP. The tables are intended for guidance only and do not prescribe enrichment measures that shall be included in the HWMP.

Table 21. Environmental enrichment provision for Atlantic salmon (*Salmo salar)*

Assessment Tier	Type A provision	Type B provision
Acceptable	**Dietary enrichment** **Temporal variation**: variable inter-meal intervals within the daily feeding schedule. **Spatial distribution**: feed delivered across ≥2 delivery points, distributed at surface and/or depth to spread foraging activity (e.g. multiple surface feeders; submerged pipe delivery to depth).	**Sensory enrichment** **Moving light array**: green-emitting submerged lights (520–525 nm) moving sequentially to prompt sustained swimming. **Noise reduction**: mechanical or vessel noise sources identified and buffered where operationally feasible.
	Physical enrichment **Visual barriers:** submerged structures minimum 2 m length and 6.4 cm diameter (*seawater*); minimum 60 cm length and 4 cm diameter (*freshwater*). **Suspended structures:** minimum 5 submerged ropes or kelp strands, minimum 50% of tank or cage depth.	**Occupational enrichment** **Alternating water velocity:** water current speed changed at least 3 times weekly within species threshold. **Bubbles/aeration:** aeration ring or line deployed within tank/cage/pen. **Natural flow variation:** systems with naturally occurring tidal or hydrodynamic variation (i.e. open water cages) may partially fulfil this function when aligned with species activity thresholds and documented in the HWMP.
Warning	**Dietary enrichment** Temporal variation or spatial distribution implemented but not both; either element is present but	**No Type B provision documented.** Pathway to green should identify a sensory enrichment provision and/or an occupational enrichment provision

	welfare monitoring linkage in HWMP documentation is absent or incomplete. **Physical enrichment** One or more physical enrichment structures in place but provision insufficient for system size, stocking density or not consistently accessible to all fish; physical enrichment present, but maintenance schedule in HWMP documentation is absent or incomplete.	suited to the system, with a target implementation date.
Unacceptable	**No dietary enrichment provision documented.** Fixed feeding schedule with single delivery point. **No physical enrichment provision documented.** Barren environment with no shelter or suspended structure.	**No Type B provision documented.** Corrective action required within the current HWMP review cycle.

Table 22. Environmental enrichment provision for Nile tilapia *(Oreochromis niloticus)*

Assessment tier	Type A provision	Type B provision
Acceptable	**Dietary enrichment** **Temporal variation:** variable feeding times within a structured daily regime. **Spatial distribution:** multiple feeding stations distributed across rearing unit to spread foraging activity and reduce competition at any single feeding point. **Physical enrichment**	**Sensory enrichment** **Lighting and colouration:** lower intensity, blue spectrum light, and dark or low-reflectance tank surfaces to reduce aggression and improve morphological OWI's. **Noise reduction:** mechanical or vessel noise sources identified and buffered where feasible.

	Shelter & cover: floating artificial plants or surface cover panels distributed consistently as non-defensible resources across at least 80% of rearing unit surface area. **Natural structural complexity:** submerged vegetation or substrate may partially fulfil this function in pond systems where documented in the HWMP.	
Warning	**Dietary enrichment** Temporal variation or spatial distribution implemented but not both; either element is present but welfare monitoring linkage in HWMP documentation is absent or incomplete. **Physical enrichment** Shelter or cover present but insufficient in area, distribution, or quantity relative to stocking density; shelter design not accessible to all fish; natural complexity present but not documented within HWMP.	**No Type B provision documented.** Pathway to green should identify a sensory enrichment provision *and/or* an occupational enrichment provision suited to the system, with a target implementation date.
Unacceptable	**No dietary enrichment provision documented.** Fixed feeding schedule with single delivery point. **No physical enrichment documented.** Barren environment with no shelter structure or natural complexity.	**No Type B provision documented.** Corrective action required within the current HWMP review cycle.

Table 23. Environmental enrichment provision for European seabass (*Dicentrarchus labrax*)

Assessment tier	Type A provision	Type B provision
Acceptable	**Dietary enrichment** **Temporal variation:** variable inter-meal intervals timed to align with food anticipatory activity patterns observed during routine feeding monitoring. **Spatial distribution**: multiple feed delivery points ensuring even feed distribution across the rearing environment. Feeder quantity and distribution relative to production system *(e.g. tank surface/cage area/raceway length)* **Physical enrichment** **Shelter structures:** visual barriers or solid refuge structures providing territorial delineation and escape from conspecific aggression. **Suspended structures:** hanging ropes or curtains where tank depth permits, minimum 50% of tank depth. **Natural structural complexity:** submerged vegetation in pond or lagoon systems may partially fulfil this function where documented in the HWMP.	**Sensory enrichment** **Circadian alignment:** husbandry, vessel activity, and handling scheduled to avoid periods of peak cortisol levels (end of dark period) and align with phases of lower baseline stress responsiveness. **Noise reduction:** mechanical and vessel noise identified and buffered where operationally feasible. **Occupational enrichment** **Directional water flow:** flow inlet positioning adjusted to create directional current aligned with species-appropriate velocity range (0.5–1.0 BL/s) and system – under assess design. **Self-selected exercise:** water velocity gradient or dispersed flow zones created to allow voluntary engagement with variable flow intensity. **Natural flow variation:** systems with naturally occurring hydrodynamic variation *(i.e.* *cage/pond/lagoon)* may partially fulfil this function when aligned with species activity thresholds and documented in the HWMP.
Warning	**Dietary enrichment** Temporal variation or spatial distribution implemented but not both; either element is present but welfare monitoring linkage in HWMP documentation is absent or incomplete. **Physical enrichment**	**No Type B provision documented.** Pathway to green should identify a sensory enrichment provision *and/or* an occupational enrichment provision suited to the system, with a target implementation date.

	Shelter structures present but insufficient for system dimensions or stocking density; suspended structures absent or below minimum depth threshold; shelter design not accessible to all fish; natural complexity present but not documented within HWMP.	
Unacceptable	**No dietary enrichment documented.** Fixed feeding schedule with single delivery point. **No physical enrichment documented.** Barren environment with no structural complexity.	**No Type B provision documented**. Corrective action required within the current HWMP review cycle.

Evidence of implementation should be maintained, e.g.:

- Mortality reduction plan. Or if a baseline mortality has been reached, a maintenance plan.
- Long-term aquatic animal health and welfare improvement measures as well as short-term mitigation measures to react to situations of declining health or welfare, included in the HWMP.
- Mortality records that allow for trend analysis for the development of a mortality reduction programme.
- Records of long-term aquatic animal health and welfare improvement measures and short-term mitigation measures to react to situations of declining health or welfare.

Auditors should confirm:

- The mortality reduction plan and the improvement and mitigation measures included in the HWMP incorporate the minimum required elements and that its outcome is implemented:
  - Implementation can be verified by cross-checking the programme and measures with relevant records, information from employee interviews and observations.

Useful Resources

- Mellor, D.J., et al. (2020) The 2020 Five Domains Model: Including Human–Animal Interactions in Assessments of Animal Welfare. Animals.

- Lawrence, A.B., Vigors, B., & Sandøe, P. (2019) What Is so Positive about Positive Animal Welfare? A Critical Review of the Literature. Animals.
- Wang, B., Thompson, K.D., Wangkahart, E., Yamkasem, J., Bondad-Reantaso, M.G., Tattiyapong, P., Jian, J., & Surachetpong, W. (2023) Strategies to enhance tilapia immunity to improve their health in aquaculture. Reviews in Aquaculture.
- Mckenzie, D.J., et al. (2021) Aerobic swimming in intensive finfish aquaculture: applications for production, mitigation and selection. Reviews in Aquaculture.
- Noble, C., et al. (2007) Influence of feeding regime on intraspecific competition, fin damage and growth in 1+ Atlantic salmon parr (Salmo salar L.) held in freshwater production cages. Aquaculture research.
- Emam, W., Lambert, H., & Brown, C. (2025) The welfare of farmed Nile tilapia: a review. Frontiers in Veterinary Science.
- Alevra, A., et al. (2024) Good husbandry practices for aquaculture. Publications Office of the European Union
- Rabadan, C.G. (2018) Improving the use of wrasse (Labridae) stocked in commercial sea cages with Atlantic salmon (Salmo salar) for sea lice control: Key features for a successful deployment. In: Cleaner Fish Biology and Aquaculture Applications. CABI.
- Imsland, A.K.D., et al. (2020) Improving survival and health of lumpfish (Cyclopterus lumpus L.) by the use of feed blocks and operational welfare indicators (OWIs) in commercial Atlantic salmon cages. Aquaculture.

Indicator:	Requirement:
4.1.1.10.8	The UoC shall report the following to a registered veterinarian or aquatic animal health professional: a. all mortality events; and b. fish health and welfare concerns identified during mortality classification.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:

4.1.1.11 The UoC shall report to the relevant authorities if a WOAH-notifiable disease[73] is confirmed at a site, and shall:

a. apply the measures according to applicable legal requirements; and

b. increase disease-monitoring in other batches of fish; and

c. coordinate oversight by a registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- Upon a WOAH-notifiable disease being confirmed, the UoC should consider within its response mechanism included in the HWMP (see Indicator 4.1.1.10) an emergency response procedure for culling the affected batches of fish (see also Criterion 4.1.3).

Evidence of implementation should be maintained, e.g.:

- HWMP includes site-specific disease monitoring, responses and reporting requirements.
  - Specific considerations should be given to WOAH-notifiable diseases, including an emergency response procedure for culling the affected batches of fish.
- National regulations. In some countries where WOAH-notifiable diseases are considered endemic, the UoC should follow the legal reporting requirements.
- Records:
  - Reporting to authorities.
  - Measures applied.
  - Notification to other sites in the vicinity or the ABM.
  - Disease monitoring.
  - Veterinarian or aquatic animal health professional coordination.

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[73] An exemption applies where the WOAH-notifiable disease is classified as endemic by the relevant authorities and reporting is not required under applicable legal requirements.

Auditors should confirm:

- The HWMP includes considerations for WOAH-notifiable diseases (see interpretation for Indicator 4.1.1.10).
- In case a WOAH-notifiable disease has been confirmed:
  - Reporting to authorities and implementation of regulatory measures.
  - Notification to other sites in the vicinity or the ABM.
  - Increased monitoring to other batches of fish.
  - Veterinarian or aquatic animal health professional coordination

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Useful Resources

- World Organisation for Animal Health (2023) Assessment and listing of emerging diseases - WOAH Bulletin
- Bondad-Reantaso, M.G. (2019) Emergency Preparedness and Contingency Plans to Aquatic Animal Disease Emergencies. FAO Article.

Indicator:	Requirement:
4.1.1.11.1	*Indicator applicability: marine salmonids in cages* The UoC shall immediately notify other sites within the Area-Based Management (ABM) (see Indicator 4.5.1) if a WOAH-notifiable disease is confirmed.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
4.1.1.12	The UoC shall calculate stocking densities, following the method outlined in **Appendix 12 (12.6.3)**.

How do I interpret this requirement?

- Rather than prescribing fixed stocking density numbers — which cannot account for the diversity of species, system types, climates, and management practices across global aquaculture — this matrix assesses whether a farm can demonstrate that its system has adequate capacity to support its current or planned biomass. The question is not 'what is your density?' but 'can you prove your system is coping?' Fish-based welfare indicators are given equal weight to system-based indicators. Density should be expressed in biomass terms (kg/m³) throughout the production cycle, calculated using the method outlined in Appendix 12 (12.6.3).

How to score

Score each indicator 1, 2, or 3 based on current farm conditions. Mark N/A for indicators genuinely not applicable to the system type. Domain 6 (Fish-Based Welfare & Performance Indicators) may never be scored N/A.

Score 1 — Inadequate / at risk: Conditions or practices that place fish welfare, water quality, or environmental performance at significant risk, or that fall below ASC minimum requirements.

Score 2 — Marginal / conditional: Conditions or practices that partially meet requirements but require improvement before stocking can be increased or maintained without risk.

Score 3 — Adequate / well-managed: Conditions or practices that meet or exceed ASC requirements, demonstrating effective system management appropriate to current biomass.

Decision rules

Supportable (≥70%): System demonstrates adequate capacity. Stocking may be maintained. Continued monitoring and periodic reassessment required.

Conditional (45–69%): System capacity marginal. Stocking may not be increased. Time-bound corrective action plan required. Increased monitoring frequency required.

Not supportable (<45% OR any Score 1 on a ★ Critical Indicator): Immediate corrective action required. Stocking should not be increased and may need to be reduced. Documented improvement plan required before reassessment.

Table 24: A decision matrix for stocking density of fish during production

★ Critical Indicators: a score of 1 on any starred indicator triggers a 'Not supportable' outcome regardless of overall score. Fish-based indicators (Domain 6) are weighted as critical because the fish are the primary evidence of whether carrying capacity is being exceeded.

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
Water Quality Management	Dissolved oxygen	4.1.1.10.1 4.1.1.26.1	DO regularly below species minimum; no corrective action	DO occasionally low; some monitoring; inconsistent response	DO consistently at species-appropriate saturation; continuous or frequent monitoring with documented response protocols; amber and red thresholds defined in HWMP traffic light system (4.1.1.10.5)	★
	Ammonia & nitrite	4.1.1.10.1 4.1.1.26.1	Levels frequently exceed safe thresholds; no monitoring	Occasional exceedances; monitoring in place but response inconsistent	Consistently within safe thresholds; real-time or frequent monitoring with action triggers; thresholds defined in HWMP traffic light system	★
	CO_2 levels (particularly relevant for RAS & intensive systems)	4.1.1.10.1 4.1.1.26.1	CO_2 not monitored or consistently >20 mg/L in RAS; fish showing opercular pumping or lethargy attributed to	CO_2 monitored but control measures limited; occasionally exceeds safe range without documented response	CO_2 maintained below 20 mg/L (RAS) or naturally buffered in flow-through/pond systems; monitored routinely; rising CO_2 triggers increased water	★

			CO_2 accumulation		exchange or aeration	
	Water exchange / flow rate	2.6.15	Exchange rate insufficient to remove metabolic waste at current biomass	Exchange rate marginal; adequate at low biomass but not at peak	Exchange rate sufficient to maintain water quality at maximum stocking density	★
	Monitoring frequency & protocols	4.1.1.10.1 4.1.1.26.1	No formal monitoring schedule; no documented response protocols; HWMP does not include a water quality monitoring process	Periodic monitoring; response protocols exist but inconsistently applied; assessment system incomplete	Water quality monitoring process included in HWMP per Appendix 12 (12.3, Table 2); traffic light system with amber/warning and red/unacceptable thresholds established and applied; monitoring conducted at required frequency; records maintained	
Enclosure Design & Space Utilisation	Effective volume available to fish	4.1.2.14 4.1.2.28	Significant dead zones or fouling; effective volume substantially less than nominal	Some reduction in effective volume; partially managed	Effective volume regularly assessed; dead zones, equipment and fouling accounted for in stocking calculations	
	Current / flow dynamics		Flow forces fish crowding in parts of enclosure	Uneven distribution; some crowding observed but not persistent	Flow distributes fish evenly throughout enclosure; behaviour confirms good space use	

	Site fallowing / rotation		No fallowing or rotation; cumulative environmental loading unmanaged	Fallowing planned but not consistently implemented	Documented fallowing or rotation plan in place and implemented between production cycles	
	Enclosure integrity		Enclosure not regularly inspected; integrity unknown	Periodic inspection; repairs reactive rather than preventive	Regular documented inspections; maintenance to a defined standard; escape prevention verified	
Oxygen Supply & Emergency Capacity	Primary oxygenation / aeration system		System undersized for current or planned peak biomass	System adequate at average biomass but marginal at peak	System designed and verified to meet peak biomass oxygen demand	★
	Backup oxygen supply		No backup system; single point of failure	Backup system exists but not regularly tested	Backup oxygen supply in place; failover procedures documented and tested	★
	Automated alarms		No automated DO alarms	Alarms in place but response times undocumented	Automated DO alarms with documented response times and escalation procedures	★
	Emergency stocking reduction plan	4.1.2.3 4.1.2.19	No contingency plan for system failure, emergency stocking reduction, or mass mortality event	Contingency plan exists but not practised or not communicated to staff	HMP includes contingency plans covering: immediate response to system failure; emergency stocking reduction or harvest; and mass mortality event response;	

					staff trained and plans tested	
Feeding Management & FCR	Feed conversion ratio (FCR)	2.12.5 Appendix 15	FCR not tracked or consistently above acceptable range for species	FCR tracked; occasionally outside acceptable range without clear cause	FCR tracked and consistently within acceptable range; deviations trigger investigation	
	Feed wastage	4.1.1.9 4.1.1.23	Uneaten feed not monitored; significant visible waste	Some monitoring; waste present but partially managed	Feed wastage minimised; uneaten feed detection system or trained observation in place	
	Appetite-responsive feeding and feeding scoring	4.1.1.10.3 4.1.1.26.3	Fixed feeding schedule regardless of appetite, temperature, or behaviour; feeding scoring process not included in HWMP	Some feeding adjustment made but not systematic; feeding scoring monitored informally rather than through a documented daily process	Feeding behaviour scoring process included in HWMP and monitored daily; fish move freely between food items and consume available food (acceptable); appetite suppression or fish not responding to food (unacceptable) triggers water quality check and stocking review; deviations from daily monitoring recorded with justification	
	Feeding records	4.1.1.9 4.1.1.23	No feeding records kept	Records kept inconsistently; insufficient for retrospective analysis	Complete records enabling retrospective analysis of	

					biomass-to-feed ratios by cycle	
System Carrying Capacity & Farmer Competence	Biomass estimation & density expressed in kg/m³	4.1.1.12 4.1.1.27 App.12 (12.6.3)	Standing biomass not regularly estimated; density expressed only as fish numbers without conversion to kg/m³; stocking density not calculated using the method outlined in Appendix 12 (12.6.3)	Biomass estimated periodically; kg/m³ calculated at some stages but Appendix 12 (12.6.3) methodology not consistently applied	Stocking density calculated using the method outlined in Appendix 12 (12.6.3); biomass regularly estimated and tracked as kg/m³ throughout the cycle; kg/m³ is the primary metric used for stocking decisions, aeration sizing, and pre-harvest review	★
	Pre-harvest risk window assessment	4.1.2.6 4.1.2.22	No fitness assessment within two weeks prior to harvest-related handling; aeration, water quality, and welfare not reviewed before crowding for harvest; no veterinary or aquatic animal health professional approval	Pre-harvest period recognised as higher risk; some management adjustment made but fitness assessment not formally approved by veterinarian or aquatic animal health professional	Fitness assessment conducted within two weeks prior to harvest-related handling, approved by a registered veterinarian or aquatic animal health professional; water quality, DO, aeration capacity, and welfare indicators formally reassessed; crowding duration during harvest minimised; emergency plan confirmed active	★

	Mortality monitoring	4.1.1.10.4 4.1.1.26.4	Mortality not monitored daily; moribund fish not collected and culled daily per Criterion 4.1.3; unexplained mortality events not investigated; post-mortem analysis not carried out	Mortality recorded but not daily; moribund fish collection inconsistent; post-mortem analysis carried out reactively; mortality events not always investigated	HWMP includes mortality monitoring process covering: daily monitoring and recording; removal of mortalities at least every two days; post-mortem analysis for each mortality event; investigation of unexplained mortality; daily collection of moribund fish and culling per Criterion 4.1.3; records maintained	★
	Morphological scoring	4.1.1.10.2 4.1.1.26.2	No monthly morphological scoring process included in HWMP; none of the seven required parameters assessed	Morphological scoring carried out informally or below monthly frequency without documented justification; not all seven required parameters assessed	HWMP includes morphological scoring monitoring process conducted at least monthly, covering all seven required parameters: (a) eye damage, (b) operculum damage, (c) skin damage, (d) fin damage, (e) deformities, (f) change of colouration, (g) emaciation; warning and unacceptable levels defined; records maintained	★
	Staffing adequacy	1.2.3	Staffing insufficient for	Staffing marginal; adequate at lower densities only; staff	Trained staff present in	

		4.1.1.1 4.1.1.2 4.1.1.14 4.1.1.15	monitoring and response at peak biomass; staff not trained on fish health and welfare awareness per Appendix 12 (12.2, Table 1)	training in fish health and welfare awareness not fully documented	sufficient numbers to monitor and respond at peak biomass; all relevant staff trained on fish health and welfare awareness per Appendix 12 (12.2, Table 1); out-of-hours cover documented	
	Historic production data use	4.1.1.10.6 4.1.1.10.7	No historic records; stocking decisions not informed by past cycles	Some historic data available but not systematically used for stocking decisions	Historic production records systematically reviewed and used to inform stocking for subsequent cycles	
Fish-Based Welfare & Performance Indicators	Body weight & growth trajectory	4.1.1.10.2	Growth rate not tracked; no comparison against expected trajectory for species, life stage, and temperature	Weight monitored periodically; some comparison to growth expectations but deviations not investigated	Regular weight sampling against documented species- and temperature-adjusted growth curves; sustained suppression below expected trajectory triggers stocking review	★
	Body condition (condition factor / emaciation)	4.1.1.10.2	Body condition not assessed; emaciation (condition factor <0.9 for sea bass or species equivalent) present in the population with no action taken	Condition factor assessed occasionally; declining trend noted but corrective action inconsistent	Condition factor (e.g. Fulton's K) monitored at regular intervals; emaciation (an unacceptable morphological score under 4.1.1.10.2(g)) at population level triggers	★

					investigation and stocking review	
	Size uniformity (size dispersion / coefficient of variation)	4.1.1.10.2	Size variance not measured; high visible heterogeneity in the population with no investigation	Size distribution assessed occasionally; increasing variance noted but not linked to stocking or management decisions	Size dispersion tracked across the cycle; increasing size variance investigated as a potential indicator of competition stress or density-driven social dominance at current density	
	Social behaviour, aggression & dominance (particularly tilapia and other hierarchical species)		Aggression, fin nipping, and hierarchical injury not monitored; elevated injury prevalence attributed solely to disease without considering density-driven social stress	Aggression and injury noted informally; interpreted in isolation rather than alongside body condition, water quality, and density as integrated welfare signals	Social behaviour and injury prevalence assessed in the context of species-specific dominance dynamics; fin nipping, hierarchical injury, and size heterogeneity interpreted together with environmental and density data; elevated prevalence triggers stocking review	
	Injury prevalence: skin, fin, eye, and operculum damage	4.1.1.10.2 4.1.1.26.2	Morphological scoring parameters (skin damage, fin damage, eye damage, operculum damage) not assessed; visible unacceptable-level injury	Morphological scoring carried out but injury parameters assessed informally or at less than monthly frequency without justification; elevated prevalence not linked to density review	Scheduled morphological scoring covering skin damage, fin damage, eye damage, and operculum damage at minimum monthly frequency; population-level	★

	Feeding monitoring	4.1.1.10.3 4.1.1.26.3	present at population level Feeding monitoring process not included in HWMP; daily monitoring not conducted; fish not responding to food not investigated	Feeding observed during feeding events but daily monitoring process not formalised in HWMP; appetite changes noted informally	prevalence at warning or unacceptable levels triggers stocking review Feeding behaviour scoring process included in HWMP and monitored daily per 4.1.1.10.3; population-level shift from acceptable (fish move freely and consume food) to unacceptable (fish do not respond to food) triggers water quality check and stocking review; deviations from daily monitoring recorded	★
	Mortality trends	4.1.1.10.4 4.1.1.26.4	Mortality not trended; no baseline established; mortality events not investigated or post-mortem analysis not carried out; moribund fish not collected daily	Mortality trended within cycle; elevation above informal expectations noted but post-mortem investigation inconsistent	Mortality trended against species-, life-stage-, and season-adjusted baseline; post-mortem analysis conducted for each mortality event; sustained elevation triggers investigation; trend data used to inform stocking decisions for subsequent cycles	★

Notes on application

1. Assessment timing: this matrix should be completed at the start of each production cycle and repeated at key life-stage transitions (e.g. post-smolt transfer, approaching harvest weight) and at the pre-harvest risk

window (final 4 weeks or when biomass is at peak). Any significant water quality event, disease episode, or unexplained mortality should also trigger reassessment.

2. HWMP and monitoring processes: water quality (4.1.1.10.1), morphology (4.1.1.10.2), feeding (4.1.1.10.3), mortality (4.1.1.10.4), and assessment system (4.1.1.10.5) must all be included in the HWMP, approved by a registered veterinarian. A Score 3 on any indicator that maps to an HWMP process requires that process to be documented and implemented.

3. Morphological scoring: the seven required parameters (eye damage, operculum damage, skin damage, fin damage, deformities, change of colouration, emaciation) are to be used consistently across all morphological assessment contexts including routine monitoring, pre-harvest fitness assessment, and stocking density review. Reference scoring tables are provided in the Interpretation Manual (Table 8 for sea bass; equivalent species-specific tools apply per the referenced resources in the manual).

4. Stocking density calculation: density should be calculated using the method in Appendix 12 (12.6.3) and expressed in kg/m³. This should be updated throughout the production cycle, not only at initial stocking.

5. Assessment system: the HWMP assessment system (4.1.1.10.5) provides the operational framework for translating welfare monitoring data into management action. Amber (warning) and red (unacceptable) findings under the assessment system should trigger increased monitoring and corrective action. Where this matrix scores water quality or welfare indicators, the assessment thresholds established in the HWMP are the reference for what constitutes acceptable, warning, or unacceptable levels.

6. Social behaviour and aggression: in species with defined dominance hierarchies (particularly Nile tilapia), fin nipping, size heterogeneity, and bite wounds may reflect density-driven competition rather than disease and should be assessed alongside water quality and feeding before concluding on cause.

7. Evidence requirements: a score of 3 should be supported by documented records. Auditors may request: HWMP with all required monitoring processes; morphology (minimum monthly); daily feeding records; mortality records including post-mortem results; Appendix 12 (12.6.3) stocking density calculations; fitness assessment reports with veterinary approval; and HWMP assessment thresholds and corrective action records.

Indicator:	Requirement:
4.1.1.13	The UoC shall report mortality related data in accordance with the ASC Data Submission Procedure.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
4.1.1.14	The UoC shall ensure that all relevant employees are trained on general aquatic animal health and welfare awareness, including biosecurity, according to **Appendix 12 (12.2, Table 1)**.
4.1.1.15	The UoC shall ensure that any person involved in aquatic animal husbandry and handling activities is trained on aquatic animal health and welfare, according to **Appendix 12 (12.2, Table 1)**.
4.1.1.16	The UoC shall ensure that the content of the training in Indicators 4.1.1.14 and 4.1.1.15 is updated as necessary and is approved by a registered veterinarian or aquatic animal health professional.

How do I interpret these requirements?

- These clauses overlap with Indicators 4.1.1.1 and 4.1.1.2 regarding fish. Please refer to Indicators 4.1.1.1 and 4.1.1.2 for a detailed description.

Indicator:	Requirement:
4.1.1.17	The UoC shall only use native **cleaner fish** species.

No additional guidance is provided for this Indicator.

Useful resources:

- Marine Conservation Society (2021) Use of 'Cleaner Fish' in UK aquaculture: Current use, concerns and recommendations.

Indicator:	Requirement:

4.1.1.18 The UoC shall carry out a risk assessment prior to stocking cleaner fish, considering at least the following:

a. the suitability of use of cleaner fish for parasite control (see Indicator 4.5.17); and

b. the disease history of the cleaner fish to avoid cross contamination (*only where using farmed cleaner fish*); and

c. site-specific environmental conditions considering the species-specific needs of cleaner fish; and

d. net mesh size; and

e. salmon size in relation to cleaner fish.

How do I interpret this requirement?

- A risk assessment regarding the use of cleaner fish should be developed.
- As part of the risk assessment the site should, along with the designated veterinarian or aquatic animal health professional, review previous information:
  - Parasite infection history at the site.
  - Disease history at the site.
  - Disease history of available farmed cleaner fish.
  - Water quality history at the site.
  - Site specific environmental conditions.
  - Net mesh size.
  - Salmon size.

Evidence of implementation should be maintained, e.g.:

- A completed risk assessment
  - This is to be reviewed at the start of each cycle.
  - Developed in accordance with the designated veterinarian or aquatic animal health professional.

Auditors should confirm:

- That at the start of each cycle, a risk assessment is carried out to ensure that cleaner fish are a viable option for the site.

Useful Resources

- Norwegian Seafood Research Fund (2018) Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.

Indicator:	Requirement:
4.1.1.19	The UoC shall only stock batches of cleaner fish that have been tested prior to stocking and are free from diseases of regional concern[74].

How do I interpret this requirement?

- The testing will be determined on where fish are sourced from:

Wild caught:

- Should be held in a quarantine facility to observe for disease symptoms before stocking.
    - There should be enhanced biosecurity employed during capture and holding phases to minimise pathogen exposure.
- Are to be caught from aquatic disease-free zones.
    - Note: Since lumpfish and wrasse species are not listed as susceptible species or vector species in accordance with Part II of Annex IV of the Council Directive 2006/88/EC, these species can be traded between aquaculture sites in Europe, including those in Member states, zones or compartments declared disease-free, and are only subject to notification

[74] An exemption applies to wild caught species sourced from zones or compartments declared disease free. See COUNCIL DIRECTIVE 2006/88/EC of 24 October 2006 on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals and European Union Reference Laboratory for Fish Diseases: Cleaner fish in aquaculture: Health management and legislative issues.

under the Traces system. Therefore, these species can be freely traded between intra-community and third country without any certification declaring VHS freedom[75].

Farmed:

- Testing will be relevant to:
  - The species.
  - The production system.
  - The scale of production.
  - The local regulations.
    - For example- viral haemorrhagic septicaemia in lumpfish and wrasse.
  - Testing might consist of:
    - Clinical examination of the fish.
    - Laboratory tests:
      - Bacteriology.
      - Molecular biology (e.g. PCR).
      - Histopathology.
      - Virology (e.g. cell culture).
- The designated veterinarian or aquatic animal health professional should determine:
  - The diseases to include in the testing, based on local regulations, scientific literature and/or publicly available.
  - The sample size, based on local regulations and/or technical judgement.
- Compulsory governmental testing programme results are acceptable for demonstrating conformance with this requirement.

Evidence of implementation should be maintained, e.g.:

- List of relevant diseases for the species in the country.
- For wild caught cleaner fish, quarantine information and report from designated veterinarian or aquatic animal health professional.
- For farmed cleaner fish, testing results written report or document that includes as a minimum:

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[75] European Union Reference Laboratory for Fish Diseases: Cleaner fish in aquaculture: Health management and legislative issues.

- The batch of fish being tested.
- The date of the test.
- The pathogen tested.
- The results of the test.
- Records:
  - Purchase.
  - Transportation.
  - Delivery.
  - Stocking.

Auditors should confirm:

- That every batch of wild caught cleaner fish has a record of quarantine and assessment.
- The record of capture of the wild caught cleaner fish including disease free status.
- That every batch of farmed cleaner fish has been tested by cross-checking the list of relevant diseases for the species in the country with the testing result's written report or document and records.

Useful Resources

- World Organisation for Animal Health (2024) Aquatic Animal Health Code. Chapter 1.3. Diseases listed by WOAH.
- Council Regulation (2016) Transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law'). Official Journal
- Commission Delegated Regulation (2020) Animal health and certification requirements for movements within the Union of aquatic animals and products of animal origin from aquatic animals. Official Journal.
- Erkinharju, T., Dalmo, R.A., Hansen, M. and Seternes, T. (2021), Cleaner fish in aquaculture: review on diseases and vaccination. Reviews in Aquaculture.
- Unknown (2016) Cleaner fish in aquaculture: Health management and legislative issues. European Union Reference Laboratory for Fish Diseases. Meeting Report 35pp.
- European Commission (unknown) Listed diseases, categorization and listed species. Webpage

- European Commission (2024) Scientific and common names of aquatic species listed in the table to the Annex to Commission implementation regulation (EU) 2018/1882. Document 7pp.
- European Commission (unknown) Surveillance, eradication programmes and disease-free status. Webpage.
- Government of Canada (2024) Domestic Movement Control Program. Map of aquatic disease areas. Webpage
- Biddiscombe et al (2020) Sampling for pathogen screening in the lumpfish (Cyclopterus lumpus) –Standard Operation Procedures 1, Centre for Sustainable Aquatic Research, 6 pages
- FishVet Group (2020) Risk analysis for the movement and use of wild caught wrasse (*Labridae*) in Ireland. 10 pp.

Indicator:	Requirement:

4.1.1.20 The UoC shall implement a vaccination plan that:

a. considers the relevant diseases and vaccine availability; and

b. includes justification for vaccine selection; and

c. is approved by a registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.4 regarding fish. Please refer to Indicator 4.1.1.4 for a detailed description.

Useful Resources

- Davies, C. (unknown) Lumpfish Vaccination – Standard Operation Procedures, Version 2, Centre for Sustainable Aquatic Research, 6 pages.

Indicator:	Requirement:

4.1.1.21 The UoC shall provide hides and refuges for the cleaner fish that are:

a) designed and placed according to the species-specific needs; and

b) sufficient for the number of cleaner fish stocked.

How do I interpret this requirement?

- The number of refuges and hides will depend on the species, the number of animals housed, and the need to rotate them during cleaning.
- Provision of hides and refuges should also consider material and configuration, including:
  - Hide type
  - Surface properties
  - Structural design
- The UoC should determine hide and refuge sufficiency with reference to the species-specific guidance in Table 25 below. Further detail on design, surface area, and site requirements is provided in Appendix 2 to this Interpretation Manual.
  - This will need to be discussed with the veterinarian or aquatic animal health professional.

Table 25. Species-specific shelter provision guidance for lumpfish and ballan wrasse in sea-cage deployments. Values represent minimum and optimal provision based on operational guidance and published evidence. The designated veterinarian or Aquatic Animal Health Professional should confirm sufficiency for site-specific conditions.

Species	Hide type	Minimum provision	Optimal provision	Key consideration
Lumpfish (Cyclopterus lumpus)	All substrate types (PVC panels, plastic plates, artificial kelp)	10 units per m^2 available attachment surface area	5 units per m^2 available attachment surface area	Surfaces should be smooth and non-abrasive. Scale dynamically as fish grow

Ballan wrasse (Labrus bergylta) >14 cm	Kelp-based systems (curtain kelp, frame kelp)	12 cm between folds per fish	25 cm between folds per fish	Distribute along cage peripheries and across multiple depths (>10–15 m where feasible)
Ballan wrasse (Labrus bergylta) ≤14 cm	Kelp-based systems	5 cm between folds per fish	15 cm between folds per fish	As above
Ballan wrasse (Labrus bergylta) — all sizes	Non-kelp structural hides (pipes, barrels, solid panels)	Sufficient shelter units to allow simultaneous access without competition	All fish able to shelter simultaneously Determined with veterinary or AAHP input.	Each unit must provide a functional access point or enclosure sized to individual body dimensions.

Evidence of implementation should be maintained, e.g.:

- The stocking numbers and numbers of hides and refuges.
- Documentation of hide and refuge provision, including species, hide type, and placement, and maintenance schedule.

Auditors should confirm:

- Stocking number of cleaner fish
- Adequate level of hides and refuges should be verified by:
    - Observation of the hides and refuges including hide type, material, and configuration relative to species and site specifications.
    - Observation of the cleaner fish confirming accessibility for all fish and absence of competition for shelter access.

Useful Resources

- Norwegian Seafood Research Fund (2018) Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.

- Rabadan, C.G. (2018) Improving the use of wrasse (Labridae) stocked in commercial sea cages with Atlantic salmon *(Salmo salar)* for sea lice control: Key features for a successful deployment. In: Cleaner Fish Biology and Aquaculture Applications. CABI.
- Erkinharju, T., et al. (2021) Cleaner fish in aquaculture: review on diseases and vaccination. Reviews in Aquaculture.

Indicator:	Requirement:

4.1.1.22 The UoC shall only stock cleaner fish:

a) during daylight; and

b) in calm weather; and

c) below the waterline; and

d) close to hides and refuges; and

e) after salmon have been fed; and

f) without forcing removal from their transport container.

How do I interpret this requirement?

- The timing and conditions of the stocking will be documented.
- Training of staff should include handling of cleaner fish.

Evidence of implementation should be maintained, e.g.:

- The stocking record along with the site diary.
- Training records.

Auditors should confirm:

- Stocking records.
- Any information not captured in the stocking record, such as weather at the time of stocking, is recorded in the site diary. Training records.

Useful Resources

- Norwegian Seafood Research Fund (2018) Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.

Indicator:	Requirement:

4.1.1.23

Indicator applicability: every UoC using feed

The UoC shall develop and implement a feeding plan that considers at least all of the following:

a. time and frequency of feeding; and

b. feed rations; and

c. feeding methods; and

d. different environmental conditions; and

e. prevention of the use of feed which has expired, spoiled or shows signs of excessive leakage; and

f. feed types for the nutritional needs and life stages of the species.

An exception applies to (f) when such feeds are not available, in which case the UoC shall use feed suitable for aquatic animals with similar nutritional needs.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.9 regarding fish. Please refer to Indicator 4.1.1.9 for a detailed description.
- Supplementary feed provision should be provided in all cleaner fish deployments.

Indicator:	Requirement:

4.1.1.24 The UoC shall ensure that cleaner fish feed is not withdrawn to enhance sea lice control.

How do I interpret this requirement?

- The cleaner fish will have a feeding plan that is not affected by the number of sea lice on the salmon.

