ASC Farm Standard

March 2021

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ASC FARM STANDARD
PUBLIC CONSULTATION III (P2) - DRAFT

March 2021

NOTES on how to read this document:

Black text: Proposed Standard (normative)

Red Text: Notes or Advance notices regarding sections forthcoming (in next round of pubic consultation).

Text in colour frame: Key considerations & notes regarding the proposed indicator(s), aimed at providing further background to readers during the March 8-May 7, 2021 public consultation. This boxed text will not be part of the ASC Farm Standard once finalised.

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VERSION CONTROL, AVAILABLE LANGUAGE(S) AND COPYRIGHT NOTICE

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For comments or questions regarding the content of this document, please contact the Standards and Science Team of ASC via standards@asc-aqua.org.

Version control

Document version history:

Version:	Sign-of date:	Effective date:	Remarks/changes:
V0.1		N/A	

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

Available language(s)

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

Version:	Available languages
v0.1	English (official language)

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

Copyright notice

ABOUT THE AQUACULTURE STEWARDSHIP COUNCIL (ASC)

The Aquaculture Stewardship Council (ASC) is an independent, not-for-profit organisation that operates a voluntary, independent third-party certification and labelling programme based on scientifically robust Standards.

The Standards define Criteria that help to transform the aquaculture[1] sector[2] towards environmental sustainability and social responsibility, as per the ASC Mission.

ASC Vision

A world where aquaculture plays a major role in supplying food and social benefits for mankind whilst minimising negative impacts on the environment.

ASC Mission

To transform aquaculture towards environmental sustainability and social responsibility using efficient market mechanisms that create value across the chain.

ASC Theory of Change

A Theory of Change (ToC) is an articulation, description and mapping out of the building blocks required to achieve the organisation's vision.

ASC has defined a ToC which explains how the ASC certification and labelling programme promotes and rewards responsible fish farming practices through incentivising the choices people make when buying seafood.

ASC's Theory of Change can be found on the ASC website.

[1] Aquaculture: see Definition List.

[2] Aquaculture sector: see Definition List.

THE ASC DOCUMENT AND CERTIFICATION SYSTEM

ASC is a full member of the ISEAL Alliance and implements a voluntary, independent third-party certification system[3] consisting of three independent actors:

I.	Scheme Owner	i.e. Aquaculture Stewardship Council
II.	Accreditation Body	i.e. Assurance Services International (ASI)
III.	Conformity Assessment Body (CAB)	i.e. accredited CABs.

Scheme Owner

ASC, as scheme owner:

- sets and maintains Standards according to the ASC Standard Setting Protocol which is in compliance with the "ISEAL Code of Good Practice - Setting Social and Environmental Standards". The ASC Standards are normative documents;

- sets and maintains Implementation Guidance which provides guidance to the Unit of Certification (UoC) on how to interpret and best implement the indicators within the Standard;

- sets and maintains the Auditor Guidance which gives guidance to the auditor how to best assess a UoC against the Indicators within the Standard;

- sets and maintains the Certification and Accreditation Requirements (CAR) which adheres at a minimum to the "ISEAL Code of Good Practice - Assuring compliance with Social and Environmental Standards". The CAR describes the accreditation requirements, assessment requirements and certification requirements. The CAR is a normative document.

These above listed documents are publicly available on the ASC-website.

Accreditation Body

Accreditation is the assurance process of assessing the Conformity Assessment Body (CAB) against accreditation requirements and is carried out by an Accreditation Body (AB). The appointed AB of ASC is Assurance Services International (ASI, "Accreditation Services International" prior to January 2019) which uses the CAR as normative document for the accreditation process.

Assessment findings of ASI-accreditation audits and an overview of currently accredited CABs is publicly available via the ASI-website (http://www.asi-assurance.org/s/).

[3] Third-party Certification System: see Definition List.

Conformity Assessment Body

The UoC contracts the CAB which employs auditor(s) that conduct a conformity assessment (hereafter 'audit') of the UoC against the relevant standard. The management requirements for CABs as well as auditor competency requirements are described in the CAR and assured through ASI accreditation.

ASC Audit and Certification Process

The UoC is audited at Indicator-level.

An ASC audit follows strict process requirements. These requirements are detailed in the Certification and Accreditation Requirements (CAR). Only ASI-accredited CABs are allowed to audit and certify a UoC against ASC Standards. As independent scheme owner, ASC itself is not - and cannot be - involved in the actual audit and/or certification decision of a UoC. Granted certificates are the property of the CAB. ASC does not manage certificate validity.

Audit findings of all ASC audits, including granted certificates, are made publicly available on the ASC-website. These include the audit findings that result in a negative certification decision.

Note: in addition to the Standard's, there are certification requirements that apply to UoCs seeking certification; these requirements are detailed in the CAR.

ASC Logo use

ASC-certified entities shall only sell their product carrying the ASC Logo if a Logo Licence Agreement (LLA) has been signed. On behalf of the ASC, the Marine Stewardship Council (MSC) Licensing Team will issue LLAs and approve logo use on ASC products. For more information see: ASC Logo.

Unauthorised logo display is prohibited and will be treated as a trademark infringement.

STRUCTURE OF ASC STANDARDS

A standard[4] is "*a document that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory*."

ASC Standards are as follows designed:

- ASC Standards consist of multiple Principles – a Principle is a set of thematically-related Criteria which contribute to the broader outcome defined in the Principle title;
- Each Principle consists of multiple Criteria – each Criterion defines an outcome that contributes to achieving the outcome of the Principle;
- Each Criterion consists of several Indicators – each Indicator defines an auditable state that contributes to achieving the Criterion outcome.

Both Principles and Criteria include Rationale statements providing a set of reasons (backed by reference notes if needed) as to why the Principle or Criterion is needed.

Language use, acronyms and definitions

The Principles, Criteria and Indicators are written in an active form, using "the UoC" as subject.

Throughout the ASC documents, several verbal forms are used to indicate:

- A requirement[5] e.g. shall, must
- A recommendation[6] e.g. should

An Acronym List, Definition List and verbal forms used are included in Annex 1.

[4] Standard: see Definition List.

[5] Requirement: see Definition List.

[6] Recommendation: see Definition List.

SCOPE AND UNIT OF CERTIFICATION (UOC)

Linked to the ASC Vision, the Scope of the ASC Farm Standard (hereafter "the Standard") addresses the key negative environmental and social impacts associated with the aquaculture industry. An ASC-certified farm contributes to the ASC Vision by reducing, mitigating or eliminating such negative impacts.

The Scope of the Standard is translated into three (3) Principles that apply to every UoC:

- Principle 1 - The UoC operates legally and applies effective business management.
- Principle 2 - The UoC operates in an environmentally responsible manner.
- Principle 3 - The UoC operates in a socially responsible manner.

The various Criteria within each of the Principles apply either to every UoC (e.g.: Criteria related to legal compliance or labour) or only to UoCs that operate a specific culture-system (e.g.: Criteria related to marine cage culture or pond culture).

Resulting from this, the Standard can establish multiple Scopes at Criteria-level. A specific Scope is defined under each Criterion's title.

It is the responsibility of the user of the Standard to ensure that the correct Criterion Scope is being applied.

Unit of Certification

The applicable UoC is determined by the CAB/auditor, and adheres to the Standard's Criteria UoC-requirements as outlined in the CAR.

Metric Performance Levels

Several indicators in the Standard require a specific Metric Performance Level (MPL). The applicable MPL is either directly defined in the indicator, or listed in Annex 2 'Metric Performance Levels'.

It is the responsibility of the user of the Standard to apply the correct MPL to the relevant indicators.

It is not possible to certify a UoC producing a species which is not listed in the MPL Table (Annex 2)"

PRINCIPLE 1: THE UOC OPERATES LEGALLY AND APPLIES EFFECTIVE BUSINESS MANAGEMENT

This Principle is not open for consultation.

PRINCIPLE 2: THE UOC OPERATES IN AN ENVIRONMENTALLY RESPONSIBLE MANNER

Scope Principle 2 - Every UoC

Rationale – Aquaculture, as any other food producing system, is reliant on ecosystem services for inputs, and absorption of outputs. If not managed well and overused, the capacity of environment services can be exceeded, resulting in negative environmental impacts. The rapid growth of the sector, particularly in remote regions and those with inadequate regulations for the scale of operations, may further amplify these negative environmental impacts.

Depending on the severity and length of the stress and negative impacts which ecosystems have to bear, this can lead to a negative public perception of the industry and of its products, and an impacted reputation can in turn restrict the latter's ability to realise its potential.

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

Aquaculture is a varied industry, both in terms of species cultured and production-systems used, as to the type of marine, freshwater and terrestrial ecosystems in which farms are sited. As a result, a wide range of impacts are identified, some relevant to practices of all farms, others to more specific situations or to certain species. The ASC Farm Standard defines these key impact areas for all main culture systems and applies specificity where needed. The defined measures to minimise identified impacts are under continues influence of new insights and development, constantly redefining what "least impact" means.

In developing the Criteria for this Principle 2, reference documents of UN FAO, RAMSAR, IUCN, OIE were used. Relevant documents are referenced in the Rationale section of each Criterion.

Through Principle 2, ASC's vision directly contributes to addressing the UN Sustainable Development Goals[9] (SDG) 6 ("Clean water and sanitation"), SDG 12 ("Responsible consumption and production"), SDG 13 ("Climate action"), SDG 14 ("Life below water") and SDG 15 ("Life on land").

The intended outcome of Principle 2 is that ASC-certified facilities operate in an environmentally responsible manner, by ensuring that:

I. The farm's siting and operation does not impact wider ecosystem functioning.
II. Resource use is optimised.
III. Any discharged outputs do not exceed ecosystem absorption rates.
IV. The aquatic species cultured do not harm native species and/or ecosystems.

