Aquaculture Stewardship Council

ASC Freshwater Trout Standard

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Responsibility for this Standard

The Technical Advisory Group of the Aquaculture Stewardship Council is responsible for this document.

Versions Issued

Version No.	Date	Description Of Amendment
0.1	January 2013	Original version developed and approved by the Fresh Water Trout Aquaculture Dialogue Steering Committee under the original title “Final draft standards for environmentally and socially responsible trout farming”
0.1	January 2013	Handover of the Standard by the Freshwater Trout Aquaculture Dialogue Steering Committee to the Aquaculture Stewardship Council
1.0	February 2013	Update of the Standard to meet ASC style requirements (e.g. inclusion of introduction chapters ‘about the ASC’ and ‘overview of the ASC system’, formatting and wording). The content of the actual Standard remained unchanged from version 0.1.
1.0	March 2014	Update of the Standard to further meet lay-out requirements. No content adjustments made.

About the ASC

ASC is the acronym for Aquaculture Stewardship Council, an independent not for profit organisation. The ASC was founded in 2009 by the WWF (World Wildlife Fund) and IDH (The Sustainable Trade Initiative) to manage the global Standard for responsible aquaculture. ASC's Standard were first developed by the Aquaculture Dialogues, a series of roundtables initiated and coordinated by the WWF.

What the ASC is

The ASC's aquaculture certification programme and label recognise and reward responsible aquaculture. The ASC is a global organisation working internationally with aquaculture producers, seafood processors, retail and foodservice companies, scientists, conservation groups, social NGOs and the public to promote the best environmental and social choice practices in aquaculture.

What the ASC does

Working with partners, the ASC runs a programme to transform the world's aquaculture markets by promoting the best environmental and social aquaculture performance. The ASC seeks to increase the availability of aquaculture products certified as sustainable and responsibly produced. The ASC's credible consumer label provides third party assurance of conformity with production and chain of custody Standard and makes it easy for everyone to choose ASC certified products.

What the ASC will achieve

The ASC is transforming aquaculture practices globally through:

Credibility: Standards developed according to ISEAL guidelines, multi-stakeholder, open and transparent, science-based performance metrics.

Effectiveness: Minimising the environmental and social footprint of commercial aquaculture by addressing key impacts.

Added value: Connecting the farm to the marketplace by promoting responsible practices through a consumer label.

Overview of the ASC System

The ASC system is made up of 3 components:

1. Aquaculture Farm Standard

The ASC works with independent third-party certification organizations that provide certification services for aquaculture operations that grow one or more of the species for which the requirements have been, or are being, developed by the Aquaculture Dialogues.

The species groups were chosen because of their potential impact on the environment and society, their market value and the extent to which they are traded internationally or their potential for such trade. The species covered include: abalone, bivalves (clams, oysters, mussels and scallops), cobia, freshwater trout, pangasius, salmon, seriola, shrimp, and tilapia.

Through the Aquaculture Dialogues more than 2,200 people have participated in the development of the ASC Standard including fish farmers, seafood processors, retailers, foodservice operators, NGOs, government agencies and research institutes. Universal, open and transparent, the Aquaculture Dialogues focused on minimising the key environmental and social impacts of aquaculture. Each Dialogue produced requirements for one or a range of major aquaculture species groups. The Standard creation process followed guidelines of the ISEAL Alliance the *ISEAL Code of Good Practices for Setting Social and Environmental Standard*. This code of good practice complies with the ISO/IEC Guide 59 *Code of good practice for standardization*, and the WTO Technical Barriers to Trade (TBT) Agreement Annex 3 *Code of good practice for the preparation, adoption and application of standards*. The requirements are science-based, performance-based and metrics-based and will apply globally to aquaculture production systems, covering many types, locations and scales of aquaculture operations.

2. Independent 3rd Party Audits Conducted by accredited Conformity Assessment Bodies (CAB)

Farms that seek ASC certification hire a CAB (conformity assessment body) that has been accredited by Accreditation Services International GmbH. (ASI). Only farms that are certified by a CAB accredited by ASI are eligible to sell certified product into a recognized chain of custody and have that product eligible to carry the ASC logo.

Accreditation is the process by which CABs are evaluated to determine their competency to provide certification to the ASC Standard. The accreditation process includes annual evaluations of each accredited CAB and the ASC audits they perform. ASC has exclusively appointed ASI to provide accreditation services for ASC. ASI is fully independent of ASC. ASI is based in Bonn, Germany and also provides accreditation services to Forest Stewardship Council (FSC) and Marine Stewardship Council (MSC). Despite similar sounding names, all of these organizations are independent of ASC.

ASI is responsible for evaluations of CABs against the requirements in this document. All accreditation decisions are taken independently by ASI. The independence of ASC, ASI and the CAB ensures that high quality, objective audits and certification decisions are performed without bias for all clients around the world.

3. MSC Chain of Custody Certification and the ASC Logo

The ASC logo has been developed for use by certified and licensed farms, processors and distributors so that all parts of the value chain and especially consumers can easily identify ASC certified product(s). The use of the ASC logo can be applied only to products that are sold through a consecutive, certified chain of custody that ensures traceability of certified products from production to final point of sale. For ASC, chain of custody is certified through application of the MSC chain of custody system, to which ASC CoC requirements have been added as a scope, to ASC certified aquaculture products. Only products that originate in ASC certified farms and are sold through an MSC certified chain of custody (with ASC CoC scope) are eligible to carry the ASC logo.

Just as with the ASC Standard, the ASC logo is owned by ASC which regulates all aspects of its use.

This Standard contains final requirements for environmentally and socially responsible freshwater trout farming. The requirements have been revised from previous drafts (released in July 2010 and May 2011) based on public feedback and the deliberations of the Freshwater Trout Aquaculture Dialogue Steering Committee.

As a package, the Steering Committee (SC) believes these requirements represent an important step forward in defining environmentally and socially responsible production of freshwater trout. SC members have disagreed, sometimes strongly, on individual requirements. The SC appreciates all of the public comments received on previous drafts of these requirements and will provide in a separate document detailed responses to the main themes and ideas that emerged in the most recent public comment period.

Auditing guidance is being developed for these requirements.

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INTRODUCTION

Seafood is one of the most popular sources of protein worldwide. By volume, approximately half of the seafood we eat is wild caught. But the other half is from aquaculture—the fastest-growing food production system in the world—and aquaculture's share of global seafood is expected to continue to rise.

As with many rapidly growing industries, the growth in aquaculture production has raised concerns about negative social and environmental impacts related to farming, such as water pollution, the spread of diseases and unfair labor practices at farms. Although some producers are addressing these issues well, others are not doing so at all or are doing so poorly.

One tool to help encourage more responsible aquaculture is a global Standard—including requirements (performance levels) that must be reached to help minimize or reduce a set of impacts. Requirements can be used to benchmark other requirements, incorporated into existing certification programs, adopted for government programs and be the foundation for buyer and investment screens. They also can be the basis for an independent, auditable certification program.

The Freshwater Trout Aquaculture Dialogue (FTAD) roundtable has created a global, performance-based Standard for freshwater trout farming. The vast majority of freshwater trout consumed today is farmed. The FTAD requirements are intended to be rigorous to eliminate or minimize any potential adverse environmental and social impacts. It is also expected to be achievable by today's top performers, in order to create a noticeable presence in the marketplace and a catalyst for improved performance across the global industry.

Each requirement developed by the FTAD will be based on an impact, principle, criteria and indicator, as defined below:

Impact: The problem to be addressed

Principle: The high-level goal for addressing the impact

Criteria: The area to focus on to address the impact

Indicator: What to measure to determine the extent of the impact

Initiated in 2008 by World Wildlife Fund (WWF), the FTAD has involved more than 200 producers, environmental and social non-governmental organizations (NGOs), development organizations, retailers, wholesalers, aquaculture associations, academics, researchers, government representatives and independent consultants.

The FTAD's eight-person Steering Committee (SC) has been responsible for managing the FTAD process and making all final decisions related to the freshwater trout Standard document. This group of volunteers included representatives from freshwater trout producers, feed manufacturers, environmental NGOs and researchers. Steering Committee members have generously donated their time to this initiative. A philanthropic foundation provided funding to cover travel expenses for SC members from NGOs and academia to attend in-person SC meetings. Other SC members covered their own expenses, including travel and accommodations.

The FTAD process and full suite of requirements (including principles, criteria and indicators) are described in this document. An audit manual is under development and will explain the methods to be used by auditors to determine if the requirements are being met.

The FTAD will assist in the implementation of the Standard through the Technical Advisory Group of the ASC. Two members of the FTAD Steering Committee will participate in the initial Technical Advisory Group, which will help ASC to use the Standard in the way the dialogue intended, guide processes to harmonize requirements across different species and periodically revise requirements.

ASC, rather than the FTAD Steering Committee, will be responsible for implementation of the Standard.

For complete information about the FTAD, including meeting summaries and presentations, go the ASC Website (www.asc-aqua.org).

PURPOSE AND SCOPE OF THE ASC FRESHWATER TROUT STANDARD

Purpose of the Standard

The purpose of the ASC Freshwater Trout Standard is to provide a means to measurably reduce or eliminate any negative impacts freshwater trout farming can have on the environment and society (i.e., farm workers and people who live in communities near freshwater trout farms). The standard is designed to describe best performance today on environmental and social issues. The requirements must meet the dual goal of being environmentally and socially rigorous, while attracting sufficient producer interest to create noticeable change over time.

The ASC Freshwater Trout Standard is designed so that a farm must achieve 100 percent compliance on each and every requirement in order for certification to be awarded.

The Standard focus on the environmental and social impacts of trout farming. Food safety, sentient fish welfare and the nutritional value of farmed trout are not addressed directly in the Standard. However, they are dealt with indirectly through fish health, feed composition and other requirements. The FTAD encourages the ASC to partner with other certification schemes that focus specifically on fish welfare issues, food safety and product quality.

Scope of the Standard

Range of activities within aquaculture to which the Standard applies

Aquaculture is the production of aquatic organisms. It involves the planning, development and operation of facilities, which in turn affect the inputs, production, processing and chain of custody components.

The ASC Freshwater Trout Standard applies to the planning, development and operation of freshwater trout aquaculture production systems. Planning includes farm siting; resource use or extraction; and assessment of environmental, social and cumulative impacts. Development includes construction, habitat alteration and access to public areas by other resource users. Operation includes effluent discharge, working conditions and use of antibiotics and other chemicals, as well as feed composition and use.

Geographic scope to which the Standard applies

The ASC Freshwater Trout Standard applies to all locations and scales of freshwater trout farm-based aquaculture production systems in the world.

Species to which the Standard applies

The ASC Freshwater Trout Standard was developed considering farming systems for rainbow trout (*Oncorhynchus mykiss*). However, they are applicable for any salmonid grown in fresh water. A future review of the Standard will consider whether specific requirements should be adapted for different species. Products marketed as freshwater trout should use this Standard, while products marketed as salmon should use the ASC Salmon Standard. Large trout raised in salt water is not covered under this Standard.

Systems to which the Standard applies

The ASC Freshwater Trout Standard applies to all types of production systems, such as flow-through systems, recirculating systems and cages in lakes. The Standard seeks to set equivalent environmental performance regardless of the production systems. In some cases, the requirements use different metrics to determine the environmental performance of different systems. For instance, the effluent requirements are divided between land-based systems and cage systems. Production systems that typically have greater environmental or social impacts will have more rigorous requirements in order to achieve full compliance.

Unit of certification to which the Standard applies

The unit of certification for the ASC Freshwater Trout Standard is the site-specific farming operation. The size of the production operation can vary considerably. Given that the focus of the ASC Freshwater Trout Standard is on production and the immediate inputs to production, the unit of certification will typically consist of a single farm or some other type of collective grouping.