Evidence of implementation should be maintained, e.g.:

- The feeding records of the cleaner fish.
- Cleaner fish feed purchase records.
- Assessment of cleaner fish morphology to ensure no emaciation.

Auditors should confirm:

- Feed purchase records.
- Veterinary records of assessing cleaner fish.
- Morphological checks (see Indicator 4.1.1.26.2).

Useful Resources

- Norwegian Seafood Research Fund (2018) Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.

Indicator:	Requirement:

4.1.1.25 The UoC shall ensure that a registered veterinarian or aquatic animal health professional periodically visits the site to perform routine checks. Checks shall be carried out at least annually, as well as reactively in cases of fish health or welfare concerns.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.8 regarding fish. Please refer to Indicator 4.1.1.8 for a detailed description.

Indicator:	Requirement:

4.1.1.26 The UoC shall develop, implement and maintain a site-specific Health and Welfare Management Plan (HWMP), approved by a registered veterinarian, with the intention of preventing disease outbreaks and ensuring the good health and welfare of cleaner fish.

The HWMP shall include all of the following:

a. disease monitoring; and

b. response, including quarantine, treatment, and humane culling; and

c. mechanisms to report to relevant authorities where required; and

d. biosecurity risks; and

e. predation risks.

The HWMP shall be reviewed:

f. at least annually for sites with cycles under one year or using continuous production methods; or

g. after each cycle for sites with longer cycles or all-in-all-out production methods.

Where the review determines that changes are required, the HWMP shall be revised.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.10 regarding fish. Please refer to Indicator 4.1.1.10 for a detailed description.

Indicator:	Requirement:

4.1.1.26.1 The UoC shall ensure the HWMP includes a water quality monitoring process according to **Appendix 12 (12.3, Table 2).**

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.10.1 regarding fish. Please refer to Indicator 4.1.1.10.1 for a detailed description.

Indicator:	Requirement:

4.1.1.26.2 The UoC shall ensure the HWMP includes a morphological monitoring process for live cleaner fish. Monitoring shall be conducted at least once every three months coinciding with any fish handling activity, and shall include at least the following scoring parameters:

a. eye damage
b. operculum damage
c. skin damage
d. fin damage
e. deformities
f. change of colouration
g. emaciation

An exception applies where deviation from monitoring frequency is justified by any of the following reasons:

h. there is no handling of the cleaner fish during the three-month period; or
i. cleaner fish are undergoing a disease event and/or being treated; or
j. a documented risk assessment is present which demonstrates that one or more scoring parameter is not relevant to the species

In which case monitoring shall be conducted using cameras or from the side of the culture unit for as many parameters as possible. The reason for any deviation shall be recorded.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.10.2 regarding fish. Please refer to Indicator 4.1.1.10.2 for a detailed description.

Useful Resources

- Noble et al. (2019) RENSVEL OWI Fact Sheet Series: An Introduction to Operational and Laboratory based welfare Indicators for ballen wrasse (*Labrus bergylta*). Nofima Fact Sheet. 43pp.

Indicator:	Requirement:

4.1.1.26.3 The UoC shall ensure the HWMP includes a feeding monitoring process for live cleaner fish. Monitoring shall be conducted weekly.

An exception applies where deviation from weekly monitoring is justified under environmental conditions that affect the welfare of the cleaner fish or the health and safety of employees.

The reason for any deviation shall be recorded.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.10.3 regarding fish. Please refer to Indicator 4.1.1.10.3 for a detailed description.

Indicator:	Requirement:

4.1.1.26.4 The UoC shall ensure the HWMP includes a mortality monitoring process which includes at least the following:

a. daily monitoring and recording of mortalities; and

b. removal of mortalities at least every two days; and,

c. classification of all recovered mortalities and conducting a post-mortem analysis for each mortality event; and

d. investigation of mortality events which remain unexplained or unattributed to fish health reasons; and

e. daily collection of moribund fish and culling according to Criterion 4.1.3.

Where any of the listed items above are not possible, the UoC shall record the reason.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.10.4 regarding fish. Please refer to Indicator 4.1.1.10.4 for a detailed description.
- Table 26 below provides illustrative examples of enrichment provision across assessment tiers for reference when developing and implementing Under 4.1.1.26.4 for cleaner fish.

Table 26. Environmental enrichment provision lumpfish *(Cyclopterus lumpus)* and ballan wrasse *(Labrus bergylta)* in sea-cage deployment

Assessment tier	Type A provision
Acceptable	**Dietary enrichment** Supplementary feed provision: species-appropriate supplementary diet maintained as a welfare baseline independent of sea lice availability and documented within the HWMP. Appropriate feeds include algae blocks or formulated cleaner fish diets for both lumpfish and ballan wrasse. **Physical enrichment** **Shelter provision:** refuge structures meeting deployment and sufficiency thresholds, with adequate attachment material, surface area, and distributed access relative to cleaner fish number and body size. Structures should be appropriate to cage hydrodynamic conditions and accessible to fish across cage depth.
Warning	**Dietary enrichment** Supplementary feed provision present but not maintained independently of sea lice burden; or welfare monitoring linkage absent or incomplete. Pathway to green should confirm supplementary feed provision is continuous and documented in accordance with the HWMP framework**.** **Physical enrichment** Physical shelter present but below minimum sufficiency thresholds, or documentation incomplete. Pathway to green should adjust provision to meet sufficiency thresholds and complete documentation in accordance with HWMP framework.
Unacceptable	**No supplementary feeding provision and no physical shelter provision documented**. Corrective action required within the current HWMP review cycle.

Indicator:	Requirement:

4.1.1.26.5 The UoC shall ensure the HWMP includes a mortality reduction plan which defines annual targets for both total and unexplained mortalities, and shall implement appropriate actions to meet the annual targets.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.1.10.7 regarding fish. Please refer to Indicator 4.1.1.10.7 for a detailed description.

Indicator:	Requirement:

4.1.1.26.6 The UoC shall report the following to a registered veterinarian or aquatic animal health professional:

a) all mortality events; and

b) cleaner fish health and welfare concerns identified during mortality classification.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:

4.1.1.27 The UoC shall calculate cleaner fish stocking densities in relation to salmon stocking, following the method outlined in **Appendix 12 (12.6.3)**.

No additional guidance is provided for this Indicator.

Comment box

In V1.1 of the ASC Farm Standard, there is no requirement to develop an assessment system such as a traffic light system (see indicator 4.1.1.10.5) or analyse trends to determine changes in health and welfare (see indicator 4.1.1.10.6) for cleaner fish, however this could be considered for inclusion as a standalone requirement in the future. It is recommended that the UoC begin to implement an assessment system and analyse trends in preparation for this.

4.1.2 - Fish – Handling

Indicators 4.1.2.1-4.1.2.16:

Scope: all fish species except cleaner fish (see Indicators 4.1.2.17-4.1.2.32)

Indicator:	Requirement:
4.1.2.1	The UoC shall develop, implement and maintain a site-specific Handling Management Plan (HMP), with the intent of ensuring the good health and welfare of farmed fish. The HMP shall be periodically reviewed and revised as necessary.
4.1.2.2	The UoC shall ensure that the HMP includes all handling activities.

How do I interpret this requirement?

- The Handling Management Plan (HMP):
  - Aims to support the development and implementation of preventive, rather than remedial, actions that prevent poor fish health and welfare at handling.
    - Examples of handling:
      - Crowding.
      - Grading (active or passive).
      - Sampling.
      - Transportation (including loading, transfer and unloading).
      - Vaccination (by immersion or injection).
      - Application of treatments (therapeutants or physical).
      - Tagging of fish with Passive Integrated Transponder (PIT) tags.
  - Should consider a description of:
    - Processes.
      - A separate process description may be required for outsourced events e.g. transportation up to the point of harvest.
    - Equipment.
      - A description of equipment, and verification if applicable may be required for both UoC, and outsourced events e.g. vaccination equipment.

- The HMP does not have to be a standalone document, it can be part of the HWMP, standard operating practices or toolbox talk instructions.
- Handling procedures should be performed in ways to minimise stress and injury.
- Handling activities include live transportation carried out by the UoC.
- Consider the following in preparation for transportation:
  - The quantity and size of the fish;
  - The starvation period in degree days for gut emptying;
  - The current health status of the fish and whether they are fit to undertake the journey- a fitness assessment (Indicator 4.1.2.6);
  - The route and planned journey time, including weather conditions on route;
  - All equipment is in good working order;
  - Ensure the journey time is as short as possible;
  - Contingency measures in place- such as reserve oxygen supply;
  - Assign responsibility for monitoring, recording and responding to deteriorating conditions;
  - Set trigger levels and corrective actions for water quality parameters.
- Loading of fish:
  - Crowding should be well controlled, preferably by using pumps to allow the fish to remain submerged in water;
  - Supplementary oxygen should be considered to ensure that the fish are not compromised during the process.
- During transportation:
  - Time and severity of crowding should be minimised.
  - Handling should be gentle and occur at an appropriate rate.
  - Loading and unloading should occur as fast as possible.
  - Ideally, aquatic animals should be handled without being taken out of water (e.g. using pumps to move fish).
  - Fish should be observed if appropriate (e.g. well boats) and the loss of equilibrium or rapid opercular movement should trigger immediate corrective.
  - Any time out of water should be minimised.
  - All equipment in direct contact with the animals should be moistened.

- When handled, the body of the animals should be adequately supported; they should not be lifted by individual body parts (e.g. gill covers).
- Records to demonstrate conformance should be kept.

- Published research indicate that transport density should be set by welfare outcomes rather than by a single universal figure.

Table 27: Suggested safe transport journey times for different species based on Luz & Favero (2024).

Species / Group	Typical Safe Transport Time	Transport System Type	Notes for Welfare Assessors
Carp (Cyprinids)	8–12 hours	Closed bags with oxygen / aerated tanks	Carp tolerates moderate stress but ammonia rises quickly; reduce time in warm water.
Tilapia	6–10 hours	Aerated tanks / oxygenated containers	High oxygen demand; reduce duration above 26°C.
Salmonids (Salmon, Trout)	12–24 hours	Well-boats / large, oxygenated tanks	Require high DO (>7 mg/L); sensitive to CO_2 and temperature shifts.
Catfish (e.g., Pangasius, Channel Catfish)	6–8 hours	Aerated tanks	Very sensitive to low oxygen; avoid overcrowding.
Sea Bass / Sea Bream	6–10 hours	Oxygenated tanks	Stress-prone; water quality must be tightly controlled.

Evidence of implementation should be maintained, e.g.:

- Confirmation that the HMP includes considerations that allow for performing standardised handling operations, e.g.:
  - Site-specific description of processes and equipment.
  - Documents:
    - Planning of handling events, e.g.:
      - Emails, reports and site 'whiteboard' communications.
      - Handling procedures.
    - Monitoring the effectiveness of the HMP.

- Handling logs, e.g.:
  - Reports detailing regular observation of fish behaviour, environmental parameters and fish conditions during and after handling procedures, including injuries, mortalities, or deviations from procedures.
  - Records documenting fitness assessment before handling, incidences of disease, and mortalities, with details on potential correlations with handling activities.
- Handling incidents reports, e.g.:
  - Emails, reports detailing any incidents during handling procedures, including injuries, mortalities, or deviations from procedures.
- Feedback from staff, e.g.:
  - Emails, anonymous box asking feedback from staff involved in handling procedures regarding their observations and any difficulties encountered.

Auditors should confirm:

- The HMP includes a description of the handling processes and equipment and considerations for planning handling events.
- Employees are familiarised with the HMP by conducting employee interviews and observations.
- Handling logs are available documenting handling processes, environment, and fish conditions.
- Existence of handling incidents reports, including feedback from staff and discussions regarding any handling procedure changes.
- Open communication is encouraged via formal documents and employee interviews and observations.

Useful Resources

- Alevra, A., Llorente Manzanares, M., Mente, E., Xandri Royo, P.M., (2025) Good husbandry practices for aquaculture, Publications Office of the European Union.
- APROMAR (2022) A guide on fish welfare in Spanish aquaculture - Volume 1: Concepts and generalities. Spanish Aquaculture Business Association. 36 pp.
- APROMAR (2024) A guide on fish welfare in Spanish aquaculture- Volume 2: Welfare of European sea bass. Spanish Aquaculture Business Association. 49 pp.

- APROMAR (2024) A guide on fish welfare in Spanish aquaculture - Volume 3: Welfare of gilthead sea bream. Spanish Aquaculture Business Association. 49 pp.
- Zaman Sajid, A., Gamperl, K., Parrish, C.C., et al., (2024) An aquaculture risk model to understand the causes and consequences of Atlantic Salmon mass mortality events: A review. Reviews In Aquaculture.
- Arechavala López, P., Bassett, D., Llorente Manzanares, M., et al., (2025) Code of good practices on fish welfare and fish welfare indicators, Publications Office of the European Union
- Luz, R.K. & Favero, G.C. (2024) Use of salt, anaesthetics, and stocking density in transport of live fish: a review. Fishes, 9(7), p. 286

Indicator:	Requirement:
4.1.2.3	The UoC shall ensure that the HMP includes contingency plans for handling activities, including at least the following: a) immediate response measures in the case of system failure; and b) humane culling response measures (see Indicator 4.1.3.4); and c) mass mortality event response measures.

How do I interpret this requirement?

- The contingency plans should consider:
  - Identification of potential failures of equipment or protocols. For example, a pump failure during transfer of fish from a crowd to a well boat.
  - Effective corrective measures, e.g.:
    - Backup power generators.
    - Oxygen support.

Evidence of implementation should be maintained, e.g.:

- HMP includes processes' contingency plans.
- Records:
  - Backup system testing.
- Additional oxygen source available.

Auditors should confirm:

- HMP includes considerations on fish health and welfare before handling events, including considerations for the existence of a backup system.
    - Backup system testing records.
- Presence of backup system.
- Employees are familiarised with the contingency plans by conducting employee interviews and observations.
- Records:
    - Backup system testing.

Useful Resources

- Singh, G.G., Sajid, Z., & Mather, C. (2024) Quantitative analysis of mass mortality events in salmon aquaculture shows increasing scale of fish loss events around the world. Nature; Scientific Reports
- Barathan, B., Wang, Y., Su, Y., Hamilton, D., et al., (2022). Methods to control harmful algal blooms: a review. Environmental Chemistry Letters.
- FAO eLearning Academy (2024) Emergency preparedness for aquatic disease outbreaks. Online course

Indicator:	Requirement:

4.1.2.4 The UoC shall ensure that the HMP includes consideration of the environmental conditions associated with handling activities, with the intent of preventing handling under adverse conditions that could affect the health and welfare of the fish.

How do I interpret this requirement?

- Examples of considerations of external conditions:
  - Avoid mechanical treatments in the event of storms.
  - Avoid crowding fish for treatment without using a shade net on a sunny day.
  - Avoid transferring juveniles during period where there are less than favourable conditions:
    - Spring tides can result in stronger currents and rapid changes in water levels, juveniles may become disoriented or stressed potentially leading to injuries or escape.
      - Risk of entrapment and loss of equipment can be associated with spring tides.

Evidence of implementation should be maintained, e.g.:

- HMP includes consideration for external conditions necessary to perform handling.
- Records:
  - Weather forecast verification.
- Employees should demonstrate knowledge of the considerations and the verification of external conditions before handling.

Auditors should confirm:

- HMP includes considerations for external conditions for handling and are implemented.
  - Implementation can be confirmed by cross-checking the HMP with records, information from employee interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:

4.1.2.5 The UoC shall ensure that the HMP, following consultation with a registered veterinarian or aquatic animal health professional, considers the use of anaesthesia during handling activities.

How do I interpret this requirement?

- The use of anaesthesia is not required in every handling operation, but it should be considered in operations that can inflict pain, e.g.:
  - Inter-peritoneal vaccinations.
  - Handling operations that require fish immobilisation.

Evidence of implementation should be maintained, e.g.:

- HMP includes consideration for the use of anaesthesia during handling.
- List of handling operations requiring the use of anaesthesia.
- List of licenced anaesthetics available on site.
- Records:
  - Anaesthetic prescriptions.
  - Anaesthetic usage.

Auditors should confirm:

- The HMP includes consideration of the use of anaesthetics during handling.
- Implementation can be confirmed by cross-checking the HMP with records, information from employee interviews and observations.

Useful Resources

- Readman, G.D., Owen, S.F., Knowles, T.G. et al. (2017) Species specific anaesthetics for fish anaesthesia and euthanasia. Scientific Reports.
- Brønstad A. (2022) Good Anesthesia Practice for Fish and Other Aquatics. Biology.
- European Food Safety Authority (EFSA) (2009) General approach to fish welfare and to the concept of sentience in fish. EFSA Journal.

- Pathinathan, P., & Roshan, H. (2024). Exploring Anesthetic Strategies in Aquaculture: Enhancing Welfare and Management Practices. The Science World.
- Husen, Md & Sharma, S. (2014). Efficacy of Anesthetics for Reducing Stress in Fish During Aquaculture Practices - A Review. Kathmandu University Journal of Science, Engineering and Technology.
- Sneddon, L., Schroedar, P., Roque, A., et al (2024) Pain Management in zebrafish: Report from a FELASA Working Group. Laboratory Animals.

Indicator:	Requirement:
4.1.2.6	The UoC shall ensure that the HMP includes a fitness assessment of the fish prior to handling activities[76], approved by a registered veterinarian or aquatic animal health professional. For the specific handling activities listed below, the fitness assessment shall be carried out: a) within a two-week period prior to transport or treatment that requires handling of the fish, except when the same type of treatment is repeated, in which case the assessment shall be carried out at least once a month after the initial treatment; b) within a two-week period prior to net change and passive grading.

How do I interpret this requirement?

- Fitness assessment may fall into two categories:
  - Single assessment: Performed within a two-week period prior to the handling.
  - Recurring assessment: Performed at least once a month in the case of serial, repeated treatments, e.g.:
    - Handling for administering multiple rounds of treatment to fish populations over a period of time, e.g.:
      - Bacterial infections, such as bacterial gill disease, furunculosis, or red spot diseases.
      - Fungal diseases, such as saprolegniasis.

[76] An exemption applies to handling activities related to health examinations (e.g. health assessment, parasite counting) and in the case of emergencies (e.g. containment of an escape).

        - Treatments for parasites control such as formalin treatments, hydrolysers or thermal delousing.

- Fitness assessment does not require handling.
- A successful fitness for handling assessment should demonstrate:
    - Fish free of diseases.
    - Minimal morphologic damage.
    - Normal behaviour.
    - Low mortality rate.
    - Usual feeding rates.
- An example of a fitness for handling assessment record is provided in the Table 28 below.
- The UoC can use other internal information channels to show that they are monitoring fish before handling and demonstrate these to the auditor rather than create a new document.
- Handling in case of emergencies are exempt from requiring fish fitness assessments e.g.:
    - Containment of an escape.
    - Imminent risk of predation.
        - It is recommended that a health representative verify the emergency procedures and provide written advice to support decision-making when handling is necessary during an emergency.

Evidence of implementation should be maintained, e.g.:

- HMP includes consideration for fitness assessment prior to handling.
- Fitness assessment report.
- Records:
    - Veterinarian or aquatic animal health professional handling approval.
    - Documented reasons for exemptions with written advice.

Auditors should confirm:

- Fitness assessments status before handling.
    - Implementation can be confirmed by cross-checking the frequency of fitness assessment and handling records, information from employee interviews and observations.

- The rationale for any deviation from the frequency of fitness assessment before handling is in accordance with those highlighted by the indicator and respective footnotes.

Useful Resources

- EFSA (2008) Animal welfare aspects of husbandry systems for farmed Atlantic salmon - Scientific Opinion of the Panel on Animal Health and Welfare.
- Barrento, S., Pedrazzani, A., Molento, C., & Quintiliano, M. (2023). Tilapia welfare indicators [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/

Indicator:	Requirement:

4.1.2.7 The UoC shall ensure that the HMP considers crowding activities with the intention of preventing stress, injury and mortality. Crowding activities shall be carried out:

a. under supervision; and

b. for a maximum of two hours.

An exception applies where a registered veterinarian or aquatic animal health professional demonstrates that exceeding two hours of crowding does not negatively impact aquatic animal welfare, in which case the maximum time period shall be defined by the registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- Appropriate crowding intensity is achieved when there is a balance between fish welfare, minimising abnormal behaviour and having sufficient fish in the crowd area for an effective handling.
- Abnormal behaviour are changes in behaviour such as balance problems, gasping for air at the surface, abnormal swimming, vertical swimming, head shaking or other panic behaviours. During crowding operations consider an appropriate fish density avoiding:
  - Vigorous escape behaviour.
  - Violent splashing.
  - Escape attempts (jumping).
  - Intense physical contact / collisions.
  - Burrowing into the crowding net.
  - Air gasping.
  - Excessive gill movement.
  - Inability to fish maintain body position (white sides constantly on surface).
  - Skin colour changes.
  - Presence of fish scales in the water.
- Ensure that there is no contact between the fish and crowding equipment or the rearing system, and that the fish can move and reposition themselves in the crowd.
- A compact and dense crowd can still be low risk if water quality is sufficient, and the fish maintain behavioural control.

Evidence of implementation should be maintained, e.g.:

- Considerations, plans and actions taken pre- and during crowding for achieving an appropriate crowding intensity.
- Records:
  - That confirms the monitoring of the crowding, e.g. time and intensity.
- Employees should demonstrate awareness of the established crowding operation.
- Rationale for exceeding the crowding time as directed by the veterinarian or aquatic health professional.

Auditors should confirm:

- The crowding operation incorporates considerations for an appropriate crowding, and it is implemented.
  - Implementation can be verified by cross-checking the crowding operations with records, information from employee interviews and observations.

Useful Resources

- Stien, L., Nilsson, K., Noble, C., Izquierdo-Gomez, D., Ytteborg, E., Timmerhaus, G., & Madaro, A. (2024) Evaluating a crowding intensity scale and welfare indicators for Atlantic salmon in sea cages. Aquaculture Reports.

Indicator:	Requirement:
4.1.2.8	The UoC shall ensure that the HMP considers biosecurity risks specific to the types of handling activities, and shall include appropriate biosecurity measures to prevent the transfer of disease.

How do I interpret this requirement?

- For developing a site-specific biosecurity mechanism within the HMP, the UoC should consider:
  - Indicator 4.1.1.10d)
  - Biosecurity measures related to the type of handling, e.g.:

- Equipment segregation.
- Equipment disinfection.

Evidence of implementation should be maintained, e.g.:

- HMP includes the considerations for:
  - Site-specific biosecurity mechanism.
  - Biosecurity specifications related to the type of handling operations.

Auditors should confirm:

- The HMP includes the required minimum considerations above.
- Employees are:
  - Familiarised with the biosecurity considerations in the HMP by conducting employee interviews and observations.
  - Trained on biosecurity specifications related to the type of handling operations by reviewing employees' training records, conducting employees' interviews and observations.

Useful Resources

- Subasinghe, R., Alday-Sanz, V., Bondad-Reantaso, M.G., Jie H., Shinn, A.P., & Sorgeloos P. (2024) Biosecurity: Reducing the burden of disease. World Aquaculture Society.
- Australian Government (unknown) Biosecurity plan and translocation policy guidelines - DAFF
- Asia-Pacific Economic Cooperation (2023) Guidebook on Biosecurity and Good Aquaculture Policies and Practices for small-scale farmers of tilapia (Oreochromis sp.) and rainbow trout (Oncorhynchus mykiss). Manual 45pp.

Indicator:	Requirement:

4.1.2.9 The UoC shall ensure that the HMP considers predation risks specific to the types of handling activities, and shall include appropriate predator control measures.

How do I interpret this requirement?

- For developing a site-specific predator control within the HMP, the UoC should consider:
  - The site-specific characteristics required to be assessed by Indicator 4.1.1.10e predator control measures specific to the type of handling, e.g.:
    - Birds scaring devices.
    - Use of anti-predator nets while moving fish from one cage/unit/pond to another.

Evidence of implementation should be maintained, e.g.:

- Predator control measures specific to the type of handling operations.
- Verification of mortalities associated with predators during handling operations.

Auditors should confirm:

- The HMP includes the required considerations above.
- Employees are:
  - Familiarised with the predator control considerations in the HMP by conducting employee interviews and observations.
  - Trained on predator control verifications, e.g.:
    - Verification of mortality events specific to the type of handling operations by reviewing employees' training records, conducting employees' interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:

4.1.2.10 The UoC shall ensure that the HMP includes a water quality monitoring process according to **Appendix 12 (12.3, Table 2).**

In the case of live transport[77], monitoring shall be conducted at the point of departure, during transport and on arrival.

How do I interpret this requirement?

- For the purpose of the indicator, live transport is when fish are taken off a site and brought to another site or to the processing facility.
    - For example, live transport of fish from a culture unit to another culture unit within the same site is not considered live transport for the purpose of the indicator.
- Where live transport time is short (i.e. less than one hour), during transport water quality monitoring is not required if it is impracticable, provided that water quality parameters are monitored at the point of departure and on arrival, and a risk assessment or other validation method demonstrates that they will remain within acceptable limits during transport.
- Maintaining good water quality is a critical factor during fish handling.
- Concentrations of substances within the water system that rise above or fall below specific levels can be harmful to fish populations and should be monitored.
- For developing an adequate environment for fish during handling the UoC should consider:
    - Water quality monitoring equipment**.**
    - Water quality monitoring frequency e.g.:
        - Prior to, during, and post handling.
        - Constant monitoring.
        - Every 15 minutes (by hand, automatic).
- For transport we have created a decision matrix (Table 28) to support the UoC to determine the length of journey.

[77] An exemption applies where live transport after uplift of fish is conducted by a third party outside of the scope of the UoC's certification and the fish are no longer owned by the UoC, or where monitoring during transport negatively affects aquatic animal health and welfare.

Decision Matrix

Transport to slaughter is one of the highest-risk welfare events in the farmed fish production cycle. Unlike stocking density, which can be managed continuously over weeks or months, transport concentrates multiple acute stressors — crowding, handling, time out of water, pump transfer, confinement, water quality deterioration, and thermal change — into a single time-limited event from which fish cannot recover before slaughter. The consequences of poor transport welfare are therefore irreversible.

This matrix assesses the welfare of the entire transport event as a system, from pre-transport fitness assessment through to post-unloading recovery and pre-slaughter condition. Transport falls within the scope of the ASC Handling Management Plan (HMP) (Indicators 4.1.2.1–4.1.2.16 for fish). Each indicator in this matrix is cross-referenced to the relevant ASC Farm Standard indicator(s).

Vessel types covered

Insulated box / road tank: Shorter journeys or smaller volumes. Oxygen supplementation and temperature management are primary welfare constraints.

Purpose-built live fish transport unit: Road or short-sea vessel with active oxygenation, CO_2 stripping, and water quality monitoring. Higher loading densities require validated system capacity and continuous monitoring.

Well boat — open water system: Well tanks exchange water with the water body through hull openings. Source water quality, ambient DO, harmful algal bloom (HAB) and pathogen risk, and sea state are primary welfare constraints.

Well boat — closed system with supplemental oxygen: Well tanks isolated from ambient water; oxygen supplemented actively; CO_2 managed. Sea state can still affect welfare through vessel motion and surging in the well.

How to score

Score each indicator 1, 2, or 3 based on current conditions for each transport event. Mark N/A only for indicators genuinely not applicable to the vessel type being used. Domain 6 (Fish-Based Welfare Indicators in Transit) may never be scored N/A.

Score 1 — Inadequate / at risk: Conditions or practices that place fish welfare at significant risk during the transport event, or that fall below the minimum requirement of the relevant ASC indicator.

Score 2 — Marginal / conditional: Conditions or practices that partially meet requirements but require improvement before the transport event can be considered acceptable.

Score 3 — Adequate / well-managed: Conditions or practices that meet or exceed the relevant ASC indicator requirements, demonstrating effective welfare management appropriate to the species, vessel type, and journey duration.

Decision rules

Acceptable (≥70%): Transport event demonstrates adequate welfare management. Proceed or approve. Transport in this case can be for over 8 hours. Post-transport review and HMP review required.

Conditional (45–69%): Welfare management marginal. Transport may proceed only with documented corrective measures in place. Transport should be as short as possible and less than 8 hours. Increased monitoring frequency required. Post-transport review and HMP revision mandatory.

Not acceptable (<45% OR any Score 1 on a ★ Critical Indicator): Transport should not proceed, or if already underway, should be aborted or diverted at the earliest safe opportunity. Documented corrective action plan required and HMP should be revised before the next transport event.

Table 28: Decision matrix to assess the welfare risks of the entire transport event as a system

★ Critical Indicators: a score of 1 on any starred indicator means the transport event is Not acceptable regardless of overall score. A registered veterinarian or aquatic animal health professional should be consulted when any critical indicator cannot be met.

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
Pre-Transport Fitness & Preparation	Fitness-for-transport assessment	4.1.2.6	No pre-transport fitness assessment carried out; fish transported regardless of condition; assessment not approved by a registered veterinarian or aquatic animal	Informal assessment by observation only; no documented protocol; assessment not consistently approved by a registered veterinarian or aquatic animal health professional; decision made subjectively	Documented fitness-for-transport assessment completed within two weeks prior to transport, approved by a registered veterinarian or aquatic animal health professional; assessment covers: fish free of disease, minimal morphological damage, normal behaviour, low mortality rate, and usual feeding rates (prior to feed withdrawal);	★

			health professional; no documented record		fish failing the assessment are not transported; records retained	
	Pre-transport health and morphological status	4.1.2.6 4.1.1.10.2	Fish with active disease signs, open wounds, severe fin damage, deformities, emaciation, or marked change of colouration transported without veterinary authorisation; morphological scoring not consulted before transport decision	Health status assessed informally; morphological scores reviewed inconsistently; fish with minor morphological damage transported without formal approval	Morphological scoring records (covering eye damage, operculum damage, skin damage, fin damage, deformities, change of colouration, and emaciation) reviewed before transport; fish with unacceptable morphological scores not transported without veterinary or aquatic animal health professional approval; health records accompany the transport	★
	Fasting duration prior to transport	4.1.2.16	Fasting period too short (gut content present, risk of fouling water quality during transport) or exceeds species-specific maximum fasting duration without documented justification; no records of fasting	Fasting applied but duration not calibrated to species, size, water temperature, or journey duration; not expressed in degree days; records inconsistent	Fasting duration documented and calibrated to species, life stage, fish size, ambient water temperature, and planned journey duration; expressed in degree days where appropriate; sufficient to clear gut content without exceeding species-specific maximum fasting limits; records kept and available to transport operator	★
	Pre-transport crowding and pen management	4.1.2.7	Fish crowded in holding pen or cage at high density for more than two hours before loading without veterinary justification; no supervision; welfare not assessed during crowding; abnormal crowding behaviours (vigorous escape, violent splashing, air gasping,	Pre-loading crowding time partially controlled; some monitoring during holding; crowding not always supervised; maximum two-hour limit inconsistently observed	Pre-loading crowding supervised, carried out gradually and partially, and limited to a maximum of two hours (or as defined by a registered veterinarian or aquatic animal health professional); DO and fish behaviour monitored throughout; crowding terminated if abnormal crowding behaviours observed; fish transferred to transport vessel promptly	

			inability to maintain body position) not acted upon			
	Species and size suitability for vessel type	4.1.2.1 4.1.2.2	Fish size or species not matched to vessel type; large, fragile, or scale-sensitive species transported in vessels without appropriate space or oxygen provision; no consideration of species-specific handling requirements in the Handling Management Plan (HMP)	Vessel type broadly appropriate but without formal assessment of size-specific loading density or oxygen demand; not documented in HMP	Vessel type, containment system, oxygen provision, and loading density formally assessed against species and size class before each transport event and documented in the HMP; large pre-harvest fish assessed against vessel-specific welfare limits	★
Loading & Handling	Crowding and net time during loading	4.1.2.7	Fish crowded by net for more than two hours without veterinary justification during loading; crowding unsupervised; abnormal crowding behaviours present (vigorous escape behaviour, violent splashing, escape attempts/jumping, burrowing into the crowding net, air gasping, excessive gill movement, inability to maintain body position with white sides on surface, skin colour changes, presence of scales in the water) without corrective action	Net crowding time partially controlled; some monitoring of crowding behaviours but not all indicators assessed; supervision inconsistent	Loading crowding supervised, carried out gradually and partially, and limited to a maximum of two hours (or as defined by registered veterinarian); welfare monitored throughout using the standard crowding behaviour indicators; crowding terminated if abnormal behaviour observed; crowding periods interspersed with recovery where possible	★

	Time out of water during transfer	4.1.2.15	Fish exposed to air for more than 15 seconds during transfer; dry handling of large fish without water; no protocol to prevent or limit air exposure; no exemption from a registered veterinarian	Air exposure generally minimised in practice but 15-second limit not formally documented in HMP; some dry contact during handling	Maximum 15 seconds out of water observed for all fish (unless anaesthetised, or pangasius as applicable); documented in HMP; water-to-water transfer used wherever possible; brailing systems or pump transfer preferred over net lifting; records confirm conformance	★
	Pump and brail transfer systems	4.1.2.1 4.1.2.2 4.1.2.14	Pump or brail system not assessed as appropriate equipment for the fish size being handled; large fish at risk of damage from impeller, pipe diameter, or drop height; equipment suitability not documented in HMP	Transfer system broadly appropriate but not formally assessed against fish size in HMP; some risk of handling damage at current fish weight class	Pump and brail specifications (impeller design, pipe diameter, flow rate, drop height) documented in the HMP as appropriate equipment for the current fish size class; impingement risk eliminated; transfer distance and drop height minimised; fish welfare assessed post-transfer; morphological scores recorded at loading and unloading	★
	Loading density calculation	4.1.2.1 4.1.2.2	Loading density not calculated prior to loading; fish loaded to capacity without reference to oxygen demand, journey duration, or vessel capability; calculation not documented in HMP	Loading density estimated but not formally calculated against oxygen demand, journey duration, water temperature, and vessel oxygen supply before each event	Loading density calculated before each transport event using a documented formula in the HMP, accounting for fish biomass, oxygen consumption rate at ambient temperature, vessel water volume, oxygen supply capacity, and planned journey duration; calculated density does not exceed vessel-specific welfare limits	★
	Staff competence and training	4.1.1.1 4.1.1.2	Staff handling live fish transport not trained in fish health and welfare awareness; no documented competence; welfare decisions made without qualified personnel	Some staff training in place; competence in fish health and welfare awareness not formally assessed or documented; welfare oversight inconsistent	All staff involved in loading, transport, and unloading have documented training in animal health and welfare awareness per Appendix 12 (12.2, Table 1); competence assessed and records maintained; a named	★

			present during loading and unloading		responsible person is present at loading and unloading	
Vessel Type & Containment System	Insulated box / road tank (road or short sea)	4.1.2.1 4.1.2.2 4.1.2.3	Insulated box or road tank used without oxygen supplementation or monitoring for journeys >1 hour; water volume insufficient for biomass; temperature management absent; no contingency plan for system failure	Oxygen supplementation present but not continuous; temperature management partial; journey duration limits informally applied; contingency plan not documented	Insulated boxes or road tanks sized and provisioned for journey duration and biomass per HMP; oxygen supplementation continuous; temperature controlled or monitored throughout; DO monitored at regular intervals; maximum journey duration defined and observed; contingency plan for system failure documented	
	Purpose-built live fish transport unit (with active oxygen and water treatment)	4.1.2.1 4.1.2.2 4.1.2.3	Active oxygen or water treatment system not functioning or not monitored; loading density not adjusted for system capacity; no contingency for system failure	System functioning but monitoring intermittent; loading density not formally validated against system capacity; contingency plan incomplete	Purpose-built unit with active oxygenation, CO_2 stripping, and water quality monitoring per HMP; system capacity validated against loading density and journey duration before departure; alarms functional; backup oxygen available; contingency plan for system failure documented and crew briefed	
	Well boat — open water system (ambient water exchange)	4.1.2.1 4.1.2.2 4.1.2.4	Open well boat operated without assessment of source water quality, pathogen or harmful algal bloom (HAB) risk, or ambient DO; no monitoring of well conditions during transit; sea state and adverse environmental conditions not considered in loading or departure decision	Source water quality assessed at departure but not monitored continuously; HAB and pathogen risk from open exchange partially managed; sea state considered informally; adverse conditions protocol not documented	Open well boat operation documented in HMP including: pre-departure assessment of route water quality, ambient DO, pathogen and HAB risk; well conditions monitored continuously; loading density accounts for absence of supplemental oxygen; sea state forecast reviewed before and during journey; journey postponed or density reduced if significant wave height exceeds vessel-specific welfare threshold; adverse	★

					environmental conditions protocol documented	
	Well boat — closed system with supplemental oxygen	4.1.2.1 4.1.2.2 4.1.2.3	Closed well boat operated without functioning oxygen supplementation or CO_2 management; DO and CO_2 not monitored continuously; backup oxygen absent; no contingency plan for oxygen system failure	Oxygen supplementation functional but not continuously monitored; CO_2 management partial; alarm thresholds not documented; contingency plan incomplete	Closed well boat with active oxygenation and CO_2 stripping operational and continuously monitored; DO maintained above species minimum; CO_2 maintained below welfare threshold; automated alarms with documented response procedures; backup oxygen supply verified before departure; loading density calculated for closed system capacity; contingency plan for system failure documented and crew briefed	★
	Sea state and adverse environmental conditions (well boat operations)	4.1.2.4	Journey undertaken in sea states or adverse environmental conditions (storms, jellyfish, algal bloom) exceeding welfare or safety limits without risk assessment; no protocol for aborting or diverting in deteriorating conditions	Sea state and environmental conditions forecast reviewed before departure but no formal welfare-based threshold for journey postponement; deteriorating conditions managed reactively	Adverse environmental conditions (including sea state, harmful algal blooms, jellyfish, storm risk) assessed before each well boat departure per HMP; formal vessel-specific welfare thresholds documented; forecast reviewed before and during journey; documented authority and procedure for journey postponement, diversion, or early unloading if conditions deteriorate	★
	Backup systems and contingency planning	4.1.2.3	No backup oxygen supply; no documented contingency plan for system failure, equipment breakdown, or mass mortality event; no emergency response measures in the HMP	Backup oxygen present but contingency plans for system failure or mass mortality not documented in HMP; crew not briefed	Backup oxygen supply verified before each journey; HMP includes contingency plans for: immediate response to system failure, humane culling response measures, and mass mortality event response; crew briefed before departure; communication protocol with receiving site and emergency services in place	★