Criterion 2.1 - The UoC is in compliance with applicable environmental regulations

Scope Criterion 2.1 - Every UoC

Rationale – In combination with the indicators under Criterion 1.1, compliance with environmental regulations represents a fundamental basis for the development of responsible aquaculture.

Indicators:	
Indicator 2.1.1	The UoC shall comply with all applicable environmental-related laws and regulations and maintain a system for compliance with them.

Criterion 2.2 - Ecologically Important Habitats

Scope Criterion 2.2 - Every UoC

Rationale

Coastal and riparian vegetation and habitats provide a variety of ecosystem services. The effective width of buffer zones[7] permit for the maintenance of essential ecosystem functions and free movement and dispersal of organisms. One internationally recognised effective tool in conserving species and ecosystem services are the establishment of Protected Areas (PAs)[8]. The development and activities of aquaculture farms can disrupt ecosystems and reduce these valuable ecological habitats, which diminishes the protective functions they provide and the environments on which species depend[9]. Farm perimeters established adjacent to or within PAs have the potential to impact critical habitats[10] on which threatened and protected species[11] depend. Habitat maintenance ensures that farms do not occupy the land-water interface and conserves these critical resources.

Intent – Farm sites maintain coastal and riparian habitats adjacent to or within farm perimeters to preserve essential ecosystem functions and comply with management objectives of protected areas and ecologically important habitats on which threatened and/or protected species depend.

Indicators	
Indicator 2.2.1	The UoC shall be located at a distance from an open coastline, lagoon, or lake, or confined natural watercourses that provides protection to the adjacent ecosystem from farm operations as defined through environmental assessment *(see Annex 3 – under development)*, or maintain natural buffer zones from those waterbodies.
Indicator 2.2.2	The UoC shall demonstrate through environmental assessment *(see Annex 3 – under development)* that existing buffer zones do not present erosion risks when the buffer zones are shorter/narrower than the ones prescribed in 2.2.1
Indicator 2.2.3	The UoC shall demonstrate through environmental assessment *(see Annex 3 – under development)* that the farm's structures do not impede animal habitats on which threatened and/or protected species depend.
Indicator 2.2.4	The UoC shall not be sited (partially, or fully) in a Protected Area (PA)[12], unless the farm, or aquaculture activity, is in compliance with the management plan and objectives of the PA, and the farm was built legally prior to the designation of the PA or the designation permits aquaculture activities.

[7] Riparian buffer zone: see Definition List.

[8] Protected Area: see Definition List.

[9] Particularly significant or essential biological or ecological function: see Definition List.

[10] Critical Habitat: see Definition List.

[11] Threatened and Protected Species: see Definition List.

[12] Including both terrestrial and marine protected areas.

Indicator 2.2.5	The UoC shall not construct or expand facilities in sensitive[13], critical habitats or High Conservation Value Areas (HCVA[14]) unless the UoC can demonstrate that its impacts are compatible with the environmental and social values identified for the HCVA.
Indicator 2.2.6	The UoC shall, if built or permitted before May 1999, successfully rehabilitate mangroves[15] or other wetland[16] loss at a surface area as is determined by the environmental assessment (2.2.1), or the national/state/local authority plans/list, or 50% of the lost surface area (whichever is greater).
Indicator 2.2.7	The UoC shall not have constructed or expanded its facilities in mangrove and other wetland habitats, after May 1999.
Indicator 2.2.8	The UoC may construct pumping stations, water pipes or canals in mangrove or other wetland habitats after May 1999, if permitted by the relevant authorities and provided that an equivalent surface area is successfully rehabilitated.

Key considerations regarding the proposed habitat indicators

Habitats indicators were expanded to ensure applicability across habitats and ecosystems. Definitions of protected and threatened species is being used to capture “endangered, threatened, protected (ETP) and vulnerable species” and will require application of the precautionary principle where species designations may vary. Designations will be according to the IUCN Red List of Threatened Species, and “Protected” species are those that have legal protections under CITES or national and other international designations. ASC seeks specific clarifications on definitions around wetlands, protected areas, High Conservation Value Areas, and rehabilitation and restoration of mangroves and other wetlands. ASC seeks to further understand the applicability and practicability of these indicators on all farming systems and locations.

Questions to stakeholders:

Please see the stakeholder survey for specific questions on this Criterion.

[13] Sensitive Habitat: see Definition List.

[14] High Conservation Value Area (HCVA): see Definition List.

[15] Mangroves: see Definition List.

[16] Wetland: see Definition List.

Criterion 2.3 - The UoC minimizes wildlife interactions

Scope Criterion 2.3 - Every UoC

Rationale – Aquaculture operations may interact with wildlife. Those interactions may lead to the predation or injury of farmed species but wildlife may also become harmed (e.g. by entanglement in farming operations equipment). Furthermore, sourcing broodstock from wild populations may lead to adverse impacts through extraction of threatened and protected species and interbreeding with captive populations. Farm operations should ensure minimal impact, protect the health and genetic integrity of wild populations and minimise both accidental[17] and intentional[18] mortalities of predators and other wildlife.

Intent – The farm deters and mitigates interactions with wildlife, particularly threatened and protected species.

Indicators	
Indicator 2.3.1	The UoC shall effectively implement a site-specific Wildlife Management Plan (WMP), with the intent to minimise the risk of Human-Wildlife Conflict[19], as a result of: – Predator interaction; – Non-predator interaction linked to feeding, breeding/nursing, migrating or otherwise important habitat use by the species; – Entanglement or entrapment of any species as a result of the farm' infrastructure or operation.
Indicator 2.3.2	The UoC shall, as part of the WMP, identify through an environmental assessment *(Annex 3; under development)* and list wildlife species likely to interact with the site, including those species that are listed as threatened and/or protected by the IUCN (Red list) or similarly listed by a national or other official body with equivalent categories (whichever is stricter).
Indicator 2.3.3	The UoC shall, as part of the WMP, outline non-lethal methods to be used prior to lethal control and conditions under which lethal control may be used.
Indicator 2.3.4	The UoC shall, as part of the WMP, outline wildlife interaction reporting requirements to relevant authorities.
Indicator 2.3.5	The UoC shall review and where needed revise the WMP. This shall occur on a regular basis as well as when changes in activities or events require an additional review.
Indicator 2.3.6	The UoC shall not cause the death of species listed as threatened and/or protected by the IUCN Red List or similarly listed by a national or other official body with equivalent categories (whichever is stricter).

[17] Accidental mortality: see Definition List.

[18] Intentional mortality: see Definition List.

[19] Human-Wildlife Conflict: see Definition List.

Indicator 2.3.7	The UoC shall not[20] intentionally kill birds, mammals, reptiles or elasmobranchs unless all other avenues were pursued prior to using lethal action.
Indicator 2.3.8	The UoC shall conduct root cause analysis and implement corrective action for each mortality event[20] with the intent to prevent repetition.
Indicator 2.3.9	The UoC shall publicly report on mortality events[20] per year and to ASC. *(Annex 4; under development)*
Indicator 2.3.10	The UoC shall only use deterrent devices (e.g., acoustic deterrent devices (ADDs) or acoustic harassment devices (AHDs), where there is clear scientific evidence that use of the technology does not result in significant stress, injury or mortality of marine mammals, and species listed as threatened and/or protected by the IUCN Red List or similarly listed by a national or other official body with equivalent categories.
Indicator 2.3.11	The UoC shall not use wild harvested broodstock listed as threatened and/or protected by the IUCN Red list or similarly listed by a national or other official body with equivalent categories, whichever is stricter, for juvenile or seed production.

[20] Excluding vermin (see Definition List).

Key considerations regarding the proposed wildlife indicators

1. Specific mortality Limits:
   The draft indicators move away from default mortality limits with the recognition that species populations can vary considerably by region, and for certain populations, a limit of even two ['2'] (as set in some of the current Standards) animals can be detrimental. In its place the revised indicators direct that independent environmental assessments must detail wildlife species likely to interact with the site and designations of those species, along with methods on all non-lethal actions, root cause analysis and implementation of corrective action for each mortality event, and reporting requirement. ASC's intent is to deter and mitigate all interactions, and therefore propose no longer defining any allowable limits but enhancing actions taken to avoid mortality events.

2. Species interaction
   Wildlife interactions seeks to consider all wildlife with the exception of vermin, with special focus on threatened and endangered species. Definitions of protected and threatened species is being used to capture "endangered, threatened, protected (ETP) and vulnerable species" and will require application of the precautionary principle where species designations may vary. Designations will be according to the IUCN Red List of Threatened Species, and "Protected" species are those that have legal protections under CITES or national and other international designations. The criterion has been expanded to include the use of wild populations in broodstock. ASC seeks to further define and justify the appropriate species groups (e.g. mammals, reptiles, sharks etc.), as the variation across a group can be considerable in terms of population impacts. Additional information is needed to develop clear guidance around protected and threatened species where designation may conflict with regionally permitted harvest or related activities.

Questions to stakeholders:

Please see the stakeholder survey for specific questions on this Criterion.

Criterion 2.4 - The UoC avoids the culture of new non-native species

Scope Criterion 2.4 - Every UoC

Rationale – The culture of non-native[21] species[22] is especially of concern when animals escape, enter the natural environment and become established. Depending on the biological characteristics of the (non-native) species and the ecosystem in which it enters, the severity of the impacts can vary[23]. Non-native species can predate on native species, (out)compete native species for food or habitat, inter-breed with native species or introduce pathogens that impact native species.

