Aquaculture Stewardship Council

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Topic:	Interim solution on Marine Raw Material Requirements in the ASC Farm Standards.
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Introduction

The ASC standards cover a wide array of impact areas, mainly focusing on environmental and social issues. ASC has seen a rapid uptake of its standards by farms globally and as such is helping to reduce the impact challenges the industry is facing. At the same time we are seeing an increasing interest from the market, which spurs even more farms to adopt responsible practices and enter ASC certification which in turn reduces the industry's impact even further, in line with ASC's mission.

However, the availability of fish meal and fish oil ingredients to meet the ambitious requirements set out in the ASC Farm Standards (to reach certification against an ISEAL member scheme), has not developed as quickly as was anticipated by the Aquaculture Dialogues. Furthermore, some major (feed) fisheries have not moved towards MSC-certification as fast as expected. As a result, there is insufficient availability of fish meal and fish oil that meets the requirements as set in the ASC Farm Standards.

At the same time, the interim requirement (a Fish Source Score of A or B1) described in the ASC Freshwater Trout, Salmon and Shrimp Standards, face a similar supply issue.

These two realities create immediate compliance challenges for ASC-certified farms as well as for those preparing for certification assessment. Non-compliance of these requirements will result in the loss of, or failure to achieve, certification. This will not only slow down the further uptake of ASC certified products in the market, but will reverse the current successful market position gained, removing the incentives created that are promoting industry's move towards more sustainable practices. At this juncture, early in the development of ASC as an independent organisation, this creates a serious challenge to its long-term viability.

ASC is currently developing the ASC Feed Standard that will address a number of inconsistencies related to the promotion of responsible feed, which will be launched in 2017. This standard will set out sustainability requirements for feed to be used by ASC certified farms. Once this standard is operational, the feed composition (ingredients) related requirements will be addressed through ASC-certified feedmills producing ASC compliant feed rather than through the species specific farm standards.

It is proposed to introduce interim requirements, as set out by this document that will promote responsible sourcing aligned with the current supply position that will be in effect until the ASC Feed Standard is fully operational.

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Purpose

The purpose of this paper is to provide:

1) an interim solution for the marine raw material requirements in the ASC Farm standards,
2) relevant background information supporting this interim solution
3) auditor guidance in support of this interim solution.

Interim solution

Under this Interim Solution it is proposed that the requirements for whole fish fishmeal and fish oil in the relevant standards[1] will be adjusted as follows[2]:

1) The requirement for sourcing certified marine raw material against an ISEAL member scheme will no longer be time bound.
2) The interim requirement requiring marine raw material to be categorized as A-B1 by the SFP's Fish Source Score, will be substituted by the requirement that marine raw material has to be categorized as A-B2.

A detailed description of the changes to the relevant indicators and requirements are presented under "Interim solution – auditor guidance" below.

These interim solutions will go into effect from the publication of this document until the release of the ASC Feed Standard.

The ASC Feed Standard will eventually replace the feed raw material requirements as well as feed (ingredient) traceability requirements of the ASC Farm Standards. A transition period for farms from the release of the ASC Feed Standard and sourcing ASC Compliant Feed will be implemented. This will allow for a period to enable feed mills to become certified without farms being non-complaint on their feed requirements.

ISEAL compliance

This Interim Soltion is in line with the ISEAL Code of Good Practice for Assuring Conformance with Social and Environmental Standards[3], section 6.4.8 Exceptions.

[1] The relevant ASC Farm Standards are: ASC Abalone Standard v1.0, ASC Freshwater Trout Standard v1.0, ASC Pangasius Standard v1.0, ASC Salmon Standard v1.0, ASC Seriola and Cobia Standard v.10, ASC Shrimp Standard v1.0 and ASC Tilapia Standard v1.0.

[2] See "Interim Solution – Auditor Guidance", page 6, for detailed changes per relevant ASC Farm Standard.

[3] http://www.isealalliance.org/sites/default/files/ISEAL_Assurance_Code_Version_1.0.pdf

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Background

With the exception of the ASC Bivalve Standard, all current released ASC Farm Standards have requirements for the origin of marine raw materials (i.e. fishmeal and fish oil). An overview on the current ASC-requirements for the origin of marine raw materials is given in Annex 1.

In all relevant standards, the shared vision is that "whole fish[4]" used for fishmeal and fish oil production must originate from a sustainable fishery(ies) that is certified by an ISEAL member scheme. In most of the relevant standards this vision is translated into a time bound requirement after which 100% of the used fishmeal and -oil must be certified by an ISEAL member scheme (see Annex 1; 2nd column).

Various interim requirements are provided for the period between the release of the relevant standards and the time bound ISEAL-requirement (see Annex 1; 3rd and 4th column).