Water Quality in Transit	Dissolved oxygen during transit	4.1.2.10	DO not monitored during transit, or regularly falls below species minimum (typically <6 mg/L for salmonids); no corrective action; fish surfacing or showing inability to maintain body position	DO monitored periodically but not at defined intervals or continuously; falls below recommended level without documented response	DO monitored continuously or at intervals not exceeding 15 minutes (by hand or automatically) per HMP; maintained above species-appropriate minimum throughout transit (typically ≥7 mg/L for salmonids, ≥6 mg/L for other species); alarm threshold triggers immediate corrective action; records retained	★
	CO_2 accumulation	4.1.2.10	CO_2 not monitored during transit in closed or semi-closed systems; no CO_2 stripping or aeration management; levels likely to accumulate above welfare threshold (>20 mg/L) at loading density	CO_2 monitored in some vessel types; management measures partially effective; alarm thresholds not defined in HMP	CO_2 monitored throughout transit in all closed and semi-closed systems; maintained below 20 mg/L (target <15 mg/L); aeration, degassing, or CO_2 stripping operational per HMP; CO_2 used alongside DO as a loading density constraint; records retained	★
	Ammonia accumulation	4.1.2.10	Ammonia not monitored during transit on longer journeys; fasting duration insufficient to minimise faecal ammonia production; no water exchange or treatment; un-ionised ammonia likely to reach stressful levels (>0.02 mg/L)	Ammonia monitored on longer journeys but threshold triggers not defined in HMP; fasting period partially effective	Ammonia (TAN and un-ionised) monitored on journeys >4 hours or where biomass load is high; un-ionised ammonia maintained below 0.02 mg/L; water exchange or treatment used on longer journeys; fasting duration calibrated to minimise faecal ammonia production; records retained	★
	Water temperature management	4.1.2.10 4.1.2.13	Water temperature not monitored during transit; temperature in transport vessel not as close as possible	Temperature monitored but acclimatisation measures not consistently applied; temperature	Water temperature in transport vessel maintained as close as possible to source water temperature throughout transit per HMP (4.1.2.13); temperature monitored	★

	and acclimatisation		to source water temperature; acclimatisation measures absent from HMP	differential not always documented	throughout journey; any necessary acclimatisation at destination documented; sudden changes in water conditions that could affect fish health and welfare avoided	
	Water quality monitoring frequency and records	4.1.2.10	No water quality records kept during transport; no monitoring protocol in HMP; welfare decisions made without data; monitoring not conducted at departure, during transit, or on arrival	Monitoring carried out at some stages but not at all three required points (departure, during, arrival); records incomplete; frequency not defined	Water quality (DO, CO_2, temperature, and ammonia on longer journeys) monitored and recorded at departure, during transit (at defined intervals not exceeding 15 minutes or continuously), and on arrival per HMP; records accompany each transport event, are retained, and reviewed to improve subsequent transport planning	
Journey Management & Route Planning	Journey duration planning and limits	4.1.2.1 4.1.2.2	No maximum journey duration defined in HMP; cumulative transport time (loading, transit, and unloading) not tracked; journeys extended beyond planned time without welfare reassessment	Journey duration limit informally recognised; extended journeys not systematically reassessed; cumulative duration not consistently tracked	Maximum journey duration documented in HMP for each species, size class, vessel type, and loading density; cumulative transport time (loading + transit + unloading) tracked; journey duration is a primary factor in loading density calculation; journeys exceeding planned duration trigger welfare reassessment	★
	Route planning and contingency routing	4.1.2.3	No documented route plan in HMP; no contingency route for breakdown, adverse weather, or welfare emergency; receiving site not pre-notified; no emergency stop locations identified	Primary route planned but no contingency; receiving site notified but emergency response contacts not established	Route plan documented in HMP including primary and contingency routes, estimated journey time, emergency stop locations where fish can be unloaded safely, and receiving site pre-notification; crew briefed on route and contingencies before departure	

	Regulatory compliance and transport documentation	4.1.2.1 4.1.2.2 4.1.2.8	No health certificate, movement documentation, or regulatory authorisation for live fish transport; biosecurity risks specific to transport not considered in HMP; journey non-compliant with applicable legislation	Documentation present but incomplete or not species/quantity-specific; biosecurity measures for transport not fully documented; regulatory requirements only partially met	All required health certificates, movement documents, and regulatory authorisations in place before departure; HMP includes biosecurity risks specific to transport and appropriate biosecurity measures (e.g. equipment disinfection, disease transfer prevention); documentation available for inspection throughout the journey	★
	Monitoring during transit and in-journey visual inspection	4.1.2.10 4.1.2.11	No welfare monitoring or visual inspection of fish behaviour during transit; fish not checked until arrival; mortality or acute stress events undetected; no provision for camera-based monitoring where direct inspection is not possible	Visual inspection carried out at some point during transit but not at defined intervals; camera alternative not established where direct inspection is impracticable	Visual inspection of fish behaviour conducted at defined intervals throughout transit per HMP (minimum every 2 hours, or after significant changes in conditions); where direct visual inspection is not possible (e.g. inside a closed well), camera-based assessment used as a minimum at loading and discharge; abnormal behaviour or water quality deviation triggers immediate corrective action; events recorded	★
	Communication and emergency response during transit	4.1.2.3	No communication protocol between transport crew and farm or receiving site; HMP does not include immediate response measures for system failure or mass mortality event; no humane culling response measures available during transit	Communication channels established but emergency response procedures not documented in HMP or crew not briefed; humane culling capability not confirmed	Communication protocol operational throughout transit; HMP contingency plans cover immediate response to system failure, humane culling response (per Criterion 4.1.3), and mass mortality event; responsible person at farm and receiving site contactable; authority to abort journey, divert, or carry out emergency culling is defined and crew are briefed	★
	Inability to maintain body	4.1.2.7	Fish showing inability to maintain body position (white	Inability to maintain body position observed and noted;	Swimming behaviour and body position observed at each visual inspection; inability to	★

Fish-Based Welfare Indicators in Transit	position and schooling behaviour	4.1.2.11	sides on surface), rolling, or spiral swimming in the water column; abnormal schooling or scatter noted; not investigated or recorded; not linked to corrective action	investigation inconsistent; not linked to immediate management response	maintain body position in any significant proportion of the population triggers immediate investigation of DO, CO_2, temperature, and loading density; events recorded; repeated occurrence triggers abort/diversion protocol	
	Surface crowding, air gasping, and piping	4.1.2.7 4.1.2.11	Fish crowding at the water surface, air gasping, or piping during transit; these abnormal crowding behaviours not recognised as welfare signals or not acted upon; no DO response	Surface crowding or air gasping recognised as stress indicators; oxygen response inconsistent; root cause not always investigated	Surface crowding, air gasping, or piping at any visual inspection triggers immediate DO measurement and oxygen supplementation increase; frequency and duration recorded throughout transit; persistent surface crowding not resolved by oxygenation triggers consideration of journey abort or early unloading	★
	Excessive gill movement and opercular rate	4.1.2.7 4.1.2.11	Excessive gill movement not assessed during transit; fish showing rapid opercular movement or laboured respiration without investigation; this abnormal behaviour not included in visual inspection protocol	Opercular rate and gill movement observed informally; abnormal respiration noted but threshold triggers not defined in HMP	Excessive gill movement and elevated opercular rate assessed at each visual inspection as indicators of respiratory stress (per crowding behaviour indicators in 4.1.2.7); elevated rate at population level triggers DO, CO_2, and temperature check; recorded alongside other behavioural indicators to assess cumulative transport stress	
	Morphological condition: skin, fin, eye, operculum, and colouration	4.1.1.10.2 4.1.2.12	Post-handling morphological assessment not carried out at loading or unloading; skin damage, fin damage, eye damage, operculum damage, or change of colouration not recorded; transport-	Morphological condition assessed at unloading but not at loading; not all required parameters scored; transport-attributable damage cannot be reliably quantified	Morphological scoring (covering eye damage, operculum damage, skin damage, fin damage, deformities, change of colouration, and emaciation) conducted at both loading and unloading per 4.1.2.12; transport-attributable morphological damage recorded and used to evaluate handling procedures;	

			attributable morphological damage not separated from pre-existing condition		scores above warning level trigger review of pump settings, loading method, and loading density	
	Skin colour changes and scale loss during handling	4.1.2.7 4.1.2.12	Skin colour changes during crowding or handling not monitored; presence of fish scales in the water during loading not recognised as an abnormal crowding behaviour indicator or acted upon	Skin colour changes and scale presence in water noted informally during loading; not linked to crowding intensity or management response	Skin colour changes and presence of fish scales in the water assessed as abnormal crowding behaviour indicators at loading (per 4.1.2.7); scale loss at population level triggers review of crowding intensity, pump settings, and loading density; recorded in post-handling morphological assessment	
	In-transit mortality and moribund fish	4.1.1.10.4 4.1.2.12	Mortality and moribund fish during transit not recorded or recorded only as total loss; moribund fish not collected and culled humanely during transit; cause of in-transit mortality not investigated	Mortality and moribund fish recorded during transit; rate not benchmarked against species/journey-type baseline; moribund fish collected inconsistently; cause investigated reactively	All mortality and moribund fish during transit recorded with time, location in vessel, and provisional cause per 4.1.2.12; moribund fish collected and culled humanely in accordance with Criterion 4.1.3; mortality rate compared against species- and journey-type-specific baseline; mortality exceeding threshold triggers post-journey investigation and review of procedures	★
	Cumulative stress and feeding behaviour assessment	4.1.1.10.3 4.1.2.12	Transport welfare assessed only in discrete stages without considering cumulative stress; feeding behaviour scoring not referenced before transport as a welfare baseline; no post-transport review integrating pre-transport fitness, handling	Some awareness of cumulative stress; feeding behaviour scoring records from HWMP reviewed informally before transport; pre-transport condition and handling duration not integrated into post-transport assessment	Pre-transport feeding behaviour scoring records (fish move freely / appetite reduced / do not respond to food – per Table 13 criteria) reviewed as a welfare baseline before departure; cumulative transport stress assessed post-journey by integrating pre-transport fitness score, loading density, handling and fasting duration, journey duration, water quality record, and	

			duration, journey duration, and water quality records		morphological outcomes; findings used to improve limits for subsequent transports	
Arrival, Unloading & Post-Transport Welfare	Arrival welfare assessment	4.1.2.10 4.1.2.12	No welfare assessment at arrival; fish unloaded without checking DO, fish behaviour, or morphological condition; moribund fish and mortalities during transport not quantified at arrival	Arrival welfare check carried out informally; DO and behaviour noted but not scored against the post-handling evaluation criteria; moribund fish and mortalities not fully recorded	Post-handling evaluation completed before unloading begins per 4.1.2.12, covering: (a) abnormal behaviour, (b) morphological scores (eye damage, operculum damage, skin damage, fin damage, deformities, change of colouration, emaciation), and (c) moribund fish and mortalities; water quality (DO, CO_2, temperature) recorded on arrival; findings determine whether fish are fit for onward processing or require a recovery period	★
	Unloading: time out of water and transfer method	4.1.2.12 4.1.2.14 4.1.2.15	Fish exposed to air for more than 15 seconds during unloading; unloading equipment not appropriate for the fish size being handled; large fish lifted dry or dropped from height; unloading rate not managed for welfare	15-second limit broadly observed but not documented in HMP for unloading; equipment suitability not formally assessed against fish size; some handling damage at unloading not quantified	Maximum 15 seconds out of water observed at unloading (unless anaesthetised or pangasius); unloading equipment assessed as appropriate for fish size in HMP; water-to-water transfer used wherever possible; drop height minimised; unloading rate controlled to avoid crowding; post-unloading morphological condition assessed and recorded	★
	Water temperature acclimatisation at arrival	4.1.2.13	Fish transferred directly from transport water to receiving facility water without temperature check; sudden change in water conditions that could affect fish health and welfare not managed; no	Temperature differential checked but standardised acclimatisation measures not consistently applied; acclimatisation not documented in HMP	Standardised acclimatisation measures documented in HMP (4.1.2.13); transport water temperature maintained as close as possible to source; temperature differential between transport and receiving water measured before transfer; if differential requires acclimatisation, a gradual transition protocol is applied; records kept	★

			acclimatisation measures in HMP			
	Time-to-slaughter and pre-slaughter welfare	4.1.2.1 4.1.2.2 4.1.3.1-4.1.3.8	Fish slaughtered immediately on arrival without welfare assessment irrespective of transport stress; or fish held in inadequate conditions for extended periods post-transport; no welfare assessment before stunning; moribund fish not humanely culled before slaughter	Recovery period applied informally; duration not defined by transport stress level; pre-slaughter welfare not formally assessed against abnormal behaviour and morphological criteria	Time-to-slaughter documented and determined by species, journey duration, and transport stress level; where post-handling evaluation at arrival indicates significant stress (abnormal behaviour, unacceptable morphological scores, or persistent inability to maintain body position), a recovery period in well-oxygenated water is provided before stunning; moribund fish humanely culled per Criterion 4.1.3; records retained	★
	Post-transport review and HMP revision	4.1.2.1 4.1.2.2 4.1.2.12	No post-transport review; in-transit welfare data not analysed; HMP not revised in response to transport outcomes; loading density and procedures not improved between events	Post-transport review carried out informally after major welfare events but not routinely; HMP not consistently updated in response to findings	Post-transport review completed after each transport event using recorded water quality, behavioural, morphological, and mortality data; outcomes compared against benchmarks; HMP periodically reviewed and revised as necessary based on transport performance; loading density, journey duration limits, and handling procedures updated accordingly; records retained	

Notes on application

1. Scope and HMP requirement: transport to slaughter falls within the scope of the Handling Management Plan (HMP) per 4.1.2.1–4.1.2.2. The HMP should describe transport processes and equipment, include contingency plans (4.1.2.3), address environmental conditions (4.1.2.4), consider anaesthesia (4.1.2.5), include fitness assessment before transport (4.1.2.6), address crowding (4.1.2.7), consider biosecurity risks (4.1.2.8), and include water quality monitoring (4.1.2.10). A separate process description may be required for outsourced transport events.

2. Fasting duration and degree days: Species-specific maximum fasting durations are set in Appendix 2 (2.4). Duration should be expressed in degree days (daily average temperature × number of days) to account for the effect of temperature on metabolic rate. Insufficient fasting risks water quality deterioration; excessive fasting risks energy depletion and reduced transport tolerance.

3. 15 seconds out of water (4.1.2.15): this is an absolute requirement, not a guideline. It applies to all finfish. Exceptions apply to anaesthetised fish, some catfish and pangasius (which can breathe air facultatively). Records confirming conformance should be maintained. Equipment and methods should be designed to achieve this.

4. Morphological scoring (4.1.1.10.2): the seven required parameters (eye damage, operculum damage, skin damage, fin damage, deformities, change of colouration, emaciation) should be used consistently in pre-transport fitness assessments, post-handling evaluations at loading and unloading, and arrival welfare assessments.

5. Water quality monitoring frequency (4.1.2.10): monitoring should occur at departure, during transit, and on arrival. The Interpretation Manual indicates monitoring every 15 minutes (by hand or automatic) as an example of appropriate frequency. An exception applies where monitoring during transport would negatively affect fish health and welfare.

6. Camera-based visual inspection (4.1.2.11): where direct visual inspection is not possible during transport (e.g. inside a closed well boat well), cameras are an acceptable alternative. As a minimum, behavioural assessment should be conducted when loading and discharging fish.

7. Regulatory framework: live fish transport is subject to Council Regulation (EC) No 1/2005 in EU member states and equivalent national legislation elsewhere. Reference documents include: AAC (2022) Recommendation on Fish Welfare in Live Fish Transport; EURCAW (2024) EU and National Legislation on Aquatic Animals Welfare at Transport and Harvest; Humane Slaughter Association (2018) Transport of Farmed Fish; Luz & Favero (2024) Use of Salt, Anaesthetics, and Stocking Density in Transport of Live Fish.

8. Evidence requirements: a score of 3 should be supported by documented records. Auditors may request: HMP (including transport process descriptions, contingency plans, and equipment specifications); fitness assessment reports with veterinary approval; fasting records (in degree days); loading density calculations; vessel monitoring logs (DO, CO_2, temperature, ammonia) at departure, during transit, and arrival; crowding behaviour records; morphological scores at loading and unloading; in-transit mortality and moribund fish records; post-transport welfare review; and records confirming 15-second out-of-water conformance.

9: Rationale for the 8-hour journey time threshold. The 8-hour journey time threshold used in the Decision Rules of this matrix is derived from and consistent with the principal legislative and intergovernmental frameworks governing the welfare of farmed vertebrates during transport. This note sets out the basis for that figure for the benefit of auditors, certifiers, and stakeholders.

EU Council Regulation (EC) No 1/2005 on the Protection of Animals during Transport

The most directly applicable legislative precedent is EU Council Regulation (EC) No 1/2005, which governs the transport of live farmed terrestrial vertebrates across EU member states and has been widely adopted as the reference standard in national legislation in many non-EU ASC-producing countries. Under this Regulation, 8 hours is the central welfare threshold: journey times up to 8 hours are classified as short journeys and subject to standard vehicle and welfare requirements, while journeys exceeding 8 hours are classified as long journeys and trigger substantially enhanced requirements. These include: vehicles equipped with ventilation and temperature management systems; mandatory water provision throughout the journey; minimum space allowances per animal; compulsory journey logs; and a requirement that animals be unloaded, rested, watered, and fed after a maximum of 14 hours of long-journey travel (with the first rest stop after the initial 8-hour period). The 8-hour figure therefore represents the legislatively established point at which cumulative journey stress is considered to move from manageable under standard conditions to requiring active mitigation through enhanced management.

Proposed revision of EU Regulation 1/2005 and current policy direction

The European Commission proposed a revised regulation in 2023 that would significantly tighten journey time limits, including proposals to establish 8 hours as an absolute maximum for transport to slaughter across all farmed species, rather than the threshold between short and long journey regimes as in the current Regulation. The Eurogroup for Animals (2024) white paper Live Animal Transport: Due Time to Change the Rules argues for this absolute 8-hour maximum for slaughter transport, citing the accumulation of welfare impacts including fatigue, dehydration, injury, immunosuppression, and mortality risk beyond this point. The current direction of EU policy therefore supports treating 8 hours not as a threshold above which enhanced requirements apply, but as a ceiling for acceptable slaughter transport duration. Using 8 hours as the boundary between Acceptable and Conditional outcomes in this matrix is consistent with both the current legislative framework and the direction of its revision.

WOAH Terrestrial Animal Health Code, Chapter 7.3 (Transport of Animals by Land)

The WOAH (World Organisation for Animal Health) Terrestrial Animal Health Code, Chapter 7.3, does not prescribe a fixed numerical journey time limit for farmed terrestrial species. It adopts a principles-based approach, requiring that journey times be kept to a minimum consistent with animal welfare, and that animals are provided with water, feed, and rest at appropriate intervals. However, WOAH guidance explicitly recognises that welfare compromise accumulates with journey duration and that 8 hours represents the widely applied threshold above which the risk of fatigue, dehydration, and stress-related welfare impacts increases significantly for most farmed species. WOAH Chapter 7.3.11 (Journey duration) states that the cumulative impact of transport should be assessed and mitigated, and that continuous journeys should not be extended to the point at which welfare cannot be maintained. The 8-hour threshold used in this matrix is consistent with WOAH's risk-based approach and with the interpretation of Chapter 7.3 by national competent authorities across the major ASC production regions.

Scientific basis and the parallel with fish transport physiology

The 8-hour threshold in terrestrial animal transport legislation is grounded in the physiology of stress accumulation: cortisol and other stress hormones are elevated and remain elevated for extended periods during transport; dehydration and energy depletion become significant after several hours; and immune function is suppressed in a duration-dependent manner. These physiological mechanisms have direct analogues in fish transport. Cortisol elevation, plasma lactate accumulation, impaired osmoregulation, and immunosuppression have all been documented in finfish in a manner that increases with transport duration, cumulative handling, and water quality deterioration. The AAC (2022) Recommendation on Fish Welfare in Live Fish Transport, the Humane Slaughter Association (2018) guidance on Transport of Farmed Fish, and Luz & Favero (2024) all cite duration as a primary determinant of transport welfare outcomes in fish, consistent with the legislative rationale for the 8-hour threshold in terrestrial species.

Application in this matrix

In this matrix, 8 hours refers to cumulative transport time — the total time from the start of loading to the completion of unloading. This is consistent with how EU Regulation 1/2005 calculates journey duration for terrestrial species. A transport event scoring in the Acceptable range (≥70%) may involve journeys exceeding 8 hours, provided that the conditions for doing so are robustly met: an Acceptable overall score indicates that loading density, water quality management, vessel capacity, monitoring frequency, and fish-based welfare indicators are all at a level that can sustain fish welfare over an extended journey. A Conditional score (45–69%) limits transport to less than 8 hours, recognising that where system management is marginal, the welfare reserve available to absorb the cumulative stress of a longer journey is insufficient. A Not Acceptable score means transport should not proceed regardless of planned duration.

Evidence of implementation should be maintained, e.g.:

- Water quality monitoring for live transport.
- Departure/arrival and during live transport unless this could cause detrimental impact.
- Minimum thresholds for oxygen should be known.
- Observation of the fish is required, and corrective action should take place immediately when fish show signs of stress, for example; loss of equilibrium, rapid opercular movements in a large proportion of the fish.
- Corrective actions should be provided according to the HWMP that may be considered acceptable as a reference to develop and implement a water quality monitoring process (Indicator 4.1.1.10.1).
- Any deviation from the limits, including the following, should be prepared for:
    - Oxygen depletion
    - Build-up of ammonia and carbon dioxide
    - Temperature fluctuations
- When fish leave the site, if a third party transports the fish and is part of the UoC, the transporter is responsible for carrying out water quality checks.

Auditors should confirm:

- The water quality monitoring, that incorporates the minimum elements required, included in the HWMP. and cross-checking with the handling operations present in the HMP.
- Implementation can be verified by cross-checking the process with records, information from employee interviews and observations.

Useful Resources

- The Fish Site (2012) Monitoring Pond Water Quality to Improve Production.
- Lindholm-Lehto, P. (2023) Water quality monitoring in recirculating aquaculture systems. Aquaculture Fish and Fisheries
- Fahad, A., N'Doye, I., & Taous-Meriem, L.K. (2023). Feeding control and water quality monitoring in aquaculture systems: Opportunities and challenges.

Erikson, U., Rosten, C., Klebert, P., Aspaas, S., & Rosten, T. (2022) Live transport of Atlantic salmon in open and closed systems: Water quality, stress and recovery. Aquaculture Research

Indicator:	Requirement:

4.1.2.11 The UoC shall ensure that the HMP includes a visual inspection process to identify abnormal behaviour in relation to the handling activity, and defines mitigation measures when identified.

How do I interpret this requirement?

- Visual inspection during handling should be included in the HMP.
    - When direct visual inspections are not possible (e.g. pangasius transportation) or considered invasive (e.g. during live fish transport inside a well), cameras can be used. Alternatively, fish behaviour can be assessed when loading and discharging the fish as a minimum requirement.

Evidence of implementation should be maintained, e.g.:

- The monitoring process, that incorporates the corrective actions required, included in the HMP.
- Records that confirm the monitoring of the behaviour.
    - A checked box on the monitoring records indicating whether behavioural monitoring took place or not is acceptable.
- Employees should demonstrate awareness of the established behavioural monitoring process.

Auditors should confirm:

- The monitoring process included in the HMP that incorporates the corrective actions and is implemented.
    - Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.

Useful Resources

- Bhadmus, Z. T. (2022) Effect of crowding on behaviour of Atlantic salmon (Salmo salar) in aquaculture. Thesis; The Artic University of Norway.
- Stien, L., Nilsson, K., Noble, C., Izquierdo-Gomez, D., Ytteborg, E., Timmerhaus, G., & Madaro, A. (2024) Evaluating a crowding intensity scale and welfare indicators for Atlantic salmon in sea cages. Aquaculture Reports.

Indicator:	Requirement:

4.1.2.12 The UoC shall ensure that the HMP includes a post-handling evaluation process that considers at least the following:

a) abnormal behaviour; and,

b) morphological scores; and,

c) moribund aquatic animals and mortalities.

How do I interpret this requirement?

- Abnormal behaviour related to the handling should be recorded.
- Post-handling evaluation should be conducted through observation only — fish do not need to be handled again
- During and post-handling moribund fish and mortalities related to the handling should be recorded and removed.
- Moribund fish should be collected and culled following responsible stunning and killing according to Criterion 4.1.3.

Evidence of implementation should be maintained, e.g.:

- Behavioural monitoring.
- Records that confirm the monitoring of the behaviour, moribund and mortalities during and post-handling.
- Employees should demonstrate awareness of the established behavioural and mortality monitoring process above.

Auditors should confirm:

- The behavioural monitoring process included in the HMP incorporates the minimum required elements and it is implemented.
  - Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.

Useful Resources

- Pavlidis, M., Samaras, A., Papaharisis, L., (2024). Welfare assessment study for European sea bass. University of Crete.

Indicator:	Requirement:
4.1.2.13	The UoC shall ensure that the HMP includes acclimatisation measures to prevent sudden changes in water conditions affecting the health and welfare status of the fish.

How do I interpret this requirement?

- This indicator is applicable at the point of transfer from hatchery to grow out sites, such as ponds or open water locations.
    - At this stage, fish transition from the controlled and consistent water conditions of a hatchery environment to external sites where water temperature may differ significantly.
- Movement from grow out sites to waiting cages are also applicable.
- The acclimatisation measures within the HMP should ensure this transition is managed gradually and carefully to minimise physiological stress and safeguard fish health and welfare
- Standardised acclimatisation measures should be designed and maintained, e.g.:
    - Water temperature during transportation should be as close as possible to that which the fish came from.
- When fish are transferred back to a sea cage after being treated with freshwater, the acclimatisation will be covered by the HMP Indicators 4.1.2.1, 4.1.2.2 & 4.1.2.7.

Evidence of implementation should be maintained, e.g.:

- Standard acclimatisation measures and monitoring of the water quality according to the HMP.
- Records that confirm the monitoring of acclimatisation parameters before stocking.
- Employees should demonstrate awareness of the acclimatisation measures and monitoring process above.

Auditors should confirm:

- The acclimatisation measures included in the HMP incorporate the minimum required elements and are implemented.

- Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.

Useful Resources

- APROMAR (2024) A guide on fish welfare in Spanish aquaculture- Volume 2: Welfare of European sea bass. Spanish Aquaculture Business Association. 49 pp.
- APROMAR (2024) A guide on fish welfare in Spanish aquaculture - Volume 3: Welfare of gilthead sea bream. Spanish Aquaculture Business Association. 49 pp.

Indicator:	Requirement:
4.1.2.14	The UoC shall ensure that the HMP includes consideration of the use of appropriate equipment during handling activities to avoid affecting the health and welfare status of the fish.

How do I interpret this requirement?

- The holding facilities should be designed and specifically constructed to hold a certain fish species or group of fish species.
- The holding facilities should be of a size that allows holding a certain number of fish for processing in a given timeframe without compromising the welfare of the fish.
- Operations should be conducted with minimal injury and stress to the fish.
- The following recommendations may help to achieve this:
  - nets and tanks should be designed and maintained to minimise physical injuries;
  - water quality should be suitable for the fish species and stocking density;
  - equipment for transferring fish, including pumps and pipes, should be designed and maintained to minimise injury.

Indicator:	Requirement:
4.1.2.15	The UoC shall adhere to a maximum limit of 15 seconds out of water[78].

How do I interpret this requirement?

- When fish are out of water:
  - Their gills collapse, preventing oxygen exchange.
  - They show violent escape behaviour accompanied by a stress response.
- Time out of water should be minimised to avoid unnecessary stress to the fish during handling.

[78] An exemption applies to anaesthetised fish and pangasius, *Clarius*, *Heterobranchus* and their hybrids (due to their ability to breathe air facultatively).

- Conformance with maximum required time out of water, customised to suit the species, should be part of the HMP and associated with good handling practices.
- Time out of water should be minimised considering the biological needs of the fish e.g. oxygen exchange, gills collapse and stress response.
- There is no scientific evidence or guidance on maximum time limits out of water for anaesthetised fish.
- If fish are anesthetised;
    - They can be removed from the water for short term examinations or diagnostic procedures.
    - The procedure needs to be carried out as quickly as possible without affecting the recovery of the fish.

Evidence of implementation should be maintained, e.g.:

- Records confirming the required parameter and their conformance with maximum value.
- Employees should demonstrate awareness of the established maximum time out of water.

Auditors should confirm:

- The maximum time of water is included in the HMP, and it is implemented.
- Implementation can be verified by cross-checking the process with records, information from employee interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:

4.1.2.16 The UoC shall adhere to species-specific limits on maximum fasting duration before any handling[79], according to **Appendix 2 (2.4)[80].**

An exception applies before slaughter where a registered veterinarian or aquatic animal health professional demonstrates that exceeding the maximum fasting duration does not negatively impact fish welfare, in which case the maximum fasting duration shall be defined in the HMP by the registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- Fasting periods should aim to meet the minimum effective duration required for gut clearance. Maximum fasting durations represent an absolute limit and should not be used as a default target or routine practice.
- The UoC should adopt a system-specific and species-specific refinement such as adjusting fasting durations based on size class, temperature, metabolic rate and observed welfare indicators.
- Under no circumstances should fasting be extended for logistics that are not aquatic animal welfare related.
- Prolonged fasting has cumulative welfare impacts, including increased susceptibility to stress during subsequent handling, higher cortisol levels and potential immune suppression.
- Fasting duration:
  - Calculation in degree days provides a more precise indication of fish metabolic activity because it incorporates time and temperature, which better reflect the biological processes, and provides a standardised metric across different locations and time periods.
    - The concept of degree days involves accumulating the average daily temperature over a period of time, i.e. 3 days at an average daily temperature of 19 °C, are 57-degree days.
- In the case of exceptional situations (see requirement footnote) the length of fasting would be linked to the duration of the event rather than a pre-set timing or veterinarian or aquatic health professional rationale.

Evidence of implementation should be maintained, e.g.:

- Records confirming the required parameter and their conformance with minimum/maximum value.

[79] An exemption applies in exceptional situations of severe weather, adverse environmental conditions (e.g. jellyfish, algal bloom) or during disease events.
[80] An exemption applies where there is no species-specific metric listed in Appendix 2.

- Employees should demonstrate awareness of the established minimum/maximum fasting time.

Auditors should confirm:

- The minimum/maximum time fasting time is included in the HMP and incorporates considerations related to intrinsic factors and is implemented.
- Implementation can be verified by cross-checking the process with records, information from employee interviews and observations.

Useful Resources

N/A

Indicators 4.1.2.17-4.1.2.32:

Scope: Cleaner fish

Indicator:	Requirement:
4.1.2.17	The UoC shall develop, implement and maintain a site-specific Handling Management Plan (HMP), with the intent of ensuring the good health and welfare of cleaner fish. The HMP shall be periodically reviewed and revised as necessary.
4.1.2.18	The UoC shall ensure that the HMP includes all handling activities.

How do I interpret this requirement?

- This clause overlaps with Indicators 4.1.2.1 and 4.1.2.2 regarding fish. Please refer to Indicators 4.1.2.1 and 4.1.2.2 for a detailed description.
- Any additional handling events that are unique to cleaner fish need to be addressed in the HMP:
  - Removal from refuges/ hides

Useful resources (if applicable)

- Norwegian Seafood Research Fund (2018) Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.

Indicator:	Requirement:

4.1.2.19 The UoC shall ensure that the HMP includes contingency plans for handling activities, including at least the following:

a) immediate response measures in the case of system failure; and

b) humane culling response measures (see Indicator 4.1.3.9); and

c) mass mortality event response measures.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.3 regarding fish. Please refer to Indicator 4.1.2.3 for a detailed description.

Indicator:	Requirement:

4.1.2.20 The UoC shall ensure that the HMP includes consideration of the environmental conditions associated with handling activities, with the intent of preventing handling under adverse conditions that could affect the health and welfare of the cleaner fish.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.4 regarding fish. Please refer to Indicator 4.1.2.4 for a detailed description.

Indicator:	Requirement:

4.1.2.21 The UoC shall ensure that the HMP, following consultation with a registered veterinarian or aquatic animal health professional, considers the use of anaesthesia during handling activities.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.5 regarding fish. Please refer to Indicator 4.1.2.5 for a detailed description.

Useful Resources

- Skår MW, Haugland GT, Powell MD, Wergeland HI, Samuelsen OB (2017) Development of anaesthetic protocols for lumpfish (*Cyclopterus lumpus* L.): Effect of anaesthetic concentrations, sea water temperature and body weight. PLoS ONE
- Calabrese, S., Jonassen T.M., Steigum, E., Åsnes H.O., Imsland, A.K.D., , Saude C.S., Wergeland T. , Höglund, E. (2024) Does sedation with AQUI-S® mitigate transport stress and post transport mortality in ballan wrasse (Labrus bergyltae)? Frontiers in Veterinary Science

Indicator:	Requirement:

4.1.2.22 The UoC shall ensure that the HMP includes a fitness assessment of the cleaner fish prior to handling activities[81], approved by a registered veterinarian or aquatic animal health professional.

For the specific handling activities listed below, the fitness assessment shall be carried out:

a. within a two-week period prior to transport or treatment that requires handling of the cleaner fish, except when the same type of treatment is repeated, in which case the assessment shall be carried out at least once a month after the initial treatment;

b. within a two-week period prior to net change and passive grading.

[81] An exemption applies to handling activities related to health examinations (e.g. health assessment, parasite counting) and in the case of emergencies (e.g. containment of an escape).

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.6 regarding fish. Please refer to Indicator 4.1.2.6 for a detailed description.

Indicator:	Requirement:
4.1.2.23	The UoC shall ensure that the HMP considers crowding activities with the intention of preventing stress, injury and mortality. Crowding activities shall be carried out: a. under supervision; and b. for a maximum of two hours. An exception applies where a registered veterinarian or aquatic animal health professional demonstrates that exceeding two hours of crowding does not negatively impact cleaner fish welfare, in which case the maximum time period shall be defined by the registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- Prior to the crowding activity, the impacts of the cleaner fish should be discussed and an action plan developed to ensure the cleaner fish are handled appropriately.
  - This may include moving the hides or refuges to one side of the net prior to the crowding.
- This clause overlaps with Indicator 4.1.2.7 regarding fish. Please refer to Indicator 4.1.2.7 for a detailed description.

Indicator:	Requirement:
4.1.2.24	The UoC shall ensure that the HMP includes a water quality monitoring process according to **Appendix 12 (12.3, Table 2).** In the case of live transport[82], monitoring shall be conducted at the point of departure, during transport and on arrival.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.10 regarding fish. Please refer to Indicator 4.1.2.10 for a detailed description.

Indicator:	Requirement:
4.1.2.25	The UoC shall ensure that the HMP includes a visual inspection process to identify abnormal behaviour in relation to the handling activity and defines mitigation measures when identified.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.11 regarding fish. Please refer to Indicator 4.1.2.11 for a detailed description.

Useful Resources

- Gutierrez Rabadan, C., Spreadbury, C., Consuegra, S. & Garcia de Leaniz, C. (2021) Development, validation and testing of an Operational Welfare Score Index for farmed lumpfish Cyclopterus lumpus L. Aquaculture
- Noble, C., Iversen, M. H., Lein, I., Kolarevic, J., Johansen, L. –H., Burgerhout, E., Puvanendran, V., Kousoulaki, K., Aas, G. H., Stene, A. & Espmark, Å. M. (2019). RENSVEL OWI FACT SHEET SERIES: An introduction to Operational and Laboratory-based Welfare Indicators for ballan wrasse (Labrus bergylta). 43 pp.

[82] An exemption applies where live transport after uplift of fish is conducted by a third party outside of the scope of the UoC's certification and the cleaner fish are no longer owned by the UoC, or where monitoring during transport negatively affects aquatic animal health and welfare.

Indicator:	Requirement:

4.1.2.26 The UoC shall ensure that the HMP includes a post-handling evaluation process that considers at least the following:

a) abnormal behaviour; and

b) morphological scores; and

c) moribund aquatic animals and mortalities.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.12 regarding fish. Please refer to Indicator 4.1.2.12 for a detailed description.

Indicator:	Requirement:

4.1.2.27 The UoC shall ensure that the HMP includes acclimatisation measures to prevent sudden changes in water conditions affecting the health and welfare status of the cleaner fish.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.13 regarding fish. Please refer to Indicator 4.1.2.13 for a detailed description.