The global aquaculture industry has for a long-time cultured species outside of their natural habitat. Examples are the culture of Rainbow trout (*Oncorhynchus mykiss*, native to the North East Pacific Ocean region), Nile tilapia (*Oreochromis niloticus*, native to the Nile system and wider tropical Africa), the Pacific oyster (*Magallana gigas*, native to the Western Pacific Ocean), Whiteleg shrimp (*Penaeus vannamei*, native to the Eastern Central and Southeast Pacific), and Atlantic salmon (*Salmo salar*, native to the North Atlantic Ocean). As such, this presents a challenge in prohibiting non-native culture altogether.

With the growth of the aquaculture industry comes the increased risk of introducing additional non-natives species into production regions, and the potential impacts that these species can pose to the natural environment. Many species have already been in production for considerable time across global regions, in some cases have escaped in the past and since formed naturalised populations. Therefore, responsible practices should strive to prevent the introduction of additional non-native species into regions (where not otherwise established), unless they are farmed in manners that minimise the risks of escape.

The level of impact depends on frequency (mass escape event vs. chronic leakage) and intensity (i.e., number) of escapes, whether the species is native, non-native or naturalised, location of escape event in relationship to wild populations, and the overall vulnerability of wild populations and the local ecosystem[24].
Escaping gametes (eggs, if so fertilised) also pose a risk. This is especially the case for species that can reproduce during grow-out[25], or where farmed species can interact with wild populations surrounding the farm[26].

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[21] Non-native: see Definition List

[22] Species: see Definition List

[23] Jeschke JM, Bacher S, Blackburn TM, Dick JT, Essl F, Evans T, Gaertner M, Hulme PE, Kühn I, Mrugała A, Pergl J, Pyšek P, Rabitsch W, Ricciardi A, Richardson DM, Sendek A, Vilà M, Winter M, Kumschick S. Defining the impact of non-native species. Conserv Biol. 2014 Oct;28(5):1188-94. doi: 10.1111/cobi.12299. Epub 2014 Apr 29. PMID: 24779412; PMCID: PMC4282110.

[24] Jensen Ø, Dempster T, Thorstad EB, Uglem I, Fredheim A (2010) Escapes of fishes from Norwegian sea-cage aquaculture: causes, consequences and prevention. Aquacult Environ Interact 1:71-83. https://doi.org/10.3354/aei00008

[25] Uglem, Ingebrigt & Knutsen, Øyvind & Kjesbu, Olav & Hansen, Øyvind & Mork, Jarle & Bjorn, Pal & Varne, Rebekka & Nilsen, Rune & Ellingsen, Ingrid & Dempster, Tim. (2012). Extent and ecological importance of escape through spawning in sea-cages for Atlantic cod. Aquaculture Environment Interactions. 3. 33-49. 10.3354/aei00049.

[26] Somarakis, S. & Pavlidis, Michail & Saapoglou, Christina & Tsigenopoulos, Costas & Dempster, Tim. (2013). Evidence for 'escape through spawning' in large gilthead sea bream Sparus aurata reared in commercial sea-cages. Aquaculture Environment Interactions. 3. 135–152. 10.3354/aei00057.

Intent - The intent of the Criteria is to avoid the culture of non-native species that could be able to become newly established in the established culture area.

Indicators:	
Indicator 2.4.1	The UoC shall only stock[27] a non-native species if at least one of the below conditions is met: 1) the species has existed in fully self-sustaining wild population(s) in the culture area since 2010[28]; 2) the species has been in commercial production in the culture area before 2010; 3) the stock is to a high degree sterile[29] or otherwise unable to establish wild populations; 4) the species is cultured in a system that prevents[30] animals from escape.
Indicator 2.4.2	The UoC shall only culture transgenic species[31] if kept in a system that prevents[30] animals from escaping.

Key considerations regarding the proposed revisions on the allowance of transgenic species if cultured in escape-proof system

The current ASC Standards prohibit the culture of transgenic species. Within the rationale-sections of these Standards, concerns over environmental impacts, if these animals escape, are carried forth as arguments to prohibit their culture.

Indeed, the consequences of transgenic animals escaping into the wild are unknown and deserve to be approached with precaution.

However, if escape of transgenic species can be prevented as a result of system design (i.e. land-based fully-closed recirculation systems), then it could be argued to allow their culture.

Transgenic species are more efficient in resource use and as have a smaller footprint compared to non-transgenic species.

ASC is aware of consumer sensitivities surrounding transgenic (food) species and will require the UoC to inform the buyer of the product in case the species is transgenic.

Questions to stakeholders:

Please see the stakeholder survey for specific questions on this Criterion.

[27] This includes species kept for the purpose of parasite control.

[28] The date (2010) refers to the year of release of the first ASC Standard.

[29] A high degree of sterility is achieved by:1) >98% triploidy monosex, 2) germ-cell migration disruption and 3) gene editing (CRISPR).

[30] I.e. land-based fully-closed recirculation systems.

[31] Transgenic species: see Definition List

Criterion 2.5 - The UoC minimises escapes

Scope Criterion 2.5 - Every UoC

Rationale – Escapes are the result of internal and/or external factors, such as human errors or unforeseen events. Escapees present economic losses to the producer, and also pose risks related to ecological, pathogenic and genetic impacts[32,33] to local populations and ecosystems, and therefore should be minimised as much as possible.

The level of impact depends on frequency (mass escape event vs. chronic leakage), intensity (i.e., number) of escapes, whether the species is native or genetically dissimilar to native species, non-native or naturalised, location of escape event in relationship to wild populations, and the overall vulnerability of wild populations and the local ecosystem[34].

Escaping gametes (eggs, if so fertilised) also pose a risk. This is especially the case for species that can reproduce during grow-out[35], or where farmed species can interact with wild populations surrounding the farm[36].

Intent – Farms shall minimise escapes.

Indicators:	
Indicator 2.5.1	The UoC shall effectively implement a site-specific Escape Management Plan (EMP), that minimises the risk of Accidental Escapes[37], Leakage Escapes[38] and Mass Escape Events[39] as a result of: – weaknesses in structural integrity of holding units in relationship to site conditions, weather events (including regional and seasonal severe weather like floodings and storms) and human maritime activities; – inappropriately-sized netting, screens or other escape barriers; – errors in operational handling processes that are escape-prone; – uncontrolled spawning for relevant species.

[32] Atalah, Javier & Sanchez-Jerez, Pablo. (2019). Global assessment of ecological risks associated with farmed fish escapes. Global Ecology and Conservation. 21. e00842. 10.1016/j.gecco.2019.e00842.

[33] Jackson, Dave & Drumm, Alan & McEvoy, Sarah & Jensen, Østen & Mendiola, Diego & Gabiña, Gorka & Borg, Joseph A & Papageorgiou, Nafsika & Karakassis, Ioannis & Black, Kenneth. (2015). A pan-European valuation of the extent, causes and cost of escape events from sea cage fish farming. Aquaculture. 436. 21-26. 10.1016/j.aquaculture.2014.10.040.

[34] Jensen Ø, Dempster T, Thorstad EB, Uglem I, Fredheim A (2010) Escapes of fishes from Norwegian sea-cage aquaculture: causes, consequences and prevention. Aquacult Environ Interact 1:71-83. https://doi.org/10.3354/aei00008

[35] Uglem, Ingebrigt & Knutsen, Øyvind & Kjesbu, Olav & Hansen, Øyvind & Mork, Jarle & Bjorn, Pal & Varne, Rebekka & Nilsen, Rune & Ellingsen, Ingrid & Dempster, Tim. (2012). Extent and ecological importance of escape through spawning in sea-cages for Atlantic cod. Aquaculture Environment Interactions. 3. 33-49. 10.3354/aei00049.

[36] Somarakis, S. & Pavlidis, Michail & Saapoglou, Christina & Tsigenopoulos, Costas & Dempster, Tim. (2013). Evidence for 'escape through spawning' in large gilthead sea bream Sparus aurata reared in commercial sea-cages. Aquaculture Environment Interactions. 3. 135–152. 10.3354/aei00057.

[37] Accidental Escapes: see Definition List.

[38] Leakage Escapes: see Definition List.

[39] Mass Escape Events: see Definition List.

Indicator 2.5.2	The UoC shall, within the EMP, detail escape response procedures, including recapture where legally required.
Indicator 2.5.3	The UoC shall dispose of sick, deformed or moribund animals in a responsible manner (i.e., no release).
Indicator 2.5.4	The UoC shall report, where applicable, any information related to escapes to the relevant authority according to regulatory requirements.
Indicator 2.5.5	The UoC shall publicly[40] disclose relevant information[41] related to any Mass Escape Event within 3 days after the event.
Indicator 2.5.6	The UoC shall report to ASC and the CAB any Mass Escape Event within 3 days after the event *(Annex 4; under development*).
	*In addition to the draft indicators above related to **management practices** and **information transparency**, ASC seeks to develop indicators that include **metric** escape limits as well.* *Explicit stakeholder input on the options outlined below, is requested.*

Key considerations for defining metric escape limits

The current ASC standards approach 'escape limits' in three ways:

1. No escape limits set:
    a. Trout Standard;
    b. Pangasius Standard;
    c. Tilapia Standard;
    d. Abalone Standard;
    e. Bivalve Standard;
    f. Shrimp Standard.

2. Relative escape limits set (varying percentages defined):
    a. Bass, Bream and Meagre Standard;
    b. Flatfish Standard;
    c. Tropical Marine Finfish Standard;
    d. Seriola/Cobia Standard;

3. Absolute escape limits set (i.e. 300 fish)
    a. Salmon Standard.

[40] E.g., via its website.

[41] Relevant information related to a Mass Escape Event, includes as a minimum: date of event, reason of escape, estimated number and size of fish escaped, root cause analysis and corrective action(s) taken (including recapture where legally required), date of reporting to authority (where applicable).

