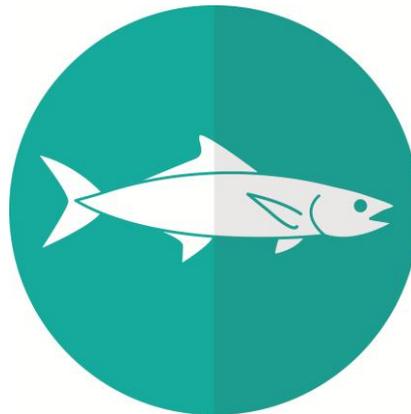
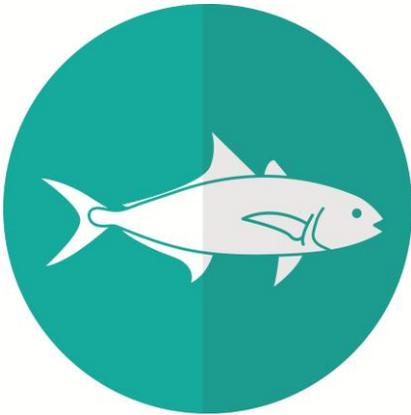




Aquaculture
Stewardship
Council



**ASC Seriola and Cobia
Standard
Version 1.0 October 2016**

This standard was submitted to the Aquaculture Stewardship Council by the Steering Committee (SC) of the Seriola and Cobia Aquaculture Dialogue (SCAD). The Steering Committee was composed of a representative from each of the following organizations: Cuna del Mar, Kampachi Farms, New England Aquarium, Nutreco, The Nature Conservancy, University of Miami, Virginia Cobia Farms, Worldwide Fund for Nature (World Wildlife Fund). (*Note: The Ocean Conservancy previously participated in the Steering Committee*)

The standard seeks to harness the power of the marketplace to promote meaningful, positive change in the way Seriola and Cobia is farmed. The standard has been debated and revised based on public feedback by means of 2 public comment periods. On any given requirement, individual SC members had a range of views, and sometimes disagreed. As a package, the Steering Committee believed the standard represents an important step forward in defining environmentally and socially responsible production of farmed Seriola and Cobia.

Collectively, the requirements in this standard seek to minimize or eliminate the key negative environmental and social impacts of Seriola and Cobia farming, while permitting the industry to remain economically viable. In order to improve the industry's overall performance, the requirements focus on today's best performers and are intended to be at a level where enough producers strive to achieve them, bringing about actual change on the ground.

The standard is intended to be a starting point for continuous improvement and to be periodically updated in line with Aquaculture Stewardship Council (ASC) policies to reflect the best available scientific knowledge, management practices and technologies, and the data collected during the certification of farms to the standard. The standard calls for greater transparency around farm-level data and monitoring to assist in these future revisions.

The standard is intended to be one tool to improve the sustainability of the industry. The Steering Committee recognized that farm-level requirements must be complemented by effective governmental regulations and coastal zone planning. Governments play a particularly important role in managing potential cumulative impacts from multiple farms. The SCAD SC would like to see ways explored to further integrate cumulative impacts in later iterations of the Seriola and Cobia production requirements.

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Postal address:

Aquaculture Stewardship Council
P.O. Box 19107
3501 DC Utrecht
The Netherlands

Office address:

Aquaculture Stewardship Council
Nieuwekade 9
3511 RV Utrecht
The Netherlands

Trade register number 34389683

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 2015	Original draft version developed and approved by the Seriola and Cobia Aquaculture Dialogue Steering Committee under the original title “Seriola and Cobia Aquaculture Dialogue” and handed over in draft to the Aquaculture Stewardship Council.
0.2	April 2015	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. A draft Audit Manual was developed by ASC, which was used for piloting standard and audit manual early 2016.
1.0	October 2016	Standard and Audit Manual updated based on feedback as received from farms which participated in on-site pilots. Both Standard and Audit Manual were approved by ASC’s Technical Advisory Group in September 2016.

About The ASC

ASC is the acronym for Aquaculture Stewardship Council, an independent not for profit organisation. The ASC was founded in 2010 by the WWF (World Wildlife Fund) and IDH (The Sustainable Trade Initiative) to manage the global Standards for responsible aquaculture. ASC's Standards 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 logo 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 NGO's 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 logo provides third party assurance of conformity with production and chain of custody standards 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 logo.

OVERVIEW OF THE ASC SYSTEM

The ASC system is made up of 3 components:

1. Aquaculture Farm Standards

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 Standards have been 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 Standards 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 standards 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 Standards*. 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 Standards 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 Standards. 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 several standard-holding organisations, like 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 Standards, the ASC logo is owned by ASC which regulates all aspects of its use.

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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. The other half is from aquaculture, the fastest-growing animal protein production sector in the world.

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 impacts on water quality, fish health and labor practices at farms. Although some businesses are addressing these issues well, many others are not.

One tool to help encourage more responsible aquaculture is the development of global standards—performance levels that must be reached to help minimize or eliminate a set of key impacts. Once established, standards can serve as the basis for new certification programs or can be incorporated into existing programs. New standards can also be used to benchmark existing standards, adopted by government programs, and inform purchase and investment decision making.

Preamble

The principles serve as a platform to minimize or eliminate the social and environmental impacts of Seriola and cobia aquaculture while permitting the industry to grow to be more economically viable. These principles—along with the corresponding criteria, indicators and requirements—are applicable at the farm level. Farms must meet 100 percent of the requirements in this document to achieve certification.

Although the SCAD created farm-level requirements, they are intended to help protect and maintain ecosystem function and ecosystem services in Seriola and cobia producing areas, with the recognition that aquaculture operations are not solely responsible for total ecosystem health. The ASC Seriola and Cobia Standard is intended to be revisited and updated periodically (e.g., every three to five years) to ensure that the requirements are based on the best available scientific knowledge and management practices and to encourage continuous improvement.

How to read this document

In the following pages, tables with indicators and their corresponding requirements are included. Within each criterion, requirements tables are followed by a rationale section that provides a brief overview of why the issues are important and how the proposed standards address them.

Definitions are provided in footnotes.

PURPOSE AND SCOPE OF THE SERIOLA AND COBIA AQUACULTURE DIALOGUE STANDARDS

Purpose of the Standard

The goal of the Seriola and Cobia Aquaculture Dialogues (SCAD) was to credibly develop comprehensive and measurable performance-based requirements that minimize or eliminate the key negative environmental and social impacts of Seriola and cobia farming, while permitting the industry to remain economically viable.

More than 130 stakeholders, including producers, non-governmental organizations (NGOs), seafood buyers, feed companies, scientists and government representatives have participated in the SCAD. An eight-person Steering Committee (SC) has been responsible for managing the SCAD process and making all final decisions related to the ASC Seriola and Cobia Standard. This group of volunteers includes representatives from Seriola and cobia producing companies, feed manufacturers, academia and environmental NGOs.

Definition of the Standard

The SCAD was an iterative, participatory process that began with identifying the key negative environmental and social impacts of Seriola and cobia production. Using a step-wise approach, the Dialogues built agreement on principles, criteria, indicators and requirements that address the impacts. The SCAD was the last of the first round of species-specific aquaculture dialogues commissioned and was therefore able to build off of the structure, research and discussions of earlier dialogues. The SCAD Steering Committee is grateful to these earlier dialogues and recognizes their work and its contribution to the SCAD standards and documents.

Issue areas of Seriola and cobia aquaculture to which the Standard applies

The SCAD established principles, criteria, indicators and measurable performance levels for responsible Seriola and cobia aquaculture with regard to social and environmental issues. The areas of key potential negative impact that were identified within the Dialogues are: impacts on biodiversity, feed use, escapes, nutrient loading and carrying capacity, benthic impacts and siting, disease and parasite transfer, chemical inputs and social impacts (i.e., labor and community impacts). It is recognized that there is overlap within the impact areas and the principles. The full suite of requirements is intended to address the range of potential negative impacts, focusing on key potential impacts of the grow-out stages of production.

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 Seriola and Cobia Standard applies to the planning, development and operation of Seriola and cobia aquaculture grow-out systems. The focus of the requirements in this standard is on production and the immediate inputs to production. The SCAD SC recognizes the value of Life Cycle Analysis (LCA) types of assessment for identifying and addressing broader impacts associated with farmed Seriola and Cobia products. However, the aim of this Standard is to improve environmental and social performance at the farm level.

Biological and geographic scope to which the Standard applies

The ASC Seriola and Cobia Standard is applicable to the species *Seriola quinqueradiata*, *S. dumerili*, *S. rivoliana*, *S. lalandi*, *S. dorsalis* and cobia (*Rachycentron canadum*) and can be applied to all global locations and scales of Seriola and cobia aquaculture farm-level production systems.

Unit of certification to which the Standard applies

The unit of certification is a farming site, which in practice means a cluster of cages located together in an operational unit or a land based system using a common facility. A farm must comply with all the requirements in this document to be certified, including providing required documentation from their feed suppliers. The standard does not focus on other areas of the supply chain, for instance transport, processing or distribution.

Implementation of the Standard

When finalized, the ASC Seriola and Cobia Standard was handed off to the Aquaculture Stewardship Council (ASC), which is responsible for working with independent, accredited, third-party entities to certify farms that are in compliance with the standards. Farms will be assessed on an annual basis, though some data will be submitted on a production cycle basis. The ASC also offers a Chain of Custody (CoC) certification that tracks fish from a certified farm to the consumer point of purchase. More information on the ASC and their certification and accreditation processes is available on their website, www.asc-aqua.org.

In addition to their use by the ASC, the requirements could potentially be incorporated into existing certification programs, government regulations, and buyer and investment screens.

PROCESS FOR CREATING THE STANDARD

General Considerations

The process of setting requirements is critical, as it significantly affects the credibility, viability, practicality and acceptance of the ASC Seriola and Cobia Standard. The process of creating the ASC Seriola and Cobia Standard aimed to be multi-stakeholder, open to anybody to participate, 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". This has allowed the process to remain transparent, open to public participation, and engage multiple key stakeholders.

Standard Setting Process

The steps in the process are described below:

- In 2009, under the leadership of WWF, the inaugural meeting of the SCAD was held in Seattle, Washington, USA (February 19-20, 2009). Draft principles were presented and discussed at this meeting, then revised based on feedback and later SC discussion.
- There were significant challenges with funding for the SCAD; however, the financial support of the US Soybean Export Council, the Turner Foundation, the Ocean Stewards Institute and organizations on the SC is greatly acknowledged.
- Additional meetings were held in Veracruz, Mexico (September 24-25, 2009) and Tokyo, Japan (February 12-13, 2013). Through 2011-2012, the SC met regularly via phone and in person in order to develop draft indicators and requirements.
- On February 15, 2013, a first draft of the standard was posted for a 60 day public comment period. Feedback received during the comment period was used by the SC to revise the standard document.
- On August 19, 2013, an overview of comments received during the first public comment period, as well as the SC's overarching responses to the feedback, were posted publicly on the SCAD portion of the WWF US website. Comments and responses were sorted according to key issues raised by principle. This represented the start of public comment period two.
- A final SCAD meeting was held in Kagoshima, Japan in October, 2013 to receive final public comments from Japanese stakeholders. The SC reviewed the comments, revised the requirements and submitted a finalized version of the standard to ASC in February 2015.
- A final series of pilots was carried out early 2016 on farms in Australia, Brazil, Japan and Panama. Feedback received was used to further improve the draft standard and the accompanying draft audit manual.
- The Aquaculture Stewardship Council (ASC) is responsible for working with independent, third-party entities to certify farms that are in full compliance with the standards as created by participants of the Aquaculture Dialogues. The ASC led the development of an auditing manual for the SCAD standards with input and guidance from SC members.