Indicator:	Requirement:

4.1.2.28 The UoC shall ensure that the HMP includes consideration of the use of appropriate equipment during handling activities to avoid affecting the health and welfare status of the cleaner fish.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:

4.1.2.29 *Indicator applicability: cleaner fish from wild caught origin*

The UoC shall demonstrate that the fishing gear used avoids injuries and unnecessary stress, and that it is suitable for the size and species of cleaner fish being captured.

How do I interpret this requirement?

- The fishing vessel sourcing the cleaner fish should be registered in the region and adhere to the local regulations.
- Cleaner fish should be visually assessed for injuries in their holding facility.

Evidence of implementation should be maintained, e.g.:

- Fishermen should be registered and aware of the transport regulations in their area.
- Records:
  - Fishing vessel.
  - Date of capture.
  - Number of cleaner fish.
  - Assessment of cleaner fish.

Auditors should confirm:

- There are records of the source of the cleaner fish.
- The assessment of the cleaner fish and any communication regarding sourcing of cleaner fish.

Useful Resources

- Norwegian Seafood Research Fund (2018)Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.

Indicator:	Requirement:
4.1.2.30	The UoC shall adhere to a maximum limit of 15 seconds out of water[83].

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.15 regarding fish. Please refer to Indicator 4.1.2.15 for a detailed description.

Indicator:	Requirement:
4.1.2.31	The UoC shall adhere to species-specific limits on maximum fasting duration before any handling[84], according to **Appendix 2 (2.4)[85]**. An exception applies before slaughter where a registered veterinarian or aquatic animal health professional demonstrates that exceeding the fasting duration does not negatively impact cleaner fish welfare, in which case the maximum fasting duration shall be defined in the HMP by the registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- This clause overlaps with Indicator 4.1.2.16 regarding fish. Please refer to Indicator 4.1.2.16 for a detailed description.

[83] An exemption applies to anaesthetised fish.
[84] An exemption applies in exceptional situations of severe weather, adverse environmental conditions (e.g. jellyfish, algal bloom) or during disease events.
[85] An exemption applies where there is no species-specific metric listed in Appendix 2.

Indicator:	Requirement:

4.1.2.32 The UoC shall segregate cleaner fish in advance of any salmonid-specific treatments and ensure they are retained under appropriate conditions.

How do I interpret this requirement?

- Prior to any salmonid-specific treatments, the cleaner fish should be segregated.
  - The hides/refuges should be checked and then moved away from the crowding area.
  - Ensure the dragnet does not include the hides/refuges.

Evidence of implementation should be maintained, e.g.:

- The procedure of salmonid-specific treatments should include how to handle the cleaner fish prior to the start of the treatment.
- Employees should demonstrate awareness of how the cleaner fish are segregated prior to salmonid-specific treatments.

Auditors should confirm:

- Implementation can be verified by cross-checking the procedure and with employee interviews.

Useful Resources

- Norwegian Seafood Research Fund (2018) Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.

4.1.3 – Fish – Slaughter and Killing

Indicators 4.1.3.1-4.1.3.8:

Scope: all fish species except cleaner fish (see Indicators 4.1.3.9-4.1.3.16)

Indicator:	Requirement:
4.1.3.1	The UoC shall appoint a staff member responsible for overseeing the implementation of fish health and welfare requirements during **slaughter**.

How do I interpret this requirement?

- If slaughter happens outside of the UoC, then it is not in the scope of the ASC Farm Standard.
- When slaughter occurs at a processing plant, the processing plant is responsible for appointing a member of staff to oversee the slaughter process.
- This clause overlaps with Indicators 4.1.1.2 and 4.1.1.3 regarding training. Please refer to Indicators 4.1.1.2 and 4.1.1.3 for a detailed description.

Auditors should confirm:

- Training records
- Verify the appointment of a certified staff member responsible for welfare oversight.
- They have appropriate training (see Indicator 4.1.1.2).
- Confirm they are monitoring effectiveness and documenting all welfare-related procedures.

Useful Resources

N/A

Indicator:	Requirement:
4.1.3.2	The UoC shall ensure all fish, including fish not destined for human consumption, are stunned prior to killing.
4.1.3.3	The UoC shall define the maximum time between stunning and killing and shall ensure the time is as short as possible so it does not negatively impact fish welfare.
4.1.3.4	The UoC shall ensure all fish, including fish not destined for human consumption, are stunned according to the applicable species-specific methods and usage requirements outlined in **Appendix 12 (12.4, Table 5).**
4.1.3.5	*Indicator applicability: UoCs where the species-specific transition period for permitted stunning methods has ended* The UoC shall ensure that at least 95% of the fish lose consciousness immediately after stunning (see Indicator 4.1.3.4), and any remaining conscious fish are re-stunned. Unconsciousness shall persist until the fish are killed.
4.1.3.6	*Indicator applicability: UoCs where the species-specific transition period for permitted stunning methods has ended* The UoC shall ensure that stunning (see Indicator 4.1.3.4) and killing are effective by verifying the absence of all of the following: a) opercular movements; and b) eye movements; and c) body movements (except for involuntary muscular spasms); and d) reaction to a physical stimulus.
4.1.3.7	*Indicator applicability: UoCs where the species-specific transition period for permitted stunning methods has ended* The UoC shall have measures in place to immediately respond to ineffective stunning (see Indicator 4.1.3.4) or killing and shall implement appropriate corrective actions to prevent recurrence.

How do I interpret these requirements?

- Slaughter is generally a two-stage process:

- The aquatic animal is first stunned to make it insensible to pain.
- Killing is then carried out.

- Aquatic animals are to be killed as soon as possible after stunning to avoid unnecessary suffering.
  - "Fish Slaughter Under the ASC Farm Standard" is a video available on YouTube or the ASC Programme Centre.
- Stunning methods are required to induce immediate or rapid unconsciousness.
- Ice-slurry is not an approved stunning method but can be used as a killing method after immediate or rapid unconsciousness.
- Brain perforation techniques such as 'spiking', 'ikejime' involve instruments that physically perforate the brain or medulla oblongata, causing severe and irreversible damage and leading to almost immediate stunning and death.
- Ikejime (also known as Ikijime) is generally not classified as a percussive stunning method. It is usually treated as its own category, often described as:
  - Destruction of the brain or medulla oblongata, and can be followed by
  - Spinal cord destruction (shinkei-jime), and often
  - Bleeding (exsanguination).
- A percussive method involves delivering a forceful blow to the head to stun or kill the animal. In fish welfare guidance, a firm knock to the head and brain spiking are typically listed as separate methods, even though both act on the brain.

Table 29: Definitions of different types of slaughter or euthanasia for fish slaughter.

Method	Category
Clubbing/knocking on the head	Percussive stunning/killing
Ikejime	Mechanical brain destruction/ spiking or destruction of the medulla oblongata
Ikejime & shinkei-jime	Destruction of the brain or medulla oblongata followed by spinal cord destruction

- All the techniques in the table above, when accurately performed, may result in rapid loss of sensibility and can therefore be compatible with good fish welfare.
- Manual percussion with a solid tool or “priest” can be used for small numbers of fish.
- An overdose of anaesthetic can also be used to kill fish. However, not all anaesthetics can be used in fish that are destined for human consumption.
- Approved methods of stunning for each species are outlined in Appendix 12 (Table 5).
- An effective stun is determined by the loss of consciousness using an electroencephalogram (EEG) measured in a laboratory, which is not practicable at a site level.
- To ensure that at least 95% of the fish are stunned before killing, the sample size should accurately reflect the scale of the harvest operations. Variable sample sizes per harvest day may be accepted, provided that justification is given based on the specific scenarios. Stunning effectiveness should be assessed by confirming signs of unconsciousness:
    - Loss of balance or coordination.
    - Reduced or absent reflex responses.
    - Cessation of opercular movements (in succession and with rhythm).
    - Absence of eye roll.
- The use of body movement as an indicator for the effectiveness of stunning or killing can be misleading as muscular spasms often occur in unconscious or dead fish.
- Body movements indicating struggling, a swimming activity or efforts to remain upright or regain equilibrium are relevant movements to watch out for and that indicate consciousness. Visual assessment comparing stunned and non-stunned fish:
- Body movements indicating struggling, a swimming activity or efforts to remain upright or regain equilibrium are relevant movements to watch out for and that indicate consciousness.
- Checks on stunning effectiveness should be carried out;
    - At the beginning of the operation and after any break,
    - On one fish at a time.

	Stunned	Non-stunned
Movements	Muscle twitches	Flapping
Breathing	Gasping, absent regular opercula movements	Regular opercula movements
Eye roll	Absent	Eye movement when rolled
Reactions to handling	None	Reactive
Reaction to tail pinch	None	Reactive
Swim response	Absent	Evident
Equilibrium	Absent	Evident

- The requirement to stun the fish before the killing also applies to fish not destined for human consumption e.g. wild species, cleaner fish, moribund fish.
- Ensure there is no chance of recovery of consciousness before fish death:
  - Minimise the stun to kill time to less than one second.
  - Consider that stun and kill can occur together, for example, pneumatic stunning with automatic gill cutting, but they are distinct operations.
  - Killing methods are carried out after stunning and include gill cutting, decapitation or ice slurry.
- If there is uncertainty about whether a fish is unconscious, the stunning should be repeated or the harvest should stop to verify stun parameters before proceeding, e.g. more than 5 fish in 10 seconds requiring re-stun
  - Or if possible use an alternative backup method, e.g. a priest.
- The procedure for stunning and killing should be outlined in the HMP, or at a processing site in a dedicated procedure.
  - The procedure should include corrective action in case of potential failures.
    - For electrical stunning, machines should adhere to manufacturers recommendations for that species, or if not available, to documented electric stunning parameters from research.

Table 30: Electrical stunning methods which have been validated in the laboratory by EEG to prove that unconsciousness was reached within 1 second.

Species	Method	Parameters	Followed by killing method	Reference
Rainbow trout	In water electric stun (two submerged stainless-steel electrodes)	30-60 seconds of 0.84 $A_{RMS}dm^{-2}$and 10.2 V_{RMS} cm Stun to maintain unconsciousness: ≥30 s, the electrical field strength (10.2 VRMS cm^{-1}) and the current density (0.84 ARMS dm^{-1}respectively). $^{-1}$	Not detailed in report	Hjelmstedt et al (2022) [86]
European sea bass	In water electric stun (electric plate)	3.3 Arms/dm2 (sinusoidal 50 Hz or pulsed square wave AC,133 Hz, 43% duty cycle) for 10 seconds	Ice slurry	Lambooij et al (2008)[87]
Turbot	Electric dry stunner with hanging electrodes	2.3 ± 0.91 A_{rms} by applying 122.6 ± 8.0 V_{rms} for 1 second Or 1.3 ± 0.4 A_{rms} for 1 s and 0.6 ± 0.3 A_{rms} for 19 seconds	Ice slurry	Daskalova et al (2016)[88]
Atlantic salmon	Electric dry stunner with hanging electrodes	A combined AC and DC supply minimum 0.5s recommended using currents of 668 mArms and ≈107 Vrms	Gill cutting*	Lambooij et al (2010)[89]
Atlantic salmon	In water electric stun	high voltage stunning, using 200 V/m for 1 second or low voltage stunning at 50–25 V/m for 3 and 12 seconds	Gill cutting*	Robb & Roth (2003)[90]
Nile tilapia	In water electric stun	t ~14 VRMS cm− 1 and a current density ~1.1 ARMS dm− 2 for 30 s	Gill cutting and ice slurry	Sundell, E. et al (2024)[91]

* Adapted killing method from reference article.

[86] Hjelmstedt, P. et al (2022) Assessing the effectiveness of percussive and electrical stunning in rainbow trout: Does an epileptic-like seizure imply brain failure? Aquaculture, 552. https://doi.org/10.1016/j.aquaculture.2022.738012
[87] Lambooij, B. et al (2007) Evaluation of electrical stunning of sea bass (Dicentrarchus labrax) in seawater and killing by chilling: welfare aspects, product quality and possibilities for implementation. Aquaculture Research, Vol 39, p. 50-58. https://doi.org/10.1111/j.1365-2109.2007.01860.x
[88] Daskalova, A.H. et al (2016) Effectiveness of tail-first dry electrical stunning, followed by immersion in ice water as a slaughter (killing) procedure for turbot (Scophthalmus maximus) and common sole (Solea solea). Aquaculture, Vol 455, p.22-31. https://doi.org/10.1016/j.aquaculture.2015.12.023
[89] Lambooij, E. et al. (2010) Percussion and electrical stunning of Atlantic salmon (Salmo salar) after dewatering and subsequent effect on brain and heart activities. Aquaculture, Vol 300, p. 107-112. https://doi.org/10.1016/j.aquaculture.2009.12.022
[90] Robb, D.H.F. & Roth, B. (2003) Brain activity of Atlantic salmon (Salmo salar) following electrical stunning using various field strengths and pulse durations. Aquaculture, Vol 216, p. 363-369. https://doi.org/10.1016/S0044-8486(02)00494-5
[91] Sundell, E., Brijs, J. & Grans, A. (2024) The quest for a humane protocol for stunning and killing Nile tilapia (Oreochromis niloticus). Aquaculture, Vol 593. https://doi.org/10.1016/j.aquaculture.2024.741317

Evidence of implementation should be maintained, e.g.:

- Employees should demonstrate knowledge confirming the stun and kill monitoring.
- Records:
  - Employee training (see Appendix 12, Table 1)
  - Slaughter monitoring, e.g.:
    - Verification and registration of stunning and killing.
    - Observation of signs of unconsciousness.

Auditors should confirm:

- Monitoring of stunning and slaughter in conformance to the requirements.
- Records, employee interviews and observations of stunning and slaughter operations during the audit should demonstrate the implementation of the requirements.

Useful Resources

- Farm Animal Welfare Committee- UK Government (2014) Opinion on the Welfare of Farmed Fish at the Time of Killing. Technical report 36pp.
- Humane Slaughter Association. (2016) Signs of Recovery. Blog.
- The EFSA Journal (2009) Scientific Opinion of the Panel on Animal Health and Welfare on a request from the European Commission on Species-specific welfare aspects of the main systems of stunning and killing of farmed carp. Scientific Opinion 37pp.
- Humane Slaughter Association. (2018) Humane Harvesting of Halibut. Technical Report 5 pp.
- Aquatic Life Institute (2023) Stunning and Slaughter: Best Practices for Animal Welfare in Aquaculture. Report 4pp.
- De La Rosa, I., Castro, P. & Ginés, R. (2021). Twenty Years of Research in Seabass and Seabream Welfare during Slaughter. Animals. 11. 2164.
- Kestin, S., Devis, J. & Robb, D. (2002). Protocol for assessing brain function in fish and the effectiveness of methods used to stun and kill them. The Veterinary record. 150. 302-7.
- Jung-Schroers, V., Hildebrandt, U., Retter, K. *et al.* (2020) Is humane slaughtering of rainbow trout achieved in conventional production chains in Germany? Results of a pilot field and laboratory study. *BMC Veterinary Research* 16, 197.

- Barrento, S., Pedrazzani, A., Molento, C., & Quintiliano, M. (2023). Tilapia behaviour & welfare indicators: from foraging to humane slaughter [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/

Indicator:	Requirement:
4.1.3.8	The UoC shall maintain records of the activities carried out under Indicators 4.1.3.5 and 4.1.3.6.

No additional guidance is provided for this Indicator.

Indicators 4.1.3.9-4.1.3.18:

Scope: Cleaner fish

Indicator:	Requirement:
4.1.3.9	The UoC shall appoint a staff member responsible for overseeing the implementation of cleaner fish health and welfare requirements during **slaughter**.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
4.1.3.10	The UoC shall ensure all cleaner fish are stunned prior to killing.
4.1.3.11	The UoC shall define the maximum time between stunning and killing and shall ensure the time is as short as possible so it does not negatively impact cleaner fish welfare.
4.1.3.12	The UoC shall ensure all cleaner fish are stunned according to the methods and usage requirements outlined in **Appendix 12 (12.4, Table 5).**
4.1.3.13	The UoC shall ensure that at least 95% of the cleaner fish lose consciousness immediately after stunning, and any remaining conscious fish are re-stunned. Unconsciousness shall persist until the cleaner fish are killed.
4.1.3.14	The UoC shall ensure that stunning and killing are effective by verifying the absence of all of the following: a. opercular movements; and b. eye movements; and c. body movements (except for involuntary muscular spasms); and d. reaction to a physical stimulus.
4.1.3.15	The UoC shall have measures in place to immediately respond to ineffective stunning or killing, and shall implement appropriate corrective actions to prevent recurrence.

How do I interpret these requirements?

- This clause overlaps with Indicators 4.1.3.2 to 4.1.3.5 regarding fish. Please refer to Indicators 4.1.3.2 to 4.1.3.5 for a detailed description of slaughter.
- In addition to the interpretation supplied in Indicator 4.1.3.2 to 4.1.3.5, there are additional requirements for cleaner fish. These include:
  - The cleaner fish should be removed prior to the salmonid stunner system.
  - The cleaner fish should undergo a specific stunning and killing process.
  - Cleaner fish are to be immediately killed after stunning to avoid unnecessary suffering.
  - The time from stunning and killing should be assessed and defined to ensure it is as short as possible.

Useful Resources

- van de Vis, H; Reimert, H; Grimsbø, E; Gerritzen, M; Foss, A; Roth, B. (2024) NOFIMA Electrical stunning and killing of lumpfish with commercial waterbath and dry stunners. Nofima Technical Report.

Indicator:	Requirement:
4.1.3.16	The UoC shall maintain records of the activities carried out under Indicators 4.1.3.13 and 4.1.3.14.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
4.1.3.17	The UoC shall re-use cleaner fish where possible and under the following conditions: a. re-use shall only occur once; and b. re-use shall only occur within the site or the ABM (see Indicator 4.5.1); and c. re-use shall only occur if the outcome of a health assessment indicates low risk of disease transfer. The health assessment shall: i. consider the health status of the salmon and the cleaner fish at the origin and destination sites; and ii. be conducted no longer than two weeks before re-use; and iii. be approved by a registered veterinarian or an aquatic animal health professional; and d. cleaner fish are segregated from the salmon before transfer to the destination site.

How do I interpret this requirement?

- Prior to the end of the salmon production cycle, discuss with the veterinarian or aquatic animal health professional to decide if the cleaner fish are to be re-used or killed.
  - This will depend on:
    - If there are suitable sites for re-use within the same site or ABM (see Indicator 4.5.1).
    - The disease history of the cleaner fish.
    - The disease history of the salmon.

- Whether the cleaner fish can be re-used within two weeks from being separated from the original salmon companions.
- The approval by the registered veterinarian or aquatic animal health professional.

Evidence of implementation should be maintained, e.g.:

- Records:
  - The original source of cleaner fish.
  - The date of the addition of the cleaner fish.
  - The date of the end of the salmon production cycle.
  - The approval by the registered veterinarian or aquatic animal health professional.

Auditors should confirm:

- The approval process by reviewing records and cross-checking dates or stocking, disease history, end of salmon production as well as approval records for re-use.

Useful Resources

- Norwegian Seafood Research Fund (2018) Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.

Indicator:	Requirement:
4.1.3.18	The UoC shall ensure that cleaner fish are humanely slaughtered where re-use is not possible. The UoC shall not release cleaner fish into the wild.

How do I interpret this requirement?

- This clause overlaps with Indicators 4.1.3.2 to 4.1.3.5 regarding fish. Please refer to Indicators 4.1.3.2 to 4.1.3.5 for a detailed description of slaughter.
- In addition to the interpretation supplied in Indicators 4.1.3.2 to 4.1.3.5, there are additional requirements for cleaner fish. These include:
  - The cleaner fish should be removed prior to the salmonid stunner system.
  - The cleaner fish should undergo a specific stunning and killing process.

- The dead cleaner fish should be disposed of appropriately.

Useful Resources

- Norwegian Seafood Research Fund (2018)Best Practice Guidelines from the Norwegian Seafood Research Fund. Technical Report 62 pp.
- van de Vis, H; Reimert, H; Grimsbø, E; Gerritzen, M; Foss, A; Roth, B. (2024) NOFIMA Electrical stunning and killing of lumpfish with commercial waterbath and dry stunners. Nofima Technical Report.

Criterion 4.2 – Crustaceans

4.2.1 - Crustaceans - Health and Welfare

Indicator:	Requirement:
4.2.1.1	The UoC shall ensure that all relevant employees are trained on general aquatic animal health and welfare awareness, including biosecurity, according to **Appendix 12 (12.2, Table 1)**.
4.2.1.2	The UoC shall ensure that any person involved in aquatic animal husbandry and handling activities is trained on aquatic animal health and welfare, according to **Appendix 12 (12.2, Table 1)**.
4.2.1.3	The UoC shall ensure that the content of the training in Indicators 4.2.1.1 and 4.2.1.2 is updated as necessary and is approved by a registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- For each employee:
  - The level of training should be appropriate to their role:
    - For all relevant employees: a basic level of awareness of crustacean health and welfare, including biosecurity, is required.
    - For any person involved in aquatic animal husbandry and handling activities: a more advanced level of training on crustacean health and welfare, handling and slaughter practices is required on an annual basis.
  - Evidence of training participation should be maintained:
    - Certificates of attendance.
    - Certificates of competency.
- The trainer should be competent in the topic of aquatic animal health and welfare and the competence should be demonstrable, e.g.:
  - Curriculum Vitae.
  - Records of qualifications.
  - Work experience.
- Best practices on the implementation of the training content should be visible during the audit.
  - Employees should demonstrate adequate knowledge of that content at interviews.

Evidence of implementation should be maintained, e.g.:

- A list of employees and subcontracted personnel involved in aquatic animal husbandry and handling operations.
- Records:
  - Training.
  - Trainer's competence.
  - Certificates of competency.

Auditors should confirm:

- Employees received the required level of training for their roles by cross-checking employees and subcontracted personnel lists with:
  - Training records.
  - Certificates of competency.
  - Trainer's competence.
  - Revision of training resources/contents.
- Adequate level of personnel knowledge of the training content should be verified by:
  - Interviews.
  - Observation of real operations during handling and slaughter of crustaceans.

Useful Resources

- Barrento, S., Pedrazzani, A., Ostrensky, A., & Quintiliano, M. (2023). *Shrimp Welfare Indicators* [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/
- World Organisation for Animal Health (2024) – Competency and Curriculum Guidelines for Community Animal Health Workers. WOAH Report, Paris, 39 pp.
- Camarones Care (2025) What is animal welfare? [Online course] Available at: Camarones Explain and Care - Shrimp well-being

Indicator:	Requirement:
4.2.1.4	The UoC shall calculate survival rate, according to **Appendix 12 (12.6.1)**, and shall adhere to species-specific survival rates, according to **Appendix 2 (2.3)**[92].

How do I interpret this requirement?

- A suitable and reliable PL counting system is important so that the SR measure is meaningful.
- Individual pond survival rates >95% are assumed to result from underestimation of PL number and, consequently, cannot be included in the calculation of the annual average survival.
- Farmers are responsible for all counts, including the stocked PL count and hatchery counts. The stocked PL count needs to be taken when PLs are transferred from the hatchery to the farm, whether they are stocked directly in grow-out ponds or in some intermediate, nursery raceway or pond.

Useful resources (if applicable)

- https://tomota.vn/en/shrimp-survival-rate-calculator
- McKay, H., & McAuliffe, W. (2024) Methods for Pre-slaughter mortality of farmed shrimp. ReThink Priorities: Technical report. 24pp.
- Šimčikas, S., & Waldhorn, D.R. (2020) Farmed shrimp and prawn numbers | Guesstimate

Indicator:	Requirement:
4.2.1.5	The UoC shall only stock batches of crustaceans, including nauplii, larvae, post-larvae and broodstock, that have been tested prior to stocking, comply with applicable legal requirements for diseases of regional concern, and meet legal importation requirements where applicable.

How do I interpret this requirement?

- Testing should be relevant to:
  - The species.
  - The local regulations.

[92] An exemption applies where there is no species-specific metric listed in Appendix 2.

- For example:
  - Early mortality syndrome (EMS), which is also known as acute hepatopancreatic necrosis disease (AHPND).
  - *Enterocytozoon hepatopenaei* (EHP).
  - White spot syndrome (WSS).

- Testing might consist of:
  - Clinical examination of the crustaceans.
  - Laboratory tests:
    - Bacteriology.
    - Molecular biology (e.g. PCR).
    - Histopathology.
    - Virology (e.g. cell culture).
- The designated veterinarian or aquatic animal health professional should determine:
  - The diseases to include in the testing, based on local regulations, scientific literature and/or publicly available information (see interpretation for Indicator 4.2.1.8).
  - The sample size, based on local regulations and/or technical judgement.
- Compulsory governmental testing programme results are acceptable for demonstrating conformance with this requirement.
- The batches of stock do not have to be disease free however, they have to comply with applicable requirements for diseases of regional concern and meet importation guidelines where applicable.

Evidence of implementation should be maintained, e.g.:

- List of relevant diseases for the species in the country (see interpretation for Indicator 4.2.1.8).
- Testing results written report or document that includes as a minimum:
  - The batch of crustaceans being tested.
  - The date of the test.
  - The pathogen tested.
  - The results of the test.
- Records:
  - Purchase.
  - Transportation.
  - Delivery.
  - Stocking.

Auditors should confirm:

- Every batch of crustaceans has been tested by cross-checking the list of relevant diseases for the species in the country with the testing result's written report or document and records.

Useful Resources

- Lee D, Yu YB, Choi JH, Jo AH, Hong SM, Kang JC, Kim JH. (2022) Viral Shrimp Diseases Listed by the OIE: A Review. Viruses.
- The Fish Site (2020) Everything you need to know about EMS in shrimp farming.

Indicator:	Requirement:

4.2.1.6 The UoC shall ensure that a registered veterinarian or aquatic animal health professional periodically visits the site to perform routine checks. Checks shall be carried out at least annually, as well as reactively in cases of crustacean health or welfare concerns.

How do I interpret this requirement?

- Regular veterinarian or aquatic animal health professional visits may fall into two categories:
  - Routine: Performed on a regular basis to monitor the health and welfare of the farmed crustaceans.
  - Reactive: Performed in response to deterioration or concerns for the health or welfare status of the farmed crustaceans.
    - Sites should be prepared to provide the veterinarian or aquatic animal health professional with detailed information about the observed symptoms, recent changes in behaviour, morphology, water quality or mortality and any relevant history of disease or treatments.
    - The site should use reactive health visits to address immediate health or welfare concerns, diagnose underlying causes of problems, and implement targeted interventions to mitigate risks and prevent further spread of disease.
- For routine visits, preparation is recommended to ensure a meaningful outcome from the veterinarian or aquatic animal health professional. Below are some practical considerations:
  - Visit scheduling: Ensure key employees are available during the visit to provide relevant required information and to facilitate adequate follow-up.
    - Designate a senior employee to serve as the primary point of contact for the veterinarian or aquatic animal health professional during the visit.
      - This individual can help coordinate the activity, ensure relevant information is available, assist during the visit and ensure follow-up.
  - Gather and organise relevant information: Compile relevant information about the operations including, for example, species being cultured, production systems, stocking densities, recent health history including treatments, water quality monitoring results, behaviour, morphology and mortalities data, feeding plan, any previous health report and of any ongoing issue.
    - Having this information readily accessible will facilitate discussion and decision-making during the visit.
  - Prepare the UoC for the visit: Ensure the UoC is prepared for the visit and for providing full access to all relevant areas to the veterinarian or aquatic animal health professional.
    - Address any maintenance issues, clean tanks or ponds as needed and ensure clear access to all relevant areas of the facility.
    - Ensure handling and other equipment that might be needed during the visit, such as nets, containers and sampling equipment, is available and in good working condition.

    - Make sure employees are aware of the visit and its objectives and encourage them to proactively participate in it.
- During the visit: Ensure relevant information is discussed with the veterinarian or aquatic animal health professional and that the visit includes all relevant areas within the UoC.
- After the visit: Follow up on any recommendations or actions discussed during the visit.
    - Implement any necessary revisions or changes to management practices, treatment protocols, or facility conditions based on the veterinarian or aquatic animal health professional's feedback and any sample or testing results
- Continuous improvement: Use the insights gained from the veterinarian or aquatic animal health professional visit to identify opportunities for continuous improvement in health and welfare management.

Evidence of implementation should be maintained, e.g.:

- Health reports.
- Testing results.
- Records:
    - Veterinarian or aquatic animal health professional qualifications.
    - Veterinarian or aquatic animal health professional visit.
    - Recommendations or actions discussed during the visit.

Auditors should confirm:

- The qualifications of the veterinarian or aquatic animal health professional and cross-check the frequency of visits with records.
- Existence of health reports and testing results.

Useful Resources

N/A

Indicator:	Requirement:

4.2.1.7 *Indicator applicability: every UoC using feed*

The UoC shall develop and implement a feeding plan which includes at least the following:

a) time and frequency of feeding; and

b) feed rations; and

c) feeding methods; and

d) different environmental conditions; and

e) prevention of the use of feed which has expired, spoiled or shows signs of excessive leakage; and

f) feed types for the nutritional needs and life stages of the species.

An exception applies to (f) when such feeds are not available, in which case the UoC shall use feed suitable for aquatic animals with similar nutritional needs.

How do I interpret this requirement?

- The feeding plan:
  - Outlines the site's feeding strategy.
  - As a minimum, it should include the following parameters:
    - Time and frequency, e.g. at daybreak and early afternoon (06:00 am and 01:00 pm).
    - Feed rations, e.g. feed type and daily amount.
    - Feeding adaptation to fit different life stages, e.g. maturation diets for black tiger with excellent digestible protein, essential fatty acids, cholesterol and chemo-attractant properties similar to which are found in natural food sources in the crustacean habitat.
    - Feeding adaptation to fit different ambient conditions, e.g. at times of crustacean stress due to water quality issues, it is accepted to reduce feeding by 50% or completely stop feeding for 2 to 4 days.
  - Should include considerations to guarantee the good working order of mechanical equipment used to deliver feed, e.g. scheduled maintenance checks of automatic feeders.
- The UoC should document the rationale for changes in the feeding plan to better inform management decisions.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Purchase.

- Transportation.
- Delivery.
- Stocking.
- Maintenance.
- Environmental and health.
- Feeding periods (time and frequency).
- Feeding rations.

- Employees should demonstrate adequate knowledge of the feeding plan.

Auditors should confirm:

- Feeding plan includes the minimum required parameters and its implemented:
  - Implementation can be confirmed by cross-checking the plan with records, information from employee interviews and observations.

Useful Resources

- Tacon, A.G.J., Jory, D. and Nunes, A. (2013) Shrimp feed management: issues and perspectives. In M.R. Hasan and M.B. New, eds. On-farm feeding and feed management in aquaculture. FAO Fisheries and Aquaculture Technical Paper No. 583. Rome, FAO. pp. 481–488.
- Barrento, S., Pedrazzani, A., Ostrensky, A., & Quintiliano, M. (2023). *Shrimp Welfare Indicators* [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/

Indicator:	Requirement:

4.2.1.8 The UoC shall develop, implement and maintain a site-specific Health and Welfare Management Plan (HWMP), approved by a registered veterinarian or aquatic animal health professional, with the intention of preventing disease outbreaks and ensuring the good health and welfare of farmed crustaceans.

The HWMP shall include all of the following:

a. disease monitoring; and

b. response, including quarantine, treatment, and humane culling; and

c. mechanisms to report to relevant authorities where required; and

d. biosecurity risks; and

e. predation risks.

The HWMP shall be reviewed:

f. at least annually for sites with cycles under one year or using continuous production methods; or

g. after each cycle for sites with longer cycles or all-in-all-out production methods.

Where the review determines that changes are required, the HWMP shall be revised.

How do I interpret this requirement?

- The Health and Welfare Management Plan (HWMP):
  - Aims to support the development and implementation of preventive, rather than remedial, actions that ensure good crustacean health and welfare.
  - Is to be developed by the UoC in collaboration with a veterinarian or aquatic animal health professional who approves it.
- For developing and establishing a site-specific disease monitoring, response and reporting mechanism within the plan, the UoC should consider:
  - Developing standardised health and welfare monitoring protocols.
    - This may involve conducting visual inspections, monitoring OWIs and performing diagnostic tests for pathogens.
  - Producing and maintaining detailed records.
    - Including records of health observations, diagnostic test results, treatments administered, mortalities, and other relevant data.
      - It is recommended to use a centralised database or electronic system for efficient data management and retrieval.
  - Implementing an early detection system.
    - To detect signs of disease outbreaks or abnormal health conditions promptly.

        - This could include environmental monitoring tools.
    - In areas where access to diagnostic capacity is limited, signs which are visible and obvious can be used to perform diagnoses.
- Establishing response protocols for responding to disease outbreaks or health emergencies.
    - Outlining procedures for:
        - Quarantine.
        - Implementing strategies for treatments or others (e.g. culling affected batches of crustaceans, see interpretation for Indicator 4.2.3.2)
        - Notifying relevant stakeholders, including other sites in the vicinity and the authorities.
- Establishing communication channels.
    - Effective communication channels should be implemented for reporting health-related issues both internally within the facility and externally to relevant authorities (e.g. WOAH-notifiable diseases) or stakeholders.
        - Employees should understand their roles and responsibilities in reporting and responding to disease events.
- Maintaining a readily accessible notification list.
    - Including contact names numbers and emails for key employees and other relevant stakeholders.
        - The list should be kept up to date to ensure quick and efficient communication during emergencies.

o For developing a site-specific biosecurity mechanism within the plan, the UoC should consider:

- Determining the objectives and scope of the biosecurity mechanism.
- Identifying relevant regulatory requirements.
- Gathering information about the site, including an up-to-date layout of buildings and production units identifying the possible movements of animals, animal products, animal waste, water, feed and equipment, material or vectors.
- Identifying potential transmission pathways into, within and from the site.
- Carrying out a risk analysis to identify and evaluate disease threats and ensure that the plan addresses them.
    - A risk analysis can be carried out wholly or only partially, e.g. disease transmission during transportation.
        - This will depend on the objectives of the biosecurity mechanism.
- Identifying mitigation measures and assessing their effectiveness and their management requirements.
- Establishing emergency procedures in the event of a biosecurity failure.

- Defining internal and external communication procedures, roles and responsibilities.
- Creating a monitoring and internal audit schedule.
- Carrying out performance evaluations.
- Developing procedures (e.g. Standard Operating Procedures, 'SOPs') to support the implementation of the mitigation measures and the biosecurity mechanism.
- Training employees in the different elements of the biosecurity mechanism.
- Maintaining a record-keeping system that provides evidence of compliance with the biosecurity mechanism.

o For developing predator control measures within the plan, the UoC should consider:

- Identifying potential predators.
  - Create a list of the predators that are present in the area and that might interact with the UoC.
    - Predators may include birds, mammals, reptiles, and other aquatic species known to prey on crustaceans.
- Assessing the risk of predation.
  - Evaluate the risk posed by each predator species identified based on factors such as proximity to the site, population size, means of accessing the site, likelihood of predation, etc.
- Implementing predator control measures.
  - Develop and implement predator control measures tailored to the specific risks identified. This may include:
    - Physical barriers such as nets, fences or screens to prevent access to crustacean tanks or ponds.
    - Scare tactics such as visual deterrents to discourage predators from approaching the facility.
- Implementing ongoing monitoring and surveillance.
  - To detect predator activity and intervene as needed.
- Regular reviewing and revision.
  - Based on the outcome of the ongoing monitoring and surveillance.
  - Adjustments to the measures should be made when the results of monitoring indicate the need to optimise protection for crustaceans and the containment system.
- Collaborating with local authorities or local wildlife agencies to address predator issues in the surrounding area.

o A periodic review and, if necessary, a revision of the HWMP should be conducted in response to changes in farming activities or external factors or as directed by the veterinarian or aquatic animal health professional.

- As a minimum, the review should occur annually.

- The UoC should develop feedback mechanisms to inform the review, e.g. proactively seeking feedback from employees and subcontracted personnel, such as the harvest team, on the operationalisation of the site-specific biosecurity mechanism.
- For a single producer overseeing multiple UoCs in a shared waterbody, a unified HWMP that incorporates site-specific details is acceptable; however, for larger companies managing multiple UoCs in one country, while common plans may apply, it is crucial to ensure HWMP adaptation to individual site circumstances, particularly in aspects like biosecurity measures, disease surveillance programmes and monitoring systems.

Evidence of implementation should be maintained, e.g.:

- The HWMP includes the required five minimum considerations above and all relevant records associated with the HWMP implementation.
- Continuous improvement.
- The auditor needs to be assured that the farm is not contaminating or spreading disease to the surrounding environment, has enacted good prevention measures adapted to the localised risks and has mechanisms to prevent the spread of infections from one pond to another.
- For example, if a small-scale farm, upon experiencing mortality events likely to be caused by white spot disease (WSD e.g., as determined using signs which are visible and obvious and/or quick pond-side tests), they know not to discharge water to the natural environment.
- Employees are:
    - Familiarised with the HWMP and the feedback mechanisms for its review by conducting employee interviews and observations.
    - Trained on the site-specific biosecurity mechanism by reviewing employees' training records, conducting employees' interviews and observations.

Auditors should confirm:

- The HWMP includes the required five minimum considerations above and all relevant records associated with the HWMP implementation.
- Employees are:
    - Familiarised with the HWMP and the feedback mechanisms for its review by conducting employee interviews and observations.
    - Trained on the site-specific biosecurity mechanism by reviewing employees' training records, conducting employees' interviews and observations.