Although not commonly applied across all ASC Standards several of the finfish Standards include metric escape limits. The approaches and limits set vary considerably across these standards – making an aligned set of Indicators with metric limits, challenging.

The key concerns revolve around two elements:

1. Accuracy of counting;
2. Determining if fish have escaped or otherwise been lost whilst in-culture.

Accuracy of counting

There are various ways to count fish. In more (technological) advanced systems, counting is conducted via automatic counters. Other approaches include hand-counting and average weight per (drip-dry) sample.

None of these approaches count with 100% accuracy. The most accurate are automatic counters with an accuracy of (minimum) 98%, if operated under ideal conditions. The other two methods depend heavily on control of human-error for accuracy.

Due to this error margin, ranges in estimated fish counts are unavoidable. For example – if 100.000 fish are counted with an automatic fish counting machine (with min. 98% accuracy), the absolute number will be between 98.000 - 102.000 fish.

Since conditions during counting events can influence the accuracy as well, the most reliable counting moment during the production cycle are at stocking/vaccination (input) and harvest (output).

Determining if fish have escaped or otherwise been lost whilst in-culture

Whilst in-culture, stocked fish can be lost due to various reasons, e.g., escapes (known and unknown), mortalities (recovered and unrecovered), cannibalism, predation and theft. With the exception of recovered mortalities and known escapes as a result of e.g. handling errors, quantifying the other individual parameters is challenging.

For instance (theoretical example) - if no known escape events have occurred and no mortalities have been recovered, yet output numbers are lower than input numbers, then fish have either been lost during the production cycle, or stocking counts overestimated the number of fish and therefore no conclusive calculation can be made as to how many, if any, fish have escaped.

Generally, quantifying losses while in-culture is extremely hard to quantify. Qualitative descriptions of in-culture events (e.g. escapes, mortalities) can be defined to describe the perceived scale of the event. For instance, for escapes, the following could be considered:

- Handling error: known small number of fish escape (e.g., one or a few fish dropped during handling).
- Small escape, unknown number: e.g., hole discovered in containment, majority of fish remain but an unknown number may have escaped. Alternatively, fish seen outside of containment structure.

- Large escape, unknown number: large hole discovered or changes in feed response suggest significant number of fish have left, etc., but mitigation measures can be put in place prevent further escapes.
- Catastrophic event: containment structures destroyed, majority – or all - of fish escape.

Questions to stakeholders:

Please see the stakeholder survey for specific questions on this Criterion.

Criterion 2.6 - The UoC maintains benthic ecosystem structure and function

Scope Criterion 2.6 – under development.

Rationale - Each of the most common used aquaculture production systems has effluent discharge which usually contains organic material (e.g. faeces, uneaten feed) and in some occasions heavy metals (i.e. copper from treated nets). Although the manner of discharge can vary (dispersed vs point-source), all have the potential to negatively impact the structure and function of the receiving ecosystem.

When deposition of organic material occurs at a rate that exceeds the capacity of the receiving environment to assimilate the additional inputs, changes in the chemical and physical composition in the sediment can occur, which in turn negatively affects the (in)faunal benthic community. The extent of these impact depends on the flux of organic material that is released by the site of operation and is further influenced by the characteristics of the water body and the natural decomposition capacity by the benthic community. However, if managed well, the rate of deposition is kept within the rate of natural decomposition, thereby minimising benthic impacts.

Besides organic material, certain culture systems have the potential to release also copper residues. Copper (Cu) is an abundant trace element found in a variety of rocks and minerals. It is an essential micronutrient and is also necessary for a wide range of metabolic processes in animals and plants. At elevated levels, however, Cu becomes toxic to benthic fauna.

Intent - To maintain the ecosystem structure and function of the area surrounding farm through the regular monitoring of the chemical properties and biodiversity of the benthic sediment.

Indicators:	
	At this stage, no Indicators are available for this Criterion. Stakeholder input is requested on the key considerations for this Criterion outlined below.

Benthic Requirements Revision

The objective of this revision is to define Criteria/Indicators that collectively address the benthic impacts of aquaculture in all major production systems[42] that discharge into different water types[43]. A Technical Working Group (TWG) was formed to revise the current approach to benthic impacts in the ASC Standards and recommend revised Criterion/Indicators based on the latest scientific knowledge and current best practices within the aquaculture industry.

[42] Major production systems are: cages, suspended/off-bottom, in or on-bottom and land-based (point-discharge systems, e.g. ponds, race-way, flow-through and RAS).

[43] Water types are: marine, brackish, freshwater.

The scope of the revision is on the following six aspects:

1) Types of benthic indicators and limits
2) Timing of monitoring sampling
3) Frequency of monitoring sampling
4) Allowable zone of effects (AZE)
5) Location and number of monitoring sampling
6) Third-party assessment/Testing methods/Accreditation

To date, the TWG has developed recommendations for a revised indicator of benthic impacts for marine cage systems, however, some elements of the recommendations have not been finalised and are still under development. The TWG seeks stakeholder feedback on the recommendations, including on the elements still under development, through public consultation. The assessment of this feedback will support the development of the final aligned benthic impacts indicator for marine cages. It is envisaged that ASC will present this final aligned indicator for public consultation in September 2021 together with the recommendations for the other production systems and water types.

Key considerations regarding the proposed recommendations for a revised indicator of benthic impacts for marine cages systems

The proposed recommendations for a revised benthic impacts indicator for marine cage systems is based on a **three-tiered sampling approach**. The approach is designed to reduce the compliance burden on farms while enhancing a farm's understanding of its benthic impacts. Under the approach, a farm will conduct increasingly more, and more detailed, benthic analysis if initial results in Tier 1 or Tier 2 do not meet the established limits. Conversely, a farm that meets the limits in Tier 1 or Tier 2, does not need to conduct additional analysis in the subsequent Tier 3.

The approach requires farms to measure redox potential (Eh_{NHE}) and total free sulphide ($S^{2-}{}_{UV}$) in a number of stations across transects in Tier 1. If the results do not meet the limits in **Table 1** below, the farm passes to Tier 2 which require samples of the same geochemical indicators in additional transects, to improve resolution due to the inherent variability of marine benthic systems and better understand the farm's footprint. If the results in Tier 2 continue to not meet the limits, a farm passes to Tier 3, which includes a number of biotic indicators. The approach anticipates that most farms can conduct the geochemical analysis required by Tiers 1 and 2 in real-time onboard a sampling vessel, allowing for a rapid site assessment.

The recommended approach requires four sampling stations per transect (0-10 metres, 30 metres, 125 metres plus a reference site). The TWG is still considering alternatives to the distance of the 125-metre location and the reference site.

Several of the limits in Table 1 were established following an ecological quality status (EQS)[44] classification system that employs the interrelations between total free sulphide concentrations, measured by a real-time field technique based on ultraviolet spectrophotometry, and biotic

[44] EQS: Qualitative description of benthic community impacts at a sampling location relative to predefined numerical boundaries (thresholds) for a specific impact indicator (from Cranford et al., 2020)

parameters. The technical citation for each limit is included as a footnote. The limits aim to achieve moderate quality at the 0-10-metre location, good quality at 30 metres and high quality at the third distance (tentatively 125 metres).

To date, some elements of the approach are still under development (*see Notes 1-3 below*). The TWG would like to receive feedback on these elements still under development (*see the Stakeholder Survey questions on the recommendations and on the elements still under development*).

Table 1: TWG recommendations for a revised indicator for benthic impacts for marine cages by tier, including the parameters to measure and its acceptable limits at different distances (sampling stations) from the edge of the cage array.

Tier	Number of Transects	Parameters	Limits **Moderate Quality** (10 m)	Limits **Good Quality** (30 m)	Limits **High Quality** (Tentatively 125 m)	Sampling stations
1 & 2	**4** for Tier 1 **6** (minimum) for Tier 2	Redox Potential* - Eh_{NHE} (mV)[1,2]	≥ -100	≥ 0	≥ 100	Each transect to have **four sampling stations** at 0 -10, 30, and (tentatively) 125 metres from the edge of the cage array, and at a reference site.
		Total Free Sulphide - $S^{2-}{}_{UV}$ (µM)[2]	≤ 500	≤ 250	≤ 75	
3	**6** (minimum)	Per cent Taxa Reduction (S/Sref) (relative to reference)[2]	≤ 60	≤ 40	≤ 20	
		Per cent Opportunistic Taxa (GrV) [2,3]	≤ 60	≤ 40	≤ 20	
		Polychaeta/amphipod ratio (BPOFA)[2,6]	≤ 0.187	≤ 0.126	≤ 0.031	
		Shannon-Wiener Index (H')[1,2]	≥ 2	≥ 3	≥ 4	
		Hurlberts Index (ESn)[5]	≥ 11.5	≥ 17.8	≥ 24.1	
		Simpson's dominance (1/D)[2]	≥ 4	≥ 6	≥ 8	
		Infaunal Quality Index ($IQI_{v.IV}$)[7]	≥ 0.44	≥ 0.64	≥ 0.75	
		Benthic Habitat Quality (BHQ)[5]	≥ 6	≥ 7	≥ 12	
		Benthic Quality Index (BQI)[5]	≥ 7.5	≥ 11.7	≥ 16	
		Infaunal Trophic Index (ITI)[5]	≥ 15	≥ 30	≥ 50	
		AZTI's Marine Biotic Index (AMBI)[2,3]	≤ 3.9	≤ 3	≤ 1.2	
		Multivariate AMBI (M-AMBI)[2,4]	≥ 0.47	≥ 0.59	≥ 0.83	
		BENTIX[8]	≥ 2.5	≥ 3.5	≥ 4.4	
		Norwegian Quality Index (NQI)[9,11]	≥ 0.43	≥ 0.68	≥ 0.86	
		Norwegian Sensitivity Index (NSI)[10]	≥ 18.8	≥ 23.1	≥ 27.4	
		Indicator Species Index (ISI_{2012})[10]	≥ 6.2	≥ 7.5	≥ 9.6	
		Enrichment Stage (ES) Index [12]	*TBD*	*TBD*	*TBD*	

* Measured Redox Potential (mV) corrected to be relative to the normal hydrogen electrode (Eh_{NHE}).