The unit of certification could be a group or cluster of facilities or operations that should, for a number of reasons, be considered collectively as the aquaculture operation under consideration. For example, they may share resources or infrastructure (e.g., water sources or an effluent discharge system), share a landscape unit (e.g., a watershed), have the same production system, and/or involve the same species and have a common market outlet. This group or cluster must be a legal entity that shares a common management structure so the ASC Freshwater Trout Standard is binding for each individual producer. Regardless of the specific situation, farms and other users often can have cumulative effects on the environment and society. As a result, some of the requirements are independent of what a producer can achieve at the farm level. Also, some requirements rely on the efforts of the producer to act as an advocate and steward of the environment.

The ASC Freshwater Trout Standard will be audited at the “grow-out” phase of trout farming, defined as production facilities for fish weighing more than 10 grams[1]. The Standard also include a set of requirements around the fingerling and egg suppliers. A farm seeking certification would need to demonstrate through documentation that its fingerling and/or egg suppliers have met those requirements. Requirements are also made around a farm’s feed inputs.

[1] The Forage Fish Depending Ratio requirement in Principle 5 is calculated for fish sizes of 30 grams or higher.

PROCESS FOR CREATING THE STANDARD

General Considerations

The process of setting a Standard is critical, as it largely determines the credibility, viability, practicality and acceptance of the Standard. The process of creating the ASC Freshwater Trout Standard has been—and will continue to be—multi-stakeholder, open and transparent. This is in line with the International Social and Environmental Accreditation and Labeling (ISEAL) Alliance's "Code of Good Practice for Setting Social and Environmental Standards." A goal of the ASC is to follow the ISEAL code.

Process for Creating the ASC Freshwater Trout Standard

In 2007, WWF notified ISEAL of the intent to apply the "Code of Good Practice for Setting Social and Environmental Standards" to the FTAD. ISEAL accepted WWF as an associate member on behalf of all the Aquaculture Dialogues.

In July 2008, under the leadership of WWF, the FTAD was created and Christoph Mathiesen of WWF Denmark was hired to coordinate the FTAD.

At the inaugural FTAD meeting, held in Denmark in November 2008, participants approved the **goals and objectives** for the FTAD, identified the key environmental and social impacts associated with the farming of freshwater trout and drafted principles for addressing each impact. They also began to create the SC, which now includes the following people:

Name	**Organization**	**Sector**	**Country**
David Bassett	British Trout Association, representing the Federation of European Aquaculture Producers	Producers	United Kingdom
Jose Villalon	World Wildlife Fund	Environmental NGO	United States
Sian Morgan	FishWise	Environmental NGO	United States
Niels Alsted	BioMar	Feed manufacturer	Denmark
Yavuz Papila	Liman	Producer	Turkey
Marco Saroglia	Università dell'Insubria	Academia	Italy

Margreet van Vilsteren	North Sea Foundation	Environmental NGO	Netherlands
Matteo Leonardi	Società Agricola Troticoltura F.lli Leonardi s.s.	Producer	Italy

The FTAD has also benefitted from the input of former SC members Merrielle Macleod of WWF, Dawn Purchase of the Marine Conservation Society, Luz Arrequi of Tres Mares and Rene Benguerel of Blue You Consultancy.

At the second FTAD dialogue meeting, held in the Faroe Islands in May 2009, participants developed draft criteria.

In June 2009, the SC finalized the FTAD process document, developed a road map for completing the FTAD requirements and created the initial outreach strategy for the FTAD.

In November 2009, the third FTAD dialogue was held in Barcelona, Spain, where participants began to develop draft indicators.

The FTAD's SC held two multiday in-person meetings and numerous conference calls between January and July 2010 to create draft requirements and to refine the FTAD road map for completing the Standard-development process.

From April 2009 to March 2010, the FTAD coordinator and SC members held outreach meetings (in person, or via phone or e-mail) with stakeholder groups identified in the FTAD's outreach strategy. Additional outreach conversations were held during the two comment periods. Outreach to date includes:

Date	**Location**	**Target Audience**
April 2009	Denmark	Producers, government aquaculture researchers, feed producers and consultants
June 2009	Spain	Producers, government researchers, consultants and environmental/social NGOs
October 2009	Poland	Producers, government and aquaculture researchers
October 2009	Italy	Producers, government and feed producers

March 2010	Turkey	Producers, government Officials and environmental/social NGOs
August 2010	Global First Public Comment Period	All interested stakeholders
September 2010	Italy	Producers, government researchers, consultants and environmental/social NGOs
May 2011	Global Second Public Comment Period	All interested stakeholders

Draft principles, criteria, indicators and requirements were posted for a public comment period from July 27, 2010, through September 27, 2010.

The fourth FTAD dialogue meeting was held in Verona, Italy, during the first public comment period. A meeting summary from Verona, as well as all comments submitted during the public comment period, were posted online and used by the Steering Committee to revise the draft Standard. The SC met for three days in January 2011 and conducted more than a dozen conference calls over the past six months to revise the draft Standard.

Draft principles, criteria, indicators and requirements were posted for a second public comment period from May 18, 2011, through June 18, 2011. The Steering Committee met in July 2011 to discuss the public comments and create a road map to finalizing the document.

The SC has been reaching out to stakeholders and key experts during and after each of the public comment periods for advice regarding revisions of the Standard.

Detailed auditing guidance was written based on these Final Standard. Once the Audit Manual is complete, the Steering Committee will review and approve the Audit Manual.

Final Standard has been given to the ASC, which will be responsible for working with independent, third-party entities to certify farms that are in compliance with the Standard for responsible aquaculture being created by participants of the Aquaculture Dialogues. ASC's Website is: http://www.asc-aqua.org/. Two members of the FTAD SC form part of the initial Technical Advisory Group of the ASC that will assist in implementing the Standard in a way that is consistent with the intent of the FTAD.

Throughout the process, WWF has written and disseminated press releases and developed/updated the FTAD website to keep people informed of upcoming meetings and progress within the FTAD.

Continuous Improvement of the ASC Freshwater Trout Standard

As stated in the ISEAL "Code of Good Practices for Setting Social and Environmental Standards," "…standards shall be reviewed on a periodic basis for continued relevance and effectiveness in meeting their stated objectives and, if necessary, revised in a timely manner." It is implicit in the development of the ASC Freshwater Trout Standard that the performance levels will be adjusted over time to reflect new data, improved practices and new technology that permits a further reduction in impacts. The Standard will be revised approximately every three to five years.

1. PRINCIPLE: COMPLY WITH ALL NATIONAL AND LOCAL LAWS AND REGULATIONS

Impact: Principle 1 is intended to ensure that all farms aiming to be certified to the ASC Freshwater Trout Standard meet their legal obligations. Adherence to the law and regulations of the land ensures farms have met basic environmental and social requirements of their country and have legitimate land tenure.

1.1 Criteria: Operate within the legal framework of national and local laws and regulations that are applicable and current

INDICATOR	REQUIREMENT
1.1.1 Presence of documents issued by pertinent authorities indicating compliance with local and national authorities on land and water use	Yes
1.1.2 Presence of documents indicating compliance with tax laws	Yes
1.1.3 Presence of documents indicating compliance with all labor laws and regulations	Yes
1.1.4 Presence of documents indicating compliance with regulations or permits concerning water quality impacts, effluent and water abstraction	Yes

Rationale

To assure trout farms are operating legitimately within their region and country, the ASC Freshwater Trout Standard requires confirmation in these focused areas: use rights, tax laws, labor laws and water quality regulations. While indicating compliance with documentation in these four areas does not ensure compliance with all laws and regulations, it is an indicator that a certified farm is aware of and fulfilling its legal responsibilities.

These requirements do not attempt to monitor or enforce local laws and regulations. Some countries have hundreds of relevant laws and regulations. It would not be possible or effective to audit against or enforce national laws and regulations. This principle aims to ensure that certified farms are engaged with and respecting local and national laws and regulations. The areas specifically addressed above were considered to be the key areas within local and national regulations frameworks and legislation.

The overall objective of the ASC Freshwater Trout Standard is to define performance requirements that will be internationally relevant and shift global production toward better practices. The ASC Freshwater Trout Standard also recognizes that different countries have different levels of regulation and so, in some cases, adhering to national and local legislation is only the initial foundation for compliance with the ASC Freshwater Trout Standard.

2. PRINCIPLE: CONSERVE HABITAT AND BIODIVERSITY

Impact: This principle encompasses biodiversity-related impacts resulting from farm siting and operation, such as conversion of eco-sensitive habitats, introduction and cultivation of exotic and transgenic species, and threats to wild populations from escapees and predator control.

The requirements under Principle 2 draw on international conventions that encourage environmental and economic sustainability simultaneously, such as the Convention on Biological Diversity that was adopted at the 1992 Earth Summit. The requirements place heavy emphasis on conserving biodiversity at the ecosystem, habitat and species levels; conserving ecosystem functions; and attempting to reward proper planning, siting and operation of trout farms based on an integrated ecosystem approach to aquaculture.

2.1 Criteria: Siting and location of farms[2]

INDICATOR		REQUIREMENT
2.1.1	Allowance for siting in National Protected Areas[3]	None[4][5]
2.1.2	Conversion of wetlands[6] after 1999	None[7]
2.1.3	An assessment of the presence on the farm of species listed on the International Union for Conservation of Nature (IUCN) "Red List of Threatened Species" as vulnerable, near threatened, endangered or critically endangered; an evaluation of the farm's impact on any such species present; and clearly defined mitigation measures to reduce any negative impacts and allow existence of such species	Yes

Rationale

[2] To determine its compliance with the requirements in 2.1, a producer will need documentation that analyzes the farm's siting and surrounding habitats and ecosystems. Documentation can be based on an Environmental Impact Assessment (EIA) or any other credible process of environmental assessment.

[3] A protected area is "a clearly defined geographical space, recognized, dedicated and managed through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values." Source: Dudley, N. (Editor) (2008), Guidelines for Applying Protected Area Management Categories, Gland, Switzerland: IUCN. x + 86pp.

[4] An exception is made for protected areas that are classified by the International Union for Conservation of Nature (IUCN) as Category V or VI. These are areas preserved primarily for their landscapes, or areas that include sustainable resource management. Details can be found here: http://www.iucn.org/about/work/programmes/pa/pa_products/wcpa_categories/.

[5] An exception is also made for farms located in protected areas that are designated as such after the farm already was established in that location. In these situations, the farm must demonstrate that its operation is compatible with the objectives of the protected area, and that it is in compliance with any relevant conditions placed on the farm by authorities as a result of the protected designation.

[6] Wetland**:** Generally, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands generally include swamps, marshes, bogs and fens (U.S. Environmental Protection Agency).

[7] Exception**:** Conversion of wetlands for access to water (e.g., canals for inlets and outlets): Converted surface area must be offset by restoration of 100% of the equivalent area of functional wetlands with the same habitat characteristics.

Trout farm siting can influence surrounding ecosystems. Farm siting decisions also should take into consideration Protected Areas, habitat for threatened species and natural wetlands.

National Protected Areas are recognized as a tool in conserving species and ecosystems. They also provide a range of goods and services essential to the sustainable use of natural resources.

The IUCN's "Red List of Threatened Species" is a global inventory of the conservation status of plant and animal species. A series of "Regional Red Lists," which are produced by countries or organizations, assess the risk of extinction of species within a given political jurisdiction. The Red Lists use criteria that evaluate extinction risk. The ASC Freshwater Trout Standard focuses on the four categories that confer the greatest risk: near threatened, vulnerable, endangered and critically endangered.

Wetlands provide fundamental ecological services and are sources of biodiversity at species, genetic and ecosystem level. Wetlands constitute a resource of great economic, scientific, cultural and recreational value for communities. Wetlands play a vital role in climate change adaptation and mitigation. Wetlands should be restored and rehabilitated, whenever possible, and conserved by ensuring wise use.