Useful Resources

- World Organisation for Animal Health (2022) Collection and Evaluation of Existing Guidelines and Awareness Materials on Aquaculture Biosecurity for Smallscale Farms in the Asia-Pacific Region. Report 36pp.
- World Organisation for Animal Health (2024) Aquatic Animal Health Code. Chapter 1.1. Notification of diseases, and provision of epidemiological information.

Indicator:	Requirement:
4.2.1.8.1	*Indicator applicability: every UoC using feed* The UoC shall ensure the HWMP includes a water quality monitoring process according to **Appendix 12 (12.3, Table 3).**

How do I interpret this requirement?

- Maintaining good water quality is a critical factor when culturing any aquatic organism.
  - Concentrations of substances within the water system that rise above or fall below specific levels can be harmful to crustacean populations.
- Concerning health and welfare, water quality has a dual role as a cause or a consequence of poor health and welfare:
  - Poor water quality can cause health and welfare hazards in an aquaculture facility, e.g. heavy rain promoting quick pH changes in a flow-through system or leaking from equipment in a recirculating aquaculture system (RAS).
  - Poor water quality can also result from poor husbandry practices resulting in a risk to health and welfare, e.g. if stocking density is too high the water quality is likely to deteriorate, especially in closed and semi-closed systems.
- While Table 3 of Appendix 12 of the ASC Farm Standard specifies water quality parameters that should be included in the monitoring process, other parameters may be considered based on the site-specific requirements of the UoC.
- Conformance with maximum and minimum thresholds for the required parameters, customised to suit the species and environmental conditions, should be incorporated as part of the water quality monitoring process.

Evidence of implementation should be maintained, e.g.:

- The water quality monitoring process, that incorporates the minimum elements required, (i.e all required individual parameters at the necessary frequencies) included in the HWMP.
- Records confirming the monitoring of the required parameters and their conformance with maximum and minimum thresholds.
- Employees should demonstrate awareness of the established water quality monitoring process.

Auditors should confirm:

- The water quality monitoring process included in the HWMP incorporates the minimum required elements and is implemented.
- Implementation can be verified by cross-checking the process with records, information from employee interviews and observations.

Useful Resources

- Srinivas, Durbha & Venkatrayulu, Ch. (2023). Water quality management in shrimp aquaculture. Book.
- Cuéllar-Anjel, J., Lara, C., Morales, V., De Gracia, A., & Gracía-Suárez, O. (2010) Manual of Best Management Practices for white shrimp *Penaeus vannamei* farming. OIESA_OSPESCA, C.A. pp. 132.

Indicator:	Requirement:

4.2.1.8.2

Indicator applicability: every UoC using feed

The UoC shall ensure[93] the HWMP includes a morphological monitoring process for live crustaceans.

Monitoring shall be conducted at least once a week, coinciding with any crustacean handling activity, and shall include at least the following scoring parameters:

a. exoskeleton damage, including at least eyes, antennas, appendages and rostrum;

b. hepatopancreas colouration and size;

c. gill colouration;

d. size dispersion/variation;

e. shell blisters and necrosis;

f. full/empty digestive tube and colouration;

g. loss of appendages, categorised according to causes. If categorisation is not possible, the UoC shall record the reason.

An exception applies where deviation from monitoring frequency is justified by any of the following reasons:

h. there is no handling of the crustaceans during the week; or

i. crustaceans are undergoing a disease event and/or being treated; or

j. a documented risk assessment is present which demonstrates that the monitoring frequency is not relevant to the species.

In which case monitoring shall be conducted using cameras or from the side of the culture unit for as many parameters as possible. The reason for any deviation shall be recorded.

How do I interpret this requirement?

- Morphological monitoring is frequently used as an immediate indicator of welfare.
- However, changes in morphology may have a variety of causes and therefore should be further analysed before drawing conclusions.
- Loss of appendages can be segregated according to potential causes e.g. bacterial infection or cannibalism.
- Each of the required morphological parameters should be scored individually. This means each parameter receives its own score.

- A documented risk assessment can be written in which the UoC can outline why a parameter is not relevant for the species they farm.

Evidence of implementation should be maintained, e.g.:

- The morphological monitoring process, that incorporates the minimum elements required, included in the HWMP.
- Records that confirm the monitoring of the morphological monitoring.
  - Where camera technology is used, evidence of use of camera technology for monitoring these parameters.
  - Risk assessment for any parameter is not included in the monitoring process.
- Employees should demonstrate awareness of the established morphological monitoring process.

Auditors should confirm:

- The morphological monitoring process included in the HWMP incorporates the minimum required elements and is implemented.
  - Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.
- Risk assessment available for any parameters not covered in the routine monitoring.

Useful Resources

- Gamberoni, P., Slater, M, J, Bierbach, D., Bögner, M., & Wuertz, S. (2026) Health and welfare monitoring in Whiteleg shrimp (Litopenaeus vannamei) aquaculture. IGB Manual. 26pp.
- Pedrazzani, A.S., Cozer, N., Quintiliano, M.H., dos Santos Tavares, C.P., da Silva, U.A.T & Ostrensky, A. (2023) "Non-Invasive Methods for Assessing the Welfare of Farmed White-Leg Shrimp (*Penaeus vannamei*)" Animals.
- Barrento, S., Pedrazzani, A., Ostrensky, A., & Quintiliano, M. (2023). *Shrimp Welfare Indicators* [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/

[93] An exemption applies immediately after stocking, or under environmental conditions that affect the welfare of the crustaceans or the health and safety of employees. The reason for the exemption shall be recorded.

Indicator:	Requirement:

4.2.1.8.3 *Indicator applicability: every UoC using feed*

The UoC shall ensure the HWMP includes a feeding monitoring process for live crustaceans in accordance with the time and frequency established in the feeding plan (see Indicator 4.2.1.7 a).

How do I interpret this requirement?

- Monitoring behaviours, such as feeding, can be used as an immediate indicator of welfare.
- Active feeding with minimal waste can indicate a healthy population with appropriate feed management.
- Feed motivation can be reduced by stressors, which can lead to reduced feed intake and growth.
- Reduced feeding can also indicate disease or poor water quality.
- However, changes in behaviour may have a variety of causes and therefore should be further analysed before drawing conclusions.
- Feeding can be carried out manually or via automated feeders.
    - Automated /technological feeding should:
        - Monitor satiation and feeding behaviour in real time (e.g. acoustic feeding monitors/gramophones that detect feeding activity and uneaten feed through sound intensity);
        - Respond automatically to welfare-relevant thresholds (e.g. automatic feed cessation when environmental or behavioural parameters fall outside welfare-safe ranges); and
        - Demonstrate continuous conformance with the intent of this indicator.
- System parameters and calibration records can be used as guidance to monitor feeding behaviour using for example:
    - Defined welfare-relevant thresholds and trigger responses (e.g. the feeding activity level or water quality value at which the system adjusts or ceases feeding)
    - Performance data (e.g. FCR, feed waste metrics)
- Records of any deviations from expected feeding behaviour and the response taken.

Evidence of implementation should be maintained, e.g.:

- The feeding behaviour monitoring process which incorporates the minimum elements required is included in the HWMP.
- Records that confirm the monitoring of the feeding behaviour.

- Employees should demonstrate awareness of the established behavioural monitoring process.

Auditors should confirm:

- The behavioural monitoring process is included in the HWMP.
- Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.

Useful Resources

- Darodes de Tailly, J.B., Keitel, J., Owen, M.A.G., Alcaraz-Calero, J.M., Alexander, M.E. & Sloman, K.A. (2021) Monitoring methods of feeding behaviour to answer key questions in penaeid shrimp feeding. Reviews In Aquaculture.
- Li D, Liu C, Song Z, Wang G. (2021) Automatic Monitoring of Relevant Behaviors for Crustacean Production in Aquaculture: A Review. Animals (Basel).
- Barrento, S., Pedrazzani, A., Ostrensky, A., & Quintiliano, M. (2023). *Shrimp Welfare Indicators* [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/

Indicator:	Requirement:

4.2.1.8.4 *Indicator applicability: every UoC using feed*

The UoC shall ensure the HWMP includes a mortality monitoring process which includes at least the following:

a. monitoring and recording of mortalities when spotted; and

b. removal of mortalities when spotted; and

c. conducting a post-mortem analysis for each mortality event; and

d. investigation of mortality events which remain unexplained or unattributed to crustacean health reasons; and

e. collection of moribund crustaceans when spotted and culling according to Criterion 4.2.3.

Where any of the listed items above are not possible, the UoC shall record the reason.

How do I interpret this requirement?

- Moribund crustaceans should be collected using appropriate equipment to prevent further injuries and stress, e.g. hand net according to crustacean size.
- Whole pond/tank health issues should be addressed under a contingency plan for emergency culling.
- Possible causes of several moribund crustaceans should be investigated.
  - A contingency plan for emergency culling should be in place.
- Monitoring for mortality is understood as visual observation of whether there is mortality at the site, e.g. observations of the crustaceans in feeding trays, observations of mortalities at the tank/pond discharge.
- Possible causes that would justify no monitoring or removal of moribunds and mortality when spotted are severe bad weather, or a major equipment failure not related to poor maintenance**.**
- Scrutiny of mortality records and cause determination is essential for preventing further avoidable deaths and improving overall crustacean health and welfare in aquaculture.
- If on-site diagnosis is inconclusive, off-site laboratory diagnosis is required.
- When designing the mortality monitoring process, the UoC should consider carrying out a post-mortem analysis for each mortality event, not necessarily every crustacean.
- A statistically relevant number of crustaceans from the mortality event should be analysed.
  - A statistically relevant number of crustaceans refers to a sample size that is large enough to yield meaningful and reliable results when conducting statistical analysis.

- In other words, the sample size should be sufficient to accurately represent the population being studied and to draw valid conclusions from the data.

- The specific size needed for statistical relevance depends on various factors such as the variability within the population, the desired level of confidence and the statistical methods being used.
  - Typically, larger sample sizes provide more reliable estimates and stronger evidence for drawing conclusions.
- The designated veterinarian or aquatic animal health professional should assist the site in determining the appropriate sample size required for statistical analysis and should conduct all diagnosis.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Mortality monitoring.
  - Mortality removal, including the results of post-mortem analysis and the rationale for determining the sample size required for statistical analysis.
  - Culling.
- The mortality monitoring process, that incorporates the minimum elements required, included in the HWMP.
- Employees should demonstrate awareness of the established mortality monitoring, removal process and culling method.

Auditors should confirm:

- The mortality monitoring process included in the HWMP incorporates the minimum required elements and is implemented.
  - Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.
- Moribunds are collected when spotted and culled following responsible stunning and killing according to Criterion 4.2.3.
  - Implementation can be confirmed by cross-checking the frequency of collection and culling methods with records, information from employee interviews and observations.
- Contingency plan for 'treatment' culling
- Monitoring and removal of mortality in conformance with the frequency required.
  - Records, employee interviews and observations should demonstrate acceptable frequency.

Useful Resources

- McKay, H., & McAuliffe, W. (2024) Pre-slaughter mortality of farmed shrimp. ReThink Priorities: Technical report. 24pp.

Indicator:	Requirement:

4.2.1.8.5

Indicator applicability: every UoC using feed

The UoC shall ensure the HWMP includes a system to identify acceptable, warning and unacceptable levels of health or welfare for:

a. water quality (Indicator 4.2.1.8.1); and

b. morphology (Indicator 4.2.1.8.2); and

c. feeding (Indicator 4.2.1.8.3); and

d. mortality (Indicator 4.2.1.8.4).

Where levels are warning or unacceptable, the UoC shall, where possible, increase monitoring and implement corrective actions to restore levels to acceptable.

How do I interpret this requirement?

- The monitoring system should be tailored to accommodate the species being farmed, their life stage and the UoC's monitoring procedures.
- The traffic light system is an example of a monitoring system. It uses three levels to classify the welfare status of each indicator. These definitions should be understood from the perspective of welfare outcomes for the aquatic animal, not from a production or market perspective:
  - Acceptable (green): No welfare concerns, or only minor deviations with little assumed impact.
  - Warning (amber): A clear welfare concern that requires increased monitoring and corrective action.
  - Unacceptable (red): A severe welfare concern with assumed large consequences for the aquatic animal. Immediate corrective action is required.
- Where an established welfare assessment protocol exists for the species being farmed, the UoC should use it as the basis for their traffic light system.
- The following table lists protocols that can be used to meet the requirements of this Indicator; the UoC may need to supplement where a protocol does not cover all required indicators.

- Where the UoC chooses not to use a recommended protocol (e.g. because a recommended protocol does not exist for their species) the UoC should develop their own scoring system using a recommended protocol as a structural template.
- Thresholds should be based on published scientific literature, the recommendation of a veterinarian or aquatic animal health professional, and/or the ASC water quality reference table. The rationale for chosen thresholds should be documented.

Table 31: ASC's recommended welfare assessment protocols, to be updated over time.

Protocol	**Species**	**Suggested traffic light mapping**	**Indicators not covered by the protocol but are expected by the ASC Indicator 4.2.1.8.2**
Whiteleg Shrimp: Welfare Indicators Scorecards (FAI Academy, 2025) (must enrol into the online course to access the document)	Whiteleg shrimp	Acceptable = Level 0 or 1 Warning = Level 2 Unacceptable = Level 3	Size dispersion/variation Shell blisters and necrosis Digestive tube colouration Feeding behaviour Mortality Turbidity Carbon dioxide Nitrate Metals Minerals Hydrogen sulphide

Applying the traffic light system

- The traffic light system should cover all four indicator categories, and all required individual indicators within each category. Each indicator should receive its own traffic light status (e.g. each morphological parameter is scored individually).
- The following examples demonstrate how a recommended protocol can be used to apply the traffic light system across all four indicator categories. For consistency, this example uses a single protocol (FAI whiteleg shrimp score card) throughout.

Water Quality Indicators:

For example, based on the FAI shrimp score card for shrimp, the traffic light system for three of the indicators could be:

	Acceptable	Warning levels	Unacceptable
Temperature	25.5-32.4°C	14.5-25.4°C or 32.5-35.4°C	≤14.4C or ≥35.5°C
DO	≥65%	49-64%	≤48%
Transparency	35-50cm	21-34cm or 51-59cm	≤20cm or ≥60cm

Morphological Indicators:

For example, based on the FAI shrimp score card for shrimp, the traffic light system for some of the morphological indicators could be (please refer to the original document which also includes more details on how to score each parameter):

Morphological Parameter		Acceptable	Warning levels	Unacceptable
Exoskeleton damage	Eyes	Both eyes look normal	One eye swollen	Both eyes missing
	Antennae	Both antennae appear normal	Both antennae are shorter	A single spotted antenna
	Rostrum	The rostrum is intact	The rostrum is not intact	The rostrum is deformed
	Appendages	No signs of erosion	Darkening and missing swimming legs	Darkened swimming legs
Hepatopancreas colouration and size		Normal size and volume, with fawn or dark brown colour	Slight reduction in volume	The hepatopancreas is pale
Gill colouration		Almost colourless	Darker than normal	Very dark brown or black colour
Full/empty digestive tube		Full	Partially full	Empty

Mortality Classification

Develop a mortality classification system that adjusts to the species, the life stage and the farming context (e.g. the geography or farming system where shrimp are reared). Staff are to be trained in the mortality classification. Broadly, the following groupings can be made:

Infectious:

- Bacterial.
- Viral.
- Parasitic.
- Fungal.
- Amoebic.

Non-infectious:

- Husbandry related (e.g. acclimatisation, etc.)
- Environmental (e.g. extreme temperatures, etc.)
- Predation (e.g. birds, others).
- Physical lesions.
- Moribund.
- Deformities.
- Undiagnosed/unknown.
- Decomposed.
- Sampled.

Mortality indicators

Mortality thresholds should primarily reflect welfare outcomes for the species and life stage being farmed, based on a recommended welfare assessment protocol (see above), published scientific literature, or the recommendation of a veterinarian or aquatic animal health professional.

Historic mortality trends and industry data may be used as supplementary context only and should not serve as the sole basis for thresholds, as this risks normalising poor welfare outcomes rather than measuring welfare against what is achievable.

Mortality thresholds should be based on shrimp numbers, and it is recommended that they are also expressed as biomass thresholds.

The use of both metrics is considered complementary.

Using biomass on its own is discouraged, as small biomasses might lead to inaccurate assessments when shrimp are small.

Create an assessment system such as a traffic light system, for example for shrimp mortality based on the FAI Course:

Acceptable	Warning levels	Unacceptable
≤10 % production mortality	11-25 % production mortality	≥26% production mortality

Evidence of implementation should be maintained, e.g.:

- The assessment system used for the required OWIs that identify ranges of acceptable, warning and unacceptable levels of health or welfare, included in the HWMP.
- Records that confirm the increased monitoring and associated short-term corrective measures.
- Rationale for the grading of the OWIs (e.g.: based on scientific literature available or the recommendation of a veterinarian or aquatic animal health professional).
- Employees should demonstrate awareness of the established assessment system.

Auditors should confirm:

- A recommended welfare assessment protocol is being used, or sufficient rationale has been documented for an alternative approach.
- The assessment system included in the HWMP incorporates the minimum required elements (i.e. scoring each indicator individually) and is implemented at the necessary frequency.
    - Implementation can be verified by cross-checking the system with relevant records, information from employee interviews and observations.
- Where warning or unacceptable results have been recorded, increased monitoring and corrective actions have been documented.
- Where the audit coincides with a scheduled welfare assessment, the auditor should observe the scoring process to verify it is being applied as described.

Useful Resources

- FAI Academy (2025). Whiteleg Shrimp: Welfare Indicator Scorecards 16pp. Course: Shrimp Welfare Indicators | FAI Academy

Indicator:	Requirement:

4.2.1.8.6

Indicator applicability: every UoC using feed

The UoC shall ensure the HWMP includes trend analysis to determine changes in health and welfare over time. This analysis shall consider drivers of the trends, and shall be based on the data analysed in Indicator 4.2.1.8.5 and feedback from the processing plant where relevant.

How do I interpret this requirement?

- The analysis of OWIs data over time, as well as information gathered from post-mortem analysis and the feedback from the processing plant:
  - Allows for the identification of trends that provide insights into factors influencing health, welfare and mortality events.
    - Regular reviews of trends, such as monthly and at least annually or at the end of the production cycle, are recommended.
  - Inform decision-making to improve overall production.
    - The veterinarian or aquatic animal health professional should assist the UoC with the trends analysis and drawing conclusions to build effective corrective measures for improving health or welfare over time.
      - Feedback from the processing plant can, for example, disclose the presence of recurring trends like shell or antenna damage.
      - Sharing observations and feedback with the UoC enables prompt and thorough investigations.

Evidence of implementation should be maintained, e.g.:

- The mechanism or trend analysis included in the HWMP.
- Records that confirm trend analysis has been conducted include as a minimum:
  - Post-mortem analysis.
  - Feedback from the processing plant.

Auditors should confirm:

- The trend analysis mechanism included in the HWMP incorporates the minimum required elements and its outcome is implemented:
  - Implementation can be verified by cross-checking the mechanism with relevant records, information from employee interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:

4.2.1.8.7 *Indicator applicability: every UoC using feed*

The UoC shall ensure the HWMP includes a mortality reduction plan which defines annual targets for both total and unexplained mortalities by considering the results of the trend analysis in Indicator 4.2.1.8.6, and shall implement appropriate actions to meet the annual targets.

How do I interpret this requirement?

- The mortality reduction programme should address the various factors contributing to crustacean mortality.
- When building the program, the UoC should consider:
  - Current mortality rates and causes, including unexplained mortality.
  - Set achievable goals and objectives.
  - Identify priority areas for intervention according to the goals and objectives.
  - Develop strategies addressing priority areas for intervention.
  - Monitor and evaluate progress regularly.
  - Provide employees with training.
  - Foster a culture of continuous improvement.
  - Collaborate with industry experts for knowledge sharing.
  - Seek health professionals' involvement in developing the reduction plan.
- Special attention should be given to unexplained mortalities which may indicate underlying health issues or poor management practices.
  - Identifying and addressing the root causes of unexplained mortalities is essential for improving overall management practices and reducing mortality rates.
- In addition, consistent, clear downward trends in OWIs indicate declining health or welfare.
  - Examples of such trends include a consistent increase in overall morphological scoring, repeated observations of abnormal behaviour, deteriorating water quality with one or more parameters that are outside of the acceptable ranges or increasing mortality.

- If a declining trend is observed, then the UoC should assess the situation and investigate the causes behind those trends.
    - One or multiple issues may be causing the decline, including those of infectious or non-infectious origin.
    - In many cases, poor or inadequate husbandry practices can predispose aquatic animals to succumb to infectious diseases.
    - Also, when declining trends are observed, the UoC is expected to review at least the following husbandry practices if appropriate:
        - Stocking densities.
        - The feeding plan.
        - Water quality.
        - Handling practices.
        - Enclosure characteristics.
        - Environmental enrichment.
        - The rearing environment, for example:
            - Additional aeration.

Evidence of implementation should be maintained, e.g.:

- Mortality reduction programme.
- Long-term aquatic animal health and welfare improvement measures as well as short-term mitigation measures to react to situations of declining health or welfare, included in the HWMP.
- Mortality records that allow for trend analysis for the development of a mortality reduction programme.
- Records of long-term aquatic animal health and welfare improvement measures and short-term mitigation measures to react to situations of declining health or welfare.

Auditors should confirm:

- The mortality reduction programme and the improvement and mitigation measures included in the HWMP incorporate the minimum required elements and that its outcome is implemented:
    - Implementation can be verified by cross-checking the programme and measures with relevant records, information from employee interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:

4.2.1.9 *Indicator applicability: every UoC using feed*

The UoC shall report the following to a registered veterinarian or aquatic animal health professional:

a. all mortality events; and

b. crustacean health and welfare concerns identified during mortality classification.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:

4.2.1.10 The UoC shall report to the relevant authorities if a WOAH-notifiable disease[94] is confirmed at a site, and shall:

a. apply the measures according to applicable legal requirements; and

b. increase disease-monitoring in other batches of crustaceans; and

c. coordinate oversight by a registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- Upon a WOAH-notifiable disease being confirmed, the UoC should consider within its response mechanism included in the HWMP (see Indicator 4.2.1.8) an emergency response procedure for culling the affected batches of crustaceans (see also Indicator 4.2.1.8.4).

Evidence of implementation should be maintained, e.g.:

- HWMP includes site-specific disease monitoring, responses and reporting requirements.
  - Specific considerations should be given to WOAH-notifiable diseases, including an emergency response procedure for culling the affected batches of crustaceans.
- National regulations.
- Records:
  - Reporting to the authorities.

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[94] An exemption applies where the WOAH-notifiable disease is classified as endemic by the relevant authorities and reporting is not required under applicable legal requirements.

- Measures applied.
- Notification to other sites in the vicinity or the ABM.
- Disease monitoring.
- Veterinarian or aquatic animal health professional coordination.

Auditors should confirm:

- The HWMP includes considerations for WOAH-notifiable diseases (see interpretation for Indicator 4.2.1.8.4).
- In case a WOAH-notifiable disease has been confirmed:
  - Reporting to authorities and implementation of regulatory measures.
  - Increased monitoring of other batches of crustaceans.
  - Veterinarian or aquatic animal health professional coordination.
  - If the disease is considered endemic by the relevant authorities and what legal responsibilities the site has in this case.

Useful Resources

- Asia Farming (2022) Common shrimp/prawn diseases, symptoms, treatment. Article.
- World Organisation for Animal Health (2024) Aquatic Animal Health Code. Chapter 1.3. Diseases listed by WOAH.
- World Organisation for Animal Health (2024) Aquatic Animal Health Code. Chapter 1.1. Notification of diseases, and provision of epidemiological information.

Indicator:	Requirement:
4.2.1.11	The UoC shall calculate stocking densities, following the method outlined in **Appendix 12 (12.6.3)**.

How do I interpret this requirement?

- A matrix for stocking density is provided below as an example for how to work out the best stocking density for each UoC however it is not a requirement.
- This matrix assesses whether a shrimp farm's system has the capacity to sustainably support its current or planned stocking density. Fixed density thresholds are not prescribed. Density should be expressed as kg/m³ rather than PL/m² alone, calculated using Appendix 12 (12.6.3). Welfare and environmental indicators are given equal weight to management indicators: good health and welfare of farmed crustaceans is the primary objective.
- Most shrimp stocking density research has been conducted in tanks or RAS systems. Direct extrapolation of those thresholds to earthen or lined pond systems is not scientifically justified. This matrix explicitly differentiates between semi-intensive, intensive, and super-intensive system tiers.

How to score

- Score each indicator 1, 2, or 3 based on current farm conditions. Mark N/A only for indicators genuinely not applicable to the system type. Domains 5 and 6 may never be scored N/A.
  - Score 1 — Inadequate / at risk: Conditions or practices that place crustacean welfare, water quality, or environmental performance at significant risk, or fall below ASC minimum requirements.
  - Score 2 — Marginal / conditional: Conditions or practices that partially meet requirements but require improvement before stocking can be increased or maintained without risk.
  - Score 3 — Adequate / well-managed: Conditions or practices that meet or exceed ASC requirements, demonstrating effective management appropriate to current biomass and declared system intensity tier.

Decision rules

- Supportable (≥70%): System demonstrates adequate capacity. Stocking may be maintained. Continued monitoring and reassessment at each production stage required.
- Conditional (45–69%): System capacity marginal. Stocking may not be increased. Time-bound corrective action plan required. Increased monitoring frequency required.
- Not supportable (<45% OR any Score 1 on a ★ Critical Indicator): Immediate corrective action required. Stocking should not be increased and may need to be reduced. Documented improvement plan required before reassessment.

Table 32: A stocking density matrix for crustacean production to establish stocking density levels that work for each UoC

★ *Critical Indicators: a score of 1 on any starred indicator triggers a 'Not supportable' outcome regardless of overall score. Dawn minimum DO, feeding behaviour scoring (digestive tube fullness and crustacean response to food), gill colouration, hepatopancreas condition, and Vibrio load are among the most sensitive signals that stocking density is exceeding system capacity.*

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
Aeration & Dissolved Oxygen	Dawn minimum DO	4.2.1.8.1	Dawn minimum DO not monitored or regularly falls below 3 mg/L; no corrective action; crustaceans surfacing observed at dawn	Dawn minimum monitored intermittently; occasionally falls below 4 mg/L; response reactive rather than anticipatory	Dawn minimum DO monitored continuously or daily pre-dawn; consistently maintained above 4 mg/L; documented threshold triggers aeration increase or emergency response; thresholds defined in HWMP traffic light system per 4.2.1.8.5	★
	Aeration capacity relative to biomass & system intensity		Aeration system undersized for current stocking density and production stage; no calculation of oxygen demand at peak biomass; system not calibrated to declared intensity tier	Aeration adequate at current biomass but not verified against peak demand; system intensity tier not formally documented	Aeration capacity calculated against peak biomass oxygen demand for the declared system intensity tier; system sized with documented safety margin and verified at each stocking cycle	★
	Aeration distribution & paddlewheel placement		Uneven aeration; significant areas of pond with low DO; no adjustment made for pond size or shape	Aeration reasonably distributed; some low-DO zones persist; partially addressed	Paddlewheel or diffuser placement optimised for pond geometry; DO distribution verified by multi-point monitoring; low-DO zones eliminated or managed	

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
	Backup / emergency aeration	4.2.2.3	No backup aeration; single point of failure in the event of power or equipment failure; HMP does not include contingency plan for system failure	Backup aeration available but not tested regularly or not sufficient to maintain safe DO alone	Backup aeration system in place, tested at defined intervals, and sufficient to maintain minimum safe DO independently; generator or UPS tested; contingency plan for system failure documented in HMP	★
	Algal bloom management	2.6.11 2.6.12	Algal dynamics unmonitored; dense blooms or crashes occur without anticipatory action; DO crashes linked to bloom die-off	Algal biomass monitored visually; some management of fertilisation; bloom crashes partially anticipated	Phytoplankton biomass (Secchi depth or chlorophyll) monitored routinely; fertilisation adjusted to maintain productive but stable bloom; bloom crash risk actively managed	★
Water Exchange & Pond Environment	Water exchange rate & scheduling	2.6.1 2.6.2 App.8 (8.2)	No planned water exchange; exchange reactive only; water quality deteriorates unaddressed	Routine exchange schedule exists but not adjusted for biomass, season, or water quality conditions	Exchange rate planned and adjusted dynamically based on water quality monitoring, biomass, and season; records maintained; tighter thresholds applied in intensive and super-intensive systems (20–50% daily)	
	Sediment quality & benthic load	4.2.2.5	Sediment condition not assessed; visible black sediment, anaerobic zones, or H_2S odour; no pond preparation between cycles	Sediment assessed informally; drying or liming between cycles inconsistent; some benthic loading evident	Sediment quality assessed between cycles; pond dried, limed, and prepared to documented standard; organic loading managed throughout cycle; sludge accumulation monitored	★

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
	Salinity management	4.2.1.8.1 App.12 (12.3, Table 3)	Salinity not monitored or fluctuates widely without management; moulting stress associated with rapid salinity change unaddressed	Salinity monitored; significant fluctuations managed partially; abrupt changes sometimes unavoidable	Salinity monitored and maintained within species-appropriate range per Appendix 12 (12.3, Table 3) thresholds; abrupt changes avoided or managed; moulting periods considered when planning exchange	
	Temperature monitoring	4.2.1.8.1 App.12 (12.3, Table 3)	Water temperature not monitored; extreme temperature events unmanaged	Temperature monitored but no documented management response to extremes	Temperature monitored at least twice daily per Appendix 12 (12.3, Table 3); stocking and feeding adjusted at temperature extremes; acceptable range (25–32.4°C for shrimp) and unacceptable thresholds documented and applied	
	Effluent management	2.6.15 2.6.16 2.6.17 App.8 (8.8 & 8.9)	Effluent discharged without treatment or monitoring; no records of discharge water quality	Effluent partially treated or settled; discharge monitored inconsistently	Effluent treated, settled, or discharged in compliance with documented standards; discharge water quality monitored and recorded; no untreated mass discharge	
Biosecurity & Pathogen Pressure	Biosecurity plan & implementation	4.2.1.8 4.2.2.8	No written HWMP or biosecurity plan for farmed crustaceans; farm open to uncontrolled water	HWMP biosecurity element exists but inconsistently implemented; some high-risk pathways uncontrolled	HWMP includes site-specific biosecurity mechanism for farmed crustaceans per 4.2.1.8(d); water source risk assessed; equipment disinfection, staff protocols, and	★

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
			sources, equipment, or personnel movement		visitor control documented and practised; reviewed at least annually	
	Disease surveillance & early detection	4.2.1.8 4.2.1.8.2 4.2.1.8.3 4.2.1.8.4	No routine health monitoring; disease detected only at mass mortality; no records of health observations; HWMP does not include disease monitoring process	Health monitoring carried out informally; some records kept; early detection inconsistent; HWMP disease monitoring process incomplete	HWMP includes standardised health and welfare monitoring protocols covering visual inspection, Operational Welfare Indicators (OWIs), and diagnostic testing; morphological scoring (weekly), behavioural scoring (daily), and mortality monitoring conducted at required frequency; records maintained and reviewed for trends	★
	Pathogen testing & diagnostic use	4.2.1.5	No pathogen testing at stocking or during cycle; batches of crustaceans not tested for relevant diseases; disease outbreaks managed without diagnostic confirmation	Testing conducted at stocking but not during cycle; diagnostics used reactively after significant losses	Specific pathogen-free (SPF) or tested post-larvae (PL) sourced; batch tested for relevant diseases before stocking per 4.2.1.5; in-cycle testing at intervals or triggered by health indicators; diagnostic results documented and inform management decisions	★
	Post-larval (PL) quality & sourcing	4.2.1.5	Batches of crustaceans stocked without testing for relevant diseases; source hatchery unknown or untested;	PL sourced from known hatchery; quality checked informally; stress test	PL sourced from documented, preferably SPF-certified hatchery; batch tested for relevant diseases per 4.2.1.5; quality assessed by	★

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
			morphological inspection and stress testing not applied	inconsistently applied; testing records incomplete	clinical examination, stress test, and morphological inspection at stocking; results recorded	
	Vibrio & total bacterial load (intensive and super-intensive systems)		Total Vibrio count not monitored in intensive or super-intensive systems; Vibrio-associated mortality or disease events occur without microbiological investigation	Vibrio monitoring conducted periodically but not at defined intervals; results not consistently linked to management decisions	Total Vibrio count monitored at defined intervals (at minimum weekly in intensive/super-intensive systems); maintained below 10^3 CFU/mL; elevated counts trigger probiotic application, water exchange, or feeding reduction; results recorded and trended	★
	Stocking density calibrated to biosecurity risk		Stocking density decisions made without consideration of current pathogen pressure or disease history at site	Disease history noted but not systematically incorporated into stocking decisions	Stocking density decisions informed by site disease history, current pathogen pressure, and season; higher-risk periods result in reduced stocking or enhanced biosecurity measures	
Management Intensity & System Capacity	System intensity tier declared & stocking calibrated accordingly		System intensity (semi-intensive / intensive / super-intensive) not declared; stocking density set without reference to tier-appropriate infrastructure and management; research from tank or RAS systems applied directly to pond systems without adjustment	System intensity tier informally recognised; some calibration to pond size and aeration, but not consistently benchmarked against tier-appropriate density ranges and OWI thresholds	System intensity tier formally declared with documented infrastructure, aeration, exchange rate, and biosecurity commensurate with that tier; density expressed as kg/m^3 and benchmarked against tier-appropriate reference ranges; tank and RAS research data not	★

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
					extrapolated directly to pond systems	
	Feeding management, FCR & feeding behaviour scoring	4.2.1.7 4.2.1.8.3	Fixed feeding schedule regardless of consumption, water quality, or moulting status; no FCR tracking; feeding behaviour scoring process not included in HWMP	Feeding adjusted informally; FCR tracked but deviations not investigated; feeding behaviour scoring monitored informally rather than through a documented daily process	HWMP includes feeding behaviour scoring process monitored daily per 4.2.1.8.3; feed input adjusted to observed consumption and water quality; FCR tracked and within acceptable range; feeding reduced or suspended during moulting periods, low DO events, or disease episodes; records maintained	
	Biomass estimation & density expressed in kg/m³	4.2.1.11 App.12 (12.6.3)	Biomass not estimated between stocking and harvest; stocking density not calculated using the method in Appendix 12 (12.6.3); density tracked only as PL/m² at stocking	Biomass estimated periodically by sampling; Appendix 12 (12.6.3) methodology not consistently applied; kg/m³ not used consistently to drive aeration, feeding, and exchange decisions	Stocking density calculated using the method in Appendix 12 (12.6.3); regular cast-net or trawl sampling used to estimate mean weight and population; biomass expressed as kg/m³ and updated throughout cycle; aeration, feeding, and exchange adjusted to standing kg/m³	★
	Staffing & monitoring capacity	1.2.3 4.2.1.1 4.2.1.2	Insufficient trained staff for reliable daily monitoring; dawn DO checks, feeding observation, and health checks not consistently performed	Core monitoring carried out but gaps exist, particularly at unsocial hours or during staff absence	Sufficient trained staff to conduct daily dawn DO monitoring, feeding observation, health checks, and emergency response at peak biomass; out-of-hours cover documented	★

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
	Production records & cycle review	4.2.1.8.6 4.2.1.8.7	No production records kept; stocking decisions for subsequent cycles not informed by previous performance	Records kept but not systematically reviewed between cycles	Complete cycle records (stocking, feeding, water quality, health events, harvest) maintained and reviewed before each subsequent cycle; stocking density and system intensity tier adjusted based on documented performance	
Behavioural & Physiological Welfare Indicators	Swimming behaviour	4.2.2.7	Abnormal swimming (spiralling, erratic movement, loss of equilibrium, surface aggregation) present at population level; not investigated or recorded	Abnormal swimming observed and noted; investigation inconsistent; not linked to management response	Swimming behaviour observed daily during feeding and health checks; abnormal behaviour at population level triggers immediate investigation of DO, disease, and water quality; linked to stocking review if persistent; recorded as part of HWMP behavioural OWI monitoring	★
	Surface aggregation		Surface aggregation (especially pre-dawn) occurring regularly; treated as normal rather than as a critical DO stress signal	Surface aggregation recognised as a stress indicator; aeration response inconsistent; root cause not always investigated	Pre-dawn or daytime surface aggregation recognised as a primary indicator of DO deficit or acute stress; triggers immediate aeration response and DO measurement; frequency logged and used to assess whether stocking density exceeds system capacity	★

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
	Feeding behaviour scoring, digestive tube fullness & survival rate	4.2.1.4 4.2.1.8.3 4.2.1.8.4	Feeding behaviour scoring process not included in HWMP; daily monitoring not conducted; most crustaceans not reacting to newly-offered food (unacceptable level) not investigated; full/empty digestive tube not assessed; survival rate not tracked	Feeding activity observed during feeding; digestive tube fullness assessed at some health checks; reduced appetite noted informally; survival rate tracked but threshold triggers not defined	HWMP includes feeding behaviour scoring process monitored daily per 4.2.1.8.3; acceptable level: most crustaceans react quickly and move to newly-offered food; unacceptable level: most crustaceans do not react; full/empty digestive tube and colouration assessed at weekly morphological scoring per 4.2.1.8.2; survival rate tracked against cycle-stage benchmarks (target >85% for RAS, >65% for ponds at harvest per 4.2.1.4); sustained decline triggers water quality check and stocking review	★
	Moulting-related vulnerability		Moulting not monitored; soft-shell crustaceans not identified; increased mortality during moulting periods not investigated	Moulting periods recognised; some management adjustment (feeding reduction) but not systematic	Moulting periods identified by observation and expected schedule; feeding adjusted or suspended during peak moulting; aeration maintained at maximum; DO and cannibalism risk assessed; moulting-associated mortality tracked separately	
	Exoskeleton damage: appendages, rostrum, eyes, and antennas	4.2.1.8.2	Exoskeleton damage not assessed as part of morphological scoring;	Exoskeleton damage noted at health checks but not assessed at weekly frequency; not all	Exoskeleton damage (including eyes, antennas, rostrum, and appendages) scored at weekly	