1. Hargraves B. T., Holmer M., Newcombe C. P. (2008). Towards a classification of enrichment in marine sediments based on biogeochemical indicators. Marine Pollution Bulletin 56: 810-824.
2. Cranford P, Brager L, Elvines D, Wong D, Law B (2020) A revised classification system describing the ecological quality status of organically enriched marine sediments based on total dissolved sulfides. Mar Poll Bull 154: 1-12.
3. Borja Á, Franco J, Pérez V, (2000) A marine biotic index to establish the ecological quality of soft-bottom benthos within European estuarine and coastal environments Mar. Pollut. Bull., 40: 1100-1114.
4. Muxika I, Borja Á, Bald J (2007) Using historical data, expert judgement and multivariate analysis in assessing reference conditions and benthic ecological status, according to the European Water Framework Directive. Mar Poll Bull 55: 16-29.
5. Hargraves B. T. (2010). Empirical relationships describing benthic impacts of salmon aquaculture. Aquaculture Environment Interactions. Vol. 1: 33–46, 2010.
6. Dauvin J. C., Andrade H., de la Ossa Carretero J. A., Del Pilar Ruso Y., Riera R. (2016). Polychaete/amphipod ratios: An approach to validating simple benthic indicators. Ecological Indicators. 63 (2016) 89–99.
7. Infaunal quality index: Water Framework Directive classification scheme for marine benthic invertebrates. Environment Agency Report SC080016.
8. Ruellet T, Dauvin J-C (2007) Benthic indicators: Analysis of the threshold values of ecological quality classifications for transitional waters. Mar Poll Bull 54: 1707-1714.
9. Rygg B (2006) Developing indices for quality status classification of marine soft-bottom fauna in Norway. In: NIVA report;5208. Norsk institutt for vannforskning.
10. Rygg B, Norling K (2013) Norwegian Sensitivity Index (NSI) for marine macroinvertebrates, and an update of Indicator Species Index (ISI) (2013). Norwegian Institute for Water Research Report 6475-2013
11. Husa V, Kutti T, Ervik A, Sjøtun K, Hansen PK, Aure J (2014) Regional impact from fin-fish farming in an intensive production area (Hardangerfjord, Norway), Marine Biology Research, 10:3, 241-252,
12. Keeley NB, Forrest BM, Crawford C, Macleod CK (2012) Exploiting salmon farm benthic enrichment gradients to evaluate the regional performance of biotic indices and environmental indicators. Ecol. Indic. 23, 453–466.

TBD: Limits to be determined. The TWG is assessing available data aiming to establish limits for this index.

Sampling protocol and requirements per tier:

Tier 1

- Sampling during peak cage biomass and based on four transects arranged orthogonally around the edge of the cage array.
- The direction of the transects to be defined by a site-specific “Predicted Zone of Influence” (referred to as Allowable Zone of Effects [AZE] in the current ASC Standards).
- Each transect to have four stations based at 0-10, 30, and (*tentatively*) 125 metres from the edge of the cage array plus a reference site.
- Grab samples are taken at each station within each transect.
- Each sample is analysed immediately (onboard the vessel) for Eh_{NHE} and $S^{2-}{}_{UV}$ and the results compared with the limits in Table 1.
- At Tier 1, if the results of each station within each transect comply with the limits then the site complies with the requirement and no further analysis is required. If, however, the result of a station fails, thus the transect fails, then the sampling shall move onto Tier 2.

Tier 2

- The number of transects per site is increased in a minimum of two additional transects covering areas not previously covered (e.g. corners and/or diagonal transect).
- Each of the additional transects to have four stations based at 0-10, 30, and (tentatively) 125 metres from the edge of the cage array plus a reference site.
- Grab samples are taken at each station within each of the additional transects.
- Each sample is analysed immediately (onboard the vessel) for Eh_{NHE} and $S^{2-}{}_{UV}$.
- The average for all stations at each distance (all Tier 1 and 2 transects combined) is calculated and compared with the limits in Table 1.
- At Tier 2, if the calculated average for all stations at each distance (all Tier 1 and 2 transects combined) complies with the limits, then the site complies with the requirement and no further analysis is required. If, however, the calculated average fails, then the sampling shall move onto Tier 3.

Tier 3

- In this tier, biotic indicators are added to the sampling. The TWG proposes defining ~2 specific biotic indicators that all farms analyse and require an additional 2-3 benthic indicators that the farm can choose (based on relevance and/or local regulation). See Note 1.
- Sampling would occur at all the stations within the transects defined as per Tier 1 and 2.
- For the conditions that would trigger a non-conformity to the requirement at Tier 3, see Note 2.

Note 1: The TWG recommends naming one or two specific biotic indicators to be calculated, probably one that denotes changes in species abundance (i.e. S/S_{ref}, BPOFA, GrV) and another that addresses effects on ecological (e.g. AMBI, ESn, 1/D, H') or trophic group diversity (ITI). Farms shall then choose an additional two to three biotic indicators of their preference. The TWG believes that running extra calculations for an existing taxonomic database will not unreasonably add extra workload to the analysis. The TWG does not intend for farms to analyse all the biotic indicators listed in Table 1.

Note 2: The TWG has not finalised yet the details of the conditions that would trigger a non-conformity to the requirement at Tier 3. Within its deliberations, the TWG has considered the following options that may constitute a non-conformity:

i. If a farm fails to comply with all the limits and all the sampled biotic indicators at all of the stations, or with a percentage of any of them.
ii. If the farm fails to comply with some type of weighted multiple indicators.

Within its deliberation, the TWG also recognise that the results obtained at the reference sites, and in comparison to the results of the stations, should be considered when deciding the conditions that would trigger a non-conformity.

The TWG is seeking feedback on this element still under development.

Note 3: Within its deliberation, the TWG acknowledge that, under certain circumstances, farms may develop their own sampling protocol. As the TWG strived to define those circumstances, it settled on two elements that may constitute conditions to be met by such sampling protocol:

i. It should be based on credible technical analysis and consistent monitoring data.
ii. It should include an EQS classification system, parameters and limits that are equivalent to the ones in Table 1.

The TWG is seeking feedback on this element still under development.

Questions to stakeholders:

Please see the stakeholder survey for specific questions on this Criterion.

Criterion 2.7 - Water Quality

This Criterion is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Criterion will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/new-farm-standards/aligned-standard/ .

Content in this topic will address water quality control parameters with regards to the impact of discharged water on the receiving waterbody.

Criterion 2.8 - The UoC minimises salinisation of soil and groundwater.

Scope Criterion 2.8 - Every UoC

Rationale - Salinisation is the increase of salt concentration in soil and freshwater (both surface and groundwater[45])[46] due to natural or human activities (so-called secondary salinisation). As a result of this, biodiversity can be impacted and in addition these natural resources can become less suitable, or even fully unsuitable, for human use. This makes this a topic of concern[47] - especially in combination with growing pressure on natural habitat due to rising demands from a growing population.

Within the context of aquaculture, known examples of secondary salinisation are caused by infiltration from saline waterbodies (e.g. aquaculture ponds), discharge of saline water into fresh surface water, or (over) use of freshwater wells resulting in (more) saline water intrusion into groundwater. The last example is particularly relevant for regions near coastlines and can be further amplified in case of sea-level rising and land subsidence.

Intent - To minimise salinisation of soil and freshwater resources as a result of the farms' activities.

Indicators:	
Indicator 2.8.1	The UoC shall assess the risk of soil and groundwater salinisation, through environmental assessment, resulting from infiltration of culture water[48], and implement measures accordingly.
Indicator 2.8.2	The UoC shall use low permeable liners[49] in case of brackish or saltwater pond culture[50].
Indicator 2.8.3	The UoC shall only discharge water of an equal or lower salinity-scale[51] compared to the salinity[52] of the receiving waterbody, unless this is a waterbody with (natural) periodic varying salinity levels[53].
Indicator 2.8.4	The UoC shall demonstrate that salinity levels in groundwater wells, where used and legally allowed to be monitored[54], does not show an increasing trend in salinity levels.

[45] Groundwater: see Definition list

[46] Metternicht, Graciela & Zinck, Joseph Alfred. (2008). Soil Salinity and Salinization Hazard. 10.1201/9781420065039.pt1.

[47] ABROL YP. Wild, A. Soils, land and food: managing the land during the twenty-first century. Ann Bot. 2004;93(6):785-786. doi:10.1093/aob/mch104

[48] Including all water-infrastructures between point of intake and point of discharge, irrelevant of premise boundaries.

[49] I.e. liners made from imported clays, ripping and re-compaction of in situ clays, mixing with bentonite, geo-membranes and composite liners.

[50] I.e. these two water types (brackish and saltwater) have salinity levels >0.5 ppt.

[51] The following **salinity-scales** are used: limnetic (freshwater; <0.5 ppt), oligohaline water (slightly saline; 0.5-4.9 ppt), mesohaline water (moderate saline; 5-17.9 ppt), polyhaline water (highly saline; 18-29.9 ppt), euhaline water (seawater; 30-34.9 ppt).