Continuous Improvement of the Seriola and Cobia Aquaculture Dialogue 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 Seriola and Cobia Standard that the performance levels (given in measurable numerical value targets), will be raised or lowered over time to reflect new data, improved practices and new technology.

PRINCIPLES, CRITERIA, INDICATORS AND REQUIREMENTS FOR GROW-OUT

This section of the document contains the full suite of principles, criteria, indicators and requirements for responsible Seriola and cobia farming at saltwater grow-out sites.

PRINCIPLE 1: COMPLY WITH ALL APPLICABLE INTERNATIONAL, NATIONAL, AND LOCAL LAWS AND REGULATIONS

Principle 1 is intended to ensure that all farms aiming to be certified against the SeriolaCobiaASC Seriola and Cobia Standard meet their legal obligations as a baseline requirement. Adhering to the law will help ensure basic environmental and social requirements are met as well as the minimal structures, such as legitimate land and water tenure rights, on which the effectiveness of the requirements will stand.

Criterion 1.1 Compliance with all applicable local, national and international legal and regulatory requirements

INDICATOR	REQUIREMENT
1.1.1 Documents demonstrating compliance with all relevant local and national laws and regulations	Yes
1.1.2 Documents demonstrating compliance with all tax laws	Yes
1.1.3 Documents demonstrating compliance with all labor laws and regulations	Yes
1.1.4 Documents demonstrating compliance with regulations and permits concerning water quality impacts	Yes

Rationale-The requirements under Principle 1 are a means to reinforce and complement the legal framework. Aquaculture operations must, at a minimum, adhere to the national and local laws and regulations of the regions where production is taking place. Farm operations that, intentionally or unintentionally, break the law violate a fundamental baseline of performance for certified farms. It is important that aquaculture operations demonstrate a pattern of legal and responsible behavior. The requirements go beyond those required by law in many circumstances, yet are not intended to contradict them. Laws that compel a farmer to take certain action take precedence over voluntary requirements.

Additional information

The primary focus of this principle is national and local laws and regulations. Although international legal requirements are agreed to be important, the practicality of including international conventions in these requirements is limited because of ratification by countries and other issues. Some specific international legal issues are addressed in other sections of the standard, such as the reference to International Labor Organization (ILO) conventions under Principle 6.

Despite concerns about equivalent status being granted to products grown in countries with varying levels of legal requirements, it is outside the scope of the ASC Seriola and Cobia Standard to address differences in national legislation, providing that legislation is complied with.

Implementation guidance

In order to ensure compliance with these requirements, auditors will need to review a range of documentation and relevant correspondence related to farm siting and operation. It is probable that some of the information will need to be generated by the headquarters of the company owning the operation, while other information will relate specifically to the site.

The documentation and auditing activities include, but are not restricted to:

- For 1.1.1: Original lease agreements or land titles; permits from government agencies; where applicable, reports from inspections for compliance with national and local laws and regulations; documents outlining allowable activities in or near conservation areas (e.g., parks, limited use protected areas). Documents showing compliance with relevant World Organization for Animal Health (OIE) regulations on transfer of fish/eggs and fingerlings and specific pathogen free (SPF) status and quarantine status.
- For 1.1.2: Proof of compliance with tax reporting and payments to appropriate authorities.
- For 1.1.3: Where applicable, reports from inspections of facility for compliance with labor codes and laws.
- For 1.1.4: Discharge laws and applicable permits for operation; records of monitoring and compliance with discharge regulations.

PRINCIPLE 2: CONSERVE NATURAL HABITAT, LOCAL BIODIVERSITY AND ECOSYSTEM STRUCTURE AND FUNCTION

*Principle 2 is intended to address potential impacts from *Seriola* and *cobia* farms on natural habitat, local biodiversity and ecosystem function. Specifically, the key impact areas of benthic impacts, siting, effects of chemical inputs and effects of nutrient loading are addressed within this principle.*

Criterion 2.1 Benthic biodiversity and benthic effects

INDICATOR	REQUIREMENT
2.1.1 Total organic carbon (TOC) levels, sulphide levels or redox potential in sediment immediately outside of the Allowable Zone of Effect (AZE) ¹ attributable to farm operations as evidenced by control	No significant change in TOC levels, sulphide levels or redox potential in sediment at the edge of the AZE in comparison to the control site
2.1.2 Abundance of harmful (invasive or noxious) macrofauna immediately outside of the AZE attributable to farm operations as evidenced by control	No significant change in harmful macrofauna at the edge of the AZE in comparison to the control site

Rationale-A majority of the Steering Committee believes that relative measures that compare a farm to a control site are the most appropriate metrics of impact. Natural systems are highly variable and so comparative sampling using null controls (removed from the farm, but subject to the same natural influences) and replicated statistical designs are needed to confirm or deny the presence and scale of any impact resulting from a particular activity in the face of the inherent natural background variability. The current indicators and requirements look at species composition and abundance as well as the chemical proxy of total organic carbon (TOC) levels, sulphide levels or redox potential as the best available chemical indicators for benthic health. Given that all methods are valid, audited farms can choose their preference for one or the other. These parameters should not be statistically significantly different from a control site.

When considering benthic effects, experts recommended measuring effects below the cages and away from the cages, within and outside of the Allowable Zone of Effect (AZE). Though an AZE is difficult to identify as a constant, experts discuss this in terms of the dispersion of solid material from the cage, which can be dependent on water depth as well as current speed. In an effort to take a

¹ Allowable Zone of Effect (AZE) is defined under this standard as either: (a) an area around the outside of the net pen with a radius equal to the depth of the water; (b) some other area defined by a reputable model of effluent dispersal and assimilation; or (c) if a single-point mooring is used, then the area scribed by the arc of the mooring. For a land-based system it is assumed that there is no significant effect outside of the outfall so there is no need for an AZE. However, it would be up to a land based system to make an argument for a reasonable AZE if there is an impact beyond the outfall.

broadly applicable approach to permissible zone of benthic impact, the ASC Seriola and Cobia Standard takes a precautionary approach in defining the radius of the AZE as being a function of the depth of water at the farm. For sites where a site-specific AZE has been determined using a valid modeling (e.g., SEPA AUTODEPOMOD) and video surveillance system, farms will use the site-specific AZE and sampling stations based on actual depositional patterns. Within three years of the publication of the ASC Seriola and Cobia Standard, all certified farms must have undertaken the appropriate analysis to determine the site-specific AZE and depositional patterns. This will help ensure that sampling is taking place in areas most appropriate to protect benthic health around farms.

For water depths of up to 250 meters, a yearly sample should be collected at the time of maximum cage biomass. For water depths > 250 meters, samples will be collected tri-annually at the point of maximum cage biomass. Samples will not be required for cage systems that are not moored (continually in motion) or those that are in excessively deep water (> 1,000 meters).

Stakeholders in the SCAD process, particularly from the Japan geography, articulated challenges around finding suitable control sites due to the concentration of current farms. The SC tried hard to find alternative options, but given a lack of feasible indicators, the SC's plan is to move forward with this method, and recognize good faith attempts to compare treatment sites against the best available reference site.

General information

One fundamental question is whether a farm is having an impact on benthic biodiversity or not. The SCAD Steering Committee defined biological diversity—or biodiversity—as the term given to the variety of life on Earth and the natural patterns it forms. The SCAD considers the maintenance of biodiversity of critical importance, as it is a key to the preservation of healthy ecosystems. It has borrowed heavily from previous Dialogue processes, particularly from our colleagues in the Salmon Aquaculture Dialogue (SAD), where considered relevant. The SCAD Steering Committee recognizes and attributes the value that this previous comprehensive work added to the SCAD process.

Auditing Guidance

- For 2.1.1: If there is a violation of the standard based on the result of a single sample, then the farm can be required to undertake a more rigorous sampling process.
- For 2.1.2: The farmer will use a measure of benthic community composition that is most appropriate to the site. Over time ASC will build lists and knowledge of appropriate species by regions and site characteristics that can inform further iterations of the requirements.

Criterion 2.2 Water quality in and near the site of operation

INDICATOR	REQUIREMENT
2.2.1 Turbidity levels in the water column inside and outside AZE	No significant change ² in turbidity levels in the water column at the edge of the AZE in comparison to the control site
2.2.2 Ammonia levels in the water column inside and outside AZE	No significant change in ammonia levels in the water column at the edge of the AZE in comparison to the control site

Rationale- Turbidity is the most obvious and readily measured metric of water quality and the most likely form of impact from a farm on surrounding water quality.

Ammonia is the best indicator of metabolic waste loading and excessive ammonia loading can be toxic to marine organisms.

Guidance

- **Turbidity:** monitoring should be undertaken monthly. If after 12 months there is no significant difference between sample sites and control sites, sampling should be undertaken on an annual basis. Turbidity should be measured using consistent procedures such as standardized methods for sampling total suspended solids (TSS) or a secchi disk at defined depths. Both should be measured 1 hour after feeding and when biomass is highest (if 1x a year).
- **Ammonia:** monitoring should be undertaken monthly. If after 12 months there is no significant difference between sample sites and control sites, sampling should be undertaken on an annual basis.

The guiding aim of this criterion is that the environment shall not become worse from the current conditions as a consequence of the farm. The baseline point is the one outside of the AZE and what we want to know is that water quality does not get any worse due to the farm. The control site has to be appropriate and is not necessarily the deepest point.

² These should be measured by consistent and standard procedures such as a secchi disk or recognized total suspended solids (TSS) sampling methods. Significance measured at a 95% confidence interval.

Criterion 2.3 Interaction with critical or sensitive habitats and species

INDICATOR	REQUIREMENT
2.3.1 Evidence of an assessment of the farm’s potential impacts on biodiversity and nearby ecosystems that contains at a minimum: a) identification of proximity to critical, sensitive or protected habitats and species, b) description of the potential impacts the farm might have on biodiversity, with a focus on affected habitats or species, and c) a description of strategies and current and future programs underway to eliminate or minimize any identified impacts the farm might have	Yes
2.3.2 Allowance for the farm to be sited in a legally designated protected area ³	None ⁴

Rationale-The intent of the requirements under criterion 2.3 is to minimize the effects of a *Seriola* and *cobia* farm on critical or sensitive habitats and species. The habitats and species to consider include marine protected areas or national parks, established migratory routes for marine mammals, threatened or endangered species, the habitat needed for endangered and threatened species to recover, eelgrass beds and High Conservation Value Areas (HCVAs) (as defined by a credible, multi-stakeholder internationally recognized process). These requirements are consistent with normal environmental assessment requirements in most jurisdictions.