Within the ASC Freshwater Trout Standard, 1999 is the benchmark for the definition and scope of "wetland conservation." This is the year that the "Convention on Wetlands of International Importance" (also known as the Ramsar Convention) was approved. The convention provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

2.2 Criteria: Riparian buffer zones[8]

INDICATOR	REQUIREMENT
2.2.1 For new farms installed on land after publication of the ASC Freshwater Trout Standard (or for significant expansions), minimum buffer zone between the farm and an adjacent water body in which there is no farm infrastructure that might impede wildlife's access to the water, except for inflow and outflow systems	≥ 15 meters from the water's edge[9]

Rationale

The zones between water bodies and the adjacent terrestrial ecosystems (i.e., riparian buffers) often serve as habitat for vulnerable or endangered species and, in the case of heavily used landscapes, are the only remaining habitats for many such species. Buffer zones with natural vegetation are also helpful to minimize erosion and run-off.

The ASC Freshwater Trout Standard requires that all new farms be constructed with a minimum natural buffer zone between the farm and the natural watercourse adjacent to a trout farm.

[8] A riparian buffer zone is the land immediately abutting a water body.
[9] An exception is made if the farm can demonstrate through a third-party scientific analysis that the farm's structures do not impede animal habitats and corridors and do not present erosion risks.

2.3 Criteria: Introduction of exotic species[10]

INDICATOR	REQUIREMENT
2.3.1 New introductions of exotic trout after the date of publication of the ASC Freshwater Trout Standard, unless in a closed production system[11]	None

Rationale

Accidental or intentional introductions of non-native species can cause significant global environmental problems with potentially far-reaching social and economic impacts as well[12].

Aquaculture is considered one of the major pathways for introducing non-native animals that could become invasive and result in biodiversity loss[13]. Rainbow trout, in particular, is one of the most widely introduced fish species in the world, leading it to be included on a list of the 100 species of greatest concern in the Global Invasive Species Database[14]. Therefore, the ASC Freshwater Trout Standard seeks to discourage the introduction of trout into waterways where these species are not native or previously established.

2.4 Criteria: Transgenic[15] Trout

INDICATOR	REQUIREMENT
2.4.1 Allowance for the culture of transgenic trout, including the offspring of genetically engineered trout	None

Rationale

The culture of transgenic trout is prohibited under the ASC Freshwater Trout Standard. Invoking the precautionary principle, the ASC Freshwater Trout Standard cannot allow these species to be cultured until there is more conclusive evidence that demonstrates that they pose an acceptable level of risk to adjacent ecosystems.

[10] The FTAD defines “exotic species” as non-native animals living in areas outside their native boundaries.

[11] A closed production system is defined as a facility with recirculating water that is separated from the wild aquatic medium by effective physical barriers that are in place and well maintained to ensure no escapes of reared specimens or biological material that might survive and subsequently reproduce.

[12] Leung, K.M.Y. and Dudgeon, D. 2008. Ecological risk assessment and management of exotic organisms associated with aquaculture activities. In: M.G. Bondad-Reantaso, J.R. Arthur and R.P. Subasinghe (eds). Understanding and applying risk analysis in aquaculture. FAO Fisheries and Aquaculture Technical Paper. No. 519. Rome, FAO. pp. 67–100.

[13] Invasive species: Organisms (usually transported by humans) that successfully establish themselves in and then overcome otherwise intact, pre-existing native ecosystems (http://www.issg.org/about_is.htm) Weigle, S.M., Smith, L.D., Carlton, J.T. & Pederson, J. 2005. Assessing the risk of introducing exotic species via the live marine species trade. Cons. Biol., 19: 213-223. Casal, C.M.V. 2006. Global documentation of fish introdcutions: the growing crisis and recommendations for action. Biol. Invasions, 8: 3-11.

[14] Global Invasive Species Database (www.issg.org).

[15] Transgenic trout: A subset of genetically modified organisms, which are organisms that have inserted DNA that originated in a different species. Some GMOs contain no DNA from other species and, therefore, are not transgenic but cisgenic.

The culture of genetically enhanced[16] trout is acceptable under the ASC Freshwater Trout Standard. This allows for further progress in feed conversion, disease resistance and environment adaptation (domestication), which should increase the efficient use of local resources. Also allowed under the ASC Freshwater Trout Standard is the cultivation of triploid and sex-reversed trout.

2.5 Criteria: Escapes from culture facilities

INDICATOR	REQUIREMENT
2.5.1 Evidence of a well-designed, maintained and managed culture system, infrastructure and farm management to prevent escapes during grow-out and at harvest, as demonstrated through the requirements in Appendix VI	Yes
2.5.2 Presence of trout farming standard operating procedures (SOP) that incorporate an escape risk assessment[17]	Yes
2.5.3 Evidence of farm staff capacities and capabilities, including training of staff prior to starting work and regular training during employment to understand and address risks from escapes and follow the defined SOP	Yes
2.5.4 Estimated unexplained loss18 of farmed trout in net pens is made publicly available	Yes
2.5.5 All fish in net pens are counted during each grading	Yes

Rationale

The management practices in this criterion seek to minimize the risk of farmed fish escaping into the wild. Escaped fish are a potential pathway for disease from the farm into the wild, and also can lead to competition for habitat and genetic impacts on wild stocks where native wild stocks of the same species are present.

[16] Genetic enhancement**:** The process of genetic improvement via selective breeding that can result in better growth performance and domestication but does not involve the insertion of any foreign genes into the genome of the animal.

[17] SOP must clearly define the correct procedures for each aspect of farm operation, identify the risks involved and define mitigation procedures for prevention of escapes.

[18] Calculated as: Unexplained loss = Stocking count - harvest count - mortalities - other known escapes.

2.6 Criteria: Predator control[19]

INDICATOR	REQUIREMENT
2.6.1 Intentional use of lethal predator control	None[20]

Rationale

In some cases, farmers employ lethal controls to deter or remove predators from their farms. The killing of predators can negatively impact predator populations and affect local biodiversity, especially when local predators (e.g., herons and egrets) become dependent on the reliable food source that trout farms provide. Although a consistent food supply is likely to enhance population numbers, it also is likely to change behavior and local dispersal patterns of the predatory species that may ultimately affect the health of those populations.

The intentional killing of animals that prey on cultured trout is inappropriate for farms certified under these requirements, and therefore is not allowed.

The ASC recognizes that, on rare occasions, a farm may encounter exceptional circumstances that might merit lethal action against a predator. The requirements, therefore, permit an exception to the prohibition on lethal action in situations where the farm can provide evidence of an assessment that demonstrates lethal action against a particular predator is appropriate, necessary and presents no risks to wild populations or ecosystems.

This exception cannot be applied to species that are threatened, endangered or critically endangered.

Vermin are classed as distinct from predators for the purposes of this requirement.

[19] Excluding “vermin” as defined in the local jurisdiction.

[20] The standard permits an exception to the prohibition on lethal action in situations where the farm can provide evidence of an assessment that demonstrates lethal action against a particular predator is appropriate, necessary and presents no risks to wild populations or ecosystems. This exception cannot be applied to species that are threatened, endangered or critically endangered. The assessment must come from an EIA or any other credible process of environmental analysis.

3. PRINCIPLE: MINIMIZE NEGATIVE EFFECT ON WATER RESOURCES

Impact: Principle 3 is intended to address potential impacts on water quantity and quality related to the establishment and operation of freshwater trout farms. Impacts can be associated with the requirement for a fresh water supply, either surface or ground water or a combination of both, and the quality of water discharged from the farm into the natural environment.

3.1 Criteria: Water Use/Abstraction Levels

INDICATOR	REQUIREMENT
Requirements 3.1.1 and 3.1.2 apply to farms utilizing surface water (such as water from a river):	
3.1.1 Maximum amount of water that a farm can divert from a natural flowing water body (such as a river or stream)	50% of the natural water body's flow immediately above the farm[21]
3.1.2 Demonstration that >90% diverted water is returned to the natural water body	Yes
Requirements 3.1.3 and 3.1.4 apply to farms utilizing groundwater (such as water from a well):	
3.1.3 All use of underground pumped water has been permitted by regulatory authorities	Yes
3.1.4 Well depths are tested at least annually, and results made publicly available[22]	Yes

Rationale

Trout aquaculture facilities utilizing flowing water (including recirculating systems) require a constant supply of fresh water. Farms removing or diverting freshwater resources require appropriate and effective management to oversee water allocations and ensure efficient utilization. Trout farms typically make use of groundwater (wells) or surface waters (rivers or streams) as their water source.

Farms that divert water from a river or stream cause a reduction in the water body's flow for the distance between the farm's inlet and outlet. It is difficult to set a global requirement that ensures that the remaining flow is sufficient to support the natural flora and fauna. Some jurisdictions are currently setting minimum flow requirements for a river or stream that farms need to respect. This is an appropriate local approach. In the absence of such regulation, or an equivalent scientific study, the

[21] Farms will be exempted from this standard if they can demonstrate that they are in a jurisdiction that regulates the farm's water abstraction based on a minimum vital water flow for the natural water body, and the farm's water use respects that minimum vital flow. Farms would also be exempt if they can demonstrate abstraction amounts respect limits determined by a scientific study that estimates minimum vital flow.

[22] Well depths must be tested at similar times of the year, with results submitted to ASC. More detailed methodology will be provided in the Auditing Guidance document.

ASC Freshwater Trout Standard requires farms to always leave at least half of the natural flow in the water body.

Groundwater requires attention because it represents the abstraction and displacement of typically higher-quality water. Well or aquifer recharge is the process of water being replenished in the ground. When abstraction increases beyond the rate of recharge, the result is a net reduction in the water table.

Groundwater levels vary naturally from year to year, making a rigid global requirement impractical. These requirements instead require a farm to keep track of water tables over time and to make that information public. In addition, all use of underground water must be explicitly permitted to avoid situations in which water use by a farm would be undisclosed to regulators.

It should be noted that a plentiful and sustainable water supply is of critical importance for trout producers; thus, protection of these resources is paramount to the farm's viability.

3.2 Criteria: Land-based systems - Water Quality/Effluent

INDICATOR	REQUIREMENT
3.2.1 Maximum total amount of phosphorus released into the environment per metric ton (mt) of fish produced over a 12-month period (see methodology in Appendix II-A)	5 kg/mt of fish produced over a 12-month period; within three years of publication of the ASC Freshwater Trout Standard, 4 kg/mt of fish produced over a 12-month period
3.2.2 Minimum oxygen saturation in the outflow, measured monthly (see methodology in Appendix II-B)	60%[23]
3.2.3 Macroinvertebrate surveys downstream from the farm's effluent discharge demonstrate benthic health that is similar to or better than surveys upstream from the discharge (see methodology in Appendix II-C)	Yes
3.2.4 Evidence of implementation of biosolids (sludge); Best Management Practices (BMPs) (see Appendix II-D)	Yes
3.2.5 Water-quality monitoring matrix completed and submitted to ASC (see Appendix II-B)	Yes

Rationale

Effluent from trout farms can have an environmental effect on rivers, streams and other bodies of water that receive the discharge. Phosphorus is the key limiting nutrient in most temperate and cool

[23] If a single oxygen reading is below 60 percent, the farm would need to demonstrate daily continuous monitoring with an electronic probe and recorder for at least a week with a minimum 60 percent saturation at all times.

freshwater systems. It is a stable nutrient in that it does not volatilize like nitrogen compounds. It is also added to feeds in proportions that can allow estimations of other waste constituents (organic matter and nitrogen). Thus, phosphorus is an ideal variable to set load limits for freshwater trout aquaculture.

The ASC developed the phosphorus load requirement based on a unit of production, making it an indicator of how well a farm is minimizing nutrient discharges per ton of fish produced. From an environmental standpoint, farms should aim for as low an annual load of phosphorus per ton of fish as possible. Farms can lower their phosphorus load on the environment by using a better feeding strategy (ratio and feed distribution), improving feed conversion efficiency through the improvement of the environmental conditions in the farm, utilizing feed that is more digestible and has lower phosphorus content, and by applying cleaning technologies such as settling ponds and filters. Production facilities are encouraged to develop methodologies to reduce their phosphorus burdens over time, while ensuring farmed fish are getting the appropriate nutrients to protect the nutritional content and health of the trout.