[52] Salinity: see Definition list

[53] I.e. river estuaries and other waterbodies subject to periodic shifts in salinity level.

[54] Where well-monitoring is legally not allowed to be conducted by the UoC, regulatory records must be obtained to demonstrate recording of salinity levels.

Criterion 2.9 - The UoC disposes biosolids responsibly

Scope Criterion 2.9 - Every UoC

Rationale - Biosolids[55] (or sludge) are a mixture of organic waste and sediment produced or accumulated through farming activities. Biosolids discharged into natural water bodies can cause eutrophication, restrict light penetration, cover plants and habitat and cause general shallowing of water bodies. Unregulated disposal of biosolids on land can cause soil eutrophication or salinization and affect groundwater. Well managed handling and disposal of biosolids generated through farming activities is a critical element of responsible farm management and should include effective recycling.

Intent - The farm regulates the disposal of biosolids and ensures recycling of nutrients where possible.

Indicators:	
Indicator 2.9.1	The UoC shall effectively implement a site specific Biosolids Management Plan (BMP), with the intent to minimise the impacts associated with biosolids disposal, as a result of: – Biosolids disposal in water ways and landfills; – Biosolids runoff from the site premises.
Indicator 2.9.2	The UoC shall, as part of the BMP, include a process flow diagram that tracks water and waste flows from production activities.
Indicator 2.9.3	The UoC shall, as part of the BMP, outline appropriate means of proper disposal[56] including transport to the designated disposal area.
Indicator 2.9.4	The UoC shall, as part of the BMP, outline record keeping requirements with regards to disposal times, amounts and location.
Indicator 2.9.5	The UoC shall, as part of the BMP, outline cleaning and maintenance procedures of water treatment system (if applicable) in relationship to biosolids disposal.
Indicator 2.9.6	The UoC shall, as part of the BMP, outline measures for reusing biosolids (e.g. as nutrients/fertiliser).
Indicator 2.9.7	The UoC shall review and where needed revise the BMP. This shall occur on a regular basis as well as when changes in activities or events require an additional review.
Indicator 2.9.8	The UoC shall only dispose of biosolids in a regulated landfill or regulated disposal area.
Indicator 2.9.9	The UoC shall contain biosolids within farm boundaries to the extent that there would be no substantial runoff or seepage during a 100-year flood event[57] or high tide flooding[58].

[55] Biosolids (sludge): see Definition List.

[56] Proper disposal: see Definition List.

[57] 100-year flood event: see Definition List.

[58] High tide flooding: see Definition List.

Criterion 2.10 - The UoC uses water responsibly and efficiently

Scope Criterion 2.10 - Every UoC

Rationale - Freshwater is limited and demand for it is increasing due to a range of factors. Water use has direct impact on availability of water for other uses as well as vital water flow[59] and level of surface water bodies. It is important that all aquaculture operations are aware of their water use and act to improve the water efficiency of their farming processes.

The source of fresh- and brackish water (i.e. surface water, ground water) and the local conditions (e.g. rainfall, sensitivity of ecosystems) determine whether or not the utilisation of this resource is detrimental to the natural environment.

Intent – The farm is aware of its water use for production and other activities and utilises water efficiently to maintain critical ecosystem services of the water source.

Indicators:	
Indicator 2.10.1	The UoC shall, in areas of "high" and "extremely high" water stress[60,61], effectively implement a Water Conservation and Efficiency Plan (WCEP) with the intent to reduce water consumption as a result of inefficient practices.
Indicator 2.10.2	The UoC shall, as part of the WCEP, outline measurable targets and timelines for water use reduction
Indicator 2.10.3	The UoC shall review and where needed revise the WCEP. This shall occur on a regular basis as well as when changes in activities or events require an additional review.
Indicator 2.10.4	The UoC shall demonstrate that water levels in groundwater wells, where used and legally allowed to be monitored[62], does not show a decreasing trend.
Indicator 2.10.5	The UoC shall not use fresh groundwater to reduce salinity, or use salt to increase the salinity of used groundwater, unless it can be demonstrated that the discharge is treated appropriately for desalinisation.
Indicator 2.10.6	The UoC shall demonstrate that the water abstraction[63] level respects the minimum vital flow for the natural water body or minimum levels of groundwater reservoirs.
Indicator 2.10.7	The UoC shall record and report to ASC the percentage of the natural water body's flow diverted immediately above the farm. *(Annex 4; under development)*
Indicator 2.10.8	The UoC shall (for operations that have continuous water intake) return >90% of the diverted water to the natural waterbody.

[59] Vital water flow: see Definition List.

[60] According to the Aqueduct Water Risk Atlas www.wri.org/applications/maps/aqueduct-atlas.

[61] Water stress: see Definition List.

[62] Where well-monitoring is legally not allowed to be conducted by the UoC, regulatory records must be obtained to demonstrate recording of water levels.

[63] Abstracted water: see Definition List.

Indicator 2.10.9	The UoC shall calculate, record and report to ASC its water consumption per water source in m^3/t fish produced/year. *(Annex 4; under development)*

Criterion 2.11 - The UoC uses energy efficiently.

Scope Criterion 2.11 - Every UoC

Rationale - Greenhouse gas (GHG)[64] emissions are a significant driver of climate change and ocean acidification, which represent substantial environmental challenges. GHG emissions result from the production and combustion of some forms of energy, with substantial additional anthropogenic GHG emissions arising from a range of biogenic processes and land use activities, many of which support aquaculture. It is necessary to improve efficiency and reduce the use of industrial energy sources, particularly those that are limited and/or carbon-based as well as all other sources of GHG emissions that result from on farm and supporting activities. In order to drive improvements, both farms and the ASC need to understand and record the GHG emissions related to aquaculture practices.

Intent – The farm makes efforts towards energy efficient and sustainable energy use to reduce their GHG emissions, both on-farm and in the feed they use.

Indicators:	
Indicator 2.11.1	The UoC shall effectively implement a site-specific Energy Efficiency Management Plan (EEMP), with the intent to reduce energy consumption[65] as a result of inefficient practices.
Indicator 2.11.2	The UoC shall, as part of the EEMP, outline measurable targets, to improve energy efficiency or increase the proportion of energy coming from renewable energy sources
Indicator 2.11.3	The UoC shall annually calculate, record and report to ASC the relative energy use per source[66], measured per ton of fish produced and its embedded GHG emissions. *(Annex 4; currently under development)*
Indicator 2.11.4	The UoC shall annually calculate, record and report to ASC the amount of used liquid oxygen (if applicable). *(Annex 4; currently under development))*
Indicator 2.11.5	The UoC shall annually record (using the economic feed conversion ratio) and report to ASC the energy use and GHG emission per ton of fish produced. *(Annex 4; currently under development))*

[64] Greenhouse gas (GHG): see Definition List.

[65] Only activities carried out on the farm site are considered. Transport of personnel, materials and shrimp to and from farm site are not considered. For clarity, farms must list activities included in the records of energy consumption, including: water aeration, water pumping, offices, internal transportation, etc.

[66] E.g.,diesel, gasoline, natural gas, electricity, etc.

Criterion 2.12 - Waste and pollution control

This Criterion is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Criterion will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/new-farm-standards/aligned-standard/ .

Content in this topic will address waste management including marine litter and pollution control measures including use of banned chemicals.

Criterion 2.13 - Feed

This Criterion is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Criterion will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/new-farm-standards/aligned-standard/ .

Content in this topic will address feed use (also in relationship to the ASC Feed Standard), FFDRm/o and FFER values, general feed-management, etc.

Criterion 2.14 - Animal Welfare

This Criterion is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Criterion will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/fish-welfare-project/.

Content in this topic will address matters related to animal welfare.

Criterion 2.15 - Parasite and pathogen control

This Criterion is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Criterion will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/new-farm-standards/aligned-standard/ .

Content in this topic will address matters related to Area Based Management (ABM), parasite (including sea lice) control, OIE notifications, resistance monitoring, etc.

Criterion 2.16 - The UoC applies antibiotics and other veterinary drugs responsibly.

Scope Criterion 2.16 - Every UoC

Rationale - Antibiotics and other veterinary drugs are chemical products that are used to treat or improve health conditions in animals, including aquatic animals. Veterinary drugs include antibiotics, antiparasitic, antifungal, antiviral, hormones, anaesthetics, and vaccines. The use of veterinary drugs has provided many benefits to the aquaculture industry, allowing aquatic animal health and welfare to be improved and increasing survival and animal welfare, as well as economic gain and production efficiency for fish farmers. Despite these benefits, the overuse and misuse of veterinary drugs (excluding vaccines) has specific risks. Most important risks associated are the development of resistance, the release of drugs or their metabolites to the environment and the presence of veterinary drug residues in final products for human consumption. Thus, strategies for the responsible use of veterinary drugs are essential.

Non-therapeutants are chemical products used in aquaculture for non-therapeutic purposes, i.e., not directly applied to farmed aquatic animals but the farming environment (e.g. water), equipment and materials for the control and prevention of unwanted organisms. Non-therapeutants include biocides, algaecides, anti-parasiticides, antifouling agents, disinfectants, and cleaning products. The use of these chemical products has provided many benefits to the aquaculture industry by improving aquatic animal health and welfare and maintaining optimal culture conditions, however, their use and disposal can negatively impact the environment or pose risks to humans or wildlife if not used responsibly.

Intent – To minimise the risk that antibiotics, other veterinary drugs and non-therapeutants used in farm activities negatively impact human health, the environment and wildlife, including farmed aquatic animals.