The requirements under criterion 2.3 ensure a farm is aware of any nearby critical, sensitive or protected areas, understands the impacts it might have on those areas, and has a functioning plan in place to mitigate those potential impacts. They also ensure that extra care is taken in areas that are

³ Protected area: “A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature 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 The following exceptions shall be made for indicator 2.3.2:

- For protected areas classified by the International Union for the Conservation of Nature (IUCN) as Category V or VI.
- For designated protected areas if the farm can demonstrate that its environmental impacts are compatible with the objectives of the protected area designation. The burden of proof would be placed on the farm to demonstrate that it is not negatively impacting the core reason an area has been identified as a protected area.
- For farms that pre-date the designation of a marine protected area (MPA).

recognized for ecological importance through designation as a protected area. It would not allow production in these areas to be eligible for certification, unless compatible with the conservation goals of the area. Legally operating farms that pre-date a designated marine protected area (MPA) would be able to be certified.

Additional information

For indicator 2.3.2. 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/.

In developing these requirements, the SC recognized that there is an important role for governments in identifying appropriate areas for protection of biodiversity along with appropriate areas for aquaculture and other economic activities. Additionally, the SC believes that Seriola and cobia farming companies should be active participants in encouraging adaptive and effective coastal zone and ocean area management that protects areas of high conservation value with a long-term vision of coastal and ocean areas that are both ecologically and economically productive.

Auditing guidance

- Farms cannot be located in any protected area that does not allow economic activities that are incompatible with the management and conservation goals of the protected areas—this falls under the concepts of Principle 1 related to obeying the law.
- Compatibility with the goals of a protected area shall be guided by the outcomes of the assessment conducted for 2.3.1.

Criterion 2.4 Interaction with wildlife, including predators

INDICATOR	REQUIREMENT
2.4.1 Acoustic deterrent devices allowed	None
2.4.2 Number of mortalities ⁵ of endangered or red-listed ⁶ animals in the farm lease area and adjacent areas due to farm operations, personnel or associates	0

⁵ Mortalities: includes animals intentionally killed through lethal action as well as accidental deaths through entanglement or other means.

⁶ Species listed as endangered or critically endangered by the IUCN or on a national endangered species list.

<p>2.4.3 Evidence that the following steps were taken prior to lethal action⁷ against a (non-endangered or non-red-listed) predator:</p> <ol style="list-style-type: none"> 1. All other avenues were pursued prior to using lethal action 2. Approval was given from a senior manager above the farm manager 	<p>Yes, unless human safety is immediately threatened</p>
<p>2.4.4 Evidence that information about any lethal incident on the farm has been:</p> <ol style="list-style-type: none"> 1. Reported to the appropriate government oversight agency 2. Made easily publicly accessible 	<p>Yes</p>
<p>2.4.5 Maximum number of lethal incidents⁸ on farm over the prior two years</p>	<p>For birds: 4 lethal incidents For sharks: 2 lethal incidents For marine mammals: 1 lethal incident</p>
<p>2.4.6 In the event of any lethal incident, evidence that an assessment of the probability of lethal incident(s) has been undertaken and demonstration of concrete steps taken by the farm to reduce the risk of future incidences</p>	<p>Yes</p>

Rationale-Scientific literature⁹ about the use of acoustic deterrent devices (ADDs), also known as acoustic harassment devices, to deter predators from marine aquaculture facilities show three main conclusions. First, ADDs have been demonstrated to damage the hearing capability of marine mammals (target and non-target species). Second, they have been demonstrated to force a change in the natural feeding or breeding behavior of some marine mammals. And, third, over time and with regular use, ADDs begin to act as an incentive that actually attracts rather than deters the target species (e.g., seals) from the aquaculture facilities. Therefore, ADD use is not allowed under these requirements.

⁷ Lethal action: action taken to deliberately kill an animal, including marine mammals and birds. No lethal action is allowed for endangered or red-listed animals as covered in 2.4.2.

⁸ Lethal incident: includes all intentional and unintentional, farm-related lethal actions, to include but not be limited to, entanglements and other accidental mortalities, excluding farm stock.

⁹ Fjalling, A, Wahlberg, M and Westerberg H, 2006 Acoustic harassment devices reduce seal interaction in the Baltic Salmon-trap, net fishery, ICES Journal of Marine Science: Volume 63, Number 9 pp. 1751-1758.

B.C. Government, 1997, The environmental risks of salmon aquaculture, pp. 35-37 and Cox, TM, Read A.J., Solow, A, Tregenza, N, 2001, Will harbor porpoises (*Phocoena phocoena*) habituate to pingers, J. Cetacean Res. Manage 3(1) 81-86.

While every effort should be made to avoid lethal action and to take appropriate measures prior to any lethal action, the safety of workers should not be compromised. In an instance where worker safety is at immediate risk, lethal actions are allowed under this standard. However, 2.4.6 mandates that adaptive management fully investigate the reasons for lethal incidents, and therefore the farm should fully analyze the reasons why human safety was compromised, and put in place measures to prevent such risks recurring.

The intent of the requirements under criterion 2.4 is to minimize the effects of a *Seriola* or *cobia* farm on critical or sensitive habitats and species. The habitats and species to consider include marine protected areas or national parks, established migratory routes for marine mammals, threatened or endangered species, the habitat needed for endangered and threatened species to recover, eelgrass beds and HCVAs, where these have been defined. These requirements are consistent with the Global Reporting Index indicators EN12, EN14 and EN15, which relate to the identification and description of significant impacts of activities on biodiversity, protected habitats and threatened species, and the communication of strategies to manage these impacts.

The requirements under criterion 2.4 ensure that a farm is aware of any nearby critical, sensitive or protected areas, understands the impacts it might have on those areas, and has a functioning plan in place to address those potential impacts. They also ensure that extra care is taken in areas that are recognized for ecological importance either through designation as a protected area or through designation as being an area of high conservation value, by not allowing production in these areas to be eligible for certification, with some exceptions made if extra conditions are met to ensure that the farms are compatible with the conservation goals of the areas.

PRINCIPLE 3: PROTECT THE HEALTH AND GENETIC INTEGRITY OF WILD POPULATIONS

*The intention of Principle 3 is to ensure that farms do not harm the health, genetics and biodiversity of wild aquatic populations. This principle addresses impacts associated with escapes, introduction and cultivation of exotic and transgenic species and the collection of wild *Seriola* and *cobia* fingerlings. When species are introduced into an area they may cause increased predation and competition, disease, habitat destruction, genetic stock alterations and in some cases, extinction. A proper assessment of the potential risks is therefore desirable.*

Criterion 3.1 Culture of non-native species

INDICATOR	REQUIREMENT
3.1.1 Culture of a non-native species	None, unless commercial ¹⁰ farming of the species already occurs in the region at time of the first publication of the ASC <i>Seriola</i> and <i>Cobia</i> Standard, or a closed land-based production ¹¹ system with minimal ¹² risk of escapes and/or pest and pathogen transfer to wild populations is used

Rationale-Accidental or intentional introductions of non-native species are significant global environmental problems. Aquaculture is considered one of the major pathways for introducing non-native aquatic plants and animals that may become harmful invasive species. The SCAD believes that these requirements are in line with the FAO guidelines that permit the culture of non-native species only when they pose an acceptable level of risk to biodiversity. This Standard does not permit introductions of non-native species, unless farming of the species already occurs in the area at the time of the adoption of the ASC *Seriola* and *Cobia* Standard by the ASC, or a completely closed production system is used.

The use of alternatives to chemical treatments for farm management, such as the use of cleaner fish for sea lice control in salmon, is permitted and encouraged under the SCAD standards. However, any wrasse, cleaner fish or other species used for management during production must be native species in order to prevent introduction of new species area.

¹⁰ Commercial: if a species is cultured as part of a permitted research trial, it will not be considered an existing commercial operation. Generally, research trials will contain no more than one pen of an experimental species.

¹¹ Land-based systems must not directly discharge into the receiving body.

¹² *Seriola* must not be established as a result of escapes.

Criterion 3.2 Introduction of transgenic species

INDICATOR	REQUIREMENT
3.2.1 Culture of transgenic fish by the farm	None

Rationale-Transgenic fish are not permitted under this Standard because of concerns about their unknown impact on wild populations. The culture of triploid or all female fish, as long as those fish are not transgenic, is allowed.

Criterion 3.3 Escapes

INDICATOR	REQUIREMENT
3.3.1 For all fish the operation must have an established plan related to escape management, and adhere to rigorous maintenance procedures and frequent net inspections	Yes
3.3.2 Operations will undertake and maintain detailed records on fish escapes and counting. This will include records of breaches in nets, estimates on escapes and stocked vs. recovered fish counts Note: farms will also include technology and methodology for undertaking fish counts	Yes
3.3.3 For selectively bred stock ¹³ or for non-selectively bred stock not from local sources ¹⁴ or for wild fingerlings not from local sources more than 2 escape events of 30% (cumulative total fish not recovered) over 2 years ¹⁵	No

¹³ Selectively bred stock: fish that have been subject to a conscious selection process in breeding and whose attributes differ from wild counterparts.

¹⁴ Non-selectively bred stock: fish where either (a) the parents are from the local wild-stock gene pool, or (b) where F1s and subsequent generations of broodstock have not been subject to any conscious selection process. No more than F2 with no active selective breeding.

¹⁵ A rare exception to this standard may be made for an escape event that is clearly documented as being outside the farm's control. Only one such exceptional episode is allowed in a 10 year period for the purposes of this standard. The 10 year period starts at the beginning of the production cycle for which the farm is

3.3.4 All escape events of farmed *Seriola* or *Cobia* are reported to the pertinent regulatory agency

Yes

Rationale-The SC aimed to generate different requirements around escapes for selectively bred or non-selectively bred fish. These are intended to create a more rigorous standard for fish that may have some genetic difference to wild stocks. Escapes of selectively bred *Seriola* and *cobia* do have some potential to alter the overall pool of genetic diversity through interbreeding with local wild stocks of the same population. However, the risks for genetic distortions or other environmental impacts from escapes of marine fish are notably less than that for anadromous fish. Additionally, current selective breeding programs for *Seriola* and *cobia* remain in their infancy and the SC believes it is unlikely there will be significant advances in this for the coming 5 years. *Seriola* and *cobia* are broadcast spawners, and there is less potential for genetic blurring between populations from escapes. There is therefore far less chance of any measureable or significant impact on wild stock genes from escapes of farmed fish. Some *Seriola* and *cobia* F1 fish¹⁶ are very poor spawners (possibly related to the high-fat diet of the cultured fish, which appears to permanently disrupt the fish reproductive endocrinology¹⁷). In addition, F1 *Seriola* escapees in Hawaii have been shown to be very poorly equipped for survival in the wild, remaining in the vicinity of the net pens, and highly vulnerable to fishing and predation pressures.