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
			unacceptable-level appendage, rostrum, eye, or antenna damage present at population level without investigation	exoskeleton parameters scored; not linked to density or management	morphological scoring per 4.2.1.8.2 using Table 12 descriptors; loss of appendages categorised according to causes (bacterial infection or cannibalism); population-level prevalence at warning or unacceptable levels triggers review of stocking density, substrate condition, and pathogen pressure	
	Gill colouration	4.2.1.8.2	Gill colouration not assessed as part of morphological scoring; unacceptable-level colour change (pale, yellowish, redness, darkening, whitish spots, erosion) present at population level without investigation	Gill condition assessed at some health checks but not at weekly frequency per 4.2.1.8.2; discolouration or fouling noted; response inconsistent	Gill colouration assessed at weekly morphological scoring per 4.2.1.8.2; warning (some lesions or darkening) and unacceptable (colour change, whitish spots, erosion) levels defined; elevated prevalence triggers investigation of sediment condition, water quality, and pathogen status; gill colouration used as an indicator of cumulative environmental loading relative to stocking density	★
	Shell blisters, necrosis, hepatopancreas colouration & size	4.2.1.8.2	Shell blisters/necrosis and hepatopancreas colouration/size not assessed at weekly morphological scoring; unacceptable level hepatopancreas abnormality (decreased size, colour change,	Shell and hepatopancreas condition noted informally or less frequently than weekly; not all required morphological parameters scored; not linked to	Shell blisters and necrosis, and hepatopancreas colouration and size, assessed at weekly morphological scoring per 4.2.1.8.2; melanisation, cuticular erosion, necrosis, and hepatopancreas abnormality tracked; population-	★

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
			tearing, fluid, or wormlike structures) or tissue necrosis present at population level without investigation	density or environmental assessment	level elevation triggers investigation of sediment quality, Vibrio pressure, and stocking density	
	Physiological stress markers (where diagnostic capacity exists)		No physiological welfare assessment beyond visible indicators; stress-related mortality or disease occurs without physiological investigation	Diagnostic laboratory used reactively after significant mortality; physiological markers not used proactively to assess density-related stress	Where diagnostic capacity is available, physiological welfare markers (e.g. haemolymph glucose, crustacean hyperglycaemic hormone (CHH), oxidative stress indicators, or immune function assays) used at defined intervals or triggered by welfare indicator deterioration; results documented and inform stocking decisions	
Environmental Indicators of Carrying Capacity	DO diurnal range as carrying capacity signal	4.2.1.8.1	Diurnal DO range >8 mg/L or dawn minimum <3 mg/L; indicative of excessive organic loading and algal-driven instability at current biomass; unacceptable per HWMP traffic light system	Diurnal range 5–8 mg/L or dawn minimum 3–4 mg/L; system under stress; carrying capacity likely approached; warning level per traffic light system	Diurnal DO range <5 mg/L and dawn minimum consistently >4 mg/L; system stable; oxygen dynamics indicate biomass within carrying capacity; green level per HWMP traffic light system	★
	Ammonia, nitrite & total organic matter trend	4.2.1.8.1	TAN >1 mg/L or nitrite >0.5 mg/L (semi-intensive); TAN >0.5 mg/L or nitrite >0.1 mg/L (intensive/super-intensive); levels	Ammonia or nitrite periodically elevated; managed reactively; trend not systematically	TAN, nitrite, and total organic matter monitored at tier-appropriate frequency per HWMP; consistently within safe thresholds;	★

Domain	Indicator	ASC Ref	Score 1 Inadequate / at risk	Score 2 Marginal / conditional	Score 3 Adequate / well-managed	Critical Indicator
			rising without management response; total organic matter not monitored in super-intensive systems	reviewed; total organic matter monitored inconsistently	traffic light system amber and red thresholds established; rising trend triggers stocking or feeding review	
	Water transparency (Secchi depth)	4.2.1.8.1	Secchi depth <20 cm (excessive bloom) or >60 cm (bloom collapse); neither condition managed; DO crashes linked to bloom die-off	Secchi depth monitored; outside target range managed partially; fertilisation or exchange adjusted inconsistently	Secchi depth maintained within target range (typically 25–40 cm for marine shrimp); monitored at least twice weekly; deviations trigger fertilisation or exchange adjustment	
	Sediment oxygen demand & H_2S risk	4.2.1.8.1	Sediment condition not assessed; H_2S odour present; black anaerobic layer at pond bottom; no management response	Sediment condition monitored informally; some aeration adjustment; H_2S risk partially managed	Sediment oxidation-reduction status assessed periodically; aeration directed to pond bottom during high-biomass periods; H_2S risk managed through aeration, exchange, and feeding control; sediment condition used as a carrying capacity indicator	★
	pH range & alkalinity	4.2.1.8.1	pH fluctuates widely (daily range >1.5 units) or outside 6.5–8.5 (unacceptable); alkalinity not managed; moulting impaired by low alkalinity	pH and alkalinity monitored; some liming applied; fluctuations partially managed; pH occasionally outside acceptable range (6.5–8.5)	pH maintained within acceptable range (6.5–8.5) with daily fluctuation minimised; alkalinity maintained above 100 mg/L $CaCO_3$ (120 mg/L in intensive/super-intensive); liming programme documented and adjusted to monitoring data	

Notes on application

Assessment timing: this matrix should be completed before stocking, repeated at key production stages (post-larvae to juvenile transition, mid-cycle biomass peak, and pre-harvest), and triggered immediately by any significant water quality event, disease episode, or unexplained mortality.

Indicator:	Requirement:

4.2.1.12 The UoC shall report survival rate related data in accordance with the ASC Data Submission Procedure.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:

4.2.1.13 *Indicator applicability: Penaeus vannamei and Penaeus monodon*

The UoC shall demonstrate that received nauplii, larvae or post-larvae (PL) originates from ablation free (AF) female broodstock according to the sourcing requirements outlined in **Appendix 12 (12.4, Table 4).** This includes an agreement with the hatchery that allows ASC or its designated agents to conduct oversight activities to verify the AF sources within the facility.

How do I interpret this requirement?

- Eyestalk ablation involves physical manipulation or removal of the eyestalk.
- Scope applicable to *Penaeus vannamei* and *Penaeus monodon* species.
- Transition periods span from May 2025 to May 2034, with staged percentages for AF broodstock conformance (see Appendix 12, Table 4).
- The objective is to ensure a gradual shift toward using only AF broodstock, aligning with improved welfare practices.

Evidence of implementation should be maintained, e.g.:

- The monitoring process involves developing and implementing a tracking system to monitor the origin of stock (nauplii, larvae or PL).
- Where feasible, conduct physical audits or site visits of hatcheries to verify by visual inspection conformance with AF broodstock sourcing.
- Hatcheries supplying the stock should provide clear documentation of the broodstock's status (AF or non-AF).

- Maintain records of sourcing, including certificates or declarations from hatcheries confirming broodstock conformance with AF requirements.
- Maintain detailed production logs showing the percentage of stock derived from AF broodstock at each transition phase.

- Employees involved in sourcing should demonstrate understanding to conform with the requirement to ensure they can explain the sourcing process to verify conformance during audits.

Auditors should confirm:

- The monitoring process to confirm that the UoC has a documented system to track and verify the origin of nauplii, larvae, or PL.
- Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.

Useful Resources

- Zacarias, S PowerPoint Presentation

4.2.2 - Crustaceans - Handling

Indicator:	Requirement:
4.2.2.1	The UoC shall develop, implement and maintain a site-specific Handling Management Plan (HMP), with the intent of ensuring good health and welfare of farmed crustaceans. The HMP shall be periodically reviewed and revised as necessary.
4.2.2.2	The UoC shall ensure that the HMP includes all handling activities carried out on site.

How do I interpret this requirement?

- The Handling Management Plan (HMP):
  - Aims to support the development and implementation of preventive, rather than remedial, actions that prevent poor crustacean health and welfare at handling.
    - Examples of handling:
      - Crowding.
      - Sampling.
      - Transportation (including loading, transfer and unloading).
  - Should consider a description of:
    - Processes.
      - A separate process description may be required for outsourced events e.g. live transportation of PL to the site.
    - Equipment.
      - A description of equipment, and verification if applicable may be required for both UoC and outsourced events e.g. harvest equipment.
- If all of the handling processes are covered in the HWMP (Indicator 4.2.1.8) then a separate HMP does not need to be created.

Evidence of implementation should be maintained, e.g.:

- HMP includes standardised handling operations, e.g.:
  - Site-specific description of processes and equipment.
  - Documents:
    - Planning of handling events, e.g.:
      - Emails, reports and site 'whiteboard' communications.

- Handling procedures.

- Monitoring the effectiveness of the HMP.
  - Documents:
    - Handling logs, e.g.:
    - Reports detailing regular observation of crustacean behaviour, environmental parameters and crustacean conditions during and post-handling procedures, including injuries, mortalities or deviations from procedures.
    - Handling incidents reports, e.g.:
      - Emails, reports detailing any incidents during handling procedures, including injuries, mortalities or deviations from procedures.
  - Feedback from staff, e.g.:
    - Emails, anonymous box asking feedback from staff involved in handling procedures regarding their observations and any difficulties encountered.
      - Encourage open communication.

Auditors should confirm:

- The HMP includes a description of the handling processes and equipment and considerations for planning handling events.
- Employees are familiarised with the HMP by conducting employee interviews and observations.
- Existence of handling incident reports, including feedback from staff and discussions regarding handling procedure changes.
- Open communication is encouraged via formal documents and employee interviews and observations.

Useful Resources

- Amatul-Samahah, Md.A., Omar, W.H.H.W., Ikhsan, N.F.M., et al (2020) Vaccination trials against vibriosis in shrimp: A review. Aquaculture Reports.

Indicator:	Requirement:

4.2.2.3 The UoC shall ensure that the HMP includes contingency plans for handling activities, including at least the following:

a. immediate response measures in the case of system failure; and

b. culling response measures (see Indicators 4.2.3.2 and 4.2.3.6); and

c. mass mortality event response measures.

Exception applicability: every UoC using feed

An exception to (b) applies in the extreme circumstances of culling whole ponds for disease control, in which case a solution of chlorine is allowed in a concentration that ensures that death occurs rapidly.

How do I interpret this requirement?

- The contingency plans should consider:
  - Identification of potential failures.
  - Effective corrective measures, e.g.:
    - Backup power generators.
    - Oxygen support.

Evidence of implementation should be maintained, e.g.:

- HMP includes processes' contingency plans.
- Records:
  - Backup system testing.
- Additional oxygen source available.

Auditors should confirm:

- The HMP includes considerations on crustacean health and welfare before handling events, including considerations for the existence of a backup system.
- Presence of a backup system.
- Employees are:
  - Familiarised with the contingency plans by conducting employee interviews and observations.
- Records:

- Backup system testing.

Useful Resources

N/A

Indicator:	Requirement:
4.2.2.4	The UoC shall ensure that the HMP includes consideration of the environmental conditions associated with handling activities, with the intent of preventing handling under adverse conditions that could affect the health and welfare of the crustaceans.

How do I interpret this requirement?

- Examples of considerations of external conditions:
  - Avoid handling in the event of storms.
  - Avoid handling crustacean without using a shade net on a sunny day.
  - Avoid transferring post-larvae during periods where there are less than favourable conditions:
    - Rainfall can quickly alter pond conditions and trigger a chain of events resulting in sub-optimal conditions for crustaceans.
      - Potential for *Vibrio spp.* to flourish, increasing the risks of bacterial infection to the shrimp.
      - Trigger the production of hydrogen sulphide. This is a toxic gas produced by sulphate reducing bacteria and is highly toxic to shrimp.

Evidence of implementation should be maintained, e.g.:

- HMP includes consideration for external conditions necessary to perform handling.
- Records:
  - Weather forecast verification.
- Employees should demonstrate knowledge of the considerations and the verification of external conditions before handling.

Auditors should confirm:

- HMP includes considerations for external conditions for handling and are implemented.

- Implementation can be confirmed by cross-checking the HMP with records, information from employee interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:

4.2.2.5

Indicator applicability: every UoC using feed

The UoC shall ensure that the HMP includes a pond preparation process including at least the following:

a) drying of the pond. An exception applies where areas cannot be dried, in which case they shall be disinfected; and

b) removal of any dead or live aquatic animals from the pond; and

c) removal of excess organic waste; and

d) adjustment of acidic pH; and

e) preparation of the surface of earthen ponds to facilitate oxygenation and UV exposure.

How do I interpret this requirement?

- Draining the pond completely helps in eliminating unwanted organisms and disease**.**
- Areas that cannot be completely drained should be treated with disinfectants to kill any pathogens, e.g.:
  - If a few wet patches are observed after draining the pond, spray these patches with a bleach solution for disinfection, ensuring no harmful bacteria or parasites survive.
- Removing any dead or living aquatic animals helps in preventing disease spread and decay, which can affect the water quality and the health of future pond crops, e.g.:
  - If a few dead crustaceans and some frogs are found, remove all these and dispose of them properly, ensuring the pond is free of any potential contaminants.

- Remove any organic debris such as leaves, branches and sludge. If the pond water is too acidic, agricultural lime (calcium carbonate) may be added to neutralise the pH, making the environment more suitable for crustacean e.g.:
    - After removing leaves and decaying plant matter from the pond bed, the pH level was 5.5. After applying agricultural lime, the pH level rose to approximately 7, a neutral level.
- Tilling the surface of earthen ponds (those with natural soil bottoms) helps to aerate the soil, promoting better oxygenation. It also exposes the soil to sunlight, which helps in killing pathogens and breaking down organic matter through UV radiation.

Evidence of implementation should be maintained, e.g.:

- Records, such as a diary entry confirming:
    - the monitoring of the required parameters for pond preparation and their conformance with acceptable quality levels included in the HMP prior to stocking.
    - the drying period.
    - the addition of lime, if applied.
- The water quality monitoring process, that incorporates the minimum elements required for pond preparation.
- Employees should demonstrate awareness of the established water quality monitoring process during handling.

Auditors should confirm:

- Pond preparation process, that incorporates the minimum elements required, included in the indicator and cross-checking with the handling operations present in the HMP.
- Implementation can be verified by cross-checking the process with records, information from employee interviews and observations.

Useful Resources

- The Fish Site (2016) Management of intensive Vannamei shrimp ponds. Article.

Indicator:	Requirement:

4.2.2.6 The UoC shall ensure that the HMP includes acclimatisation measures to prevent sudden changes in water conditions affecting the health and welfare status of the crustaceans.

How do I interpret this requirement?

- Acclimatisation measures should be designed and maintained, e.g.:
  - Water temperature during transportation should be as close as possible to that which the crustaceans came from.
  - Crustaceans can be released into a small area of the pond 'hapa' or net enclosures in the grow out pond itself for a risk-assessed period to evaluate the capacity of the PL to adjust to the pond conditions.

Evidence of implementation should be maintained, e.g.:

- Acclimatisation measures and monitoring of the water quality according to HMP.
- Records that confirm the monitoring of acclimatisation parameters before stocking.
- Employees should demonstrate awareness of the acclimatisation measures and monitoring process above.

Auditors should confirm:

- The acclimatisation measures included in the HMP incorporate the minimum required elements and are implemented.
- Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:

4.2.2.7 *Indicator applicability: every UoC using feed*

The UoC shall ensure that the HMP includes a visual inspection process to identify abnormal behaviour in relation to the handling activity and defines mitigation measures when identified.

How do I interpret this requirement?

- Visual inspection after handling should be included in the HMP.
  - Crustacean morphology and behaviour can be assessed when verifying the crustacean feeding trays as a minimum requirement.

Evidence of implementation should be maintained, e.g.:

- The monitoring process, that incorporates the corrective actions required, included in the HMP.
- Records that confirm the monitoring of the morphology and behaviour at the feeding trays. A checked box on the monitoring records indicating whether monitoring morphology and behaviour took place or not is accepted.
- Employees should demonstrate awareness of the established behavioural monitoring process.

Auditors should confirm:

- The monitoring process included in the HMP that incorporates corrective actions and is implemented.
- Implementation can be verified by cross-checking the process with relevant records, information from employee interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:

4.2.2.8 The UoC shall ensure that the HMP considers biosecurity risks specific to the types of handling activities and shall include appropriate biosecurity measures to prevent the transfer of disease.

How do I interpret this requirement?

- For developing a site-specific biosecurity mechanism within the HMP, the UoC should consider:
  - Indicator 4.2.1.8.d
  - Biosecurity measures related to the type of handling, e.g.:
    - Equipment segregation.
    - Equipment disinfection.

Evidence of implementation should be maintained, e.g.:

- For developing a site-specific biosecurity during handling the HMP includes the considerations for:
  - Site-specific biosecurity mechanism.
  - Biosecurity specifications related to the type of handling operations.

Auditors should confirm:

- The HMP includes the required minimum considerations above.
- Employees are:
  - Familiarised with the biosecurity considerations in the HMP by conducting employee interviews and observations.
  - Trained on biosecurity specifications related to the type of handling operations by reviewing employees' training records, conducting employees' interviews and observations.

Useful Resources

- Lightner, D.V. (2007), Biosecurity in Shrimp Farming: Pathogen Exclusion through Use of SPF Stock and Routine Surveillance. Journal of the World Aquaculture Society.

Indicator:	Requirement:

4.2.2.9 The UoC shall ensure that the HMP considers predation risks specific to the types of handling activities and shall include appropriate predator control measures.

How do I interpret this requirement?

- For developing a site-specific predator control within the HMP, the UoC should consider:
  - The site-specific characteristics required to be assessed by Indicator 4.2.1.8.e) predator control measures specific to the type of handling, e.g.:
    - Birds scaring devices.
    - Use of appropriate nets sizes while moving crustaceans from one unit/pond to another.

Evidence of implementation should be maintained, e.g.:

- Predator control measures specific to the type of handling operations.
- Verification of mortalities associated with predators during handling operations.

Auditors should confirm:

- The HMP includes the required considerations above.
- Employees are:
  - Familiarised with the predator control considerations in the HMP by conducting employee interviews and observations.
  - Trained on predator control verifications, e.g.:
    - Verification of mortality events specific to the type of handling operations by reviewing employees' training records, conducting employees' interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:
4.2.2.10	The UoC shall ensure that the HMP includes consideration of the use of appropriate equipment during handling activities to avoid affecting the health and welfare status of the crustaceans.

No additional guidance is provided for this Indicator.

4.2.3 – Crustaceans - Slaughter and Killing

Indicator:	Requirement:
4.2.3.1	The UoC shall appoint a staff member responsible for overseeing the implementation of crustacean health and welfare requirements during **slaughter**.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
4.2.3.2	The UoC shall ensure that crustaceans are killed: a. On-farm: immediately after uplift from the pond; or b. After live transport: as soon as possible, provided that transport conditions follow the HMP requirements. Killing shall be carried out by: c. by immersion in an ice slurry bath; or d. through an electrical stunning device followed by immersion in an ice slurry bath.
4.2.3.3	The UoC shall ensure crustaceans are killed prior to processing.
4.2.3.4	The UoC shall ensure ice slurry baths are maintained at ≤4°C at all times and crustaceans are immersed for an appropriate amount of time to be killed effectively.
4.2.3.5	The UoC shall ensure that if electrical stunning devices are used for stunning, the manufacturer's instructions are followed.
	Guidance for 4.2.3.6 can be found after Indicator 4.2.3.8.
4.2.3.7	The UoC shall ensure that killing has been effective by verifying the absence of coordinated leg and body movements.

4.2.3.8 The UoC shall have measures in place to immediately respond to ineffective stunning or killing, and shall implement appropriate corrective actions to prevent recurrence.

How do I interpret this requirement?

- These indicators do not prohibit:
  - Transporting live shrimp to a processing facility- while ensuring that temperature, oxygenation, stocking density and duration are considered and follow the HMP requirements.
  - Shrimp arriving at the processing facility while still alive.
- These indicators do require:
  - That crustaceans are killed using one of the approved methods specified in Indicator 4.2.3.2.
  - That crustaceans are not subjected to any processing activities (e.g., peeling, cooking, freezing, cutting, or similar operations) while alive.
  - That killing takes place before the start of any processing activity.
- Option A – Killing at the processing facility
  - Shrimp are harvested and transported alive to the processing facility. Upon arrival, they are killed using one of the methods permitted under Indicator 4.2.3.2 before any processing activities begin.
- Option B – Killing on-farm prior to transport
  - Shrimp are killed on-farm immediately after harvest using one of the approved methods specified in Indicator 4.2.3.2 and are subsequently transported dead (on ice) to the processing facility.
- Both option A & B conform with the requirements, provided that an approved killing method is applied before any processing activities begin.
- Slaughter is generally a two-stage process:
  - The crustacean is first stunned to make it insensible to pain.
  - Killing is then carried out.
- “Crustaceans Slaughter Under the ASC Farm Standard” is a video available on YouTube or the ASC Programme Centre.
- The only killing method allowed for crustaceans is a controlled ice slurry:

- This involves immersing crustaceans in a slurry of ice and water, causing rapid cooling.

- To clarify, electrical stunning is a stunning method and not a killing method. Stunning methods are designed to render aquatic animals insensible to pain before they are killed, whereas killing methods result in the aquatic animal's death. Stunning is a preliminary step followed by a killing method to ensure that the aquatic animal does not regain consciousness.
- An effective stun is determined by the loss of consciousness using an electroencephalogram (EEG) measured in a laboratory, which is not practicable at a site level.
- Current stunning methods for crustaceans include a controlled ice slurry bath at ≤4 °C or electric stunning followed by an ice bath.
- To ensure a controlled ice slurry bath at ≤4 °C, the ice slurry bath should be adjusted in relation to the amount and crustacean size. Below is an example for a batch of crustaceans using an ice slurry bath maintained at ≤4 °C.
- Preparation: determine the approximate amount and size of crustacean by considering the amount planned for slaughter and taking a sample of the pond.
- Results of amount and size: e.g. 5kg of medium-sized crustaceans (approximately 15cm each).
- Ice slurry preparation: create an ice slurry bath in a large, insulated container. For 5kg of crustaceans, prepare an ice slurry mixture with approximately 10 Liters of water and a sufficient amount of ice to maintain the temperature at ≤4 °C.
- Add ice gradually to the water, continuously stirring to create an even slurry.
- Monitor the temperature using a thermometer, ensuring it reaches and stays at ≤4 °C.
- Adjust according to crustacean size and amount: since the crustaceans are medium-sized and weigh a total of 5kg, ensure that the ice slurry bath can accommodate the entire batch without overcrowding. Overcrowding can reduce the effectiveness of the ice slurry by raising the temperature.
- Immersion: gently place the 5kg of crustaceans into the ice slurry bath, ensuring they are fully submerged.
- Stir the ice-slurry occasionally to maintain uniform temperature distribution.
- Define the timing for effective Killing: for medium-sized shrimp, a typical immersion time in an ice slurry bath at ≤4 °C is around 2-7 minutes.

Table 33: Suggested time in ice bath for killing of *Penaeus vannamei* shrimp

Size of shrimp	Time in ice bath
<40 pcs/kg	2 minutes
40- 60 pcs/kg	5 minutes
60-80 pcs/kg	7 minutes

- Immersion time: set a timer to ensure all shrimp are effectively killed using the timings worked out.
- Monitoring and verification: periodically check the temperature of the slurry bath to ensure it remains at ≤4°C. Add more ice if necessary to maintain the temperature. Check for indicators of death according to Indicator 4.2.3.7 which are outlined in Table 34.
- In extreme hot conditions, and the impossibility to stabilise the temperature of the slurry bath, a range of temperatures may be accepted.
- After the set time, remove a few shrimp and check for the absence of movements; the shrimp should also exhibit body rigidity, indicative of effective killing.

Table 34: Determination of the effectiveness of stunning and / or killing based on behaviour.

Shrimp behaviour	Effective stun and / or kill	Ineffective stun and / or kill
Movement	Little movement of the shrimp; lying belly up or on side with no attempt to right themselves and under the water surface Muscle twitches if isolated	Showing active movement, at the surface, continuously jumping reflexes or leg movements or recurring
Body shape	Curled	Straight lying belly down, attempting to right themselves

- The use of body movement as an indicator for the effectiveness of stunning or killing can be misleading as muscular spasms regularly occur in unconscious or dead shrimp. Studies on crustaceans, including shrimp, indicate that they can exhibit reflex actions and movements even when they are unconscious or brain dead. This is because such movements are often dominated by nerve circuits in the peripheral nervous system rather than the brain. Body

movements indicating walking leg movements and coordinated swimming movements are relevant movements to watch out for, and that may indicate consciousness

- Killing effectiveness in the UoC should be assessed by confirming signs of unconsciousness:
  - Immediate loss of balance.
  - Absence of voluntary movements.
  - Absence of coordinated swimming movements.
  - Limited pleopods and pereiopod movements.
  - Laying on side with no activity.
- The requirement for killing also applies to aquatic animals not destined for human consumption, e.g. bycatch, wild species.
- If there is uncertainty about whether a crustacean is unconscious:
  - When using an electrical stunning, the stunning should be repeated or the harvest stopped to verify stun parameters before proceeding, e.g. more than 5 crustaceans in 10 showing signs of consciousness.
  - Or use an alternative backup method, e.g. ice slurry bath When using the ice slurry bath method, the temperature of the bath should be checked, and the length of time in the bath extended.
- Electric stunning should be performed according to the manufacturer's instructions.

Evidence of implementation should be maintained, e.g.:

- Employees should demonstrate knowledge of the approved slaughter methods and monitoring.
- Records:
  - Employee training (see Appendix 12, Table 1).
  - Slaughter monitoring, e.g.:
    - Verification and registration of stunning and killing of 100 individual crustaceans per harvest.
    - Observation of signs of unconsciousness.
    - Records of stunning and killing of crustaceans not destined for human consumption if applicable.

Auditors should confirm:

- Monitoring of stunning and slaughter in conformance to the requirements.
    - Records, employee interviews and observations of stunning and slaughter operations during the audit should demonstrate the implementation of the requirements, and that there is knowledge of corrective measures to be carried out.

Useful Resources

- ASC Training: Crustaceans Slaughter Under the ASC Farm Standard. YouTube
- Weineck, K., Ray, A.J., Fleckenstein, L.J., Medley, M., Dzubuk, N., Piana, E., & Cooper, R.L. (2018) Physiological Changes as a Measure of Crustacean Welfare under Different Standardized Stunning Techniques: Cooling and Electroshock Animals.
- CIWF (2020) Tesco and Hilton Seafood – Improving the welfare of whiteleg shrimp (Pennaus vannamei) at harvest. CIWF Report 7pp.
- Conte, F.; Voslarova, E.; Vecerek, V.; Elwood, R.W.; Coluccio, P.; Pugliese, M.; Passantino, A. (2021) Humane Slaughter of Edible Decapod Crustaceans. Animals.
- Barrento, S., Pedrazzani, A., Ostrensky, A., & Quintiliano, M. (2023). *Shrimp Welfare Indicators* [Online course]. In S. Barrento, M. Quintiliano, & J. Muirhead (Eds.), FAI Academy. https://fai.academy/
- Somerville, J., et al (2026) Behavioural and neurological profiles after electrical stunning and cold shock in Pacific whiteleg shrimp (Penaeus vannamei) to inform humane slaughter. Currently not peer reviewed.

Indicator:	Requirement:
4.2.3.6	The UoC shall ensure that an overdose of anaesthetic is only used to kill crustaceans not destined for human consumption.

How do I interpret this requirement?

- The use of anaesthesia should be considered as a humane method for crustaceans not destined to human consumption.

Evidence of implementation should be maintained, e.g.:

- Consideration for the use of anaesthesia for killing.
- Culling procedure.
- Records:
  - Anaesthetic usage amount and number of culled crustaceans.

Auditors should confirm:

- The UoCs consideration of the use of anaesthetics for killing.
- Implementation can be confirmed by cross-checking the culling procedure with records, information from employee interviews and observations.

Useful Resources

N/A

Indicator:	Requirement:
4.2.3.9	The UoC shall maintain records of the activities carried out under Indicators 4.2.3.4 and 4.2.3.7.

No additional guidance is provided for this Indicator.

Criterion 4.3 - Molluscs

4.3.1 - Bivalves

Indicator:	Requirement:
4.3.1.1	*Indicator applicability: every UoC using hatchery raised seed* The UoC shall only stock batches of bivalves which comply with applicable legal requirements for diseases of regional concern and meet legal importation requirements where applicable.
4.3.1.2	*Indicator applicability: every UoC using wild caught seed* The UoC shall demonstrate that no known diseases of concern are present in the region where the seed is harvested.

How do I interpret this requirement?

- Information from the regional animal health department on diseases of concern should be available.
- The batches of stock do not have to be disease free however, they have to comply with applicable requirements for diseases of regional concern and meet importation guidelines where applicable.

Evidence of implementation should be maintained, e.g.:

- Information from animal health department on regional diseases.
- Importation requirements.

Auditors should confirm:

- Staff are aware of diseases of regional concern.

Useful Resources

N/A

Indicator:	Requirement:

4.3.1.3 The UoC shall develop, implement and maintain a site-specific Bivalve Health Management Plan (BHMP).

The BHMP shall include all of the following:

a) environmental monitoring; and

b) biosecurity measures; and

c) emergency response measures; and

d) mechanisms to report to relevant authorities where required.

The BHMP shall be reviewed:

e) at least annually for sites with cycles under one year or using continuous production methods; or

f) after each cycle for sites with longer cycles or all-in-all-out production methods.

Where the review determines that changes are required, the BHMP shall be revised.

4.3.1.4 The UoC shall ensure that all relevant employees are trained in the BHMP.

How do I interpret this requirement?

- Environmental monitoring can include monitoring of water temperatures, harmful algal blooms, storms and other factors which may have an impact on the health of the bivalves.
- For developing a site-specific biosecurity mechanism within the plan, the UoC should consider:
  - Determining the objectives and scope of biosecurity.
  - Gathering information about the site, including an up-to-date layout of production units identifying the possible movements of people, equipment, material or vectors.
  - Identifying potential transmission pathways into, within and from the site.
  - Establishing emergency procedures in the event of a biosecurity failure.
  - Establishing response protocols for responding to disease outbreaks or health emergencies.
    - Outlining procedures for:
      - Isolating affected units.
      - Implementing strategies for treatments of others.

        - Notifying relevant stakeholders, including other sites in the vicinity and the authorities.

- Establishing communication channels.
    - Effective communication channels should be implemented for reporting health-related issues both internally within the facility and externally to relevant authorities or stakeholders.
        - Employees should understand their roles and responsibilities in reporting and responding to disease events.
- Maintaining a readily accessible notification list.
    - Including contact names numbers and emails for key employees and other relevant stakeholders.
    - The list should be kept up to date to ensure quick and efficient communication during emergencies.
- Identifying mitigation measures and assessing their effectiveness and their management requirements.
- Establishing emergency procedures in the event of a biosecurity failure.
- A periodic review and, if necessary, a revision of the BHMP should be conducted in response to changes in farming activities or external factors.

Evidence of implementation should be maintained, e.g.:

- The BHMP includes the considerations for:
    - Environmental monitoring.
    - Site-specific biosecurity.
    - Emergency responses.

Auditors should confirm:

- The BHWP includes the considerations above.
- Employees are:
    - Familiarised with the BHMP.
    - Trained on the site-specific biosecurity mechanism by reviewing employees' training records, conducting employees' interviews and observations.

Useful Resources

- Alevra, A., Llorente Manzanares, M., Mente, E., Xandri Royo, P.M., (2025) Good husbandry practices for aquaculture, Publications Office of the European Union.

- World Organisation for Animal Health (2024) Aquatic Animal Health Code. Chapter 1.3. Diseases listed by WOAH.

Indicator:	Requirement:
4.3.1.5	The UoC shall report to the relevant authorities if a WOAH-notifiable disease[95] is confirmed at a site, and shall: a) apply the measures according to applicable legal requirements; and b) increase disease-monitoring in other batches of bivalves; and c) coordinate oversight by a registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- Upon a WOAH-notifiable disease is confirmed, the UoC should consider within its mechanisms to report to relevant authorities included in the BHMP (see Indicator4.3.1.3) an emergency response procedure for dealing with the affected batches of animals.

Evidence of implementation should be maintained, e.g.:

- BHMP includes site-specific disease monitoring, responses and reporting requirements.
  - Specific considerations should be given to WOAH-notifiable diseases, including an emergency response procedure for dealing with the affected batches of animals.
- National regulations / legal requirements.
- Records:
  - Reporting to authorities.
  - Measures applied.
  - Notification to other sites in the vicinity.
  - Disease monitoring.
  - Veterinarian or aquatic animal health professional coordination.

Auditors should confirm:

- The BHMP includes considerations for WOAH-notifiable diseases
- In case a WOAH-notifiable disease has been confirmed:
  - Reporting to authorities and implementation of regulatory measures.

[95] An exemption applies where the WOAH-notifiable disease is classified as endemic by the relevant authorities and reporting is not required under applicable legal requirements.

- Notification to other sites in the vicinity.
- Increased monitoring to other batches of animals.
- Veterinarian or aquatic animal health professional coordination

Useful Resources

- World Organisation for Animal Health (2024) Aquatic Animal Health Code. Chapter 1.3. Diseases listed by WOAH.
- Arzul I, et al (2021) Manual for bivalve disease management and biosecurity - H2020 VIVALDI Project - 44p.

4.3.2- Abalone

Indicator:	Requirement:
4.3.2.1	The UoC shall ensure that all relevant employees are trained on general aquatic animal health and welfare awareness, including biosecurity, according to **Appendix 12 (12.2, Table 1)**.
4.3.2.2	The UoC shall ensure that any person involved in aquatic animal husbandry and handling activities is trained on aquatic animal health and welfare, according to **Appendix 12 (12.2, Table 1)**.
4.3.2.3	The UoC shall ensure that the content of the training in Indicator 4.3.2.1 and 4.3.2.2 is updated as necessary and is approved by a veterinarian, aquatic animal health professional or a member of site management with the necessary competencies, experience and training.

How do I interpret this requirement?

- For each employee:
  - The level of training should be appropriate to their role:
    - For all relevant employees: a basic level of awareness of biosecurity, disease recognition, handling, behaviour and feeding.
  - Evidence of training participation is to be maintained:
    - Certificates of attendance.
- The trainer should be competent in the topic of aquatic animal health and welfare and the competence should be demonstrable, e.g.:
  - Curriculum Vitae.
  - Records of qualifications.

- Work experience.

- An example of member of site management with necessary competencies would be someone who has knowledge and training in abalone disease and could ensure the information in the training is relevant to the specific site.
- Best practices on the implementation of the training content should be visible during the audit.
  - Employees should demonstrate adequate knowledge of that content at interviews.

Evidence of implementation should be maintained, e.g.:

- A list of employees and subcontracted personnel
- Records:
  - Training.
  - Trainer's competence.

Auditors should confirm:

- Adequate level of personnel knowledge of the training content should be verified by**:**
  - Interviews.
  - Refresher training.

Useful Resources

- World Organisation for Animal Health (2024) – Competency and Curriculum Guidelines for Community Animal Health Workers. Paris, 39 pp. (https://doi.org/10.20506/woah.3535).

Indicator	Requirement
4.3.2.4	*Indicator applicability: every UoC using hatchery raised seed* The UoC shall: a. only stock batches which have been tested prior to stocking, comply with applicable legal requirements for diseases of regional concern, and meet legal importation requirements where applicable; and b. implement a minimum 8-week isolation period[96] for new stock.

[96] Isolation means not mixed with other animals on the farm but can be kept in the same culture system.

How do I interpret this requirement?

- There should be batch certification using diagnostic tests capable of detecting all diseases and parasites/ pests of concern.
    - Diseases and parasites/ pests of concern include:
        - notifiable diseases present in the country of origin,
        - diseases that have been the primary cause of abalone mortality in the country of origin,
        - organisms that may be transferred with the abalone and are regarded as pests.
- All acquired seed (farm to farm) should undergo a period of isolation following translocation, for at least 8 weeks, in order to ensure that they are free of disease and parasites prior to being mixed with other farm animals.

Evidence of implementation should be maintained, e.g.:

- Test records.
- Health records.
- An isolation area.
- Isolation records.
- Mortality records (see Indicator 4.3.2.7).

Auditors should confirm:

- That every batch of farm-to-farm raised seed has records of:
    - Health assessments.
    - Isolation.
    - Mortality.

Useful Resources

N/A

Indicator	Requirement
4.3.2.5	*Indicator applicability: every UoC using wild caught seed* The UoC shall only stock batches that have a quarantine procedure which: a. requires a minimum length of eight weeks of quarantine; and b. includes **sentinel** monitoring; and c. includes mortality event response; and d. requires a pre-release health assessment.

How do I interpret this requirement?