Indicators:	
Indicator 2.16.1	The UoC shall effectively implement a site-specific Fish Health Management Plan (FHMP), with the objective to prevent disease outbreaks and ensure optimal health of farmed animals.
Indicator 2.16.2	The UoC shall, as part of the FHMP, outline site-specific biosecurity measures.
Indicator 2.16.3	The UoC shall, as part of the FHMP, outline site-specific disease surveillance and response measures.
Indicator 2.16.4	The UoC shall, as part of the FHMP, outline site-specific provisions regarding health management and husbandry practices.
Indicator 2.16.5	The UoC shall, as part of the FHMP, outline provisions regarding the responsible use, monitoring and recording of veterinary drugs and non-therapeutants.
Indicator 2.16.6	The UoC shall, as part of the FHMP, outline provisions regarding reporting of notifiable (OIE or otherwise listed) diseases to the relevant authorities.
Indicator 2.16.7	The UoC shall ensure that the FHMP is signed-off by a veterinarian doctor or aquatic animal health professional.

Indicator 2.16.8	The UoC shall review and where needed revise the FHMP. This shall occur on a regular basis as well as when changes in activities or events require an additional review, or upon direction of the veterinarian doctor or aquatic animal health professional.
Indicator 2.16.9	The UoC shall use and dispose non-therapeutants products as disinfectants or for oxygenation (e.g., biocides, peroxides, algicides or antifouling) with a specific use/scope, and in accordance with the FHMP.
Indicator 2.16.10	The UoC shall vaccinate fish for diseases for which an effective vaccine exists and is regionally available.
Indicator 2.16.11	The UoC shall only use hormones for sex-reversal or to stimulate artificial reproduction.
Indicator 2.16.12	The UoC shall not use any antibiotic, veterinary drug or non-therapeutants prophylactically, as growth promoters, to increase feed efficiency or otherwise outside its intended use.
Indicator 2.16.13	The UoC shall only use any antibiotic and other veterinary drugs under prescription by a veterinary doctor or an aquatic animal health professional.
Indicator 2.16.14	The UoC shall record and store the prescription for each individual and specific treatment with antibiotics and other veterinary drugs and shall include the following minimum information: – diagnosis; – aetiology; – product; – dose; – administration method; – duration of treatment; – minimum withdraw period; – antimicrobial susceptibility tests results, either prior or as post-treatment, as confirmatory; – alternatives strategies explored to the prescribed antimicrobial treatment; – methods applied to prevent the release of antibiotics (or the residues thereof) to the environment before the withdrawal period has expired.
Indicator 2.16.15	The UoC shall not use antimicrobials listed as Critically Important Antimicrobials for Human Medicine by the World Health Organization (WHO), with the exception of specific bacterial pathologies affecting specific aquatic species where there is no other alternative treatment, taking into account the following criteria: – aetiology of the bacterial pathology; – specific species and life stage; – results of the antibiotic susceptibility test/s; – administration method; – type of farming system; and – allowance under national legislation.
Indicator 2.16.16	The UoC shall record and store the prescription for each individual and specific treatment with hormones, either for artificial reproduction or for sex reversal and shall include the following minimum information: – purpose of use;

	– life stage of species to be treated; – hormonal product; – dose; – administration method; – duration of treatment; – minimum withdraw period; – methods applied to prevent the release of hormones (or the residues thereof) to the environment before the withdrawal period has expired.
Indicator 2.16.17	The UoC shall record and store the prescription for each individual and specific vaccine applied and shall include the following minimum information: – purpose of use; – species to be vaccinated; – life stage of species to be vaccinated; – product; – dose; – administration method; – duration or repetition of vaccination.
Indicator 2.16.18	The UoC shall record and store the prescription for each individual and specific treatment with anaesthetics and shall include the following minimum information: – purpose of use; – species to be treated; – life stage of species to be treated; – product; – dose; – administration method; – duration of treatment; – minimum withdraw period; – methods applied to prevent the release of anaesthetics (or the residues thereof) to the environment before the withdrawal period has expired.
Indicator 2.16.19	The UoC shall provide buyers of certified product a list of all antibiotics, veterinary drugs and non-therapeutants applied to the product.
Indicator 2.16.20	The UoC shall report annually to ASC on its antibiotics, other veterinary drug and non-therapeutants use. (Annex 4; under development)

Key considerations regarding the proposed revisions of the antibiotic, veterinary drug or non-therapeutants requirements

The final set of revised indicators meet the objectives of alignment, offering improved consistency across all species and production systems, and adding the rigour necessary to ensure best practices in the use of veterinary drugs, including antibiotics, and non-therapeutants chemicals. Furthermore, it is envisaged that the requirements for data provision will allow for improved impact monitoring and higher audit efficiencies. Overall, these improvements will contribute to better assurances that can be offered to the market.

Criteria and indicators related to the responsible use and monitoring of antibiotics have been thoroughly reviewed across all ASC Standards by a Technical Working Group. This TWG is composed of independent experts in the field of (veterinarian) medicine, academics, industry experts and related international organizations (OIE, WHO and FAO) and acts in an advising role to the ASC' Technical Advisory Group (TAG).

Due to the divergence in the current ASC Standards regarding antibiotic use, a holistic approach was chosen to compile all current indicators and reflect on these from an expert point of view based on the principle of the 'One Health Approach' (https://www.who.int/news-room/q-a-detail/one-health).

In addition to improved indicators that sit in-line with existing Indicators, this wider review has resulted in a number of proposed indicators that differ from the existing Standards. It is important that stakeholders are aware of these proposed changes, and the rationale behind it.

The section below outlines the main changes and a summary as to why they are preferred over the existing indicators.

1. Banning the use of certain types of antibiotics

Critically important antibiotics (as listed by WHO) have been banned for all species and farming systems, although the indicator leaves some flexibility for the use of this group of antibiotics in specific bacterial pathologies, specific farmed aquatic species, and specific farming systems, where the veterinarian in charge of the facility takes this decision. This use must be justified in the veterinary prescription, based on the aetiology of the bacterial disease, the species and the national legislation.

This flexibility regarding critically important antibiotics is mostly based on the authorisation of antibiotics under this list to be used for aquaculture purposes under the EU legislation, in European countries, such as Denmark, where only oxolinic acid (currently in this list) is authorised legally to be used in rainbow trout for the treatment of salmonicida bacterial disease. Applying less effective antibiotics for these situations will lead to bacterial resistance built-up which undermines the efforts made under the One Health Approach. It is therefore, for these circumstances better to apply, in a controlled manner, critically important antibiotics so that disease treatments are maximally effective.

2. Maximum number of antibiotic treatments per production cycle

The TWG recommended that indicators focused on the maximum number of antibiotic treatments allowed per production cycle should be removed since this type of indicator do not assist in minimising the use of antibiotics, nor promote transparency in the auditing process.

The use of antibiotics varies in each production cycle and depends on many environmental and management related factors, e.g., some production cycles are longer than others, certain production cycles are conducted in summer periods, while others in winter periods, etc.

Therefore, fixing a maximum number of treatments per production cycle is not realistic and it can easily lead to limited transparency and hidden information by the farmers. Besides that, if animals are ill, treatments must be given – regardless of the number of treatments already given prior.

Furthermore, it was strongly recommended to include in one of the indicators the minimum contents of the fish health management plan for each farm, which should contain sections on the responsible use and monitoring of antibiotics, the alternatives explored for their minimisation and the approaches towards reduction of releases to the environment.

3. Specific percentage of reduction in the use of antibiotics per production cycle

In line with point 2 above, it was decided not to fix a specific percentage of reduction of antibiotic use per production cycle, since the use of these products is directly linked to environmental and management related factors.

It was strongly recommended to focus the efforts on the minimum information to be included in the veterinary prescription and in the specific roles and responsibilities of the veterinarian in charge of the facility.

Furthermore, it was strongly recommended to include in one of the indicators the minimum contents of the fish health management plan for each farm, which should contain sections on the responsible use and monitoring of antibiotics, the alternatives explored for their minimisation and the approaches towards reduction of releases to the environment.

Questions to stakeholders:

Please see the stakeholder survey for specific questions on this Criterion.

Criterion 2.17 - Hatchery, fingerlings, broodstock and seed.

This Criterion is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Criterion will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/new-farm-standards/aligned-standard/ .

Content in this topic will address key environmental and social matters related to hatcheries, fingerlings, smolt production (including genetic introgression study), broodstock and seed use.

PRINCIPLE 3: THE UOC OPERATES IN A SOCIALLY RESPONSIBLE MANNER

This Principle is not open for consultation.