Still, a conservative approach demands that conscientious fish farmers will strive to minimize the number of escapes of farmed *Seriola* or *cobia*. Escapes can occur in large events that are immediately noticeable at a farm, smaller events that are still noticeable, and through slower, lower levels of losses of fish that might go unnoticed. The SC would like to set metrics based requirements for escapes. However, current counting technology, established cannibalism rates and their impact on counting error margins currently render such requirements challenging. Therefore, the SC chose to set strict requirements for net pen maintenance and escape procedures while also requiring farms to collect data on stocking and recovery that will enable future iterations of the SCAD to set meaningful escape targets. The SC also set mass escape requirements, in order to prevent the certification of farms that allow mass escapes more than twice over a period of two years while still providing a clause related to circumstances clearly outside of the farm's control. The requirements require transparency about unexplained loss of *Seriola* or *cobia* to help the farm and the regulators understand trends related to the cumulative numbers of losses of fish that go unnoticed during production.

applying for certification. The farmer must demonstrate that there was no reasonable way to predict the events that caused the episode.

¹⁶ F1 is first generation captive-reared. i.e. the parents are wild-caught.

¹⁷ Neil Anthony Sims, Kampachi Farms, Pers. Comm.

Criterion 3.4 Collection of fingerlings

INDICATOR	REQUIREMENT
3.4.1 Evidence that purchased or collected wild fingerlings are harvested from a source fishery with a public fishery assessment, for example FishSource or is in a credible fishery improvement process (FIP) moving towards an ISEAL compliant fisheries sustainability certification scheme	Yes
3.4.2 Traceability of wild or hatchery purchased or collected fingerlings to their source	Yes

Rationale-The use of wild fingerlings for culture is acceptable, however they need to be from a well-managed sustainable source. Currently there is only one ISEAL compliant credible fisheries certification scheme (MSC). However, in the future there may be others. Because some of these source fisheries may not have all the data available immediately or there may not be appropriate conditions to drive certification of a seed fishery, the standard also accepts source fisheries with a public assessment such as 'FishSource' or fisheries in a credible fishery improvement process (FIP) moving towards an ISEAL compliant sustainability certification scheme. Farmers also need to be able to prove the traceability of their wild caught or hatchery reared fingerlings from the source fishery or hatchery.

PRINCIPLE 4: USE RESOURCES IN AN ENVIRONMENTALLY EFFICIENT AND RESPONSIBLE MANNER

*The culture of marine fish such as *Seriola* and *cobia* requires the use of resources including 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. Other Dialogues have used this rationale to include a broad array of criteria, with the intention of moving towards 'global' sustainability of resources in the relevant production system. However, the SCAD SC believes that it is important to address the primary issue that will encourage producers to focus their improvement efforts in ways that have the largest benefit to ocean ecosystems. For marine fish, that parameter is unquestionably the use of fish meal and fish oil, and the impacts that such use has on forage fish resources and marine food webs.*

Criterion 4.1 Traceability and transparency of marine raw materials in feed

INDICATOR	REQUIREMENT
4.1.1 Evidence of traceability, demonstrated by the feed producer, of fishmeal and fish oil ingredients ¹⁸	Yes

Rationale-Traceability of forage fish resources and edible seafood processing by-products is required to ensure their authentic origin. Traceability is a necessary prerequisite to comply with the primary feed requirement under this principle. The farmer must have full knowledge of the source of the fishmeal (FM) and fishoil (FO) ingredients used in the feed.

Additional information

Assuring traceability of FMFO feed inputs requires transparency at the feed manufacturer and producer level. The SCAD recognizes that there are costs and systems required to demonstrate traceability, and welcomes ideas about how feed manufacturers can minimize these costs. The SCAD recommends that the traceability information provided by the feed manufacturer does not normally need to be further verified by the auditor unless there are compelling reasons to believe otherwise.

¹⁸ Traceability should be at a level of detail that permits the feed producer to demonstrate compliance with the standards in this document. This standard also assumes that the feed producer will make available to the farm a list of the FMFO ingredients, the inclusion rates of FMFO, and the sources of each component of the FMFO.

Criterion 4.2 Efficient and optimized diets

INDICATOR	REQUIREMENT
4.2.1 (a) Fishmeal Forage Fish Dependency Ratio (FFDR _m) and Fish Oil Forage Fish Dependency Ratio (FFDR _o) for <i>Seriola</i> (calculated using formulae in Appendix 1). Kampachi (<i>S. rivoliana</i> , <i>S. dumerili</i> ¹⁹), Hamachi (<i>S. quinqueradiata</i>)	Kampachi: FFDR _m ≤ 2.9/FFDR _o ≤ 2.9 Hamachi: FFDR _m ≤ 6.0/FFDR _o ≤ 7.0 (now) FFDR _m ≤ 4.8/FFDR _o ≤ 5.0 (3 years) FFDR _m ≤ 2.9 /FFDR _o ≤ 2.9 (6 years)
(b) FFDR _m and FFDR _o cobia (calculated using formulae in Appendix 1)	FFDR _m ≤ 6.0/FFDR _o ≤ 6.0 (now) FFDR _m ≤ 4.0/FFDR _o ≤ 4.0 (3 years) FFDR _m ≤ 2.9/FFDR _o ≤ 2.9 (6 years)
4.2.2 Use of wet feed and moist pellets	Must be sourced from the same ecosystem in which the farm is located

Rationale-The use of the Forage Fish Dependency Ratio (FFDR) encourages producers to decrease reliance on forage fish resources by reducing the inclusion rate of fishmeal (FM) and fish-oil (FO) from such sources in their feed, and optimizing their feed conversion ratio on the farm. FFDR is the primary metric for assessing the use of limited natural resources in the most straightforward manner. It is designed to optimize the transfer of resources from wild forage fish to feed constituents (FM and FO), and then into the cultured fish that is eaten by the consumer. The SC recognizes that the quality and marketability of forage fish (such as anchoveta and menhaden) is considerably less than that of the cultured end products, but does not seek to make any value judgments in end use of these resources. The SC seeks to establish criteria that reward the better-performing *Seriola* and cobia producers for their efforts, and to encourage the rest of the industry to improve their FFDR performance.

The SC supports the regular review of this metric, so that over time, as science improves and producers find additional innovative solutions, the FFDR is lowered towards a value that reflects an ecological ideal (i.e., 1:1). The SC has specifically suggested a timeline for increasingly strict requirements for Hamachi and Cobia over the period of 3 years and again 6 years from the publication of the standard. The SC hopes that if technology and innovation become available sooner, the number can be revised faster. The SC believes that the current window will encourage producers to work towards better performance on an aggressive timeframe.

¹⁹ Specific scientific data related to *Seriola dumerili*, *S. dorsalis* or *SeriolaS. lalandi* was not included in the SCAD process and therefore the SC did not have enough species specific information to warrant an additional species specific FFDR requirement. If producers of *S. dumerili* can produce scientific evidence of FFDR that promotes best practice, an additional FFDR level for that species of *sSeriola* could be considered. Until that time, the same FFDR as *S. rivoliana* should be used. There is currently approximately between 1000-1500 tons of *S. lalandi* produced in Australia per year. Miranda and Peet (2008) state that for *S. lalandi* the ratio of wild fish input to farmed fish input is 4.9 : 1, which is considered high. Until further species specific requirements can be determined, *SeriolaS. lalandi* or *S. dorsalis* operations would also need to meet the FFDR requirements of *S. rivoliana*.

The SC heavily debated appropriate species specific FFDR metrics. Achieving a slightly lower FFDR could be possible for some small scale operations using experimental feed methods and selling smaller fish. However, the SC reviewed data indicating that better performing medium- to larger-scale ocean-based production systems currently selling into existing markets demanding larger fish size would need to improve their performance to near impossible levels, in order to meet the requirements that are identified here. The SC felt that it was better to set achievable FFDRs that would incentivize change on the water, rather than setting FFDRs that were clearly unachievable, even with significant improvement above current practices. In the latter case, operators would probably dismiss the ASC process as irrelevant, and there would be no net improvement on the water. The SC hopes that those who might otherwise be critical of such high FFDRs would also consider the purpose and process of certification.

After careful review of data from producers and feed companies, the SC has established FFDRs for each species that we believe will incentivize producers to make meaningful improvements in their farm practices. The SC notes that the ASC standards seek to push best practice within each species sector. Although these FFDR numbers are higher than those of other species, the SC is confident that they are set at the right level to encourage commercial *Seriola* and cobia farmers to further improve their practices in order to achieve ASC certification.

The SC felt that engaging the best performing Japanese Hamachi producers and commercial cobia producers over a 3-6 year time frame would result in more change globally than setting an unachievable initial FFDR for Hamachi and cobia. The ASC Technical Advisory Group will review these levels and reset to encourage continuous improvement. If data or new technology allows for even more frequent review and revision, any such suggestions would always be considered. It should also be noted that for Hamachi, the production data was carefully reviewed and it was determined that given current practices in Japan, an FFDR in the range of 11 would push all Japanese producers. However, knowing that further substitution of up to 25% of fish oil would not be likely to detrimentally impact fish health, the SC decided to set this limit lower in the hope of pushing greater efficiency.

FFDR justification for Kampachi:

Kampachi (*S. dumerili*) and Hirenaga-Kampachi (*S. rivoliana*) are generally harvested at a smaller size than Hamachi, and thus are usually more likely to achieve a lower FFDR. This smaller harvest size may also be related to the better market price for Kampachi, compared to Hamachi (Miranda and Peet, 2008 ^{a20}). Most of the Japanese production is *S. dumerili*, with very little *S. rivoliana*. However, the SC was not able to obtain any information from Japanese producers on FM or FO inclusion rates or economic Feed Conversion Ratios (eFCRs) for either species, most probably because the large proportion of the diet for these fish is moist pellet or wet fish, rather than extruded pellets.

The only reliable data that the SC had access to for either of these species beyond Japan was the Kona Blue Water Farms operation, which has since transitioned ownership to Blue Ocean Mariculture. This one site produced—at most—500 metric tons in a year, but had been able to achieve an eFCR of around 1.8 for the better cohorts of fish, using an extruded pellet diet with 30% fishmeal inclusion. This would have resulted in an FFDR of 2.43. The range of FFDR in the Hawaii operation had historically varied between 1.8 and 3.6, for fish that were harvested in the 2 – 2.5 kg

²⁰ Miranda and Peet, 2008a. *Seriola*, Worldwide.

range.

An achievable FFDR for Kampachi – assuming they are fed with extruded pellet diets, and harvested at an optimum size - is therefore 2.9, for both FM and FO. Attaining this target will require Japanese operators to change from use of wet fish or moist pellet diets to extruded pellets that have some substitution of alternative proteins and oils for the wild-sourced FM and FO, and to harvest the fish at a size less than 3 kg. These are achievable, but still desirable goals for these initial requirements to effect some meaningful change in production methods, and some lessening of impacts. Further tightening of these metrics should be possible with time, as the industry in Japan and elsewhere begins to focus more on continuous improvement in efficiencies.