In an attempt to limit the oxygen burden on natural water bodies from the release of nutrients, these requirements include a minimum saturation level of dissolved oxygen at discharge.

Benthic biodiversity is often a measure of aquatic ecosystem health. These requirements use faunal surveys as a reference for a farm's actual impact on the environment. By comparing surveys downstream and upstream from the farm's effluent discharge, the requirement aims to isolate the impact of the production facility, and ensure that no significant impact is occurring.

Biosolids are a mixture of organic waste and sediment produced or accumulated through the farming activity. Biosolids discharged into natural water bodies are of concern because solids can restrict light penetration in water bodies, accumulate downstream, cover plants and habitat and cause general shallowing of water bodies. Additionally, the organic component of biosolids will exert an oxygen demand as the organic matter decays. The simplest and best way to minimize these impacts is to remove sediments from the water column and allow organic matter to decay prior to discharge. Functionally, this infers the use of a settling basin to let solids settle out of the water column, and for bacterial decomposition and oxygen depletion to occur at the same time prior to disposal of biosolids. To provide assurance of appropriate disposal of biosolids, these requirements include a small number of BMPs.

These requirements do not require a specific effluent monitoring regime beyond the dissolve oxygen requirements and benthic analyses. However, the requirements do require farms to submit to the ASC the results of the effluent monitoring they conduct as part of their regulatory requirements. In particular, the requirement requires data on any sampling of phosphorus, nitrogen, total suspended solids (TSS) and biological oxygen demand (BOD). This data will help to distinguish the performance of farms certified by this requirement over time and assist in revisions to the requirement.

3.3 Criteria: Cage-Based Systems - Water Quality/Benthic Community

	INDICATOR	REQUIREMENT
3.3.1	For cages located on water bodies with a surface area less than 1,000 km^2, evidence that farm production levels reflect the results of an assimilative capacity study (see Appendix II-E)	Yes

3.3.2	For cages located on water bodies with a surface area of 1,000 km^2 or greater, evidence that cages are located at sites that are classified as "Type 3" sites, as defined in Appendix II-F	Yes
3.3.3	Water quality monitoring matrix completed (see Appendix II-G)	Yes
3.3.4	Maximum baseline total phosphorus concentration of the water body (see Appendix II-H)	≤ 20 µg/l [24]
3.3.5	Minimum percent oxygen saturation of water 50 centimeters above bottom sediment (at all oxygen monitoring locations described in Appendix II-G)	≥ 50%
3.3.6	Trophic status classification of water body remains unchanged from baseline (see Appendix II-H)	Yes
3.3.7	Maximum allowed increase in total phosphorus concentration in lake from baseline	25% for water bodies with a surface area of less than 1,000 km^2 15% for water bodies with a surface area of 1,000 km^2 or greater
3.3.8	Maximum total amount of phosphorus released into the environment per metric ton (mt) of fish produced over a 12-month period (see Appendix II-A)	5 kg/mt of fish produced over a 12-month period; within three years of publication of the ASC Freshwater Trout Standard, 4 kg/mt of fish produced over a 12-month period

Rationale

With no mechanism for collection or treatment of fish wastes (solid and dissolved) and uneaten feed, cage-based production systems release nutrients directly into the surrounding water column. Water quality impacts associated with these nutrient releases include increases in primary productivity of the water body and the subsequent reduction in dissolved oxygen levels upon decomposition of organic materials and phytoplankton respiration and increases in TSS, which can limit photosynthesis and oxygen production. Bottom sediment impacts include deposition of solids on the lake bottom, resulting in increases in sediment oxygen demand, habitat destruction and changes to the benthic macroinvertebrate communities.

With respect to water quality, the magnitude of the impact of nutrients from cage-based operations is a function of many factors, including farming practices (feed utilization, species cultivated and stocking densities), site characteristics such as basin morphology and hydraulic retention time, ambient water quality conditions within the receiving waters and inputs from other sources within the catchment. Because of natural processes in stratified lakes and reservoirs where water bodies can "turn over," cage- based farms should only be established at sites where there is good mixing of both

[24] This concentration is equivalent to the upper limit of the Mesotrophic Trophic Status classification as described in Appendix II-H.

surface and bottom water and where the hypolimnion is not locally bounded within a water body. Enclosed basins or lakes may only be suitable for a limited level of production as established by an assimilative capacity assessment.

These requirements require a comprehensive assimilative capacity assessment of the water body. The study will determine if cage farming is appropriate in the water body and will set a limit on production and/or nutrient discharge based on the water body's assimilative capacity. Detailed requirements of this study are provided in Appendix II-E and reflect global best practice. For very large lakes, such as the North American Great Lakes, an assimilative capacity study would not be practical or as relevant. In these situations, farms must be located at sites that are least sensitive to nutrient discharges because they are exposed to more energetic conditions, have connection to deep offshore waters and don't have hydrodynamically isolated embayments.

On the lake bottom, decreases in oxygen levels are an indication of the degradation. This may be due to a release of organic wastes from the cages. DO levels measured 50 centimeters from the bottom sediments provide a signal of the build-up of organic matter and the risks of oxygen deficiency in the lake bottom.

Water quality in a lake can be assessed in many ways. These requirements focus on phosphorus as a reference for water quality. The ASC recognizes that other indicators, such as nitrogen and biological indicators, are important as well. Phosphorus provided the most practical global proxy for these requirements, despite the challenges of its likely fluctuations during the year.

The requirements require that a farm monitors total phosphorus concentrations to gauge potential changes in water quality over time. Potential increases in concentrations may or may not be the result of farming activities. Regardless of the cause, if total phosphorus concentrations rise to the point that the lake's trophic status changes, or if they rise more than 25 percent from a baseline, trout production would no longer be certifiable in that lake. Technical advisors to the FTAD have signaled that increases in concentration greater than 25 percent would cause stresses that would likely result in changes in ecosystem structure and function. For massive lakes such as the North American Great Lakes, a more precautionary threshold is set at 20 percent, since no assimilative capacity study is required. The ASC expects that these requirements will be refined in subsequent revisions based on additional data and experience.

Cage producers must also meet the same phosphorus discharge requirements as land-based farms, calculated as total phosphorus per metric ton of production.

The requirement does not require an analysis of benthic invertebrates because of scientific literature that suggests these studies are not a reliable indicator of farm impacts in a lake[25].

[25] Moss, B., Johnes, P.J. and Philips, G.L. (1996) The monitoring and classification of standing waters in temperate regions – a discussion and proposed based on a worked scheme for British waters, Biological Reviews, 71, 2, 310-339.
Wetzel, R.G. (1990) Land-water interfaces: metabolic and limnological regulators. Verhandlungen der Vereinigung international theorethische und angewandte Limnologie 24, 624

4. PRINCIPLE: PROACTIVELY MAINTAIN THE HEALTH OF CULTURED FISH AND MINIMIZE THE RISK OF DISEASE TRANSMISSION

Impact: Trout farms that don't implement biosecurity measures and don't maintain their aquatic environment in optimum condition pose an increased risk to wild populations through disease transfer and amplification. Stressful conditions on farmed fish increase risks of disease outbreaks that can affect both farmed and wild species. The excessive or improper use of disease and/or parasite treatments can have toxic impacts on wild populations or alter habitats.

4.1 Criteria: Farm health management

INDICATOR		REQUIREMENT
4.1.1	Presence of a site-specific farm health plan that is reviewed at least annually and addresses biosecurity, veterinary health, crisis management and risk assessment	Yes
4.1.2	All fish, at all stages in the life cycle, are sourced from a supply that is of equal or better health status than its own stock	Yes
4.1.3	All fish that are moved off site, at all stages in the life cycle, are moved to a location of equal or lesser health status	Yes
4.1.4	Site access, disinfection and hygiene protocols are written and observed	Yes
4.1.5	Biosecure disposal of mortalities and fish trimmings	Yes
4.1.6	Immediate investigation of all mortality events on site and, in instances where mortality remains unexplained or unattributed, further investigation with fish health professionals off site	Yes
4.1.7	Minimum frequency of inspection of the farm by a designated veterinarian[26] who specializes in aquatic animal health. The inspection must review the farm health plan.	≥ 1 inspection per year, at a time when the site is in production
4.1.8	Evidence that maximum stock density was	Yes

[26] A designated veterinarian is the professional responsible for health management on the farm who has the legal authority to diagnose disease and prescribe medication. He/she is expected to have a degree in veterinary medicine and a strong background in fish disease control. In some countries such as Norway, a fish health biologist or other professional has equivalent professional qualifications and is equivalent to a veterinarian for purposes of these standards. This definition applies to all references to a veterinarian throughout the standards document.

determined jointly by the designated veterinarian	

Rationale

Creating and implementing risk-based farm management protocols (e.g., health management plans, biosecurity plans and crisis procedures) and maintaining daily records on fish health and behavior are important tools for keeping farmed fish healthy and for minimizing or eliminating the impact trout farming can have on the aquatic environment. For example, a veterinary health plan can help reduce the disease risk load of any farm stock to a minimum level. Therefore, it is critical for these documents to be created and for all producers to be aware of the documents and understand their role in implementing them. Documentation must be backed up by site visits from a designated veterinarian who can critically review the efficacy of any farm health management protocols.

4.2 Criteria: Chemicals and treatments

INDICATOR	REQUIREMENT
4.2.1 Presence of a treatment plan, treatment record book and farm health history that includes a detailed recording of all treatments and all health events on the farm, as well as written veterinary prescriptions and receipts	Yes
4.2.2 Use of therapeutic treatments, including antibiotics or other treatments, that are banned under European Union (EU) law	Not permitted
4.2.3 Prophylactic use of chemical antimicrobial treatments (excluding prebiotics and probiotics that have been approved by a regulatory process that included a risk assessment)[27]	Not permitted
4.2.4 Public disclosure of all antimicrobial treatments used on the farm	Yes
4.2.5 Proactive vaccination against diseases that present a risk in the region and for which an effective, legally authorized and commercially viable vaccine exists, as determined by the farm's designated veterinarian	Yes

Rationale

The use of certain therapeutic treatments may impact human health or have a damaging effect on the aquatic environment, both in terms of water quality and direct impact on flora and fauna. Since there is no single global list of banned treatments, these requirements have adopted EU regulation as a source for a list of banned treatments because of the significant experience of EU regulatory agencies.

[27] The washing of eggs is permitted under this standard.

Prophylactic use of antimicrobial treatments may lead to excessive or unnecessary treatments, increasing the risks of development of antibiotic-resistant bacterial strains. In addition, the ASC is concerned about the use of antimicrobial treatments that are listed as “critically important” or “highly important” for human health by the World Health Organization. In future revisions of the standard, the ASC expects to address how to restrict the use of “critically” and “highly” important antimicrobial treatments. In the meantime, these requirements require certified farms to make public all applications of antimicrobial treatments to better inform interested parties about the extent of use.

Vaccination reduces the necessity for therapeutic treatments, thereby reducing potential impacts. The ASC strongly encourages the use of vaccines to minimize disease risks.

5. PRINCIPLE: USE RESOURCES IN AN ENVIRONMENTALLY EFFICIENT AND RESPONSIBLE MANNER

Impact: The culture of trout requires the use of resources (other than water) that include feed inputs (e.g., wild-forage fisheries, terrestrial plant and animal protein), non-therapeutic chemical inputs and consumables (e.g., building supplies and fuel), etc. Extraction, production and/or consumption of these resources have the potential to negatively impact marine and terrestrial ecosystems.

Note on auditing the feed requirements

These feed requirements require a trout producer to work with its feed supplier(s) to demonstrate compliance. The ASC Freshwater Trout Standard permits two methods for demonstrating compliance with the requirements. One method requires the farm to buy feed that contains the ingredients as specified in these requirements and provide an auditor with third-party documentation that the manufacturing process did indeed produce this special feed for the farmer.