- All acquired seed (wild to farm) should undergo a period of quarantine following translocation, for at least 8 weeks, in order to ensure that they are free of disease and parasites prior to being mixed with other farm animals.
- Abalone translocated from the wild to a farm represent a high risk of disease introduction for abalone farms and so are required to be held in a bio secure quarantine facility with effluent treatment for at least eight weeks before being moved elsewhere on the farm.
- It is often not an option to sacrifice wild abalone to screen for diseases. To help detect any diseases present in the wild abalone, farmed “sentinel” abalone should be placed in the grow out units containing the wild stock for the duration of the quarantine period (minimum eight weeks) and monitored as follows.
    - A batch of at least 50 farmed abalone >30 millimetre shell length will be placed in the grow out units with each batch of translocated wild abalone.
    - Both the wild and farmed abalone will be inspected for abnormal behaviour or mortality at least once every 10 days.
    - If more than two of the farmed sentinel abalone in a grow out unit have died or become moribund since that grow out unit was last inspected, then this can be regarded as a mortality event (see Indicator 4.3.2.7).
- Before the wild stock is released from quarantine, at least 10 abalone should be submitted for pathological analysis and found free of significant infectious diseases.
    - These abalone should include in order of priority:
        - Any moribund wild abalone,
        - Any moribund farmed sentinel abalone, and
        - A selection of farmed abalone including any that show signs of ill health.

- During the quarantine period farm staff should attempt to identify moribund abalone and preserve them for pathology testing.

- A “sentinel” abalone is a naïve animal which is intentionally placed in an environment of potential infection that is monitored at short time intervals to detect infection.
- The frequency of stock inspection on an abalone farm varies with feed type, grow out unit design, weather and management strategies.

Evidence of implementation should be maintained, e.g.:

- Quarantine procedure.
- Records:
  - The origin of the brood stock.
  - All translocations to the farm and within the farm.
  - Quarantine length.
  - Health inspections
  - Mortalities (see Indicator 4.3.2.7)

Auditors should confirm:

- Quarantine area.
- Existence of quarantine protocol through interviews with staff.
- Records of origin, translocations, quarantine, health inspections and mortalities.

Useful Resources

N/A

Indicator	Requirement
4.3.2.6	The UoC shall develop and implement a feeding plan.

How do I interpret this requirement?

- Where farms use fresh seaweed, the feeding plan should detail that the seaweed:
  - Should be locally sourced.

- Fresh seaweed is a potential vector for parasites, pests, diseases and associated organisms. For this reason, fresh seaweed should be locally sourced.

- Should be from a regulated or recognised well-managed resource.

- The feeding plan for farms using fresh seaweed and compound feed should include the following parameters:
  - When the abalone are fed e.g. in the evening, daily.
  - Feed rations, e.g. feed type and daily amount.
  - Feeding adaptation to fit different life stages.
  - Feeding adaptation to fit different ambient conditions, e.g. increase feeding during warmer weather.
  - Feed provided is in good condition- not spoiled or evidence of pests.

Evidence of implementation should be maintained, e.g.:

- Employees should demonstrate adequate knowledge of the feeding plan.

Auditors should confirm:

- Employees are aware of the feeding plan through employee interviews and observations.

Useful Resources

N/A

Indicator	Requirement
4.3.2.7	The UoC shall develop, implement and maintain a site-specific Abalone Health Management Plan (AHMP), approved by the veterinarian, aquatic animal health professional, or a member of site management with the necessary competencies, experience and training, with the intention of preventing disease outbreaks and ensuring the good health of farmed aquatic animals. The AHMP shall include all of the following: a. behaviour monitoring; and b. disease and mortality monitoring; and c. response, including quarantine, treatment, and culling; and d. mechanisms to report to relevant authorities where required; and e. biosecurity risks; and f. predation risks. The AHMP shall be reviewed: g. at least annually for sites with cycles under one year or using continuous production methods; or h. after each cycle for sites with longer cycles or all-in-all-out production methods. Where the review determines that changes are required, the AHMP shall be revised.

How do I interpret this requirement?

- The Abalone Health Management Plan (AHMP):
  - Aims to support the development and implementation of preventive, rather than remedial, actions that ensure good abalone health.
  - Is to be developed by the UoC in collaboration with a veterinarian, aquatic animal health professional or a member of site management with the necessary competencies, experience and training who approves it.
- All farms should observe stock on a regular basis to help ensure that any abnormal behaviour of the abalone is quickly investigated.
  - The frequency of stock inspection on an abalone farm varies with feed type, grow out unit design, weather and management strategies and should be detailed in the AHMP.
- For abalone farming, disease management is critical both to the success of the farm and to the protection of wild stocks and other species in the vicinity of the farm.

- For abalone this challenge is heightened by the lack of established veterinary medicines with which to treat diseases in most countries and so biosecurity should be kept high to reduce disease risk.
- Surveillance testing of abalone for disease is an important part of disease management.
    - There should be six-monthly disease surveillance testing of at least 66 abalone.
    - This number of test animals gives each survey a 95 percent chance of detecting a disease, with 5 percent prevalence, assuming that the test procedure has 90 percent sensitivity and 100 percent specificity (WOAH, 2009).
    - One of these samples will be taken during a period of high stress (e.g., high seawater temperature at sites with stressfully warm summers, or immediately after spawning at cool water sites) as identified by past experience,
    - The second sample approximately six months later.
    - Sampling and fixation procedures should be as advised by the pathology laboratory.
    - The pathology laboratory or veterinarian should provide a written report to the farm as a permanent record of the surveillance results.
    - The report should explain the significance of the results.
- All farms should identify the key infectious diseases of concern for the abalone in their area and ensure that the AHMP incorporates measures for their detection.
    - The laboratories to be used for pathology work should have diagnostic procedures that would detect these diseases (if present) or confirm absence of these diseases (if absent).
- Given the limited tools available to treat abalone diseases, it is critical that there is effective biosecurity and disease surveillance on farms.
- Every grow out unit on the farm should be inspected at least once every 10 days in sufficient detail to detect abnormal behaviour or abnormal mortality of abalone.
- Mortalities should be removed when found with numbers recorded.
    - If the number of mortalities in any grow out unit exceeds the trigger level for a mortality event or if abnormal behaviour is observed, then the details must be recorded.
    - A mortality event is defined as:
        - More than 1 percent of the abalone in a grow out unit have died since the grow out unit was last inspected.
        - The total number of abalone dead in the grow out unit is greater than 50 abalone.

- Response protocols should be developed for responding to disease outbreaks or health emergencies.
- A mortality event or disease outbreak should be investigated and a satisfactory explanation for the mortality event or outbreak provided and logged. Relevant details to be recorded are date, abalone behaviour, grow out unit number, suspected cause of event or outbreak, action taken and conclusion.
- If there is no obvious non-infectious cause of abalone dying, or if mortality continues to increase, then farms should take the following actions:
    - Isolate the affected grow out unit(s).
    - Submit moribund abalone (at least five if available) from the affected grow out unit(s) for pathological analysis to an auditor-approved laboratory experienced in aquatic animal pathology.
    - Submit apparently unaffected abalone (at least five) from the same production unit and from a completely unaffected unit matched as closely as possible with respect to size, age, parentage, etc.
    - Seek advice from an aquatic health expert.
    - Continue to monitor and record the behaviour and mortality of the abalone population daily.
    - If the level of mortalities continues to increase or if similar mortalities occur in other grow out units/cages on the farm, the farm must immediately consult with their aquatic health expert to decide a course of action and notify the competent authority.
    - In cases where the aquatic health expert's determination is that the disease cannot be effectively mitigated or treated, the animals in the affected production unit(s) must be culled and the unit(s) disinfected.
    - A report on the mortality event shall be filed detailing the course of events. The report shall include the results of the pathology testing, a record of any instructions from the farm's veterinarian or relevant authorities, and the farm's response to these.
- Many facets of biosecurity affect disease risk, for example fresh seaweed is a potential vector for parasites, pests, diseases and associated organisms. For this reason, farms that use fresh seaweed must use local sources.
- Given the limited tools available to treat abalone diseases, it is critical that there is effective biosecurity and disease surveillance on farms and appropriate disease response plans in place.
- Establishing response protocols for responding to disease outbreaks or health emergencies.
    - Outlining procedures for:
        - Isolating affected units.

- Implementing strategies for treatments of others.
- Notifying relevant stakeholders, including other sites in the vicinity and the authorities.

- Establishing communication channels.
  - Effective communication channels should be implemented for reporting health-related issues both internally within the facility and externally to relevant authorities (e.g., WOAH-notifiable diseases) or stakeholders.
    - Employees should understand their roles and responsibilities in reporting and responding to disease events.
- Maintaining a readily accessible notification list.
  - Including contact names numbers and emails for key employees and other relevant stakeholders.
  - The list should be kept up to date to ensure quick and efficient communication during emergencies.
- For developing a site-specific biosecurity mechanism within the plan, the UoC should consider:
  - Determining the objectives and scope of the biosecurity mechanism.
  - Identifying relevant regulatory requirements.
  - Gathering information about the site, including an up-to-date layout of buildings and production units identifying the possible movements of animals, animal products, animal waste, water, feed and equipment, material or vectors.
  - Identifying potential transmission pathways into, within and from the site.
  - Carrying out a risk analysis to identify and evaluate disease threats and ensure that the plan addresses them.
    - A risk analysis can be carried out either on the whole operation or only partially, e.g. disease transmission during transportation.
      - This will depend on the objectives of the biosecurity mechanism.
  - Identifying mitigation measures and assessing their effectiveness and their management requirements.
  - Establishing emergency procedures in the event of a biosecurity failure.
- For developing predator control measures within the plan, the UoC should consider:
  - Identifying potential predators.

- Create a list of the predators that are present in the area and that might interact with the UoC.
    - Predators may include birds, mammals, reptiles, and other aquatic species known to prey on abalone.

- Assessing the risk of predation.
    - Evaluate the risk posed by each predator species identified based on factors such as proximity to the site, population size, means of accessing the site, likelihood of predation, etc.
- Implementing predator control measures.
    - Develop and implement predator control measures tailored to the specific risks identified. This may include:
        - Physical barriers such as nets, fences, or screens to prevent access to grow out units.
        - Scare tactics such as visual deterrents to discourage predators from approaching the facility.
- Implementing ongoing monitoring and surveillance.
    - To detect predator activity and intervene as needed.
- Regular reviewing and revision.
    - Based on the outcome of the ongoing monitoring and surveillance.
- Collaborating with local authorities or local wildlife agencies to address predator issues in the surrounding area.

- A periodic review and, if necessary, a revision of the AHMP must should be conducted in response to changes in farming activities or external factors

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Evidence of implementation should be maintained, e.g.:

- If abnormal behaviour is observed, then the details should be recorded.
- The AHMP includes the required minimum considerations above and all relevant records associated with the AHMP implementation.
- Employees are:
    - Familiarised with the AHMP by conducting employee interviews and observations.
    - Trained on the site-specific biosecurity mechanism by reviewing employees' training records, conducting employees' interviews and observations.

Auditors should confirm:

- The AHMP includes the required minimum considerations above and all relevant records associated with the AHMP implementation.
- Employees are:
  - Familiarised with the AHMP by conducting employee interviews and observations.
  - Trained on the site-specific biosecurity mechanism by reviewing employees' training records, conducting employees' interviews and observations.

Useful Resources

- Department of Primary Industries. (2008). Abalone Aquaculture Biosecurity Protocol Audit Guidelines. Fisheries Victoria Management Report Series No. 52. Department of Primary Industries. Melbourne.
- Government of Canada (2017) Bacterial Diseases of Abalone. Webpage.

Indicator:	Requirement:

4.3.2.8 The UoC shall report to the relevant authorities if a WOAH-notifiable disease[97] is confirmed at a site, and shall:

a. apply the measures according to applicable legal requirements; and

b. increase disease-monitoring in other batches of abalone; and

c. coordinate oversight by a registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- Upon a WOAH-notifiable disease is confirmed, the UoC should consider within its response mechanism included in the AHMP (see Indicator4.3.2.7) an emergency response procedure for dealing with the affected batches of animals.

Evidence of implementation should be maintained, e.g.:

- AHMP includes site-specific disease monitoring, responses and reporting requirements.
  - Specific considerations should be given to WOAH-notifiable diseases, including an emergency response procedure for dealing with the affected batches of animals.
- National regulations / legal requirements.
- Records:
  - Reporting to authorities.
  - Measures applied.
  - Notification to other sites in the vicinity.
  - Disease monitoring.
  - Veterinarian or aquatic animal health professional coordination.

Auditors should confirm:

- The AHMP includes considerations for WOAH-notifiable diseases
- In case a WOAH-notifiable disease has been confirmed:
  - Reporting to authorities and implementation of regulatory measures.
  - Notification to other sites in the vicinity.
  - Increased monitoring to other batches of animals.
  - Veterinarian or aquatic animal health professional coordination.

[97] An exemption applies where the WOAH-notifiable disease is classified as endemic by the relevant authorities and reporting is not required under applicable legal requirements.

Useful Resources

- World Organisation for Animal Health (2024) Aquatic Animal Health Code. Chapter 1.3. Diseases listed by WOAH.
- Arzul I, et al (2021) Manual for bivalve disease management and biosecurity - H2020 VIVALDI Project - 44p.

Criterion 4.4– Veterinary therapeutants

Indicator:	Requirement:
4.4.1	The UoC shall only use therapeutants as prescribed by a registered veterinarian or aquatic animal health professional.

How do I interpret this requirement?

- Therapeutant prescriptions should be accordance with regulatory requirements.
  - Prescribed by a registered veterinarian or a qualified aquatic animal health professional.
- 'Veterinary medicines and chemicals should be approved for use in aquaculture by national authorities, the FDA, & Council Regulation EEC No. 2377/90 Annex 1 (EU-Lex 1990)
- The definition of a treatment is outline in the vocabulary portal.
  - An example of a treatment would include when a number of prescriptions are required for different sizes of fish on the UoC at the same time.

Evidence of implementation should be maintained, e.g.:

- If prescriptions are made by health professionals who are not veterinarians, obtain evidence of competency (e.g. accreditation) in diagnosing, for the purposes of the WOAH Aquatic Animal Health Code.
- Records:
  - Prescriptions and therapeutants use (for details, refer to Indicator 4.4.2).

Auditors should confirm:

- Prescriptions and therapeutants use.
- The observation of any medicine containers on site should be cross-checked with records.
- If a non-veterinarian wrote prescriptions, confirm that the individual is qualified as an aquatic animal health professional.

Useful Resources

- Desbois., A et al (2025) Aquaculture requires special consideration in National Action Plans for Antimicrobial Resistance. Science of the Total Environment. 958

- Responsible Use of Medicines In Agriculture Alliance (2004) Responsible use of antimicrobials in fish production. Report 21pp.
- Ibrahim, M., Ahmad, F., Yaqub, B., Ramzan, A., et al. (2020) Chapter 4 - Current trends of antimicrobials used in food animals and aquaculture. Book: Editor(s): Hashmi, M.Z. Antibiotics and Antimicrobial Resistance Genes in the Environment
- WOAH (2022) Fighting Antimicrobial Resistance: A guide for aquatic animal producers. 8pp.

Indicator:	Requirement:
4.4.2	The UoC shall ensure that prescriptions for each application of therapeutants include at least the following: a. the name, address, telephone number and signature of the registered veterinarian or aquatic animal health professional; and b. the date of the prescription; and c. the name and address of the site; and d. the identification, including the species, of the batches of aquatic animals to be treated; and e. the name and quantity of the therapeutant prescribed; and f. the dosage and administration instructions; and g. the withdrawal period. The UoC shall maintain records of each therapeutant prescription.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
4.4.3	The UoC shall not use hormones or antibiotics to stimulate growth.

Indicator applicability:

This indicator is only applicable if hormones or antibiotics are used. If no hormones or antibiotics have been used, then this indicator should be marked as N/A.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
4.4.4	The UoC shall only use hormones for the following purposes: a. sex-reversal; or b. to induce and coordinate spawning; or c. to produce single-sex stock. The UoC shall maintain records of each hormonal treatment.

Indicator applicability:

This indicator is only applicable if hormones are used. If no hormones have been used, then this indicator should be marked as N/A.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:

4.4.5 The UoC shall not use antibiotics prophylactically.

How do I interpret this requirement?

- A registered veterinarian or aquatic animal health professional should confirm possible causes for antibiotic treatment, e.g. a diagnosed bacterial infection.
- Metaphylactic use of antibiotics is allowed if a veterinarian or aquatic animal health professional diagnoses a bacterial infection in the stock and prescribes treatment for the aquatic animals in contact with sick aquatic animals.

Evidence of implementation should be maintained, e.g.:

- Health report detailing the health issue found on site and the rationale for treatment.
- Testing results that prove the diagnosis of a bacterial infection.
- Records:
  - Mortality.
  - Treatments and veterinary prescriptions.
  - Recommendations or actions discussed.

Auditors should confirm:

- Confirm who signed the prescription, then verify that the veterinarian or aquatic animal health professional holds the required qualifications by cross-checking official records. Recommendations or actions discussed.
- Existence of health reports and testing results.
- Log of medication events.

Useful Resources

- Bondad-Reantaso, M.G., MacKinnon, B., Karunasagar, I., et al (2023) Review of alternatives to antibiotic use in aquaculture. Reviews In Aquaculture.

Indicator:	Requirement:

4.4.6 The UoC shall only use **non-therapeutants** registered or approved by applicable legal requirements and shall apply them according to the manufacturer's instructions.

How do I interpret this requirement?

- When using non-therapeutants:
  - Verify product registration or approval (e.g. identify regulatory authorities, check official database, contact regulatory authorities in case of uncertainties, consult association, verify through manufacturers or suppliers, check for local regulations).
  - Review product labels and documentation. Approved products usually have specific registration numbers or approval statements that indicate their status.
  - Follow the manufacturer's instructions to ensure their effectiveness and safety or follow the advice of the registered veterinarian or aquatic animal health professional.

Evidence of implementation should be maintained, e.g.:

- Verification of product registration or approval.
- Records:
  - The name and amount of the product;
  - The reason to use;
  - The dosage and administration instructions;
  - Tracking of effectiveness.

Auditors should confirm:

- Adequate level of knowledge related to product registration or approval and cross-checking with use records.

Useful Resources

N/A

Indicator:	Requirement:

4.4.7 The UoC shall monitor all **probiotics** produced in-house for build-up of bacteria antimicrobial resistance.

How do I interpret this requirement?

- This indicator can be N/A for many species and culture units.
- Probiotics are living microbial cells that help improve the natural immunity level and positively impact aquatic animal growth and reproduction.
- Probiotics are often used in aquaculture, agriculture or food products.
- In-feed, in the soil, and water-applied probiotics are not antimicrobials. When probiotics are used according to the manufacturer's recommendations, antimicrobial effects do not occur.
- If they harbour antimicrobial-resistant genes, these could transfer to harmful bacteria in humans, animals, or the environment, posing public health risks.
- Repeated culturing, selection pressure, or strain drift may result in microorganisms exhibiting unintended antimicrobial activity.
- Accordingly, this indicator focuses on ensuring that probiotic strains produced in-house are identified and appropriately screened to confirm their identity and functional properties, and to avoid the unintended introduction or propagation of microorganisms with antimicrobial activity within the production system.
- This indicator supports responsible management of in-house probiotic production and alignment with broader antimicrobial resistance (AMR) risk-management objectives. It does not imply that probiotics are classified as antimicrobials, nor does it require testing for intentional antimicrobial use.
- Bacteria in probiotics can share resistance genes with pathogenic bacteria through horizontal gene transfer, worsening the antimicrobial resistance (AMR) problem.
- Registration and maintenance of detailed records of the source and strain of probiotics used are relevant to:
    - Safety assurance- preventing adverse effects that might arise from compromised or contaminated batches.
    - Resistance monitoring-probiotics can potentially develop resistance to antimicrobials, which could undermine their therapeutic benefits and lead to the emergence of resistant strains.

- Public health protection- preventing the spread of antimicrobial-resistant strains is essential for safeguarding public health.
- Regulatory compliance - maintaining the integrity and the quality of probiotic products.
- Traceability - maintaining records ensures the ability to trace the origin of probiotic strains, which is essential for quality control and accountability. In addition, confirm that the strain being used matches the intended species or subspecies, preventing the use of unverified or potentially harmful strains.

Evidence of implementation should be maintained, e.g.:

- Records:
  - Source and strain of all probiotic batches;
  - The name and amount of the product;
  - The reason to use;
  - The dosage and administration instructions.

Auditors should confirm:

- Adequate probiotic source and strain knowledge and cross-checking with use records.

Useful Resources

- Okeke, E.S., Chukwudozie, K.I., Nyaruaba, R., et al (2022) Antibiotic resistance in aquaculture and aquatic organisms: a review of current nanotechnology applications for sustainable management. Environmental Science and Pollution Research.
- Thakur, K., Singh, B., Kumar, S., et al (2025) Potential of probiotics and postbiotics in aquaculture: Connecting current research gaps and future perspectives. The Microbe

Indicator:	Requirement:

4.4.8 *Indicator applicability: every UoC using antibiotic treatments*

The UoC shall monitor for antibiotic resistance by carrying out antibiotic sensitivity testing either:

a) before or during each antibiotic treatment; or

b) at a frequency determined through a documented risk assessment.

How do I interpret this requirement?

- Awareness of the epidemiological situation at a regional level may be relevant.
- It is recommended that antibiotic sensitivity testing is carried out prior to the start of any antibiotic treatment:
  - Test results should be used to assist the veterinarian or aquatic animal health professional in selecting the most adequate antibiotic.
  - Test results should be combined with clinical and postmortem examinations of the aquatic animals.
  - Other laboratory tests should be considered if deemed appropriate. In acute cases, treatment might need to be initiated immediately to avoid aquatic animal suffering or the spread of infection. It is still advisable to collect samples immediately prior to the start of treatment:
  - The results can be used to validate the choice of antibiotic, epidemiological follow-up and future treatments.
- Conformity with this indicator does not require successful antibiotic sensitivity testing (AST) results in all cases but does require that the UoC demonstrates a risk-based, documented approach to monitoring antibiotic resistance, supported by veterinary or aquatic animal health professional oversight.
- In some cases, the relative lack of standardised and validated methods for culture and antimicrobial sensitivity testing for a significant number of bacterial species of aquatic importance might mean this is not possible.
  - In such cases, efforts should be placed towards developing alternative monitoring processes.

Evidence of implementation should be maintained, e.g.:

- Health reports.
- Testing results.
- Revision and discussion of disease surveillance and monitoring programmes.
    - Especially for those bacterial infections where limited laboratory tests are available or where bacteria are fastidious and difficult to grow.
- For recurring bacterial infections, the site should demonstrate efforts to isolate and characterise the problematic strains and test them periodically (at least on a cyclical basis) for antibiotic resistance.
- The UoC has evidence that bacterial culture and antibiotic sensitivity testing (AST) were attempted but were unsuccessful due to technical limitations (e.g. no bacterial growth).
- Records include sampling methods, laboratory used, and reasons AST could not be completed.
- Use of relevant historical or regional AST data.
- Historical data are updated when new successful AST results become available.
- The UoC uses recent, representative AST data from the same farm, production system, species, or region.
- Data are reviewed and endorsed by a registered veterinarian or aquatic animal health professional.
- Trigger-based AST strategy.
- AST is prioritised and conducted when risk increases, such as treatment failure, repeated antibiotic use within a production cycle, unexpected mortality patterns.
- This approach focuses AST efforts where the risk of antimicrobial resistance is highest.
- Written justification by registered veterinarian or aquatic animal health professional includes rationale for antibiotic choice in the absence of AST, considering prior efficacy and known resistance patterns.
- Complementary AMR risk mitigation measures.
- The UoC implements preventive health measures (e.g. biosecurity, water quality management, vaccination where applicable, non-antibiotic health tools).
- Antibiotic use is minimised and reviewed over time as part of continuous improvement.

Auditors should confirm:

- Existence of health reports and testing results.

- Disease surveillance and monitoring programmes.
- Especially for those bacterial infectious where limited laboratory tests are available or where bacteria are fastidious and difficult to grow.
- For recurring bacterial infections, the site should demonstrate efforts to isolate and characterise the problematic strains and test them periodically (at least on a cyclical basis) for antibiotic resistance.

Useful Resources

N/A

Indicator:	Requirement:
4.4.9	*Indicator applicability: every UoC using antibiotic treatments* The UoC shall investigate the root cause when an antibiotic treatment does not produce the expected efficacy and shall implement appropriate corrective actions to improve the efficacy of subsequent treatments.
4.4.11	*Indicator applicability: every UoC using antiparasitic treatments except for marine salmonids in cages treated for sea lice* The UoC shall investigate the root cause when an antiparasitic treatment does not produce the expected efficacy and shall implement appropriate corrective actions to improve the efficacy of subsequent treatments.

How do I interpret this requirement?

- Treatment failure:
  - Persistent symptoms or signs of diseases, or continued detection of the infectious agent causing the diseases being treated.
  - In many cases, is detected in the form of sustained mortality that does not decrease in response to treatment.
    - Possible causes are multiple and varied e.g.:
      - The development of resistance.
      - Low appetite in the case of in-feed medication.
      - Inadequate dosage.

    - Inaccurate diagnosis.
    - Inaccurate treatment selection
    - Inadequate distribution of medicated feed
- The UoC should document treatment efficacy and changes to inform disease management, leading to better future treatments and early resistance detection.

Evidence of implementation should be maintained, e.g.:

- Treatment efficacy records:
    - Analysis of received actual dose versus effect (for example, in terms of parasite clearance).
    - Plotting mortality trends.
    - Taking samples and testing them for the pathogen of interest.
- Employees should demonstrate adequate knowledge of the treatment plan.

Auditors should confirm:

- Treatment plan and efficacy checks implemented:
- Implementation can be confirmed by cross-checking the plan with records, information from employee interviews and observations.

Useful Resources

- St-Hilaire, S., Price, D., Chalmers, W. H., & McClure, J. (2020) Understanding Antibiotic Treatment Failures in Salmon Aquaculture. Asian Fisheries Society.
- Responsible Use of Medicines In Agriculture Alliance (2010) Responsible Use of Anti-Parasitics In Aquaculture. RUMA Guidelines 30pp.

Indicator:	Requirement:

4.4.10 *Indicator applicability: every UoC using antiparasitic treatments except for marine salmonids in cages treated for sea lice*

The UoC shall monitor for antiparasitic resistance by carrying out bioassays[98] either:

a) before or during each antiparasitic treatment; or

b) at regular intervals.

How do I interpret this requirement?

- It is recommended that bioassays are carried out prior to the start of any antiparasitic treatment:
  - Test results should be used to assist the veterinarian or aquatic animal health professional in selecting the most adequate antiparasitic.
  - Test results should be combined with clinical and postmortem examinations of the aquatic animals.
- Other laboratory tests should be considered if deemed appropriate.
  - Awareness of the epidemiological situation at a regional level may be relevant.
- In acute cases, treatment may need to be started immediately to avoid aquatic animal suffering or the spread of infection. It is still advisable to collect samples immediately prior to the start of treatment:
  - The results can be used to validate the choice of antiparasitic, treatment, epidemiological follow-up and future treatments.
- In some cases, the relative lack of standardised and validated methods for culture and testing for a significant number of parasite species of aquatic importance might mean this is not possible.
  - In such cases, efforts should be placed towards developing alternative monitoring processes.

Evidence of implementation should be maintained, e.g.:

- Health reports.
- Testing results.

[98] An exemption applies where no methods exist to determine resistance using bioassays.

- Revision and discussion of disease surveillance and monitoring programmes.
    - Especially for those parasitic infectious where limited laboratory tests are available or where parasites are fastidious and difficult to grow.
- For recurring parasitic infections, the site should demonstrate efforts to characterise and test them periodically (at least on a cyclical basis) for antiparasitic resistance.

Auditors should confirm:

- Existence of health reports and testing results.
- Disease surveillance and monitoring programmes.
    - Especially for those parasites where limited laboratory tests are available or where parasites are fastidious and difficult to grow.
    - For recurring parasitic infections, the site should demonstrate efforts to characterise and test them periodically (at least on a cyclical basis) for antibiotic resistance.

Useful Resources

N/A

Indicator:	Requirement:
4.4.12	The UoC shall not use any antimicrobials listed as Authorised for use in Humans Only by the World Health Organisation (WHO)[99] at any stage in the lifecycle of the product.
4.4.13	The UoC shall not use[100] antimicrobials listed as Highest Priority Critically Important Antimicrobials (HPCIA)[101] or Critically Important Antimicrobials (CIA) by the World Health Organisation (WHO)[102] at any stage in the lifecycle of the product. An exception applies where the following can be demonstrated: a. all other available antimicrobials are not effective, or there is no availability of antimicrobials other than the HPCIA and CIA; and

[99] https://www.who.int/publications/i/item/9789241515528
[100] Batches treated with antimicrobials listed as Highest Priority Critically Important Antimicrobials (HPCIA)and Critically Important Antimicrobials (CIA) by the World Health Organisation (WHO) are not eligible for ASC certification.
[101] An exemption applies to the use of oxolinic acid in freshwater salmonid production.
[102] https://www.who.int/publications/i/item/9789241515528

b. previous monitoring has not determined build-up of antimicrobial resistance.

A registered veterinarian shall provide a written justification for the use of any HPCIA and CIA under the exceptional circumstances listed above.

How do I interpret this requirement?

- The use of any antimicrobials listed as Authorised for use in Humans Only is not allowed with no exceptions.
- The use of HPCIA and CIA is not allowed unless they are the only possible treatment option and there is no indication of resistance.

Evidence of implementation should be maintained, e.g.:

- If HPCIA or CIA are used, the decision should be documented.
- Specific registered veterinarian justification should be in place, including evidence that there is no resistance towards the selected HPCIA or CIA.

Auditors should confirm:

- The use of antibiotics- this indicator should never be marked as N/A.
- Veterinary considerations for the use of CIA and resistance testing.

Useful Resources

- Luthman, O., Robb, D.H.F., Henriksson, P.J.G., Jørgensen, P.S. & Troell, M. (2024) Global overview of national regulations for antibiotic use in aquaculture production. Aquaculture International.
- Responsible Use of Medicines In Agriculture Alliance (2004) Responsible use of antimicrobials in fish production. RUMA Alliance Guidelines 21pp.

Indicator:	Requirement:
4.4.14	The UoC shall adhere to species-specific limits on antibiotic[103] treatments, according to **Appendix 2 (2.5)**[104].

How do I interpret this requirement?

- The course of medication refers to the full planned duration over which a specific drug is administered to treat a particular illness or condition.
- It typically includes:
  - A defined start and end date,
  - Multiple doses (e.g., once or twice a week)
  - A consistent treatment objective (e.g., treating a bacterial infection)
- Even though the medicine is administered several times (e.g., daily for 5-7 days), this is considered a single treatment event or "one course" as long as the treatment is continuous, and for the same condition.
- Example: If a group of fish is diagnosed with a bacterial infection and given oxytetracycline in feed for 7 days, this 7-day period is one course of treatment. If the disease returns later and a second round is administered, that would count as a second treatment, and it is associated with a new veterinary prescription.
- In summary: 1 treatment = 1 course of medication = 1 veterinary prescription
- The course of medication is understood as the complete, planned duration during which a specific drug is administered to treat a particular disease. This includes a defined start and end date, multiple doses, and a single therapeutic objective. As long as the treatment is continuous and directed at the same condition, it is considered a single treatment, even when the medication is administered several times per day or over multiple days.
- The definition does not limit the route of administration. Therefore, two different administrations (for example, an injectable treatment followed by medicated feed) may be considered a single treatment provided that:
  - The same active ingredient is used,

[103] Crustaceans treated with antibiotics are not eligible for ASC certification.
[104] An exemption applies where there is no species-specific metric listed in Appendix 2.

- The same disease is being treated,
- It is part of a continuous therapeutic strategy indicated by the veterinarian, and
- It corresponds to the same course of medication, without clinical interruptions between one route and the other.

- In the case presented above (injectable Oxytetracycline followed immediately by Oxytetracycline in medicated feed, as part of the same health strategy against SRS). All four conditions are met. The two routes of administration may therefore be considered a single treatment.
- At the regulatory level (e.g., separate prescriptions required by SERNAPESCA), this does not affect the ASC definition of a treatment, which focuses on the continuity of the therapeutic course and the common health objective.
- Another example: In Chile, approximately one month after sea cages are stocked, farms begin sea lice treatments roughly every 14 days, using a maximum of three pulse treatments.
  - Pulse treatments refer to discrete, time-limited therapeutic administrations of an antiparasitic, separated by defined intervals, allowing the active compound to act while reducing continuous exposure that can accelerate resistance development.
  - A maximum of three pulse treatments within a three-month period typically provides 5–6 months of protection against Caligus without the need for additional interventions.
  - A pulse treatment is thought to offer a prolonged therapeutic effect, giving fish residual protection against sea lice over several months. This approach aims to reduce the total number of treatments and limits fish handling.
  - Importantly, this strategy cannot be considered prophylactic, as sea lice are continuously present in the farming environment.
  - Each treatment pulse requires a separate prescription.

Indicator:	Requirement
4.4.15	The UoC shall adhere to species-specific limits on parasiticide treatments[105], according to **Appendix 2 (2.5)[106]**.

No additional guidance is provided for this Indicator.

Indicator:	Requirement:
4.4.16	The UoC shall calculate the antibiotic load, following the method outlined in **Appendix 12 (12.6.2)**.

No additional guidance is provided for this Indicator.

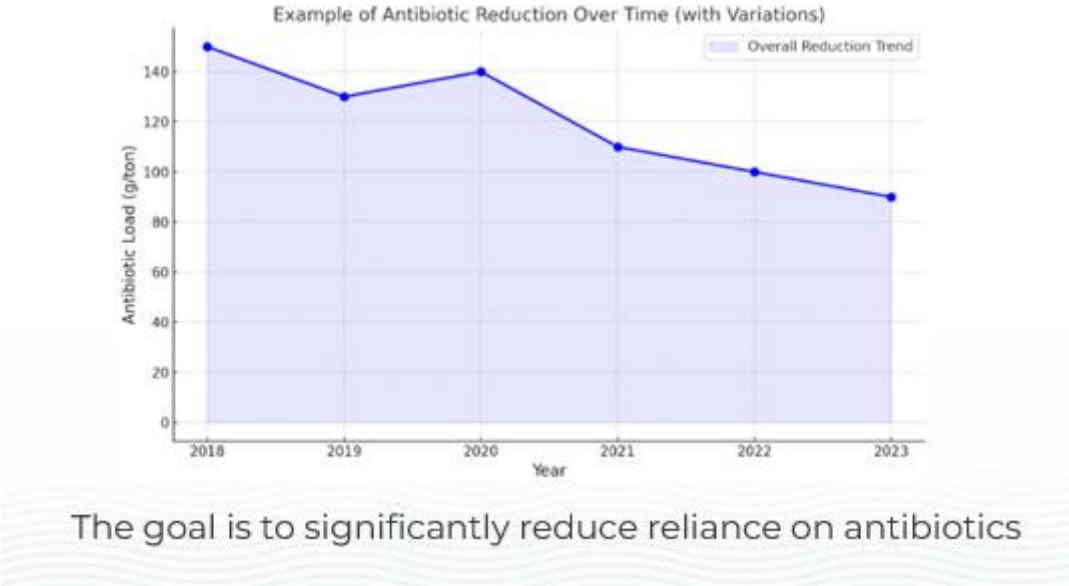
Indicator:	Requirement:
4.4.17	The UoC shall[107] reduce the antibiotic load over time and shall demonstrate measures being taken to achieve this reduction.

How do I interpret this requirement?

- When the UoC has a history of using antibiotics, they need to reduce the antibiotic load over time and demonstrate the measures being taken to achieve this reduction.

[105] The following substances are exempt from this Indicator: freshwater and hydrogen peroxide (seabass, seabream, meagre, seriola, cobia, flatfish and tropical marine fish); formaldehyde (flatfish, seabass, seabream, meagre, seriola and cobia only).
[106] An exemption applies where there is no species-specific metric listed in Appendix 2.
[107] An exemption applies to sites which have not used antibiotics.

- Antibiotic load reduction is evaluated by demonstrating a clear trend of reduction in antibiotic use over time, backed by documented measures and improvements.



- If a reduction trend is not reached, the UoC will have to justify why not. Acceptable reasons could include the emergence of a new or exotic pathogen for which no effective preventive measure or alternative treatment is available. The UoC shall still demonstrate the prevention measures in place and show that treatments remain limited to what is necessary.
- The target would be to decrease antibiotic use until a situation is reached where treatments are only sporadic. Sporadic means that treatments are not required every year or every production cycle. ASC emphasises the importance of improved prevention strategies and reduced dependency on antibiotics.
- This approach reduces the risk of antimicrobial resistance (AMR), a major concern and aligns with the 'One Health' framework, which recognises the interconnected health of humans, animals and the environment.
- Rotational stocking (e.g. sea bass and sea bream). Where cohorts are stocked and harvested on a rotating basis, calculate the antibiotic load per production cycle (per cohort or cage), not per calendar year, so the trends are comparable.
- Vaccination is a preventive measure and is not counted as an antibiotic treatment. It is not included in the antibiotic load calculation, but it can be presented as evidence of measures taken to reduce antibiotic dependency.

Evidence of implementation should be maintained, e.g.:

- Prescriptions.
- Antibiotic treatment records.

- Antibiotic load calculations.
- Actions or measures aimed to reduce antibiotic use.