FFDR justification for Hamachi (*Seriola quinqueradiata*):

The FFDR is based on an extensive review of data of the better performers in key production regions, particularly Japan, where the vast majority of the world's Hamachi is produced. The recommendation for this metric is based on the current best available data and the knowledge that further fish oil replacement of 25% would not pose a risk to fish. In addition to published data (mainly for young fish in laboratory), the SC collected data on *S. quinqueradiata* from major Japanese feed manufactures. When rearing fish to shipping size of 5.0 to 6.0 kg, the eFCR varies 3.0 to 6.0, and FM% and FO% varies between 48% and 53% and between 19% and 22% respectively. Therefore, at eFCR=3.0, FM%=48 and FO%=19, FFDR_m is 6.0 and FFDR_o is 7.0. At three years later, the SC expects that producers could reduce FM% and FO% at least to 80% of the present level, that is FM%=38.4 and FO%=15.2. Therefore, the SC set FFDR_m and FFDR_o after 3 years of SCAD standards publication at 4.8 and 5.0 respectively. Currently, Japanese feed manufacturers are developing environmentally/economically efficient feed for *Seriola* by reducing FM/FO% and using processing trimmings (e.g., <http://www.allaboutfeed.net/Home/General/2010/6/How-low-can-you-go-with-fishmeal-AAF004559W/>).

FFDR justification for cobia:

Further stakeholder outreach by the SC revealed that the FFDR numbers for cobia originally proposed in the first draft of the SCAD were representative only of smaller-scale experimental type systems. Commercial ocean-based cobia culture is a relatively new industry, and feed formulations and strategies are evolving rapidly. Given the early stage of these developments, feed efficiency has not yet reached the levels of other farmed fish species which have been cultured longer.

The cobia industry is more difficult to define, and is less developed than the *Seriola* industry. There is no association representing this species. There are producers in China, Taiwan and Panama, with some additional smaller scale projects in other regions. The latest information indicates an annual cobia production rate out of Asia (mainly China) of approximately 30,000 metric tons. As far as can be determined, the majority of the producers in China and Taiwan use wet fish during some or all of the production cycle. When pellet feeds are used, the formulations usually use high fishmeal inclusion levels. FCRs of 1.5-2.0 therefore yield a FFDR from 4-10. An additional 1000 metric tons of cobia is produced in Vietnam, with similar diets, but not as much wet fish.

Production of cobia in the Americas is an additional 1000 metric tons annually. Currently, the FFDR for these facilities, utilizing extruded diets, (no wet fish), with 35 – 40% fish meal and 10% fish oil, ranges between 5.5 and 7.8, depending on the size of the fish and the amount of fish meal and fish oil used in the specific feed formulations. Several trials are underway at the University of Miami - these include consumption statistics on 1 kg and 3 kg fish, energy analysis, ingredient digestibility and assessment of several diets as well as trials on a range of different ingredients to assess substitution potential. Early findings are that maturation has a large effect on FCRs. The market demand for larger fish has complicated this factor.

Given the above evidence of industry-standards, the SC considered that a FFDRm and FFDRo of 6.0 would be achievable by the more conscientious producers, using formulated pellet diets (no wet fish) with some substitution of fishmeal and fish-oil. This would encourage participation in certification by the better producers, and would affect real change on the water.

Auditing guidance

The feed supplier must document inclusion rates for fishmeal and fishoil for the actual diet. The producer must show records of feed purchases and fish sales. See Appendix 1 for detailed information on FFDR calculation methodology.

Criterion 4.3 Responsible origin of marine raw materials

[Note: In November 2016 ASC published an Interim Solution for ASC Marine Feed Ingredients, which will replace indicators 4.3.1 and 4.3.2 of this standard. This solution applies to all ASC’s standards, which have indicators for marine raw material origin, including this ASC Seriola and Cobia Standard. This interim solution will apply until the ASC Feed Standard will be available or until further official and public notice by ASC.]

INDICATOR	REQUIREMENT
4.3.1 Timeframe for at least 90% fishmeal or fish oil used in feed to come from fisheries ²¹ certified under an ISEAL member’s accredited certification whose primary goal is to promote ecological sustainability	Within 5 years following the date of the publication of the ASC Seriola and Cobia Standard [see note above]
4.3.2 Prior to achieving 4.3.1 the fishmeal or fish oil used in feed must have a FishSource score of 6.0 or higher, and an 8 in the biomass category or show evidence of being engaged in a credible and time bound fisheries improvement project (FIP)	At least 80% of the fish meal and fish oil used in feed (excluding fishmeal and oil from byproducts) must meet this criteria [see note above]
4.3.3 Feed containing fishmeal and/or fish oil originating from by-products ²² or trimmings from fish species which are categorized as vulnerable, endangered	None

²¹ This requirement applies to fishmeal and fish oil from forage fisheries and not to by-products or trimmings used in feed.

²² 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.

or critically endangered, according to the IUCN Red List of Threatened Species ²³	
4.3.4 Feed ingredients which come from other fish from the same genus	None

Rationale-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.

Ultimately, the requirements will use marine ingredients certified by a widely recognized authority, such as the Marine Stewardship Council (MSC) or another standard, as the best option available to promote responsible catch. In addition to the MSC standard, other standards developed by an ISEAL member that promote the ecological sustainability of pelagic fisheries as a primary focus could qualify.

Given the current modest supply of MSC certified sources of fishmeal and fish oil, the SCAD proposes to restrict fisheries currently known to have the poorest status from being used for fishmeal and fish oil used in the feed. This will be achieved by requiring the vast majority of marine ingredients to come from a fishery that receives a minimum score of 6 using the FishSource methodology. The standard requires 80% of the fishmeal and fish oil to meet the FishSource score because the products are sold as blends, where the origin of fisheries can come from multiple fisheries (for further information see Appendix 2 and the scheme website: www.FishSource.com).

These standards support the use of marine trimmings and by-products, as long as they don't originate from fisheries targeting endangered or vulnerable species. The SCAD Steering Committee seeks to encourage the use of fishmeal and fish oil derived from by-products from phylogenetically distinct species. These represent sustainable, underutilized resources.

Even in the presence of an ISEAL member certification scheme for forage fisheries, many stakeholders believe that growth in marine fish production must be accompanied by reduced reliance on globally finite wild forage species. This reduction is already happening due to market realities of supply and demand for fishmeal and fish oil. However, the rate of growth is offsetting these per capita improvements, resulting in greater aggregate reliance on forage fish (Naylor et al. 2010).

Forage fisheries serve multiple purposes, being both ingredients for fish feeds as well as direct food items for humans. Most forage fisheries are reasonably biologically resilient (i.e., rapid life cycles, early age at maturity, highly fecund and can be harvested by low impact gears) and important sources of EPA/DHA that are important for human health and cognitive development. Particularly in developing countries and within local economies, forage fish such as anchovies, sardines and mackerel can be important parts of a healthy diet including sources of protein and essential fatty acids. Conversion of wild fish, used for subsistence, into farmed fish represents a meaningful issue of equity and food security. By minimizing forage fish inclusion rates, these requirements acknowledge this issue and will strive to optimize use of resources allocated to aquaculture.

²³ International Union for the Conservation of Nature (IUCN) reference at <http://www.iucnredlist.org/static/introduction>.

Some stakeholders in other Dialogues have argued against including FFDR requirements. For these stakeholders, once a feed source becomes a certified responsible fishery, farms should feel free to use it. Also, limiting aquaculture from using fishmeal and fish oil from responsible sources may be globally inefficient, given that other users (such as livestock farmers) who are less efficient than fish farmers at producing protein, would likely use it instead. Limiting amounts of marine ingredients also has implications for feed retention, digestibility and a farmed fish’s nutritional value.

Criterion 4.4 Responsible origin of non-marine raw materials in feed

INDICATOR	REQUIREMENT
4.4.1 Presence and evidence of traceability and a responsible sourcing policy for the feed manufacturer for feed ingredients which comply with internationally recognized moratoriums and local laws ²⁴	Yes
4.4.2 Documentation of the use of transgenic ²⁵ plant raw materials, or raw materials derived from genetically modified plants, in the feed	Yes
4.4.3 Percent of non-marine ingredients from sources certified by an ISEAL Member’s certification scheme that addresses environmental and social sustainability	80% for soy and palm oil within 5 years following the date of the publication of the ASC Seriola and Cobia Standard

Rationale-The ASC Seriola and Cobia Standard encourages the use of non-marine protein and lipid sources as a key method to reduce the dependence upon fishmeal and fish oil in the culture of Seriola and cobia. However, the sourcing of non-marine raw materials must take into account their culture areas and production methods—these must be sustainably secure and respect the environment within which they are raised. Products from conservation and biodiversity hotspots (for example the Amazon rainforest) must not be allowed under the ASC Seriola and Cobia Standard.

While the use of genetically modified organisms (GMOs) in feed is allowed, it must be

²⁴ 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.

²⁵ Transgenic: containing genes altered by insertion of DNA from an unrelated species. Taking genes from one species and inserting them into another species to get that trait expressed in the offspring. The SC notes that there is currently no credible evidence of food safety or environmental detriment from GMO applications.

acknowledged. Transgenic plants are commonly used in aquaculture and animal feeds throughout the world, yet some consumers and retailers want to be able to identify food products, including farmed fish, that are genetically modified or that have been fed genetically modified ingredients. Documentation of the use of GMOs (such as Roundup Ready soybeans), can be obtained from the feed manufacturer. This is not an onerous or unrealistic demand for a fish producer to make to their feed producer since the purchase, use and manufacture of a non-GMO sourced complete feed (i.e., organically certified feed) would require much more stringent documentation and disclosure by the feed manufacturer to meet that particular certification.

The requirements ensure transparency (above one percent volume) around any transgenic material used in the feed in order to support informed choices by retailers and consumers. The ASC Seriola and Cobia Standard also requires that the producers disclose to the first-order buyer of their Seriola or cobia the use of any genetically modified ingredients in feed, and publicly disclose whether transgenic ingredients are used.

The SCAD does not preclude the use of terrestrial protein byproducts in fish feed. Indeed, we would encourage the use of such products within normal standards of nutrition for the fish and human health for the consumer. These requirements assume that feed producers are following local regulations around food safety when incorporating land-animal by-products into feed. Retailers or importing countries remain free to formulate their own standards in relation to use of land-animal byproducts in feeds. We believe that it is critical to focus these requirements on encouraging reduced reliance on forage fish resources, and this goal can only be achieved through the judicious and conscientious use of appropriately sourced, sustainably produced alternate protein and lipid sources. Other mechanisms are more appropriate for influencing standards for sustainable production of agricultural proteins and oils.

Feed ingredients sourced from areas where significant ecological damage has occurred was of concern to the SCAD SC. Therefore, the standard requires producers to source feed from feed producers who comply with any relevant, recognized crop moratoriums that, at the time of the writing of these requirements, includes only the Brazilian Soy Moratorium, as far as the SCAD SC understands. Such moratoriums are temporary measures intended to protect defined geographic regions. Looking to the future, the SCAD SC intends to incorporate a requirement for feed manufacturers to use soy certified to an ISEAL member scheme, which the SCAD recognizes as the most environmentally meaningful certification process today. Because these schemes are recently starting up, the requirement builds in a five-year window for this requirement to be met.