Farmers also have a second option, commonly referred to as the "mass-balance approach." With this option, the farm's feed manufacturer must demonstrate, using a third-party audit, that it purchased the appropriate amount and type of ingredients to supply feed to all its customers requesting specific ingredients through schemes such as the FTAD. These ingredients, however, would be mixed into the general silos and production lines of the manufacturer, greatly reducing costs associated with special storage capacity and production lines. This mass-balance approach is commonly used in other certification schemes and in situations such as purchasing "green" energy off an electricity grid. Ingredients that could be included in a mass-balance approach are primary fishmeal and fish oil inputs, as well as vegetable ingredients such as soy.

5.1 Criteria: Traceability and transparency of raw materials in feed

INDICATOR	REQUIREMENT
5.1.1 Evidence of traceability, demonstrated by the feed producer, of feed ingredients that make up more than 1% of the feed[28]	Yes
5.1.2 Presence of a list of all ingredients that make up more than 1% of the feed	Yes

Rationale

Traceability of raw materials is required to ensure their authentic origin. Traceability is a necessary first step to comply with the remainder of feed requirements under this principle.

The farmer also must have full knowledge of all major ingredients used in the feed, particularly such ingredients as land-animal by-products.

[28] Traceability should be at a level of detail that permits the feed producer to demonstrate compliance with the standards in this document (i.e., marine raw ingredients must be traced back to the fishery, soy to the region grown, etc.). Feed manufacturers will need to supply the farm with third-party documentation of the major ingredients covered under this standard (e.g., marine ingredients, soy).

These requirements assume that a farm will work closely with its feed supplier to obtain copies of the necessary records. In-person auditing will occur only on the farm, not at the feed manufacturing facility.

5.2 Criteria: Responsible origin of marine raw materials

INDICATOR	REQUIREMENT
5.2.1 Percentage of fishmeal and fish oil used in feed that comes from fisheries[29] certified under a scheme that is ISEAL-accredited and has guidelines that specifically promote responsible environmental management of small pelagic fisheries	10% within three years of publication of the ASC Freshwater Trout Standard and 100% within five years
5.2.2 Prior to 100% achievement of 5.2.1, the Fishsource[30] score required for the fisheries from which marine raw material in feed is derived (excluding trimming and by-products)	All individual scores ≥ 6, and biomass score ≥ 8
5.2.3 Prior to 100% achievement of 5.2.1, demonstration of chain of custody and traceability for fisheries products in feed through an ISEAL-accredited or ISO 65-compliant certification scheme that incorporates the United Nations Food and Agriculture Organization's "Code of Conduct for Responsible Fisheries"	Yes
5.2.4 Evidence that by-product feed ingredients do not come from fish species that are categorized as vulnerable[31], endangered or critically endangered according to the IUCN Red List of Threatened Species[32]	Yes

Rationale

Wild fish harvested from the ocean and reduced into fishmeal and fish oil are an important component of trout feeds. Demand for these wild pelagic fish resources is increasing as the aquaculture industry expands and as forage fish are increasingly consumed by humans or by other industries including other animal production. There is concern that higher demand could lead to the overfishing—and

[29] This standard applies to fishmeal and oil from forage fisheries and not to by-products or trimmings used in feed.
[30] Fishsource scores and their methodology are available here: http://www.fishsource.org/site. While the score must be counted using Fishscore methodology, Fishsource itself does not need to calculate the score.
[31] An exception is made for sub-populations of "vulnerable" species that can demonstrate healthy populations through a fishery certified by the Marine Stewardship Council, or approved by the technical committee of the IFFO Responsible Sourcing standard.
[32] The IUCN reference can be found at http://www.iucnredlist.org/

collapse—of small forage fish stocks. Wild small pelagic fish play a critical role in the ecosystem and the marine food chain.

These indicators strive to ensure that marine-based feed ingredients come from responsible sources. A main concept of the proposed requirements is to align industry incentives to support processes that will lead to improved fisheries management, and then certification, of forage fisheries.

In the medium term, the requirements will require marine ingredients in feed to be certified by a widely recognized authority. This recognized authority must be accredited by the ISEAL Alliance, which promotes transparent, multi-stakeholder standard-setting processes. The authority also must specifically address the challenges of small pelagic fisheries. Currently, the Marine Stewardship Council (MSC) is the only scheme that is ISEAL-accredited, and MSC is in the process of developing specific requirements for small pelagic fisheries. Additional schemes may emerge in the future that meet these requirements.

Given the current lack of certified sources of fishmeal and fish oil, the ASC Freshwater Trout Standard uses two interim requirements to immediately promote steps toward responsible sourcing. First, Fishsource provides scores on many fisheries that can be roughly equated to the scoring system of MSC. Second, requirement 5.2.3 seeks to have feed suppliers use the International Fishmeal and Fish Oil Organization (IFFO) Responsible Sourcing standard or a future equivalent that might emerge. Under no circumstances do these requirements expect the interim feed requirements to continue beyond the five-year time horizon envisioned in this document, as they are insufficiently rigorous as a medium-term goal.

The ASC Freshwater Trout Standard recognizes that reaching the five-year goal may be challenging and expects these requirements will serve as an incentive for more fisheries to seek certification. The ASC Freshwater Trout Standard encourages stakeholders to review how the feed industry is progressing toward the five-year goal about two years before the milestone.

These requirements support the use of marine trimmings and by-products, as long as they do not come from endangered or vulnerable fisheries. For species classified as “vulnerable,” which is the lowest level of risk on the IUCN Red List, an exception is made for subpopulations that can demonstrate healthy status through an MSC-certified fishery or an approval by the IFFO Responsible Sourcing technical committee.

Auditing guidance

While the Fishsource scores required under 5.3.2 must be calculated using Fishscore methodology, an organization other than Fishsource may calculate the scores.

5.3 Criteria: Dependency on wild-caught marine ingredients in feed[33]

INDICATOR	REQUIREMENT
5.3.1 Fishmeal Forage Fish Dependency Ratio (FFDRm) for grow-out (calculated using formulas in Appendix III, subsection 1)	≤1.5
5.3.2 Compliance with one of the two following requirements: a) Fish Oil Forage Fish Dependency Ratio (FFDRo) for grow-out (calculated using formulas in Appendix III, subsection 1) or b) Maximum level of EPA/DHA content from marine sources as a percentage of fatty acids in the feed (excluding EPA/DHA from trimmings and by-products)	a) ≤2.95 or b) ≤ 9%

Rationale

There is concern that today's limited supply of marine ingredients from small pelagic fisheries must be shared across an expanding aquaculture industry and other users, including direct human consumption. The ratios defined in this requirement will encourage farmers to use limited marine resources sparingly and enable the industry to produce more without putting additional pressure on fisheries.

The ratios complement the requirements described in criterion 5.2, which will move farms toward using feed with marine ingredients from fisheries certified as responsibly managed. Given the relatively finite amount of marine ingredients, trout producers and the aquaculture industry in general will need to continue to reduce their dependency ratios should they wish to continue expanding.

[33] The FFDR requirements are calculated for fish weighing 30 grams and more.

5.4 Criteria: Responsible origin of non-marine raw materials in feed

INDICATOR	REQUIREMENT
5.4.1 Presence and evidence of a responsible sourcing policy for the feed manufacturer for feed ingredients that comply with internationally recognized moratoriums and local laws[34]	Yes
5.4.2 Percentage of soy ingredients that are certified by the Roundtable on Responsible Soy, or equivalent35	100% within five years of publication of the ASC Freshwater Trout Standard
5.4.3 Disclosure by the feed supplier of any ingredients that contain more than 0.9% transgenic36 plant material	Yes
5.4.4 Disclosure by the farm to the direct purchasers of its harvested fish of any feed ingredients that have contained more than 0.9% transgenic material	Yes

Rationale

The ASC Freshwater Trout Standard aims to promote responsible sourcing of all terrestrial feed ingredients and, in particular, exclude feed ingredients that are sourced from areas where significant ecological damage has occurred. Producers are required to provide evidence that they are purchasing from feed manufacturers that have a responsible sourcing policy for feed ingredients that, at a minimum, demonstrates no ingredients come from areas with moratoriums, such as the Amazon soy moratorium.

A responsibility policy provides a layer of accountability for trout producers and enables them to use their purchasing preferences to reward feed suppliers who support responsible practices (e.g., organic feed ingredients or soy grown using certain practices).

In addition, these requirements support the Roundtable on Responsible Soy as the best available certification process known at this time for sourcing soy. Since the scheme is just now starting to certify soy, the requirements allow five years for feed manufacturers to develop their supply chains.

Transgenic plants are commonly used in aqua feeds throughout the world. Some consumers and retailers want to know if food products are themselves genetically modified organisms (GMOs), or if their purchases support the production of GMOs as feed for the animal products they are purchasing. By ensuring transparency around any transgenic material used in the feed, the requirements support informed choices by retailers and consumers.

The ASC Freshwater Trout Standard does not preclude the use of land animal by-products in fish feed. These requirements assume that feed producers are following relevant regulations around food

[34] Specifically, the policy shall include that vegetable ingredients, or products derived from vegetable ingredients, must not come from the Amazon Biome as geographically defined by the Brazilian Soya Moratorium.
[35] The technical governance structure of the ASC must approve any other certification scheme as equivalent.
[36] Transgenic: Containing genes altered by insertion of DNA from an unrelated species; this involves taking genes from one species and inserting them into another species to get that trait expressed in the offspring.

safety when incorporating land- animal by-products into feed. Retailers or importing countries remain free to formulate their own requirements in relation to use of land-animal by-products in feeds.

5.5 Criteria: Energy consumption and greenhouse gas emissions (on farm)

INDICATOR	REQUIREMENT
5.5.1 Presence of records and evidence of all energy consumption on the farm (including electric power and fuels) and evidence of an energy use assessment of on-farm energy consumption, measured in kilojoule/mt fish/year	Yes

Rationale

Climate change represents perhaps the largest environmental challenge facing our global ecosystem. Because of this, energy consumption used in food production has become a major source of concern. The ASC Freshwater Trout Standard recognizes the importance of efficient and responsible energy use. Therefore, these indicators will require that energy consumption in the production of fish be monitored on a continual basis and that growers should develop means to improve efficiency and reduce consumption of energy, particularly those that are limited or carbon-based. Energy assessments are a new area for producers. Requiring that producers conduct these assessments will raise awareness and build capacity for documentation. In the future, the ASC Freshwater Trout Standard anticipates that this capacity will be leveraged to include a requirement stipulating thresholds for energy use or GHG emissions per unit of production.

5.6 Criteria: Non-therapeutic chemical inputs

INDICATOR	REQUIREMENT
5.6.1 Percentage of combustibles contained in waterproof bunds	100%
5.6.2 Percentage of chemicals stored in impermeable containers or buildings	100%
5.6.3 Percentage of used lubricants recycled or turned over to a waste management company	100%
5.6.4 Percentage of chemical containers reused or turned over to a waste management company	100%

5.6.5	Percentage of non-hazardous, non-recyclable wastes turned over to a waste management company or landfill[37]	100%
5.6.6	Demonstration that a farmer is aware of recycling facilities that are accessible to the farm and demonstration of a commitment to use those facilities	Yes

Rationale

The construction and operation of trout farms can involve the use of hazardous chemicals (e.g., combustibles, lubricants and fertilizers) and the generation of waste. The storage, handling and disposal of such hazardous materials must be done responsibly, according to their respective potential impacts on the environment and human health. Quantifiable indicators have been proposed that imply the implementation of a management plan and the separation of wastes, depending on their destination. The requirement for the percentage of recycled waste reflects the fact that some farms are in extremely remote locations with no viable recycling systems nearby. Still, it is important to set a minimum percentage of recycled waste in the requirements, understanding that many farms may be able to greatly exceed that minimum.

[37] In case of absence of a managed landfill in the area, farms are allowed to bury non-hazardous solid wastes on site, provided all precautions have been taken to prevent the contamination of surrounding surface and underground waters. Wastes that are not biodegradable must not be burned on site because of the possible emissions of toxic gases.