ANNEX 1: LIST OF ACRONYMS, DEFINITIONS AND VERBAL FORMS USED

Acronym List

AB	Accreditation Body
ABM	Area Based Management
ADD	Acoustic Deterrent Device
AHD	Acoustic Harassment Device
AMBI	AZTI Marine Biotic Index (AMBI)
ASC	Aquaculture Stewardship Council
ASI	Assurance Services International
AZE	Allowable Zone of Effect
(B)EIA	Biodiversity Environmental Impact Assessment
BHQ	Benthic Habitat Quality
BMP	Biosolids Management Plan
BPOFA	Benthic Polychaeta/Amphipod Ratio
BQI	Benthic Quality Index
CAB	Conformity Assessment Body
CAR	Certification and Accreditation Requirements
CITES	Convention on International Trade in Endangered Species
CoC	Chain of Custody
CRISPR	Clustered Regularly Interspaced Short Palindromic Repeats
EEMP	Energy Efficiency Management Plan
EMP	Escape Management Plan
EQS	Ecological Quality Status
ES	Enrichment Stage
ESRAF	Environmental and Social Risk Assessment Framework
FFDRm/o	Forage Fish Dependency Ratio for fishmeal or fish oil
FFER	Fish Feed Efficiency Ratio
FHMP	Fish Health Management Plan
FAO	UN Food and Agriculture Organization
GHG	Greenhouse Gas
HCVA	High Conservation Value Area
IUCN	International Union for Conservation of Nature
IQI	Infaunal Quality Index
ISEAL	International Social and Environmental Accreditation and Labelling (Alliance)
ISI	Indicator Species Index
ITI	Infaunal Trophic Index
LLA	Logo Licence Agreement
M-AMBI	Multivariate AMBI
MPL	Metric Performance Level
MSC	Marine Stewardship Council
NGO	Non-Governmental Organisation

NOAA	U.S. National Oceanic and Atmospheric Administration
NQI	Norwegian Quality Index
NSI	Norwegian Sensitivity Index
OIE	The World Organisation for Animal Health
PA	Protected Area
P(SIA)	Participatory Social Impact Assessment
SDG	UN Sustainable Development Goal
SLO	social licence to operate
ToC	Theory of Change
TWG	Technical Working Group
UN	United Nations
UoC	Unit of Certification
WCEP	Water Conservation Efficiency Plan
WHO	World Health Organisation
WMP	Wildlife Management Plan

Definition List

Term:	Definition:	Reference:
100-year flood event	The 100-year flood event describes the mean level of a body of water that is statistically reached or exceeded once every 100 years. It is also referred to as the 1% flood as it has a 1% probability of happening in any given year.	ASC
Abstracted water	Water removed from the water body and introduced into the farm. It includes both surface water and groundwater.	ASC
Accidental escapes	Escapes as a result of human errors during operational handling procedures.	ASC
Accidental mortality	Unintentional mortalities, including entanglements or other accidental mortalities, excluding farm stock.	ASC
Aquaculture	Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated.	FAO
Aquaculture sector	Represents a group of industries (e.g.: feed industry, farming industry, processing industry, etc.) and markets that share common attributes (i.e. aquaculture products).	ASC
Biosolids	mixture of organic waste and sediment produced or accumulated through farming activities.	ASC

Buffer zone	Protected zones established around sensitive or critical areas — such as wildlife breeding or hibernation habitats, streams, and wetlands — to lessen the impacts of human activity and land disturbance, whether or not it embodies natural or cultural value itself. The ecological buffer zones are necessary to minimize the impacts of an adjacent land use. They protect the natural environment and help keep nearby ecological niches stable and functioning.	Adapted from the Nature Conservancy and Martin, O., and G. Piatti (eds.) World Heritage and Buffer Zones, International Expert Meeting on World Heritage and Buffer Zones Davos, Switzerland 11 – 14 March 2008
Critical habitat	Specific geographic areas that contain features essential to the conservation of a threatened and protected species and that may require special management and protection, or areas not occupied by the species but may be essential for its conservation.	Adapted from The US Endangered Species Act
Greenhouse Gas (GHG)	Greenhouse gas, any gas that has the property of absorbing infrared radiation (net heat energy) emitted from Earth's surface and reradiating it back to Earth's surface, thus contributing to the greenhouse effect. Defined are the six gases listed in the Kyoto Protocol: carbon dioxide (CO2); methane (CH4); nitrous oxide (N2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulphur hexafluoride (SF6). For the purpose of the ASC Standard, only carbon dioxide is referred to.	ASC
Groundwater	All sub-surface water.	ASC
High Conservation Value Area (HCVA)	Natural habitats of outstanding significance or critical importance due to their high biological, ecological, social or cultural values. These areas need to be appropriately managed in order to maintain or enhance those identified values. HCVAs are not protected by the set of rules and regulations that apply to similar biodiversity rich landscapes found in National Parks, Wildlife Sanctuaries and other Protected Areas (PAs),	Adapted from UN Environment Programme and HCV Resource Network

	and therefore face a high risk of degradation in the near future.	
High tide flooding	Flooding which causes public inconvenience.	NOAA
Human-Wildlife Conflict	Any interaction between humans and wildlife that results in negative impacts of human social, economic or cultural life, on the conservation of wildlife populations, or on the environment. Human-wildlife conflict occurs when the needs and behaviour of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife.	IUCN
Intentional mortality	Includes animals intentionally killed through farm-related lethal action.	ASC
Leakage escape	Recurrent escape of small numbers of fish. Usually due to inappropriate net mesh sizes or shortcomings in containment barriers	ASC
Mangroves	Mangroves are a group of trees and shrubs that live in tropical and subtropical coastal intertidal zones and are among the world's the most productive and biologically diverse ecosystems on the planet. Mangrove forests stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides, and provide a wide variety of ecosystem goods and services. The intricate root system of mangroves makes these forests attractive to fish and other organisms seeking food and shelter from predators.	Adapted from IUCN Mangrove and Coastal Ecosystems and NOAA National Ocean Service
Mass escape event	A unique event that involves a significant number of fish escaping at once	ASC
Non-native species	a species introduced outside its natural past or present distribution.	IUCN
Particularly significant or essential biological or ecological function	Areas containing biogenic structures that are not particularly adapted to sedimentation or organic enrichment (e.g., tubeworm mounds, bryozoans mounds, bivalve beds and reefs or sponge gardens that form a structure for other epifauna).	ASC
Possibility	An expression that conveys an expected outcome. Note: Possibilities are expressed using the verbal forms specified in Annex 1.	ASC
Proper disposal	Proper disposal includes delivery to a regulated landfill or farmers may re-use the sludge as e.g. fertilizer or soil conditioner for the production of agriculture crops.	ASC
Protected Area	A clearly defined geographical space, recognized, dedicated and managed through legal or other effective means, to achieve the long-term conservation of nature	IUCN.

	with associated ecosystem services and cultural values.	
Region	A geographical area in which all farms that may be the source of a defined ingredient are located.	ASC
Requirement	An expression that conveys criteria to be fulfilled. Note: Requirements are expressed using the Verbal Forms Used section, specified in Annex 1.	ASC
Riparian buffer zone	The land immediately abutting a water body; wetlands adjacent to rivers or streams.	ASC
Risk Assessment	Risk assessment is the overall process or method where one: I. Identifies hazards and risk factors that have the potential to cause harm (hazard identification). II. Analyses and evaluate the risk associated with that hazard (risk analysis, and risk evaluation). III. Determines appropriate ways to eliminate the hazard or controls the risk when the hazard cannot be eliminated (risk control).	ASC
Salinity	The amount of dissolved salts in water.	ASC
Sensitive habitat	A habitat whose conservation status, including its extent and the condition (structure and function) of its biotic and abiotic components, is adversely affected by pressures arising from human activities.	Regulation of the European Parliament and of the Council)
Species	A group of interbreeding individuals with common characteristics that produce fertile (capable of reproducing) offspring and which are not able to interbreed with other such groups, that is, a population that is reproductively isolated from others; related species are grouped into genera.	IUCN
Standard	A document that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory.	ISEAL – Standard Setting Code v6
Surface water	Water collecting on the ground or in a stream, river, lake, wetland, or ocean.	ASC
Third-party Certification System	Conformity assessment activity that is performed by a person or body that is independent of the person or organisation that provides the object, and of the user interests in that object.	ISO 17000
Threatened and Protected Species	Species listed as Critically Endangered, Endangered, or Vulnerable (i.e., collectively referred to as “threatened”) according to the IUCN Red List of Threatened Species; OR species listed as Threatened With Extinction in CITES Appendix I; OR species listed	IUCN

	by a similar local, regional, national or international organization with categories equivalent to those of IUCN or CITES; OR any species legally protected under any such designations.	
Transgenic species	A species containing genes altered by insertion of DNA from an unrelated organism.	ASC
Vermin	As defined in the local jurisdiction and classified as distinct from predators.	ASC
Vital water flow	The water provided within a river, wetland or coastal zone to maintain ecosystems and their benefits where there are competing water uses and where flows are regulated.	IUCN
Water stress	Water stress occurs when the demand for water exceeds the available amount during a certain period or when poor quality restricts its use.	EEA
Waste	Solid or semi-solid, non-soluble, material (including gases and liquids in containers) resulting from a production process and not of any use by the producer.	ASC
Wetland	Areas of land that are saturated with water. This include areas of marsh, fen, peat, and or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. Wetland habitats provide vital ecosystem services, through the provision of water, protection from floods and erosion, support rich biodiversity, and store more carbon than any other ecosystem. Wetlands therefore include the following: – coastal wetlands such as coastal lagoons, rocky shores – deltas, tidal marshes and mangroves – wetlands associated with lakes – wetlands along rivers and streams – marshes, swamps, and bogs, peatland	Adjusted from RAMSAR, IUCN and NOAA

Verbal forms used

Indication of:	Verbal forms used:
Requirement (normative)	– shall (not)
Recommendation	– should (not)

ANNEX 2: METRIC PERFORMANCE LEVELS (MPL)

This Annex is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Criterion will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/new-farm-standards/aligned-standard/ .

This Annex will contain table(s) that list the required species-specific metric performance levels.

ANNEX 3: ENVIRONMENTAL AND SOCIAL RISK ASSESSMENT FRAMEWORK

This Annex is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Annex will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/new-farm-standards/aligned-standard/ .

This Annex will contain the outline and key elements of the Environmental and Social Risk Assessment Framework which will draw from existing requirements in the (B)EIA and (p)SIA.

ANNEX 4: FARM PERFORMANCE DATA SUBMISSION

This Annex is not open for consultation during the March 8 - May 7, 2021 Consultation Round.

This Annex will be made available for consultation in an upcoming consultation round. For consultation dates, please see https://www.asc-aqua.org/what-we-do/our-standards/new-standards-and-reviews/new-farm-standards/aligned-standard/ .

This Annex will contain the outline for the calculation and submission requirements of farm performance data.