PRINCIPLE 5: PROACTIVELY MAINTAIN THE HEALTH AND WELFARE OF CULTURED FISH AND MINIMIZE THE RISK OF DISEASE TRANSMISSION

There are three primary mechanisms by which fish health management on marine fish farms may negatively impact the environment: proliferation of pests and parasites on the farm may create a vehicle for increased prevalence of diseases among wild fish; use of prophylactic antibiotics or improper use of other therapeutants may result in development of resistance to the treatment; and use of some therapeutants may lead to contamination of farm effluents. In keeping with the SCAD focus on those criteria which most need to be addressed, and which we can most impact, the principle of fish health therefore focuses on indicators for these three criteria. This is not to suggest that the SCAD is unconcerned with issues of fish welfare, or responsible overall approaches to farm biosecurity and fish health management. However, these are secondary concerns. We earnestly believe that the SCAD should focus on the most important issues for each principle.

These requirements do not seek to address all issues relating to fish welfare (for example, harvesting of fish using humane slaughter). These issues are not addressed here because the SCAD Steering Committee considered it to be outside the scope of social and environmental standards. Separate standards are available for certification of humane treatment.

Criterion 5.1 Transfer of pests or parasites to wild stocks

INDICATOR		REQUIREMENT
5.1.1.	Commitment to participate in an Area-Based Management (ABM) scheme	The farm participates in an ABM, where it exists, for managing disease and resistance to treatments
5.1.2	A demonstrated commitment ²⁶ to collaborate with NGOs, academics and governments on areas of mutually agreed research to measure possible impacts of pests or parasites on wild stocks	Yes
5.1.3	On-farm testing for ectoparasites, with test results made easily publicly available ²⁷	Yes, with results made easily publicly available within seven days of testing

²⁶ Commitment: at a minimum, a farm and/or its operating company must demonstrate this commitment through providing farm-level data to researchers, granting researchers access to sites, or other similar non-financial support for research activities.

²⁷ Posting results on a public website is an example of “easily publicly available.”

Rationale-Farming of fish can lead to an increased risk of aquatic diseases in the environment.. Marine fish producers should naturally want to optimize fish health on the farm site, due to the dramatic impacts this has on economic viability. We do not want to restrict how marine fish producers innovate around the challenge of optimizing fish health on the farm site, so long as there is negligible risk to wild stocks.

Criterion 5.2 Chemicals and treatments

INDICATOR	REQUIREMENT
5.2.1 Use of therapeutic treatments that are banned by law under the local jurisdiction or listed as critically important for human medicine by the World Health Organization ²⁸	Not permitted
5.2.2 Prophylactic use of chemical antimicrobial treatments (excluding prebiotics or vaccinations)	Not permitted
5.2.3 Farms have a comprehensive fish health management plan approved by the farm's designated veterinarian that includes either a) vaccination against diseases that present a risk in the region and for which an effective and commercially viable vaccine exists, or b) veterinarian-approved alternative fish health management strategies	Yes
5.2.4 Allowable farm level anti-parasiticide treatment, not including freshwater, formaldehyde ²⁹ or hydrogen peroxide	None ³⁰

Rationale-The SC considered the comprehensive review undertaken by the Salmon Aquaculture Dialogue (Burrige, Weis, Cabello and Pizarro, 2008).

The use of certain therapeutic treatments may impact upon human health or have a damaging effect on the aquatic environment, both in terms of water quality and direct impact on flora and fauna. It is appropriate that a comprehensive fish health management plan is in place that tracks

²⁸ refer to <http://www.who.int/foodsafety/publications/antimicrobials-third/en>.

²⁹ In countries where formaldehyde is banned, its use would not be permitted under Principle 1, obey all laws takes precedence.

³⁰ The SC believes that the ASC can make an exception for benign treatments. The burden of proof for a benign treatment that has no impacts on the surrounding environment or species is the responsibility of the producer.

and investigates mortalities and includes either vaccination procedures or alternative methods approved by the farm’s veterinarian. In the interest of environmental monitoring and product traceability, all chemical treatments must be recorded in a special file or treatment log made available to auditors.

This Principle does not consider the broader impacts of therapeutants on the surrounding ecosystem, as these impacts should be more properly considered under the criteria for Principle 2.

Criterion 5.3 Environmental welfare

INDICATOR	REQUIREMENT
5.3.1 Weekly average percent dissolved oxygen (DO) saturation on farm, calculated in the following methodology (<i>see in guidance section below</i>)	≥ 70% saturation ³¹
5.3.2 Maximum percentage of weekly samples from 5.3.1 that fall under 70%	5%

Rationale-Water quality is essential for the health of farmed *Seriola* and *cobia* as well as wild species surrounding a farm. One component of water quality, dissolved oxygen (DO), is particularly critical for the survival and good performance of farmed *Seriola* and *cobia*. As a result, most farms regularly measure DO. DO saturation³² (%) naturally fluctuates in the environment. This is due to a range of factors, including temperature, time of day and upwelling of oxygen-poor waters from deep in the ocean. Low DO levels can also be a sign of excessive nutrient loading. DO provides a useful overall proxy for a water body’s ability to support healthy biodiversity and supplements the benthic indicators that will also pick up excessive nutrient loading.

Seriola and *cobia* ideally need a % saturation of dissolved oxygen over 70% to avoid any possible stress, although they are able to live under lower oxygen concentrations, particularly if only for short periods of time. Under routine production, the average minimum percent saturation of DO in the water column should be above 70%. Measuring DO as a percent saturation takes into account salinity and temperature at the farm site. Compliance with the ASC *Seriola* and *Cobia* Standard will limit the number of low DO readings in the water column below 70% for open net pen systems and land-based systems, with less than 5% incidence rate, which will allow for periodic physical phenomena, such as upwelling. For exceptions to this standard, DO levels must be determined as

³¹ Exception if farm can document evidence that DO levels do not represent stress to cultured animals, as evidenced by DO levels being monitored with a DO meter regularly, with a frequency determined by a qualified veterinarian and remaining above the minimum level, as determined by the designated veterinarian. To determine stress levels, the veterinarian should examine stress hormone levels, FCR, growth rate

³² Percent saturation: percent saturation is the amount of oxygen dissolved in the water sample compared to the maximum amount that could be present at the same temperature and salinity.

non-stressful to fish by a qualified veterinarian (see footnote below). Some farms may be located in places with non-farm related low oxygen saturation.

Dissolved Oxygen Rationale. Note: The SC debated the inclusion of dissolved oxygen (DO) as an indicator in Principle 2 but ultimately decided to include the indicator under Principle 5 as the most significant impact of DO in *Seriola* and *Cobia* farm production systems is on fish health rather than directly on the environment. DO is a valuable indicator of responsible production management.

Guidance

Methodology for sampling dissolved oxygen (indicator 5.3.1 and 5.3.2).

These indicators require the sampling of dissolved oxygen on the farm site and the calculation of the percent saturation for those samples.

- DO shall be measured twice daily (proposed at 6 am and 3 pm—with recognition that this will vary depending on region and operational practices). Percent saturation shall be calculated for each sample from the data and a weekly average percent saturation shall result.
 - A minimal amount of missed samples due to extreme weather conditions will be considered acceptable.
 - Sampling once daily shall also be considered acceptable, though not preferred.
- DO shall be measured at a depth of 5 meters at a location where the conditions of the water will be similar to those the fish experience. For example, measurements can be taken at the edge of the net-pen array, in the downstream direction of the current, or off of a feed shed or housing structure on the site. Measurements shall be taken at the same location at the same time to allow for comparison between days.
- Weekly averages shall be calculated and remain at or above 70% saturation.
- Should a farm fall below the 70% weekly average, demonstration of consistency of percent saturation with a reference site.
- The reference site shall be at least 500 meters from the edge of the net-pen array, in a location that is understood to follow similar patterns in upwelling to the farm site and is not influenced by nutrient inputs from anthropogenic causes including aquaculture, agricultural runoff, or nutrient releases from coastal communities.

PRINCIPLE 6: OPERATE FARMS WITH RESPONSIBLE LABOR PRACTICES

Aquaculture, as any agricultural production system, often requires intensive labor. The labor requirements in this document are based on the core principles of the International Labor Organization (ILO) as well as other matters on which the United Nations has agreed, which are considered to be the fundamental rights of individuals. Particularly in developing countries, workers often live on or near the farm in a rural environment lacking good infrastructure and living conditions.³³ The criteria and indicators under this principle apply to all hired workers (temporary and/or permanent; with or without written contract). Conditions for so-called ‘family-workers’ must be comparable to those for the formally employed, but the ASC Seriola and Cobia Standard recognizes the more flexible arrangement between employer and worker in this case.

Criterion 6.1 Child labor and young workers³⁴

INDICATOR	REQUIREMENT
6.1.1 Number of incidences of child labor	None
6.1.2 Percentage of young workers that are protected ⁽³²⁾	100%

³³ Please note that many countries have national laws that address labor issues rigorously and intensively, however this is not consistent in a global context. Addressing these key issues in aquaculture is critical, given the important human rights implications and proven societal benefits of labor standards related to poverty, sustainable economic growth, good governance and political stability. The labor requirements in this document help ensure that all aquaculture operations certified against the ASC Seriola and Cobia Standard have reduced or eliminated the potential impacts of key labor issues associated with production. Moreover, the ASC Seriola and Cobia Standard labor requirements are based on the core principles of the International Labor Organization (ILO): freedom of association, the right to collective bargaining, prohibition on forced labor, prohibition on child labor, and freedom from discrimination, as well as the other elements that are considered to be the fundamental rights at work: fair wages and working hours, decent health and safety conditions and non-abusive disciplinary practices. Social Accountability International (SAI), an international and renowned social standards/labor NGOs, worked with the Dialogues to recommend ways to best align the requirements with best practice labor standards, including ILO conventions.

³⁴ Child labor: refers to any work by a child younger than the age specified in definition of a child, except for light work as provided for by ILO Convention 138, article 7. The conventions permit children between 15 and 17 to work on farms, provided that time for school and play is guaranteed and children are excluded from hazardous, abusive and physically hard work.

Protected: workers between 15 and 18 years of age will not be exposed to hazardous health and safety conditions; working hours shall not interfere with their education and the combined daily transportation time and school time, and work time shall not exceed 10 hours.

Rationale-Adherence to the child labor codes and definitions included in this section indicates compliance with what the ILO and related international conventions generally recognize as the key areas for the protection of children³⁵ and young workers³⁶. 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 should never be exposed to work or working hours that are hazardous to their physical or mental well-being. To this end, the requirements related to what constitutes child labor are intended to protect the interests of children and young workers in certified aquaculture operations.