6. PRINCIPLE: BE SOCIALLY RESPONSIBLE

Impact: This Principle addresses key labor issues outlined by the ILO, including freedom of association, the right to collective bargaining, freedom from discrimination, fair wages and working hours, safe working conditions and non-abusive disciplinary practices. It also addresses a farm's interaction with local communities, including impacts on livelihoods, cultural institutions and access to natural resources.

NOTE: A farm does not have to adopt the ASC Freshwater Trout Standard's labor requirements if it can demonstrate compliance with SA 8000 (a Social Accountability International labor certification program) or an equivalent labor certification scheme that is accredited by ISEAL.

6.1 Criteria: Child labor

INDICATOR	REQUIREMENT
6.1.1 Number of incidences of child[38] labor[39]	None

Rationale

Adherence to the child labor codes and definitions included in this section indicates compliance with what the ILO and international conventions generally recognize as the key areas for the protection of child and young workers[40]. Children are particularly vulnerable to economic exploitation, due to their inherent age-related limitations in physical development, knowledge and experience. Children need adequate time for education, development and play and, therefore, shall never be exposed to work or working hours that are hazardous[41] to their physical or mental well-being. These protections are equally applicable to children who are paid workers and to children who are unpaid but their labor contributes to their families' and their own welfare. To this end, the requirements related to what constitutes child labor will protect the interests of children and young workers in certified aquaculture operations.

[38]Child: Any person under 15 years of age. A higher age would apply if the minimum age law of an area stipulates a higher age for work or mandatory schooling

[39]Child labor**:** Any work by a child younger than the age specified in the definition of a child.

[40]Young worker**:** Any worker between the maximum age of a child, as defined above, and under the age of 18.

[41]Hazard: The inherent potential to cause injury or damage to a person's health (e.g., being unequipped to handle heavy machinery safely and unprotected exposure to harmful chemicals). Hazardous work: Work that, by its nature or circumstances in which it is carried out, is likely to harm the health, safety or morals of workers.

6.2 Criteria: Forced, bonded or compulsory labor

INDICATOR	REQUIREMENT
6.2.1 Number of incidences of forced[42], bonded[43] or compulsory labor	None

Rationale

Forced labor—such as slavery, debt bondage and human trafficking—is a serious concern in many industries and regions of the world. Ensuring that contracts are clearly articulated and understood by employees is critical to determining that labor is not forced. The inability of a worker to freely leave the workplace and/or an employer withholding original identity documents of workers are indicators that employment may not be at-will. Employees shall always be permitted to physically leave the workplace and to manage their own personal time. Employers are never permitted to withhold original worker identity documents. Adherence to these policies shall indicate an aquaculture operation is not using forced, bonded or compulsory labor forces.

6.3 Criteria: Discrimination[44] in the work environment

INDICATOR	REQUIREMENT
6.3.1 Evidence of proactive antidiscrimination practice[45]	Yes
6.3.2 Number of incidences of discrimination	None

Rationale

Unequal treatment of employees based on certain characteristics (e.g., sex or race) is a violation of the workers' human rights. Additionally, widespread discrimination in the working environment can negatively affect overall poverty and economic development rates.

Discrimination occurs in many work environments and takes many forms. In order to ensure that discrimination does not occur at certified aquaculture farms, employers must prove their commitment

[42] Forced (Compulsory) Labor**:** All work or service that is extracted from any person under the menace of any penalty for which a person has not offered himself/herself voluntarily or for which such work or service is demanded as a repayment of debt. "Penalty" can imply monetary sanctions, physical punishment or the loss of rights and privileges or restriction of movement (e.g., withholding of identity documents).

[43] Bonded labor**:** When a person is forced by the employer or creditor to work to repay a financial debt to the crediting agency.

[44] Discrimination**:** Any distinction, exclusion or preference that has the effect of nullifying or impairing equality of opportunity or treatment. Not all distinction, exclusion or preference constitutes discrimination. For instance, a merit- or performance-based pay increase or bonus is not, by itself, discriminatory. Positive discrimination in favor of people from certain underrepresented groups may be legal in some countries.

[45] Employers shall have written antidiscrimination policies stating the company does not engage in or support discrimination in hiring, remuneration, access to training, promotion, termination or retirement based on race, caste, national origin, religion, disability, gender, sexual orientation, union membership, political affiliation, age or any other condition that may give rise to discrimination.

to equality with an official antidiscrimination policy, a policy of equal pay for equal work, as well as clearly outlined procedures to raise, file and respond to a discrimination complaint in an effective manner. Evidence, including worker testimony, of adherence to these policies and procedures will indicate minimization of discrimination. The combination of both proactive antidiscrimination policies and procedures and auditor-verified worker testimony confirmation of antidiscrimination practices in the workplace is the strongest indication that a certified aquaculture farm of any size is not discriminating in the work environment.

6.4 Criteria: Work environment health and safety

INDICATOR	REQUIREMENT
6.4.1 Percentage of workers trained in health and safety practices, procedures and policies	100%
6.4.2 Evidence that health- and safety-related accidents are recorded and corrective actions are taken	Yes
6.4.3 Proof of company accident insurance covering employee costs stemming from a job-related accident or injury when not covered under national law	Yes
6.4.4 Workers use and have access to appropriate personal protective equipment (PPE)	Yes
6.4.5 Evidence of a health and safety assessment of site facilities and processes	Yes

Rationale

A safe and healthy working environment is essential for protecting workers from harm. It is critical for a responsible aquaculture operation to minimize these risks. One of the key risks to employees is hazards resulting in accidents and injury. Consistent and effective employee training in health and safety practices is an important measure for preventing accidents and injuries. All training and information must be provided in an appropriate language. When an accident, injury or violation occurs, the company must record it and take corrective action to identify the root causes of the incident, remediate and take steps to prevent future occurrences of similar incidents. This addresses violations and the long-term health and safety risks. Finally, while many national laws require that employers assume responsibility for job-related accidents and injuries, not all countries require this and not all employees (including, in some cases, migrant workers) will be covered under such laws. When not covered under national law, employers must prove they are insured to cover 100 percent of employee costs in a job-related accident or injury.

6.5 Criteria: Wages

INDICATOR	REQUIREMENT
6.5.1 The percentage of employees who are paid a basic needs wage[46].	100%
6.5.2 Evidence of transparency in wage setting	Yes

Rationale

Workers shall be paid fair and equitable wages that, at a minimum, meet the legal and industry-standard minimum basic needs[47] of workers and provide some discretionary income. A legal minimum wage will be considered a basic needs wage if it is set in a manner consistent with the intent of ensuring that basic needs are met. In instances where there is no legal minimum wage, or a legal minimum that is not set in the spirit of a basic needs wage, the auditor must determine an appropriate proxy for basic needs.

Certified aquaculture operations shall also demonstrate their commitment to fair and equitable wages by having and sharing a clear and transparent mechanism for wage setting and a labor conflict resolution policy that tracks wage-related complaints and responses. Payments shall be made in a manner convenient to workers. Having these policies outlined in a clear and transparent manner will empower the workers to negotiate effectively for fair and equitable wages that will, at a minimum, satisfy basic needs. Revolving labor contract schemes designed to deny long-time workers full access to fair and equitable remuneration and other benefits are prohibited.

6.6 Criteria: Access to freedom of association and the right to collective bargaining[48]

INDICATOR	REQUIREMENT
6.6.1 Incidences of employees denied freedom to associate, the ability to bargain collectively or denied access to representatives, or representative organizations, chosen by workers	0

[46] Basic needs wage**:** Enables workers to support the average-sized family above the poverty line, based on local prices near the workplace. Basic needs include essential expenses (e.g., food, clean water, clothes, shelter, transportation and education), a discretionary income, as well as legally mandated social benefits (e.g., health care, medical insurance, unemployment insurance and retirement).

[47] A legal minimum wage will be considered a basic needs wage if it is set in a manner consistent with the intent of ensuring basic needs are met. In instances where there is no legal minimum wage, or a legal minimum that is not set in the spirit of a basic needs wage, the auditor must determine an appropriate proxy for basic needs.

[48] Bargain collectively**:** A voluntary negotiation between employers and organizations of workers to establish the terms and conditions of employment by means of collective (written) agreements.

Rationale

Having the freedom to associate and bargain collectively is a critical right of workers, as it allows them to have a more balanced power relationship with employers when doing such things as negotiating fair compensation. Although this does not mean all workers of a certified trout farm must be in a trade union, or even the same trade union or a similar organization, workers must not be prohibited from accessing the organizations of their choice when they exist. If they do not exist or are illegal, companies must make it clear that they are willing to engage in a collective dialogue through a representative structure freely elected by the workers.

6.7 Criteria: Disciplinary practices

INDICATOR		REQUIREMENT
6.7.1	Incidences of abusive disciplinary actions	None
6.7.2	Evidence of non-abusive disciplinary policies and procedures whose aim is to improve the workers' performance[49]	Yes

Rationale

The rationale for discipline in the workplace is to correct improper actions and maintain effective levels of employee conduct and performance. However, abusive disciplinary actions can violate workers' human rights. The focus of disciplinary practices shall always be on the improvement of the workers' performance. A certified trout farm shall never employ threatening, humiliating or punishing disciplinary practices that negatively impact workers' physical and mental[50] health or dignity. At the same time, employers should demonstrate that they have non-abusive disciplinary practices and procedures in place, as described in the accompanying guidance. Worker testimony will assist auditors in assessing farms around this requirement.

[49] If disciplinary action is required, progressive verbal and written warnings shall be engaged. The aim should always be to improve the worker before letting him/her go. (indicated by policy statements as well as evidence from worker testimony.)

[50] Mental abuse**:** Characterized by the intentional use of power, including verbal abuse, isolation, sexual or racial harassment, intimidation or threat of physical force.

6.8 Criteria: Overtime and working hours

INDICATOR	REQUIREMENT
6.8.1 Violations or abuse of working hours[51] and overtime[52] laws and agreements	None

Rationale

Abuse of overtime working hours is a widespread issue in many industries and regions. Workers subject to extensive overtime can suffer consequences in their work-life balance and are subject to higher fatigue-related accident rates. In accordance with better practices, employees in certified aquaculture operations are permitted to work—within defined guidelines—beyond normal work week hours but must be compensated at premium rates[53]. Requirements for time off, working hours and compensation rates, as described elsewhere in this principle, should reduce the impacts of overtime.

6.9 Criteria: Interactions with communities

INDICATOR	REQUIREMENT
6.9.1 For new farms, evidence of engagement and consultation with surrounding communities about potential social impacts[54] from the farm	Yes
6.9.2 Evidence of regular communication, engagement and consultation with surrounding communities	Yes
6.9.3 Evidence of an operational grievance and conflict resolution mechanism to address community concerns	Yes

[51] Working hours (a.k.a. normal work week) can be defined by law but shall not exceed 48 hours on a regular basis (i.e. constantly or the majority of the time). Variations based on seasonality may apply but personnel shall be provided with at least one day off in every seven-day period.

[52] All overtime shall be paid at a premium and should not exceed 12 hours per week. In the case of exceptional or emergency events, additional overtime hours are permitted. In such exceptional cases, which must pose an acute and long-term threat to the farm, workers will receive a premium wage and an equal amount of time off in addition to normal time off. Overtime work shall be voluntary, except in cases where it is legal and in which there is a collective bargaining agreement in place that permits compulsory overtime in order to meet short-term business demands.

[53] Premium rate**:** A rate of pay higher than the regular work week rate. Must comply with national laws/regulations and/or industry standards

[54] Evidence could include minutes from community meetings and a log of communications with stakeholders. Social impacts to be discussed would likely include economic impacts, natural resource access and use, human health and safety issues, and changes to physical infrastructure and cultural issues, with a particular focus on impacts to indigenous people, where applicable

Rationale

These requirements are informed by the ISEAL “Code of Good Practice for Assessing the Impacts of Social and Environmental Standards Systems” and a livelihood framework that analyzes the objectives, scope and priorities for development.