Auditors should confirm:

- Antibiotic treatments and accuracy of antibiotic load calculation:
  - Implementation can be confirmed by cross-checking the treatment records and information from employee interviews and observations.

Useful Resources

- Centre for Environment, Fisheries and Aquaculture Science (2020) One Health Aquaculture – Marine Science. Blog
- Milijasevic M, Veskovic-Moracanin S, Babic Milijasevic J, Petrovic J, Nastasijevic I. (2024) Antimicrobial Resistance in Aquaculture: Risk Mitigation within the One Health Context. Foods.

Indicator:	Requirement:
4.4.18	The UoC shall adhere to the withdrawal period defined by the therapeutant manufacturer. An exception applies where a withdrawal period is not defined, in which case the UoC shall adhere to a minimum of 500 degree days.

How do I interpret this requirement?

- If there is no specific withdrawal period provided for therapeutants used, a minimum withdrawal period of 500 degree-days must be observed.

Evidence of implementation should be maintained, e.g.:

- Prescriptions.
- Treatment records.
- Degree day of treated products at the time of harvest.

Auditors should confirm:

- Treatments and withdrawal checks implemented:
- Implementation can be confirmed by cross-checking the treatment records and information from employee interviews and observations.

Useful Resources

- Ranjan, A., Sahu, N.P., Gupta, S., & Aklakur, Md. (2017) Prospects of Medicated Feed in Aquaculture. Nutrition & Food Science.

Indicator:	Requirement:
4.4.18	The UoC shall report antibiotic related data in accordance with the ASC Data Submission Procedure.

No additional guidance is provided for this Indicator.

Criterion 4.5 – Parasite Management (Sea Lice)

Scope: Cage-culture marine Salmonids

Indicator:	Requirement:
4.5.1	The UoC shall participate in an Area-Based Management (ABM) scheme following the method outlined in **Appendix 13 (13.2)**.
4.5.2	*Indicator applicability: areas with native salmonids*[108] The UoC shall establish, review annually, and revise where needed, a maximum sea lice load for the entire ABM and for the individual site, following the method outlined in **Appendix 13 (13.2)**.

How do I interpret this requirement?

- Appendix 13 (13.2.1), states that if an ABM is a regulatory requirement in a jurisdiction and its definition of 'area' aligns with the considerations outlined in this section, sites may use that definition for the requirements in Criterion 4.5.
    - The Marine Scotland Management Areas[109] and the Agrupación de Concesiones de Salmónidos[110], set by SERNAPESCA in Chile, are examples of regulatory requirements where the definition of 'area' aligns with the considerations of Appendix 13 (13.2.1).
- The shared ABM objectives for disease management, required by Appendix 13 (13.2.1), should be drafted and agreed upon by all participants within the ABM.
    - It is advisable to assign a focal point who will coordinate information, data sharing and the coordination required by this section.
        - The focal point should ideally be a rotating position, though determination is left to the discretion of the ABM.

Evidence of implementation should be maintained, e.g.:

- Records relating to the establishment of the ABM, including:

[108] Within 75 kilometres of a wild salmonid migration route or habitat. This definition is expected to encompass all, or nearly all, of salmon-growing areas in the northern hemisphere.
[109] Fish disease management areas: maps, Scottish Government. https://www.gov.scot/publications/fish-disease-management-areas/.
[110] Servicio Nacional de Pesca y Acuicultura, SERNAPESCA. https://www.sernapesca.cl/normativas/agrupacion-de-concesiones-de-salmonidos/.

- Definition of the area.
- Participation in the ABM.
- Required documentation.
- Information and data sharing.
- Coordination.
- The definition of area by ABM regulatory requirements (if applicable).

o Records relating to the establishment, review and revision of ABM sea lice load and on-site sea lice levels, including:

- Documentation showing how the ABM protects native salmonids by interpreting sea lice data from native salmonids monitoring.
- Final documented recommendation and justification for maintaining or revising maximum sea lice loads in the ABM and the on-site sea lice thresholds.

Auditors should confirm:

o ABM includes the required attributes of Appendix 13 (13.2.1).

- The establishment, review and revision (if applicable) of an ABM sea lice load and on-site sea lice levels.

Useful Resources

N/A

Indicator:	Requirement:

4.5.3 The UoC shall demonstrate commitment to collaborating with NGOs, academics and regulators on areas of mutually agreed research to measure possible impacts of sea lice on native fish species, including native salmonids. The collaboration shall include as a minimum:

a) provisions for sharing site-level data; and

b) granting access to sites; and

c) provision of other non-financial support.

How do I interpret this requirement?

- If a site does not receive any requests to collaborate on research, the site may demonstrate conformance by showing evidence of commitment through other proactive means.
  - Examples may include published policy statements or directed outreach to relevant organisations or stakeholders.

Evidence of implementation should be maintained, e.g.:

- Records that demonstrate verification of how the site or Certificate Holder has communicated with external groups (NGOs, academics, regulators) to agree on and collaborate towards areas of research to measure the impacts of sea lice on native fish.
  - Records should include requests for research support and collaboration, and responses to those requests.
- Records that demonstrate collaboration with NGOs, academics and regulators.
  - When a site or Certificate Holder denies a request to collaborate on research, there should be a written justification for rejecting the request.

Auditors should confirm:

- Evidence that the site or Certificate Holder has communicated with external groups to agree on areas of research and is tracking and responding to research requests.
  - As applicable, a written justification rejecting proposals to confirm that denials were justified and there is no consistent pattern that indicates a lack of demonstrated commitment to collaborate on research.

Useful Resources

N/A

Indicator:	Requirement:

4.5.4 *Indicator applicability: areas with native salmonids*

The UoC shall collect sea lice data on native salmonids, following the method outlined in **Appendix 13 (13.3)**.

How do I interpret this requirement?

- The collected sea lice data on native salmonids will inform the review and potential revision of the maximum sea lice load for the ABM and the corresponding sea lice levels at individual sites (see Indicator 4.5.2 and Appendix 13 (13.2.2).

Evidence of implementation should be maintained, e.g.:

- Records that verify:
  - The methodology used for collecting sea lice data on native salmonids conforms with the requirements in Appendix 13 (13.3).
  - The site's participation in collecting sea lice data on native salmonids.
  - The application of an exception as per Appendix 13 (13.3).

Auditors should confirm:

- The site's participation in collecting sea lice data on native salmonids.
- The rationale for any exception.
- That the methodology used for collecting sea lice data on native salmonids conforms with the requirements in Appendix 13 (13.3).
- The information should be cross-checked with local regulations and records.

Useful Resources

N/A

Indicator:	Requirement:

4.5.5 *Indicator applicability: areas with native salmonids*

The UoC shall publicly disclose sea lice data on native salmonids within 30 days of finalising the collection of the data.

How do I interpret this requirement?

- Make the results easily publicly available (e.g., posted to the company's website) within 30 days of completion of monitoring.

Auditors should confirm:

- Confirm that results are easily publicly available and that they were posted within the required timeframe.

Useful Resources

N/A

Indicator:	Requirement:

4.5.6 *Indicator applicability: areas with native salmonids*

The UoC shall conduct on-site sea lice sampling, following the method outlined **Appendix 13 (13.4).**

How do I interpret this requirement?

- The following are examples of exceptions to the sampling frequency required by Appendix 13 (13.4) regarding environmental conditions that may affect fish welfare:
  - Water temperature (i.e. below 4°C).
  - Low oxygen.

- Algal bloom.
- Jellyfish event.

- The person conducting on-site sea lice sampling should demonstrate competence and training.
  - Including competence and training in identifying sea lice species and stages.

Evidence of implementation should be maintained, e.g.:

- Records that demonstrate:
  - On-site sea lice sampling complies with the requirements in Appendix 13 (13.4).
  - The application of an exception as per Appendix 13 (13.4).
  - The competence and training of the person conducting on-site sea lice sampling.

Auditors should confirm:

- On-site sea lice sampling complies with the requirements in Appendix 13 (13.4).
- If practicable, auditors should observe sampling while on-site.
- The rationale for any exception.
- Competence and training of the person conducting on-site sea lice sampling.

Useful Resources

N/A

Indicator:	Requirement:

4.5.7 *Indicator applicability: areas with native salmonids*

The UoC shall publicly disclose on-site sea lice levels per site. The disclosure shall:

a. include data for *L. salmonis* for at least the stages required in **Appendix 13 (13.4)**; and,

b. include data for adult *Caligus spp.* for sites located on the west coast of Canada; and,

c. be made publicly available within seven days after the last day of sampling; and,

d. remain publicly available for the duration that the site is ASC-certified.

4.5.8 *Indicator applicability: areas with native salmonids*

The UoC shall report on-site sea lice level related data in accordance with the ASC Data Submission Procedure.

No additional guidance is provided for these Indicators.

Indicator:	Requirement:

4.5.9 *Indicator applicability: areas with native salmonids*

The UoC shall, during sensitive periods, maintain on-site sea lice levels below the threshold outlined in **Appendix 13 (13.5)**.

4.5.10 *Indicator applicability: areas with native salmonids*

The UoC shall notify the CAB if sea lice thresholds have been reached or exceeded (see Indicator 4.5.9). The notification shall be made by the next working day following the last day of sampling in accordance with the ASC Data Submission Procedure.

4.5.11 *Indicator applicability: areas with native salmonids*

The UoC shall, if sea lice thresholds have been reached or exceeded (see Indicator 4.5.10) reduce on-site levels below the threshold within 21 days following the last day of sampling.

If the reduction is not achieved within 21 days, the UoC shall:

a. submit a formal request to the CAB for cancellation of the certificate or site under the certificate by the next working day; and

b. not identify, sell or dispatch the fish as ASC-certified[111].

An exception applies where a registered veterinarian or aquatic animal health professional delays fish from being treated, affecting the site's ability to reduce sea lice levels within the required timeframe, in which case the site shall reduce the on-farm sea lice levels below the threshold within 14 days from the first day of treatment. The allowed reasons for delaying fish from being treated are:

- Situations of severe weather.
- Adverse environmental conditions.
- Unforeseen increases in on-site lice levels.
- Logistical considerations.
- Fish are undergoing a disease event and/or being treated.
- The registered veterinarian or aquatic animal health professional determines that treatment at that time would compromise fish health or welfare.

The reason for any delay in treatment shall be recorded.

[111] This applies to all fish present at the site at the time the UoC submits the formal notification of cancellation of certification to the CAB.

How do I interpret this requirement?

- The following are examples of allowed reasons for delaying fish from being treated, thus affecting the site's ability to reduce sea lice levels within the timeframe required by Indicator 4.5.11 (see exceptions to the timeframe for reducing sea lice levels in Appendix 13 (13.5):
    - Adverse environmental conditions:
        - Water temperature (i.e. below 4°C).
        - Low oxygen.
        - Algal bloom.
        - Jellyfish event.
    - Logistical considerations:
        - Strikes (trucks, cargo, freight, vessels, customs, etc.).
        - Fish diagnosed with Cardiomyopathy Syndrome (CMS) and too sensitive to handle.
        - Pathogen concerns and too sensitive to handle.
    - Unforeseen:
        - A sudden and sharp rise in lice levels “out of nowhere”
- Aligning treatment with other sites in the ABM, equipment not available, fish having just been treated and needing rest. Fish pending harvest etc are not valid reasons for a treatment exemption.
- If a person acts as coordinator compiling weekly sea lice reports, staff on site carrying out the sampling should be aware that they need to notify the coordinator**,** so the coordinator is aware parasite numbers are higher than expected.

Evidence of implementation should be maintained, e.g.:

- Records that demonstrate:
    - On-site sea lice levels are below the threshold outlined in Appendix 13 (13.5) during sensitive periods (Indicator 4.5.9).
    - The site notified the CAB within the next working following the last day of sampling if sea lice thresholds have been reached or exceeded (Indicator 4.5.10).
    - The application of an exception to the timeframe for reducing sea lice levels as per Appendix 13 (13.5) (Indicator 4.5.11).

- The site's process for notifying the CAB if sea lice thresholds have been reached or exceeded (Indicator 4.5.10).

Auditors should confirm:

- On-site sea lice levels are below the threshold outlined in Appendix 13 (13.5) during sensitive periods (Indicator 4.5.9).
- The site's process for notifying the CAB if sea lice thresholds have been reached or exceeded (Indicator 4.5.10).
- That the site notified the CAB within the next working day following the last day of sampling if sea lice thresholds have been reached or exceeded (Indicator 4.5.10).
- The rationale for any exception to the timeframe for reducing sea lice levels (Indicator 4.5.11).

Useful Resources

N/A

Indicator:	Requirement:
4.5.12	The UoC shall demonstrate that the Weighted Number of Medicinal Treatments (WNMT) for sea lice is at or below the Entry Level (EL) per site, following the method outlined in **Appendix 13 (13.6)**.
4.5.13	The UoC shall[112] reduce the WNMT for sea lice by 25% every production cycle until the WNMT is at or below the Global Level (GL) per site, following the method outlined in **Appendix 13 (13.6)**.

How do I interpret this requirement?

- By requiring sites to continuously reduce the number of medicinal treatments applied in treating sea lice, the indicators aim to incentivise the development and implementation of non-medicinal treatments (e.g. biological and mechanical control).
    - The ultimate goal is to no longer have to treat sea lice with medicinal treatments, however currently the aim is to be at or below the Global Level.
    - The requirement to reduce the WNMT by 25% each production cycle applies only while a site's WNMT is above the GL.
    - Once a site's WNMT is at or below the GL, the requirement to reduce is met. No further reduction is required under this indicator.
    - An increase in WNMT between production cycles is not a nonconformity against this indicator where the WNMT remains at or below the GL.
    - If the WNMT of a site rises above the GL, the site is again subject to the 25% reduction requirement from the following production cycle, using the preceding cycle's WNMT as the reference, per Appendix 13 (13.6). See the following example for a site located in Scotland:

WNMT numerical example for a site in Scotland

Application of Indicators 4.5.12 and 4.5.13 and Appendix 13 section 13.6

For Scotland, the Entry Level (EL) is 9.0, and the Global Level (GL) is 3.0. Indicator 4.5.12 requires the site's WNMT to be at or below the EL. Indicator 4.5.13 requires a 25% reduction each production cycle until WNMT is at or below the GL.

[112] An exemption applies to farms conforming to the EL requirements of Indicator 4.5.12 and where the EL requirement is at or below the GL requirement, as per Appendix 13 (13.6).

The table below provides an example on the application on the indicators across 8 production cycles:

Cycle	Site WNMT	4.5.12 Entry Level (EL)	4.5.13 Reduction requirement (to GL or below)
1	8.0	Met: below EL 9.0.	Reference for Cycle 2. A 25% reduction gives a target of 6.0.
2	6.0	Met.	Met: 25% reduction achieved. Above GL; Cycle 3 target is 4.5.
3	4.5	Met.	Met: 25% reduction achieved. Above GL; Cycle 4 target is 3.375.
4	3.0	Met.	Met: reduction exceeds 25% and GL is reached. No further reduction required.
5	2.0	Met.	Met: below GL. No reduction required.
6	2.8	Met.	Met: increase remains below GL and in conformance with the indicator, as no reduction is required once WNMT is at or below the GL.
7	4.0	Met: below EL 9.0.	Above GL. Reduction applies again from Cycle 8; target is 4.0 × 0.75 = 3.0. When a site rises above the GL again, the reduction requirement restarts and this cycle becomes the new reference.
8	3.0	Met.	Met: 25% reduction achieved and GL reached again. No further reduction required.

The two indicators apply separately. Being below the EL does not remove the reduction requirement while WNMT is above the GL. For example, a Cycle 2 WNMT of 7.0 would meet Indicator 4.5.12 but fail the 25% reduction required under Indicator 4.5.13, because the target is 6.0. Likewise, a WNMT of 10.0 would exceed Scotland's EL and will not meet Indicator 4.5.12.

- The calculation of the WNMT should be made and updated on an ongoing basis throughout the production cycle.
- Some examples of how to count the WNMT are given below:
  - Treating an entire site (all cages) once, counts as WNMT = 1.
  - Treating 1 cage, out of 10, once, count as WNMT = 0.1.
  - Treating 1 cage, out of 10, twice (i.e. two unique treatments), count as WNMT = 0.2.

- Treating 1 cage, out of 10, once as a 'coupled treatment[113]', count as WNMT = 0.2.
- Treating 5 cages, out of 20, once, count as WNMT = 0.25.

Evidence of implementation should be maintained, e.g.:

- Records that demonstrate:
  - Medicinal parasiticide treatments, including the number of cages treated from the total number of cages in use.
  - The WNMT calculation.

Auditors should confirm:

- WNMT calculation is conducted as per the requirements in Appendix 13 (13.6).
  - WNMT results should be cross-checked with medicinal parasiticide treatment records.
- WNMT conform with the Entry Level (EL), the 25% reduction or the Global Level (GL), as applicable.
- If WNMT is at or below the Global Level the indicator has been achieved.

Useful Resources

N/A

[113] A 'coupled treatment' is defined as a bath treatment applied in two treatment events (i.e. one treatment at t1 and a follow-up treatment at t2). Each treatment (t1 and t2) shall be included in the calculation of the WNMT.

Indicator:	Requirement:
4.5.14	The UoC shall, when two consecutive applications of a sea lice treatment per site have not produced the expected efficacy, carry out a bioassay to determine resistance.
4.5.15	The UoC shall, when bioassays determine resistance, apply an alternative sea lice treatment or immediately harvest all fish at the site.

How do I interpret this requirement?

- Expected efficacy will vary depending on the health condition of the fish and type of medicinal treatment.
    - Therefore, the site will need to review the pre- and post-treatment sea lice levels to understand and evaluate the efficacy of treatment.
        - Example: sea lice treatment with emamectin benzoate.
            - A typical baseline for the effectiveness of emamectin benzoate is a minimum of 90% reduction in the abundance of sea lice on the farmed fish.
            - To determine whether an emamectin benzoate treatment has produced the expected efficacy, the percent reduction between pre-and post-treatment sea lice levels should be calculated.
            - If the calculated percent reduction in sea lice is <90%, then the treatment did not produce the expected efficacy, and a bioassay should be carried out to determine whether sea lice have developed resistance.
- The person conducting bioassays should demonstrate competence, experience and training.

Evidence of implementation should be maintained, e.g.:

- Records that demonstrate:
    - for cases where the site uses two consecutive applications of a sea lice treatment.
        - The observed efficacy of treatment against the expected efficacy of treatment.
    - Calculated percent reduction in sea lice levels between pre- and -post treatment.
    - The bioassay results for every case where two consecutive applications of a sea lice treatment have not produced the expected efficacy.

- Alternative sea lice treatment or records to confirm harvest of all fish at the site when bioassays determine resistance.
- Competence, experience and training of the person conducting the bioassay.

Auditors should confirm:

- Medicinal parasiticide treatments.
  - With a focus on cases where the site uses two consecutive applications of a sea lice treatment.
- Pre-and post-treatment calculated percent reduction in sea lice levels.
- Bioassay result for every case where two consecutive applications of a sea lice treatment have not produced the expected efficacy.
- Alternative sea lice treatment or harvest of all fish at the site when bioassays determine resistance.
- Competence, experience and training of the person conducting the bioassay.

Useful Resources

N/A

Indicator:	Requirement:

4.5.16 The UoC shall implement an appropriate sea lice **treatment rotation** strategy in accordance with the instructions of a registered veterinarian or aquatic animal health professional.

Where consecutive treatments use the same antiparasitic class, the UoC shall document the rationale for this approach, including confirmation from the registered veterinarian or aquatic animal health professional that it is unlikely to contribute to resistance development.

How do I interpret this requirement?

- A single treatment is considered to have taken place when the majority of a site (i.e. more than half of all cages) is treated.
- The strategy should consider available treatment options, their effectiveness, previous treatment history, fish health and welfare, and the risk of resistance development.
    - Rotation supports resistance management.
- The requirement does not prescribe a fixed treatment sequence or maximum number of consecutive treatments using the same antiparasitic class.
    - Consecutive treatments using the same antiparasitic class are permitted where the rationale is documented and includes professional confirmation that consecutive use is unlikely to contribute to resistance development.
- Changing products does not constitute rotation between antiparasitic classes where the products belong to the same class.

Evidence of implementation should be maintained, e.g.:

- A treatment rotation strategy documented, for example, in the Health and Welfare Management Plan (see Indicator 4.1.1.10).
- List of effective sea lice medicinal treatments available.
    - Including rationale for the non-inclusion of other available sea lice medicinal treatments.
- Records that demonstrate medicinal parasiticide treatments.
- Supporting information informing treatment decisions, such as treatment efficacy results, treatment history and available resistance or sensitivity data.

Auditors should confirm:

- A treatment rotation strategy is in place and reflects instructions from a registered veterinarian or aquatic animal health professional.
- Effective sea lice medicinal treatments available.
- Treatment records demonstrate implementation of the strategy and any subsequent professional instructions.
- Consecutive treatments using the same class are supported by a documented rationale and explicit professional confirmation that consecutive use is unlikely to contribute to resistance development.

Useful Resources

N/A

Indicator:	Requirement:

4.5.17 The UoC shall develop, implement and maintain a site-specific Integrated Parasite Management Plan (IPMP) with the intent of controlling sea lice using multiple prevention and control strategies. The IPMP shall:

a) consider non-therapeutic treatments; and

b) be approved by a registered veterinarian; and

c) be periodically reviewed and revised as necessary.

How do I interpret this requirement?

- Effective integrated parasite management:
  - Is essential for robust sea lice control.
  - Involves:
    - The use of various techniques and strategies primarily aimed at slowing the development of resistance.
    - The coordinated application and integration of all available management practices to control sea lice.
- The Integrated Parasite Management Plan (IPMP) should:
  - Emphasise the importance of surveillance, communication, and cooperation among sites within a defined area (see Indicators 4.5.1 and 4.5.2).
  - Be reviewed and updated, if necessary, on a production cycle basis.

Evidence of implementation should be maintained, e.g.:

- Documented IPMP.
- Rationale for setting the frequency of revisions of the IPMP.

Auditors should confirm:

- Documented IPMP.
- The revision process of the IPMP.
  - Including the rationale for the frequency of its revisions.

Useful Resources

N/A

Appendix 1: Environmental Enrichment

The tables below outline the environmental enrichment requirements that certified UoC should become familiar with before the next version of the standard.

These are relevant for fish in Indicator 4.1.1.10 and 4.1.1.10.7, and for cleaner fish in Indicators 4.1.1.21 and 4.1.1.26.5.

Table 35. Valid provision criteria for environmental enrichment within the HWM

Criterion	Requirement
1. Documentation and rationale	Documented in the HWMP with a selection rationale referencing species, production system, and life stage, demonstrating how the provision actively engages species-appropriate behaviour and is compatible with biosecurity and operational requirements.
2. Consistent implementation	Implemented consistently and verifiable through HWMP records, employee interview, or direct observation during audit.
3. Welfare monitoring linkage	Monitored against at least one existing HWMP welfare indicator — feeding behaviour scoring, morphological scoring, or water quality parameters — with outcomes recorded and linked to the provision.
4. Accessibility	Accessible to all fish in the culture unit, not only to dominant individuals or those proximate to a single installation point.
5. Continuity	Maintained on a continuous basis. Provisions that are temporary, removed for extended periods without documented justification, or applied only in response to welfare deterioration do not meet this criterion.

Table 36. Assessment framework for proposed environmental enrichment provision in fish culture units.

Assessment tier	Criteria	Auditor confirmation
Green	At least one valid provision from Type A and at least one valid provision from Type B. Minimum two provisions in total spanning both types.	Cross-check HWMP enrichment documentation against valid provision criteria. Verify implementation through records and direct observation. Confirm monitoring linkage to at least one existing OWI per provision. Confirm accessibility and continuity through employee interview and observation.

Assessment tier	Criteria	Auditor confirmation
Amber	At least one valid provision from either Type A or Type B but not both, two valid provisions from the same type or, incomplete implementation, documentation and monitoring.	As above for provisions present. Confirm that an enrichment improvement plan identifying the missing type, the provision selected to address it, and a target implementation date has been documented within the HWMP and approved by the designated veterinarian or AAHP.
Red	No valid enrichment provisions documented within the HWMP.	Note absence of EE documentation. Flag as corrective action required within the current HWMP review cycle.

Note: Where a UoC documents valid provisions from both Type A categories (dietary and physical) and both Type B categories (sensory and occupational), this should be recognised in audit records as demonstrating comprehensive welfare provision across all enrichment dimensions. This level of provision is not required for green status but represents the fullest expression of the proposed enrichment framework.

Table 37. Assessment framework for environmental enrichment provision for cleaner fish.

Only Type A provisions (dietary and physical enrichment) are suggested at this stage, reflecting the current evidence base for cleaner fish enrichment.
Assessment of Type A physical enrichment builds on the established shelter requirement under Indicator 4.1.1.21.

Assessment tier	Criteria	Auditor confirmation
Green	At least one valid dietary enrichment provision and at least one valid physical enrichment provision, both satisfying all five valid provision criteria	Verify physical enrichment against sufficiency guidance and species-specific design requirements under Indicator 4.1.1.21. Confirm dietary enrichment documentation, implementation, and welfare monitoring linkage. Confirm accessibility and continuity for both provisions.
Amber	At least one valid provision from either dietary or physical enrichment but not both; or provisions present across both categories but one fails a	As above for the provision present. Confirm that a pathway to green, identifying the missing category, the provision selected to address it, and a target implementation date, has been documented within the HWMP and approved by the designated veterinarian or AAHP.

Assessment tier	Criteria	Auditor confirmation
	valid provision criterion — for example, incomplete documentation, inconsistent maintenance, or absent welfare monitoring linkage.	
Red	No valid enrichment provisions documented within the HWMP.	Note absence of enrichment provisions. Non-conformance with the existing shelter requirement under Indicator 4.1.1.21 should be flagged as a separate corrective action independent of the EE assessment framework.

Type B provisions for cleaner fish: Where sensory or occupational provisions are documented for cleaner fish and satisfy all five valid provision criteria, they should be recognised in audit records as demonstrating welfare provision beyond the assessed baseline. They do not contribute to the assessment tier at this stage, but their documentation is encouraged as the cleaner fish evidence base develops.

Table 38. Environmental enrichment provision reference

Each row presents a provision example alongside its enrichment category and type classification, the most applicable systems for implementation, and the existing indicators through which outcomes can be monitored. This is not an exhaustive list of all valid provisions.

Provision	Category	Type	Applicable systems	Relevant OWI (Indicator)
Production species				
Temporal feeding variation	Dietary	A	All systems	Feeding behaviour (4.1.1.10.3)
Spatial feed distribution	Dietary	A	All systems	Feeding behaviour (4.1.1.10.3)
Shelter and refuge structures	Physical	A	All systems	Morphological scoring (4.1.1.10.2)
Visual barriers and dividers	Physical	A	Enclosed and open-water systems	Morphological scoring (4.1.1.10.2)

Provision	Category	Type	Applicable systems	Relevant OWI (Indicator)
Overhanging or surface cover	Physical	A	All systems	Morphological scoring (4.1.1.10.2)
Substrate provision	Physical	A	Enclosed systems and pond/lagoon systems	Morphological scoring (4.1.1.10.2)
Hanging curtains and suspended structures	Physical	A	All systems where depth permits	Morphological scoring (4.1.1.10.2)
Light spectrum management	Sensory	B	Enclosed systems; partial provision in pond/lagoon and open-water systems	Feeding behaviour (4.1.1.10.3)
Tank or pond colouration	Sensory	B	Enclosed systems and pond/lagoon systems	Feeding behaviour (4.1.1.10.3); morphological scoring (4.1.1.10.2)
Acoustic noise reduction	Sensory	B	All systems; active management most applicable in enclosed systems	Feeding behaviour (4.1.1.10.3)
Circadian-aligned husbandry scheduling	Sensory	B	All systems	Feeding behaviour (4.1.1.10.3)
Directional flow complexification	Occupational	B	Flow-controlled systems	Water quality (4.1.1.10.1)
Aeration and flow variation	Occupational	B	Flow-controlled systems and open-water systems	Water quality (4.1.1.10.1)
Alternating current velocity	Occupational	B	Flow-controlled systems	Water quality (4.1.1.10.1)
Moving light array	Occupational	B	Enclosed systems	Feeding behaviour (4.1.1.10.3)
Foraging-based cognitive tasks	Occupational	B	All systems	Feeding behaviour (4.1.1.10.3)

Provision	Category	Type	Applicable systems	Relevant OWI (Indicator)
Cleaner fish provisions (Indicators 4.1.1.21 and 4.1.1.26.5)				
Supplementary feed (agar blocks, formulated feed)	Dietary	A	Open-water systems	Morphological scoring (4.1.1.26.2)
Kelp-based shelter systems	Physical	A	Open-water systems	Morphological scoring (4.1.1.26.2)
Structural hides	Physical	A	Open-water systems	Morphological scoring (4.1.1.26.2)
Artificial substrate panels	Physical	A	Open-water systems	Morphological scoring (4.1.1.26.2)

Applicable systems key

Enclosed systems *— tank-based flow-through, raceway, and recirculating aquaculture systems (RAS) where environmental conditions can be actively controlled.*

Pond and lagoon systems *— outdoor earthen or lined ponds and coastal lagoons where some environmental modification is possible but direct control is limited.*

Open-water systems *— sea-cage, freshwater cage, and net-pen environments where environmental conditions are largely externally determined.*

Flow-controlled systems *— any system in which water velocity and direction can be actively managed, including RAS, raceway, and flow-through systems.*

All systems *— applicable across enclosed, pond/lagoon, and open-water contexts; implementation should be configured appropriately to the production context.*

Table 39. Suggested documentation framework for environmental enrichment

Each enrichment provision should include all seven of the following components. Employees should demonstrate awareness of the enrichment provisions in place, their welfare objectives, and the associated monitoring process.

Environmental Enrichment component	What the farm should document
Enrichment selection	Identified enrichment type and category; rationale for suitability to species, life stage, and production system. Where the provision has a dual operational function, the enrichment function should be explicitly named and distinguished.
Implementation details	Description of provision including materials, dimensions, quantity, and spatial distribution within tank, pond, or cage. For provisions with ongoing operational parameters such as feeding schedules,

Environmental Enrichment component	What the farm should document
	flow rates, lighting settings, current parameters should be recorded and updated when changes are made. Biosecurity assessment conducted prior to introduction should be noted.
Maintenance procedure	Cleaning schedule; inspection frequency; replacement protocol; removal procedures during health monitoring, treatment, or harvest operations. Periods of temporary removal should be recorded with reason for removal and date of reinstatement.
Welfare objectives	Specific welfare outcomes targeted by the provision. For example, reduction in fin damage score, improvement in feeding behaviour scoring, or reduction in aggression-related morphological indicators are linked to existing HWMP OWIs.
Monitoring indicators	Existing HWMP welfare indicator against which provision effects are monitored; frequency and method of assessment; monitoring outcomes recorded in the relevant HWMP monitoring log with cross-reference to the enrichment provision.
Review schedule	Trigger and frequency for reviewing enrichment provisions. At minimum annually or aligned with the HWMP review cycle, and following changes in species, life stage, production system, or monitoring outcomes. Review outcomes and any revisions should be documented with veterinary or AAHP input recorded where sought.
Evidence basis	Reference to the scientific literature, industry guidance, or professional recommendation informing enrichment selection, where available. Where veterinary or Aquatic Animal Health Professional recommendation informed selection, this should be noted.

Appendix 2: Hides and refuges provision for cleaner fish

The following tables provide technical guidance on hides and refuges provision for lumpfish and ballan wrasse in sea-cage deployment as required under Indicator 4.1.1.21.

Lumpfish hides and refuges provision

Hides and refuges provision for lumpfish is calculated from available attachment surface area, scaled to fish size and stocking density. Table 40 should be consulted at stocking and reviewed at regular intervals throughout the deployment period, using current mean body weight to identify the appropriate surface area requirement and adjust provision as fish grow.

Table 40. Mean surface area and total surface area required per 1,000 lumpfish *(Cyclopterus lumpus)* by body size. Based on Imsland et al. (2018). Values represent means ± SD (N = 2,640).

Height (cm)	Width (cm)	Length (cm)	Weight (g)	Surface area per fish (cm²)	Surface area per 1,000 fish (m²)
3.5 ± 0.2	2.9 ± 0.4	8.3 ± 0.5	24.3 ± 2.8	23.9 ± 3.2	0.239
3.8 ± 0.2	3.3 ± 0.2	9.5 ± 0.5	33.3 ± 2.5	31.8 ± 2.8	0.318
4.5 ± 0.3	3.5 ± 0.2	10.7 ± 0.3	46.4 ± 2.4	37.6 ± 2.6	0.376
4.7 ± 0.2	3.6 ± 0.2	11.3 ± 0.4	55.2 ± 2.6	41.1 ± 2.3	0.411
5.0 ± 0.2	3.7 ± 0.2	11.9 ± 0.5	63.7 ± 3.0	43.5 ± 2.6	0.435
5.3 ± 0.2	3.7 ± 0.2	12.5 ± 0.5	73.9 ± 3.1	47.1 ± 2.9	0.471
5.6 ± 0.3	4.0 ± 0.3	13.1 ± 0.6	84.7 ± 2.5	52.1 ± 4.4	0.521
5.9 ± 0.5	4.1 ± 0.3	13.6 ± 0.4	94.4 ± 2.9	55.5 ± 4.6	0.555
6.0 ± 0.3	4.3 ± 0.3	13.9 ± 0.4	104.4 ± 2.8	59.2 ± 4.8	0.592
6.3 ± 0.4	4.4 ± 0.3	14.4 ± 0.6	113.9 ± 2.9	63.7 ± 6.5	0.637
6.5 ± 0.3	4.7 ± 0.3	15.2 ± 0.5	125.1 ± 2.5	71.0 ± 4.8	0.710
6.8 ± 0.3	4.9 ± 0.3	15.2 ± 0.5	133.9 ± 3.2	75.1 ± 5.0	0.751
7.1 ± 0.2	5.2 ± 0.2	15.6 ± 0.5	144.7 ± 2.7	81.0 ± 2.8	0.810
7.5 ± 0.5	5.3 ± 0.2	15.8 ± 0.6	164.5 ± 2.9	84.2 ± 3.1	0.842

Height (cm)	Width (cm)	Length (cm)	Weight (g)	Surface area per fish (cm^2)	Surface area per 1,000 fish (m^2)
7.5 ± 0.2	5.4 ± 0.2	16.3 ± 0.5	174.9 ± 3.0	88.5 ± 3.1	0.885
7.6 ± 0.1	5.6 ± 0.4	16.3 ± 0.5	184.9 ± 2.8	90.8 ± 6.6	0.908
8.0 ± 0.3	5.8 ± 0.3	17.1 ± 0.6	205.7 ± 2.7	98.1 ± 7.5	0.981
8.2 ± 0.2	6.1 ± 0.3	17.1 ± 0.6	214.4 ± 2.7	103.9 ± 6.1	1.039
8.3 ± 0.2	6.4 ± 0.5	17.2 ± 0.5	223.9 ± 3.3	111.7 ± 7.8	1.117
8.6 ± 0.2	6.4 ± 0.2	17.6 ± 0.8	234.4 ± 3.1	112.5 ± 4.7	1.125
8.6 ± 0.4	6.4 ± 0.2	17.6 ± 0.6	244.2 ± 4.0	115.8 ± 6.5	1.158
8.6 ± 0.2	6.6 ± 0.4	18.2 ± 0.7	253.2 ± 2.2	119.6 ± 11.4	1.196
8.9 ± 0.2	6.7 ± 0.6	18.2 ± 0.7	265.5 ± 2.5	121.3 ± 6.3	1.213
8.9 ± 0.6	6.8 ± 0.3	18.3 ± 0.7	273.5 ± 2.8	124.1 ± 4.7	1.241
9.1 ± 0.4	7.0 ± 0.4	18.8 ± 0.7	283.0 ± 2.8	131.5 ± 9.4	1.315
9.2 ± 0.4	6.9 ± 0.4	19.3 ± 1.0	304.6 ± 3.1	133.6 ± 3.4	1.336

Ballan wrasse hide and refuge provision

Table 40 summarises hide and refuge configurations for ballan wrasse in sea-cage deployment, with indicative deployment characteristics and operational considerations. Provision should be scaled to cleaner fish number, fish size, site exposure, and maintenance capacity, and confirmed with the designated veterinarian or Aquatic Animal Health Professional.

Table 41. Ballan wrasse (*Labrus bergylta*) hide and refuge design and implementation guidance for sea-cage deployment.

Shelter type	Typical application	Deployment characteristics	Operational considerations
Curtain hides	General sea-cage refuge provision	Suspended artificial kelp curtains distributed vertically through the cage water column to create salmon "corridors"	Lower infrastructure requirements and easier deployment across standard sea-cage systems; may move substantially under strong current or wave exposure

Floating frame hides	Exposed or high-energy sea-cage sites	Artificial kelp mounted onto floating or weighted frame structures to maintain stable refuge zones	Greater structural stability under hydrodynamic activity but typically requires additional lifting equipment and handling infrastructure
Kelp-ball refuges	Winter deployment and deep refuge provision	Dense bundled kelp structures suspended deeper within the cage water column	Commonly used to provide refuge below surface turbulence and during periods of winter environmental instability.
Structural hides	Persistent refuge structures and resting areas	Hollow or semi-enclosed rigid structures constructed from durable marine-grade materials	Must permit adequate water exchange and cleaning access; structure dimensions should remain appropriate to cleaner fish size and stocking density