Guidance for implementation:

1. The minimum allowable age of permanent workers is 15 years old. If the legal minimum age allowed in the country is higher than 15, the legal minimum age of the country is followed. (Note: employer is accountable for employee age documentation. In most countries, the law states that the general minimum age for employment is 15 years.)
2. Child workers above the age of 15 perform only light work.³⁷ According to the ILO convention 138, Article 7.1: light work is defined as work that is 1) not likely to be harmful to a child's health or development and 2) not likely to prejudice their attendance at school, participation in vocational orientation or training programs, or diminish their capacity to benefit from instruction received (as long as it does not exceed 2 hours per day on school days or holidays). Also, the total number of hours spent on light work and on school shall not exceed 7 hours per day. (Note: Per ILO Convention 138, Article 7.4: Some developing countries may apply for an exception to the minimum age, thereby defining 12 as the minimum age for light work by children and 14 for the minimum age for young workers; however, few, if any countries still invoke this clause.)
3. For employees aged 15-17 (young workers), work shall not conflict with schooling. The combined daily transportation time, school time and work time shall not exceed 10 hours. Hazardous work³⁸ (e.g., heavy lifting disproportionate to a person's body size, operating heavy machinery, working night shifts, and exposure to any toxic chemicals) is not performed by those under the age of 18.

³⁵ Child: any person less than 15 years of age, unless local minimum age law stipulates a higher age for work or mandatory schooling, in which case the higher age would apply. If however, local minimum age law is set at 14 years of age in accordance with developing country exceptions under ILO Convention 138, the lower age will apply.

³⁶ Worker (Young worker): Any worker or employee between the age of child as defined and under the age of 18.

³⁸ Hazardous work: work which, by its nature or circumstances in which it is carried out, is likely to harm the health, safety or morals of workers.

Criterion 6.2 Forced, bonded or compulsory labor³⁹

INDICATOR		REQUIREMENT
6.2.1	Number of incidents where employers withhold any part of worker salary, property, or benefits upon termination of employment	None
6.2.2	Number of incidents where employees are required to surrender original identity documents upon commencing employment (except as required for processing of legal documentation)	None

Rationale-Forced labor⁴⁰—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 workers⁴¹ is critical to determine that labor is not forced. The inability of a worker / employee to freely leave the workplace and/or an employer⁴² withholding original identity documents of employees / workers are indicators that employment may not be at-will. Employees shall always be permitted to leave the workplace and manage their own 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.

Guidance for implementation

6.2.1 Forced, bonded or compulsory labor:

1. Contracts shall be clearly stated and understood by employees/workers and never lead to an Employee/worker being indebted, such as employees paying for essential job training programs;
2. Employees/workers shall be free to leave the workplace and manage their own time;
3. The employer shall never be permitted to withhold an employee's / worker's original identity documents.

³⁹ Bonded Labor: when a person is forced by the employer or creditor to work to repay a financial debt to the crediting agency.

⁴⁰ 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 him/ 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 (withholding of identity documents)

⁴¹ Worker or Employee: a worker or employee is a person who enters an agreement, which may be formal or informal, with an enterprise to work for the enterprise in return for remuneration in cash or in kind. An 'employee' or 'worker' is anyone working on the farm, whether directly employed or indirectly via for example a sub-contractor. The terms worker and employee are considered the same in this standard.

⁴² Employer: employers are those workers who, working on their own account or with one or a few partners, hold the type of job defined as a self-employed job, and in this capacity, on a continuous basis (including the reference period) have engaged one or more persons to work for them in their business as employees.

Criterion 6.3 Discrimination⁴³ in the work environment

INDICATOR	REQUIREMENT
6.3.1 Evidence of comprehensive and pro-active anti-discrimination policies, procedures and practices including but not limited to, discrimination in the workplace and equal access to all jobs in relation to gender, age, race, religion, creed, caste, or sexual orientation	Yes
6.3.2 Number of confirmed incidences of discrimination	None
6.3.3 Equality of pay, benefits and promotion opportunities for all workers independent of gender, age, race, religion, creed, caste or sexual orientation	Yes
6.3.4 Number of incidents where employers dismiss a worker on the basis of marital status or pregnancy or deny employee legal rights to pregnancy or maternity leave	None

Rationale-Unequal treatment of employees / workers, based on certain characteristics (such as sex or race), is a violation of 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.

To ensure that discrimination does not occur at certified aquaculture farms, employers must prove their commitment to equality with an official antidiscrimination policy, a policy of equal pay for equal work and 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 a minimization of discrimination. Differences in quality of work between equal workers can be rewarded through discretionary bonus payments on top of regular salary.

Guidance for implementation

6.3.1 Discrimination in the work environment:

Evidence of proactive anti-discrimination policies/practices

⁴³ Discrimination: any distinction, exclusion, or preference, which 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.

1. Employers shall have written anti-discrimination policies stating the company does not engage 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.
2. Clear and transparent company procedures are outlined to raise/file and respond to discrimination complaints.
3. Employers shall respect the principle of equal pay for equal work. Worker shall be able to support that the company is adhering to the above policies and practices.

Criterion 6.4 Work environment health and safety

INDICATOR		REQUIREMENT
6.4.1	Percentage of employees / workers trained in health and safety practices, procedures and policies relevant to the job	100% in operations above five workers ⁴⁴
6.4.2	Safety equipment (Personal Protective Equipment, PPE) provided and maintained and in use	Yes
6.4.3	All health and safety related accidents and violations are recorded and corrective actions taken when necessary	Yes
6.4.4	Evidence of employer responsibility and/or proof of insurance (accident or injury) for 100% of worker costs in a job-related accident or injury when not covered under national law	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. Some of the key risks to employees / workers include workplace hazards⁴⁵ and accidents that can result in injury. Consistent and effective worker training in health and safety practices are an important preventative measure,

⁴⁴ Certificate of training issued by the relevant competent national or provincial authority or by such authority's recognized training center, or evidence of adequate on the job training for health and safety practices. For any employee involved in diving work there must be evidence of adequate training from an appropriate national or commercial authority, e.g. NAUI, PADI.

⁴⁵ Hazard: the inherent potential to cause injury or damage to people's health—for instance unequipped to handle heavy machinery safely / unprotected exposure to harmful chemicals.

as is providing workers proper equipment for the job. 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. These requirements address violations as well as the long-term health and safety risks. Finally, while many national laws require that employers assume responsibility for job-related accidents/injuries, not all countries require this and not all employees (e.g., migrant and other workers) will be covered under such laws. When not covered under national law, employers must prove they are insured to cover 100% of employee costs in a job-related accident or injury.

Guidance for implementation

6.4.1 Work environment health and safety:

Workers trained in health and safety practices, procedures and policies

1. Minimization of hazards/risks in the working environment, including documented systemic procedures and policies to prevent workplace hazards and their risks, shall exist and the information shall be available to employees.
2. Emergency response procedures shall exist and be known by employees.
3. Offer regular health and safety training for employees, including training on potential hazards and risk minimization.
4. Consistent and effective employee training in health and safety practices are an important preventative measure, as is providing employees with proper equipment for the job.
5. 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.
6. A proactive, preventative policy should identify potential hazardous situations, analyze the associated risk and define and implement corrective actions. It is important for employees and employers to collaborate in this process.

Determining occurrences of health and safety related accidents and incidents are documented and corrective actions taken

1. At a minimum, all job-related accidents that require professional medical attention shall be documented. Documentation shall be generated with regards to occupational health and safety violations.
2. A corrective action plan shall be implemented in response to job-related accidents and violations of safety practices that have occurred. This needs to analyze and address the root causes and prevent future risks or accidents of a similar nature.

6.4.2 Proof of accident insurance:

The documents pertaining to worker insurance can be verified with the indicated insurance company.

Criterion 6.5 Wages

INDICATOR		REQUIREMENT
6.5.1	Percentage of workers whose basic wage ⁴⁶ (before overtime and bonuses) is below the minimum wage ⁴⁷	0%
6.5.2	The percentage of workers whose basic wage (before overtime and bonuses) is below the basic needs wage ⁴⁸ , 5 years after adoption of the standard	0%
6.5.3	Evidence of transparency in wage-setting and rendering	Yes

Rationale-Wages and the process for setting wages are important components of the ILO core principles. For this reason, it is important to highlight under these requirements the importance of workers' basic wages meeting the legal minimum wage and being rendered to workers in a convenient manner. Unfortunately, minimum wage in many countries does not always cover the basic needs of workers.

Unfairly or insufficiently compensated workers can be subject to a life of sustained poverty. Therefore, it is important for socially responsible employers to pay or be working toward paying a basic needs wage. The calculation of a basic needs wage can be complex, and it is important for employers to consult with workers, their representatives and other credible sources when assessing what a basic needs wage would be.

Certified Seriola and cobia farms 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. Having these policies outlined in a clear and transparent manner will empower the workers to negotiate effectively for fair and equitable wages that shall, at a minimum, satisfy basic needs.

⁴⁶ Basic wage: the wages paid for a standard working week (no more than 48 hours).

⁴⁷ If there is no legal minimum wage in a country, basic wages must meet the industry-standard minimum wage.

⁴⁸ Basic needs wage: a wage that covers the basic needs of an individual or family, including housing, food, and transport. This concept differs from a minimum wage, which is set by law and may or may not cover the basic needs of workers.

Criterion 6.6 Access to freedom of association and the right to collective bargaining

INDICATOR		REQUIREMENT
6.6.1	Percentage of employees with access to trade unions, worker organizations, and/or the ability to self-organize as well as the ability to bargain collectively or access the representative(s) chosen by workers without management interference	100%
6.6.2	Incidences of members of unions or worker organizations being discriminated against	None

Rationale-Having the freedom to associate and bargain collectively⁴⁹ is a critical right of workers, because it allows workers 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 aquaculture operation must be in a trade union or similar organization, no workers will be prohibited from accessing such organizations 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.

Guidance for implementation

6.6.1 Freedom of association and collective bargaining:

Determining the percentage of employees with access to trade unions, and the ability to bargain collectively, and or worker access to the appropriate representative(s) chosen by workers without management interference.

1. Companies shall ensure that workers interested in collective bargaining or joining a union or worker organization of their choice are not subjected to discrimination. When rights are restricted, the company should make it clear to workers that they are willing to engage with workers in collective dialogue through representative structure and that they will allow workers to freely elect their own representatives.
2. Workers have the freedom to form and join any trade union or worker organization, free of any form of interference from employers or competing organizations set up or backed by the employer. The ILO specifically prohibits “acts which are designated to promote the establishment of worker organizations or to support worker organizations by financial or

⁴⁹ Bargain collectively: voluntary negotiation between employers and organizations of workers in order to establish the terms and conditions of employment by means of collective (written) agreements.

other means, with the object of placing such organizations under the control of employers or employers’ organizations.”

3. Evidence provided will be cross-checked with the indicated union or by the organization chosen by the worker.

Criterion 6.7 Harassment and disciplinary practices in the working environment causing temporary or permanent physical and/or mental harm

INDICATOR		REQUIREMENT
6.7.1	Incidences of excessive or abusive ⁵⁰ disciplinary actions	None
6.7.2	Evidence of clear, fair and transparent disciplinary procedures documented and communicated to employees	Yes
6.7.3	Evidence that allegations of harassment are recorded and addressed with corrective actions	100%

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 worker. A certified aquaculture operation shall never employ threatening, humiliating or punishing disciplinary practices that negatively impact a worker’s physical and/or mental health or dignity. Employers that support non-abusive disciplinary practices as described in the accompanying guidance, accompanied by evidence from worker testimony, shall indicate that a certified aquaculture operation is not employing abusive disciplinary practices.