The requirements aim to ensure that new farms engage surrounding communities in a discussion around potential social impacts from the farm. In addition, all farms must demonstrate regular communication with communities and a transparent process for handling complaints. While these mechanisms will vary depending on the scale of the trout operation and the extent of community participation in the farm, open communication and transparency are required.

SECTION: REQUIREMENTS FOR FINGERLING AND EGG SUPPLIERS

A farm seeking certification must have documentation from all of its fingerling and egg suppliers to demonstrate compliance with the following requirements. The requirements are, in general, a subset of the requirements in Principles 1 through 6, focusing on the impacts that are most relevant for this stage of production.

INDICATOR		REQUIREMENT
7.1	Presence of documents issued by pertinent authorities proving compliance with local and national authorities on land and water use, effluent regulations and use of treatments	Yes
7.2	New introductions of exotic species from the date of publication of the ASC Freshwater Trout Standard, unless the hatchery/fingerling facility is a closed production system[55]	None
7.3	Allowance for siting in National Protected Areas[56]	None[57] [58]
7.4	Evidence of an assessment of the property for the presence of species listed on the International Union for Conservation of Nature (IUCN) "Red List of Threatened Species" as vulnerable, near threatened, endangered or critically endangered; an evaluation of the farm's impact on any such species present; and clearly defined mitigation measures to reduce any negative impacts and allow existence of such species	Yes
7.5	Evidence that the egg and fingerling producer	Yes

[55] A closed production system is defined as a facility with recirculating water that is separated from the wild aquatic medium by effective physical barriers that are in place and well maintained to ensure no escapes of reared specimens or biological material that might survive and subsequently reproduce.

[56] A protected area is "A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values." Source: Dudley, N. (Editor) (2008), Guidelines for Applying Protected Area Management Categories, Gland, Switzerland: IUCN. X + 86pp.

[57] An exception is made for protected areas that are classified by IUCN, or the International Union for Conservation of Nature, as Category V or VI. These are areas preserved primarily for their landscapes, or areas that include sustainable resource management. Details can be found here: http://www.iucn.org/about/work/programmes/pa/pa_products/wcpa_categories/ .

[58] An exception is also made for farms located in protected areas that are designated as such after the farm already exists in that location. In these situations, the farm must demonstrate that its operation is compatible with the objectives of the newly protected area, and that it is in compliance with any relevant conditions placed on the farm as a result of the designation.

	must have an equivalent or better health status than that of the grow-out facility, and must follow all national and local (jurisdictional) guidance on disease management	
7.6	Evidence of disclosure to the grow-out farm of all chemical and antibiotic treatments on eggs and fry, including the reason for their use and the quantity used	Yes
7.7	Allowance for the use of therapeutic treatments, including antibiotics or other treatments, that are banned under European Union (EU) law	Not permitted
7.8	Presence of a fish health management plan implemented in agreement with the facility's designated veterinarian	Yes
7.9	Evidence of company-level policies and procedures that demonstrate the company's commitment to each of the 8 key ILO labor issues described in Principle 6	Yes
7.10	Evidence of regular communication, engagement and consultation with surrounding communities	Yes

Rationale

The production of trout eggs and fingerlings can involve some of the same potential environmental and social impacts as a grow-out site. These 10 requirements focus on the priority issues for this stage of production. These issues include assuring the facility is complying with local regulations, appropriate siting, introduction of exotic species, health and biosecurity management, treatments, respect for ILO labor requirements and being a responsible neighbor.

The grow-out facility seeking certification will need to work with its fingerling and/or egg supplier(s) to collect the necessary documentation that demonstrates compliance with these requirements. Auditors will not visit the fingerling or egg production facility. For the purposes of these requirements, fingerlings are defined as trout weighing less than 10 grams.

Appendix I: Assessment data needed to comply with ASC Freshwater Trout Standard

The ASC Freshwater Trout Standard requires a farm to have certain environmental and social assessment data that will allow the farm to demonstrate compliance with specific requirements. Below is a summary of the documentation needed. In some instances, the assessment must include specific recommendations for mitigating impacts, as well as a timeframe for implementing those mitigation steps.

This information is required for new and existing farms. If an existing farm has only some of the required information from a previous study or regulatory filing, it will need to fill in the gaps of information that it does not have. Significant farm expansions (increasing the physical footprint by more than 30 percent) would require revised assessment data.

A producer may be able to collect some of this information by himself/herself. Collaboration with local environmental organizations or other entities with relevant knowledge is strongly encouraged.

Principle 2

Farmers must provide the following information:

an analysis of habitats and ecosystems at the farm site and surrounding the farm, with a specific focus on identifying the farm's impact on:

- protected areas
- existing species listed on the IUCN Red List of Threatened Species as vulnerable, near threatened, endangered or critically endangered and their relevant habitats
- natural wetlands

mitigation measures/restoration of functional wetlands in line with the requirements in

Requirement 2.1.2, if wetlands were subject to conversion for inlet and outlet infrastructure

for new farms (built after publication of these requirements) that don't have a minimum 15-meter riparian buffer zone, a third-party scientific analysis that demonstrates the farm's structures do not impede animal habitats and corridors, and do not present erosion risks

(if needed) an analysis of why any exceptional lethal actions against predators would not negatively affect wild populations or ecosystems, as well as specific limits on such actions

Principle 3

For cage farms, see requirements under Appendix II-E. For land-based farms, see the faunal survey requirements in Appendix II-C.

Appendix II: Methodologies related to Principle 3—Water resources

Appendix II-A: Methodology—total phosphorus discharged per ton of production

This requirement looks at how much phosphorus (P) is discharged from the farm per unit of fish produced. The requirement is set at 5 kg/ton for the first three years after publication of the ASC Freshwater Trout Standard, dropping to 4 kg/ton thereafter. Trout facilities must calculate their discharge using a "mass balance" approach that calculates the discharge from the phosphorus in the feed and the phosphorus in the fish biomass. Farms would be able to subtract P that is physically removed in sludge (documented sludge removal with P levels tested).

To calculate P released into the environment, one must calculate P used to produce one unit of fish and subtract P taken up by the fish and P removed in sludge. The basic formula per time period, to be calculated for a maximum period of 12 months, is:

P released to the water body per unit of trout produced = (P in – P out)/biomass produced

where:

- **P in = Total P in feed**
- **P out = (Total P in biomass produced) + (Total P in sludge removed)**

Where the following definitions of the parameters apply in the basic formula:

Equation #1: Total P in feed

- ∑(Total amount of feed type (product) multiplied by content of phosphorus) 1…….X), where 1…….X represents the number of different feed types (products) used.
  - The phosphorus content per feed type can be determined either by chemical analyses of the feed type, or based on declaration by the feed producer of phosphorus content in the feed type in jurisdictions where national legislation order phosphorus content of feed to be declared.

Equation #2: Biomass produced

- Biomass of fish produced over the specific time period is calculated as: (biomass harvested + biomass of mortalities + remaining standing biomass) - biomass at start of time period

Equation #3: P content in biomass produced

- P content in biomass produced = (Biomass produced)*(% of P in fish)
  - For purposes of calculating this requirement, the following phosphorus percentages will be used for harvested fish or mortalities:
    1. Less than 1 kg: 0.43%
    2. More than 1 kg: 0.4%

Equation #4:Total P in removed sludge

- P content in sludge removed = (sludge removed) * (% of P in sludge)
  - Phosphorus in sludge removed per unit shall be determined based on analytical values that are representative of the batch of sludge removed from the farm.
  - The trout farm must demonstrate the sludge was physically removed from the farm site and that the sludge was disposed of according to the principles in requirement 3.2.4

Appendix II-B: Water quality sampling methodology and data sharing for land-based systems

Requirement 3.2.2 requires land-based farms (flow-through and recirculation systems) to measure dissolved oxygen in the effluent. Requirement 3.2.5 requires these farms to submit to ASC the results from the water quality monitoring they conduct to comply with their local regulatory requirements. In particular, the requirement requires data on any sampling of phosphorus, nitrogen, TSS and BOD. This data will help to distinguish the performance of farms certified by this requirement over time, and assist in revisions to the requirement.

Oxygen saturation must be measured at least monthly in the early morning and late afternoon. A single oxygen reading below 60 percent would require daily continuous monitoring with an electronic probe and recorder for at least a week demonstrating a minimum 60 percent saturation at all times.

Farms shall use the following table to submit the results of effluent monitoring to ASC. Please list each analysis separately over the previous 12-month period.

Date	**Analysis** (*TP, TN, BOD, TSS, etc.*)	**Location** (*Effluent, Inlet, etc.*)	**Method** (*Single grab, 24-hour bulk, etc.*)	**Sampling by Third Party?** (*Yes/No*)	**Analysis by Third Party?** (*Yes/No*)	**Result** (*including units*)

Appendix II-C: Sampling methodology for Benthic macro invertebrate surveys

To comply with requirement 3.2.3, land-based farms must conduct sampling of the Benthic macro invertebrate habitats in the receiving body of water downstream and upstream of the effluent discharge point. The requirement requires that the downstream benthic status be similar or better than the upstream benthic status. To demonstrate this, the survey must demonstrate that the downstream location has the same or better benthic health classification as the upstream location.

Below are required components of the sampling methodology and classification scheme that a farm must use. It is expected that a farm will use the faunal sampling regime in its own jurisdiction, as long as the regime includes the following minimum requirements.

This appendix also includes additional suggested ideas on conducting the surveys. The suggestions are intended as a guide only. The consultant conducting the faunal survey should use his/her discretion based on local knowledge, national fauna index systems, and expertise as to what specific sub-element or parameter will provide the best representation to document the status of the Benthic macro invertebrates and the impact that the fish farm may have on this environment in the receiving water body.

Minimum requirements for faunal surveys:

Classification system

The benthic health classification system must have at least five categories of benthic status.

Focus of the survey

The survey must detect the composition, abundance, diversity and presence of benthic invertebrate fauna in the receiving water body (upstream and downstream from farm outlet). The survey must focus on key sensitive indicator species.

When and how often

The samples must be collected once every year upstream and downstream from the farm outlet. In case the downstream survey drops a category according to the faunal index, two consecutive faunal surveys must be conducted during the following 12 months, using the same faunal index system, that demonstrate compliance with the requirement.

After three years of demonstrating consistent results, a farm may reduce sampling to once every two years.

Where to sample

The samples must be taken from both midstream and near the bank and must also include marginal areas with slacker water flow.

All efforts must be made to isolate the impact of the farm, for example by seeking similar conditions, such as type of bottom, water flow and/or substrate types present along the bank, in the upstream and downstream locations.

The location of sampling sites downstream from the farm must reflect a scientific assessment of the most likely area of potential impact from the farm, with consideration to the mixing of water and the minimum and maximum distance from the farm outlet.

Number of samples

The survey must collect samples in at least three transects (10 meters apart), with at least four samples in each transect across the river. This must be conducted both upstream and downstream from the farm outlet.

Analysis of the samples and how to sample

All collected samples must be analyzed by an accredited laboratory and the sampling methodology must be approved by the laboratory conducting the analysis.

Further recommendations to sampling

When and how

When collecting macro-invertebrates, consideration should be given to the seasonality of the presence of the macro-invertebrate species, namely insects in their larval stage of the life cycle. It is generally recommended that samples are conducted during summer and/or winter. In geographical regions like Scandinavia, spring and autumn are recommended as the best times for sampling.

Where to sample

Survey results may depend on the type of water body, type of marginal areas, sample method and sampling practice. More standardized data collection are typically needed to assess the relative merits of sampling in midstream or marginal areas although practical considerations (e.g., strong currents), particularly in wide, deep rivers, will favor the use of marginal samples in areas where the water flow is slacker. If samples are only collected near the bank and/or in the marginal areas, it is recommended to sample all available substrate types present along the bank.

Sampling gear

The sampling should be undertaken using standard equipment such as surber sampler, handnet and grab. More detailed sampling guidelines can also be found in the following ISO standards: ISO 8265,

7828 and 9391.

References

Common Implementation Strategy for the Water Framework Directive (2000/60/EC) Guidance document no. 7. Monitoring under the Water Framework Directive.

Biological assessment of running waters in Denmark: introduction to the Danish Stream Fauna Index (DSFI) Skriver et al., 2000.

The performance of a new biological water quality score system based on macroinvertebrates over a wide range of unpolluted running-water sites. Amitage P.D et al., 1982.

Common Implementation Strategy for the Water Framework Directive (2000/60/EC) Guidance document no. 13. Overall approach to the classification of ecological status and ecological potential.

UN/ECE Task Force on Monitoring & Assessment under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992) Volume 3: Biological Assessment Methods for Watercourses.

Appendix II-D: Sludge BMPs for land-based systems (RAS/recirculation and flow-through)

Methods to mitigate the impacts from fish metabolic wastes on water can range from the employment of simple settling ponds to the use of advanced technology filters and biological process. Dealing responsibly with the waste (sludge, liquid slurry, biosolids) from these processes is a critical element to responsible trout farm management. The ASC Freshwater Trout Standard acknowledges that BMPs related to other principles such as correct feed composition and texture as well as good feed management practices—such as not storing feed for too long—can also influence the effectiveness of biosolids capture; however, this section deals with practices for cleaning, storage and disposal that will minimize the potential impacts of sludge/biosolids being released into the environment.

All land-based systems shall employ/undertake the following in relation to sludge/biosolids:

- A process flow drawing that tracks/maps the water and waste flow of a farm, including treatment of waste, transfer of wastes, waste storage and final waste utilization options. Flow diagram should indicate the farm is dealing with biosolids responsibly. (Auditing guidance for evaluating whether the plan indicates responsible use: The system design shall allow for simple cleaning routines of pipes, sumps, channels and units.)
- Farm shall have a management plan for sludge/biosolids that details cleaning and maintenance procedures of the water treatment system. The plan must also identify and address the farm's specific risks such as—but not limited to—loss of power, fire and drought. The management can be evaluated in relation to maintenance records.
- Farm must keep detailed records/log of sludge/biosolid cleaning and maintenance including how sludge is discarded after being dug out of settlement ponds.
- Biosolids accumulated in settling basins shall not be discharged into natural water bodies.

Appendix II-E: Assimilative capacity assessment—cage systems

All cage farms in lake or reservoir settings with a surface area of less than 1,000 km^2 must demonstrate that an assimilative capacity assessment has been conducted to determine if there is sufficient capacity from a water quality perspective to allow for the level of proposed additional loading to the system. The assessment is also required for operations in these water bodies proposing an increase in production of 30 percent or more.

Many suitable models exist that can help determine assimilative capacity, such as Dillon and Rigler (1975), Kirchener and Dillon (1975), Reckhow (1977) and Dillon and Molot (1996). The ASC Freshwater Trout Standard SC will not favor one existing model over another but considers it important to outline key elements of a credible assimilative capacity study.

At a minimum, the study must do the following:

- Undertake assessment as to allocation of capacity for the whole water body
- Undertake assessment as to land use, slope, sewage, other discharges, stream input
- Account for retention in lake and mixing
- Predict total phosphorus concentration
- Classify trophic status
- Undertake impact assessment of fish farm

The study must pay particular attention to the nature and morphology of the lake basin where the farm will be established. The study must analyze at a minimum:

- mixing of the surface and bottom waters
- whether bottom waters are isolated within the water body
- the naturally occurring oxygen levels in the surface and bottom waters
- whether the water forms part of an enclosed basin, or an area with isolated bottom waters

Appendix II-F: Classification of cage sites

For cages located on water bodies with a surface area of 1,000 km^2 or greater, the assimilative capacity study described in Appendix II-C is not required because of the difficultly conducting such studies on massive water bodies and linking them to the appropriate production levels of an individual farm. Instead, farms must demonstrate they are located at sites that are least sensitive to nutrient discharges because they are exposed to more energetic conditions, have a connection to deep offshore waters and don't have hydrodynamically isolated embayments.

To determine if a farm is in such an appropriate location, these requirements reference the classifications developed by the Ontario Ministry of Environment (Boyd et al 2001):

Type 1: enclosed (lake-like) basins with limited flushing;

Type 2: partially exposed sites having good epilimnion/metalimnion flushing but limited or no hypolimnion exchange; and

Type 3: exposed locations where the hypolimnion is also well flushed.

(Definitions: The epilimnion is the top-most layer in a thermally stratified lake; the metalimnion is the middle layer in a thermally stratified lake or reservoir; the hypolimnion is the dense, bottom layer of water in a thermally stratified lake.)

Farms must be located in a Type 3 site. If the farm's local regulator uses the above classification system and has already classified the site, the regulator's classification will be used. If such a system is not in place, an independent consultant (not an employee of the trout producer or any related companies) must certify that the farm's location is consistent with the definition of Type 3 as described in Boyd et al., 2001, and provide a detailed analysis to support that determination.

Appendix II-G: Receiving water monitoring for cage-based systems

Sampling Regime for Receiving Water Quality Monitoring

Location of sampling stations: Stations will be established at the limit of the cage farm management zone on each side of the farm, roughly 50 meters from the edge of the cages and at reference stations located approximately 1-2 kilometers (km) up current and down current. All sampling locations will be identified with GPS coordinates on a schematic outline of the farm operations and on available satellite imagery.

Sampling methods: All water samples testing for total phosphorus shall be taken from a representative composite sample through the water column to a depth of the bottom of the cages. Samples will be submitted to an accredited laboratory for analysis of TP to a method detection limit of < 0.002 mg/L. Dissolved oxygen measurements will be taken at 50 centimeters from the bottom sediment.

Frequency: Samples will be taken at least once every three months during periods without ice.

**NOTE: Some flexibility on the exact location and method of sampling is allowed to avoid farms needing to duplicate similar sampling for their local regulatory regime.

	Boundary Stations (note that if the farm is attached to land via a walkway, only three stations would be used)			**Reference Stations**		
	North	**South**	**East**	**West**	**Upcurrent**	**Downcurrent**
TP (mg/L)	X	X	X	X	X	X
DO profile (mg/L)	X	X	X	X	X	X

Appendix II-H: Trophic status classification and determining baseline trophic status

Requirement 3.3.6 requires a farm to determine a baseline trophic status for the water body and demonstrate through monitoring that the status is maintained. The ASC Freshwater Trout Standard uses a modified version of the trophic status system developed by the Organization for Economic Cooperation Development (OECD) (Vollenweider and Kerekes, 1982). Trophic status is determined by the concentration of total phosphorus.

Trophic Status	Range of Total Phosphorus Concentration (μg/l)
Ultra-oligotrophic	< 4
Oligotrophic	4-10
Mesotrophic	10-20
Meso-eutrophic	20-35
Eutrophic	35-100
Hyper-eutrophic	> 100

(Note: these ranges are identical to ones described in an Environment Canada report titled “Canadian Guidance Framework for the Management of Phosphorus in Freshwater Systems, Science-based Solutions Report 1-8, February 2004.”)

Determining baseline

See Audit Manual.

Appendix III: Feed resource calculations and methodologies

1. Forage Fish Dependency Ratio calculation

Feed Fish Dependency Ratio (FFDR) is the quantity of wild fish used per quantity of cultured fish produced. This measure can be weighted for fishmeal or fish oil, whichever component creates a larger burden of wild fish in feed. In the case of trout at current status, the fish oil usually will be the determining factor for the FFDR. The dependency on wild forage fish resources should be calculated for fishmeal and fish oil using the formulas provided below. In this requirement, it is the highest number (i.e., dependency) that is relevant and must be used. This formula calculates the dependency of a single site on wild forage fish resources, independent of any other farm.

NOTE: THESE REQUIREMENTS ARE ONLY CALCULATED ON FISH WEIGHING 30 GRAMS OR MORE.

$$FFDR_{fm} = \frac{(\%\ \text{fishmeal in feed from forage fisheries}) \times (\text{eFCR})}{22.2}$$

$$FFDR_{fo} = \frac{(\%\ \text{fish oil in feed from forage fisheries}) \times (\text{eFCR})}{5.0}$$

Notes:

Economic Feed Conversion Ratio (eFCR) is the quantity of feed used to produce the quantity of fish harvested.

The percentage of fishmeal and fish oil excludes fishmeal and fish oil derived from fisheries by-products[59]. Only fishmeal and fish oil that is derived directly from a pelagic fishery (e.g., anchoveta) is to be included in the calculation of FFDR. Fishmeal and fish oil derived from fisheries by-products (e.g., trimmings and offal) should not be included because the FFDR is intended to be a calculation of direct dependency on wild fisheries.

The amount of fishmeal in the diet is calculated back to live fish weight by using a yield of 22.2 percent. This is an assumed average yield. If a different yield is used, documentation must be provided.

The amount of fish oil in the diet is calculated back to live fish weight by using a yield of 5 percent. This is an assumed average yield.

[59] Trimmings are defined as by-products when fish are processed for human consumption or if whole fish is rejected for use of human consumption because the quality at the time of landing does not meet official regulations with regard to fish suitable for human consumption. Fishmeal and fish oil that are produced from trimmings can be excluded from the calculation as long as the origin of the trimmings is not from any species that are classified as critically endangered, endangered or vulnerable on the IUCN Red List of Threatened Species (http://www.iucnredlist.org/).

2. Calculation of EPA and DHA in feed

In order to demonstrate compliance with the requirement related to the maximum amount of EPA and DHA from direct forage fisheries in the feed, the calculations shall be done according to the following formula:

Grams of EPA and DHA in feed = (grams of fish oil per kg feed)* (% of EPA and DHA in fish oil)/100 where:

If the fish oil content varies in different feeds used during the production cycle, a weighted average can be used. The grams of fish oil relate to fish oil originating from forage fisheries for industrial purposes.

The content of EPA and DHA of the fish oil shall be calculated using these average figures:

- Fish oil originating from Peru and Chile and Gulf of Mexico: 30 percent EPA and DHA in fish oil (also known as Group a)
- Fish oil originating from the North Atlantic (Denmark, Norway, Iceland and the UK): 20 percent EPA and DHA in fish oil (also known as Group b)
- If fish oil is used from areas other than mentioned above, they should be classified as belonging to Group a if analyses of EPA and DHA is above 25 percent, and into Group b if analyses of EPA and DHA is below 25 percent

Analyses of EPA and DHA are the percentage of fatty acids in the oil that are EPA and DHA. In the calculation above, we make the simplification that 100 percent of the oil consists of fatty acids. EPA and DHA originating from fish oil originating from by-products and trimmings are not included in the calculation above. The feed producer can justify and demonstrate the amount of fish oil coming from trimmings and by-products by using a percentage of fish oil originating from trimmings based on information from purchases in an annual year, either using information related to the current year when the feed is produced or the previous year.

Appendix IV—Measures to prevent escapes

Farms must implement these measures to prevent escapes.

Effective screens or barriers of appropriate mesh size for the smallest trout present

Records for all movement of trout on the farm, number of fish being kept on the farm, known escapes and unexplained loss of fish

For open-net pen systems: Evidence of proper site selection, installation, choice of materials and maintenance of open-net pens and cages to prevent escapes through damaged nets, specifically when there are exceptional weather conditions

For open-net pen systems: Presence of a protocol for regular net inspections that includes:

- daily visual inspections (weather and safety conditions permitting);
- weekly inspection of the top section of nets;
- full inspection (lifted out of the water) prior to any procedure such as crowding of fish or grading;
- annual testing, in accordance with a detailed test procedure based on manufacturer's advice and using a documented quality control system;
- inspections with divers in situations where fish are reported to have escaped, or after specific incidents such as vandalism, predator attack or extreme weather.

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