⁵⁰ Physically or mentally. Mental abuse: characterized by the intentional use of power, including verbal abuse, isolation, sexual or racial harassment, intimidation, or threat of physical force.

If disciplinary action is required, progressive verbal and written warnings shall be issued. The aim shall always be to improve the worker; dismissal shall be the last resort. Policies for bonuses, incentives, access to training and promotions are clearly stated and understood, and not used arbitrarily. Fines or basic wage deductions shall not be acceptable disciplinary practices.

Guidance of implementation

6.7.1 Disciplinary actions in the work environment:

Determining incidences of abusive disciplinary actions

There shall be absolutely no engagement in or support of corporal punishment, mental or physical coercion or verbal abuse. Fines or wage deductions shall not be acceptable as a method for disciplining workers, as indicated by policy statements and evidence from worker testimony. If there has been an exceptional, isolated incidence of abuse, there must be evidence that the company has responded appropriately and such incidents do not re-occur.

Evidence of non-abusive disciplinary policies and procedures

If disciplinary action is required, progressive verbal and written warnings shall be used. Aim should always be on improving the worker before letting him/her go, as indicated by policy statements, personnel records and evidence from worker testimony.

Criterion 6.8 Working hours and overtime

INDICATOR		REQUIREMENT
6.8.1	Incidences, violations or abuse of working hours or overtime laws	None
6.8.2	Overtime is limited, voluntary, paid at a premium rate and restricted to exceptional circumstances	Yes

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, workers in certified Seriola and cobia farms are permitted to work— within defined guidelines—beyond normal work week hours, but must be compensated at premium rates. Requirements for time off, working hours and compensation rates as described should reduce the impacts of overtime.

In cases where local legislation on working hours and overtime exceed internationally accepted recommendations (48 regular hours, 12 hours overtime), the international standards will apply.

Criterion 6.9 Contracts or other written employment agreements

INDICATOR		REQUIREMENT
6.9.1	Percentage of workers who have contracts or other written employment agreements	100%
6.9.2	Evidence of a policy to ensure social compliance of its suppliers and contractors when operating on the farm site	Yes

Rationale-Fair contracting is important to ensure transparency between the employer and employee and fairness in the employment relation. Short-term and temporary contracts are acceptable but cannot be used to avoid paying benefits or to deny other rights. The company shall also have policies and mechanisms to ensure that workers contracted from other companies for specific services (e.g., divers, cleaning or maintenance) and the companies providing them with primary inputs or supplies have socially responsible practices and policies.

Criterion 6.10 Conflict resolution

INDICATOR		REQUIREMENT
6.10.1	Evidence of worker access to effective, fair and confidential grievance procedures	Yes
6.10.2	Percentage of grievances handled that are addressed ⁵¹ within a 90-day timeframe	100%

Labor-only contracting relationships or false apprenticeship schemes are not acceptable. This includes revolving/consecutive labor contracts to deny benefit accrual or equitable remuneration. False Apprenticeship Scheme: The practice of hiring workers under apprenticeship terms without stipulating terms of the apprenticeship or wages under contract. It is a “false” apprenticeship if its purpose is to underpay people, avoid legal obligations or employ underage workers. Labor-only contracting arrangement: The practice of hiring workers without establishing a formal employment relationship for the purpose of avoiding payment of regular wages or the provision of legally required benefits, such as health and safety protections.

⁵¹ Addressed: acknowledged and received, moving through the company’s process for grievances, corrective actions taken when necessary.

Rationale-Companies must have a clear labor conflict resolution policy in place for the presentation, treatment and resolution of worker grievances in a confidential manner. Workers shall be familiar with the policy and its effective use. Such a policy is necessary to track conflicts and complaints raised, and responses to conflicts and complaints.

Criterion 6.11 Living conditions for employees accommodated on the farm

INDICATOR	REQUIREMENT
6.11.1 Farm employees accommodated on the farm have access to clean, sanitary, safe and suitable living conditions	Yes
6.11.2 Existence of separate sanitary and toilet facilities for men and women; with the exception of work sites with fewer than 10 employees or where married couples are working and accommodated together	Yes

Rationale-The protection of the workers that reside or live on the farm’s property is an integral part of the employer’s responsibility. To maintain the health and performance of workers, farms will provide clean, sanitary and safe living quarters with access to clean water and nutritious meals. Accommodation facilities must provide for the needs of those (presumably, but not exclusively, women) who can be considered at risk of sexual or privacy harassments.

PRINCIPLE 7: BE A GOOD NEIGHBOR AND CONSCIENTIOUS CITIZEN

Principle 7 aims to address any broader off-site potential social impacts associated with Seriola and cobia production, including interactions with local communities.

Criterion 7.1 Community engagement and effective conflict resolution

INDICATOR		REQUIREMENT
7.1.1	Evidence of regular and meaningful ⁵² consultation and engagement with community representatives and organizations	Yes
7.1.2	Presence and evidence of an effective ⁵³ policy and mechanism for the presentation, treatment and resolution of complaints by community stakeholders and organizations	Yes

Rationale- Seriola and cobia farms must respond to human concerns that arise in communities located near the farm, and to concerns related to the farm's overall operations. In particular, appropriate consultation must be undertaken within local communities so that risks, impacts and potential conflicts are properly identified, avoided, minimized and/or mitigated through open and transparent negotiations. Communities shall have the opportunity to be part of the assessment process (e.g., by including them in the discussion of any social investments and contributions by companies to neighboring communities).

Channels of communication with community stakeholders are important. Regular consultation with community representatives and a transparent procedure for handling complaints are key components of this communication. Negative impacts may not always be avoidable. However, the process for addressing them must be open, fair and transparent, and must demonstrate due diligence. A company shall share with neighboring communities any pertinent information about any potential health and safety risks or changes in access to resources.

⁵² Regular and meaningful: meetings shall be held at least bi-annually with elected representatives of affected communities. The agenda for the meetings should in part be set by the community representatives. Participatory Social Impact Assessment methods may be one option to consider here.

⁵³ Effective: in order to demonstrate that the mechanism is effective, evidence of resolutions of complaints can be given.

Criterion 7.2 Respect for local cultures and traditional territories

INDICATOR		REQUIREMENT
7.2.1	Local groups consulted during project design and operation	At least 2x per year, or more if required by relevant local and/or national laws and regulations

Rationale-Interactions with and evidence of due diligence to prevent and mitigate negative impacts on local cultures and traditional territories is important globally, and takes on an additional dimension in regions where indigenous or aboriginal people or traditional territories are involved. In some jurisdictions, aboriginal groups have legal rights related to their territories. These shall be respected, as in Principle 1. It is also expected that operations seeking to meet this standard that are operating in indigenous territories have directly consulted with bodies functioning as territorial governments and have come to agreement with local entities such as indigenous governments, or are working towards such an agreement. The requirements are designed to be consistent with the United Nations Declaration on the Rights of Indigenous Peoples.

Criterion 7.3 Access to resources

INDICATOR		REQUIREMENT
7.3.1	Changes undertaken restricting access to vital community resources without community approval	0
7.3.2	Assessments of company's impact on access to resources	At least once per year

Rationale-Companies should make a maximum effort to not affect the surrounding community's access to vital resources as a result of its presence and activities. Some change in access is expected. What is to be prevented is an unacceptable degree of change.

Appendix 1. Forage Fish Dependency Ratio calculation

Forage Fish Dependency Ratio (FFDR) is the quantity of wild fish used per quantity of cultured fish produced. This measure can be calculated based on fishmeal (FM) and/or fish oil (FO). The dependency on wild forage fish resources shall be calculated for both FM and FO using the formulas noted below, and then the higher of the two values shall be applied to the Standard. This formula calculates the dependency of a single site on wild forage fish resources, independent of any other farm.

$$\text{FFDR FM} = \frac{\% \text{ fishmeal in feed from forage fisheries (e FCR)}}{24}$$

$$\text{FFDR FO} = \frac{\% \text{ fishmeal in feed from forage fisheries (e FCR)}}{5.0 \text{ or } 7.0, \text{ depending on source of fish}}$$

Where:

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

$$\text{eFCR} = \frac{\text{Feed, kg or mt}}{\text{Net aquaculture production, kg or mt (wet weight)}}$$

2. The percentage of fishmeal and fish oil excludes fishmeal and fish oil derived from fisheries' by-products.⁵⁴ Only fishmeal and fish oil that is derived directly from a pelagic fishery (e.g., anchoveta) or fisheries where the catch is directly reduced (such as krill or blue whiting) 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.
3. The amount of fishmeal in the diet is calculated back to live fish weight by using a yield of 24%.⁵⁵ This is an assumed average yield.

⁵⁴ 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 do not meet official regulations with regard to fish suitable for human consumption. Restrictions on what trimmings are allowed for use under the standard are under 4.3.3.

⁵⁵ Reference for FM and FO yields: Péron, G., et al. 2010. Where do fishmeal and fish oil products come from? An analysis of the conversion ratios in the global fishmeal industry. Marine Policy, doi:10.1016/j.marpol.2010.01.027.

4. The amount of fish oil in the diet is calculated back to live fish weight by using an average yield in accordance with this procedure:
 - a. Group A: Fish oil originating from Peru and Chile and Gulf of Mexico, five percent yield of fish oil.
 - b. Group –B: Fish oil originating from the North Atlantic (Denmark, Norway, Iceland and the UK) seven percent yield of fish oil.
 - c. If fish oil is used from other areas than mentioned above, they should be classified as belonging to group A if documentation shows a yield less than or equal to six percent, and into group B if documentation shows a yield more than six percent.
5. FFDR is calculated for the grow-out period in the sea as long as the fingerling phase does not go past 200 grams per fingerling. If the fingerling phase goes past 200g then FFDR is calculated based on all feed used from 200 grams and onwards. If needed, the grow-out site shall collect this data from the fingerling supplier.

Appendix 2. Explanation of FishSource scoring

FishSource scores provide a rough guide to how a fishery stacks up against existing definitions and measures of sustainability. The FishSource scores currently only cover five criteria of sustainability, whereas a full assessment—such as that by the Marine Stewardship Council (MSC)—will typically cover more than 60. As such, the FishSource scores are not a firm guide to how a fishery will perform overall. Nonetheless, the FishSource scores do capture the main outcome-based measures of sustainability.

The Steering Committee for the *Seriola Cobia* Aquaculture Dialogue was composed of a representative from each of the following organizations:

- Cuna del Mar,
- Kampachi Farms,
- New England Aquarium,
- Nutreco,
- The Nature Conservancy,
- University of Miami,
- Virginia Cobia Farms,
- Worldwide Fund for Nature (World Wildlife Fund).

(Note: The Ocean Conservancy previously participated in the Steering Committee)