Both the time bound ISEAL-requirement, as well as the provided interim requirement are facing compliance challenges for ASC-certified farms and for those preparing to join the programme.

Within this section, more background information is provided on:

1. Expectations on ASC's demand for compliant marine raw materials.
2. Status of fisheries certified by an ISEAL member scheme
3. Status of fisheries assessed against Fish Source Score.

Expectations on ASC's demand for ASC compliant marine raw materials

See Annex 2 for details.

<u>In addition to Annex 2:</u>

The estimated demand for ASC compliant marine raw materials is calculated from the current number of ASC-certified farms in combination with the expected number of certified farms in 2020, the average production volume per ASC-certified farm, average Feed Conversion Ratio (FCR) and the average fishmeal and -oil content of the relevant diets.

From these elements the <u>total ASC-certified production volume per year</u> is calculated:

*= Estimated number of ASC-certified farms * average production volume per ASC-certified farm*

[4] Whole fish are fish caught with the purpose to be reduced to fishmeal and –oil. This excludes trimmings and by-products.

From the total ASC-certified production volume per year, the needed estimated total feed volume is calculated:
*= Total ASC-certified production volume per year * average FCR per species*

Finally, this total feed volume is used to calculate the needed estimated fishmeal and –oil volumes:
*= Total feed volume * the average fishmeal and -oil content of the relevant diets*

The above calculations are calculated per ASC standard and summed-up for a grand total.

From these calculations it can be concluded that by 2020 an estimated 614,860 tonnes of ASC-compliant fishmeal and 286,254 tonne of fish oil is needed. This is respectively 12% and 28% of the total global fishmeal supply (±5 million tonnes) and –oil supply (±1 million tonne).

Status of fisheries certified by an ISEAL member scheme
See Annex 3 for details.

NOTE: the only sustainable fishery scheme within the ISEAL membership base is the Marine Stewardship Council (MSC).

In addition to Annex 3:

- From the various tables in Annex 3 it becomes clear that the overall volume of MSC-certified fisheries supplying raw material to fishmeal and -oil factories is increasing. ASC considers this positive trend as an important signal that the need for sustainable fishmeal and fish oil is driving change in the supply chain – and is resulting in improving fisheries' practices in order to meet the MSC requirements. The ASC aims to further strengthen the incentives created for feed fisheries to improve their sustainability with its ASC Feed Standard.

- Despite the increase in MSC-certified fisheries delivering certified raw material to fishmeal and -oil factories it is clear that the supply does not (yet) meets demand. In addition, the projected supply volume required are further constrained by a number of supply chain realities:
    - Feed producers purchase fishmeal and -oil primarily based on physical quality specifications of the product (protein content, fat content, omega3,6,9, content etc.), and less so on sustainability criteria. (Certified) batches with unfavourable physical specifications are commercially less attractive.
    - Various chain of custody (traceability) challenges:

- Fish meal/oil is often composed of various species. For certification to be valid, a major percentage of the batch needs to meet stringent requirements, which becomes more challenging when multiple fish species are mixed.
- Traceability is often complicated and challenging for the various links in the supply chain.

In addition to the points mentioned above, the global geographical distribution of MSC-certified fisheries delivering raw material to fishmeal and -oil factories is unevenly distributed with some supplies available from some North West Atlantic fisheries but almost none available from South East Pacific fisheries or South East Asian Fisheries.

- ASC aims to address these challenges within the ASC Feed Standard.

Status of fisheries assessed against Fish Source Score (by the Sustainable Fisheries Partnership)[5]

See Annex 4 for details.

In addition to Annex 4:

- The SFPs' Fish Source Score is one of the interim requirements for the period between the release of the relevant farm standards and the time bound ISEAL-requirement.

- A fishery assessed against the Fish Source Score is categorized according to one of the following scores:
  - Score A (relevant to: ASC Freshwater Trout, Pangasius, Salmon, Seriola and Cobia, Shrimp, Tilapia)
  - Score B1 (relevant to: idem to Score A)
  - Score B2 (relevant to: ASC Pangasius, Tilapia)
  - Score C (not relevant to any of the ASC standards)

- In the second half of Annex 4, an analysis is made on the volume of ASC-compliant Fish Meal (FM) and Fish Oil (FO) for 2014-2016.
  From 2014 to 2015 a big drop in volume of compliant A-B1 material is noted as a result of "Anchoveta – Peruvian northern-central stock" moving from category B1 to B2. This fishery is a major supplier into the global feed industry. This situation remains the same for the 2016 assessment.

- Following the 2016 Fish Source Score (FSS) assessment, 5.4% and 5.6% of the world volume of FM and FO is category A-B1 compliant and thereby ASC-compliant to the ASC Freshwater Trout Standard, Pangasius Standard, Salmon Standard, Shrimp Standard and Tilapia Standard.

[5] Source: https://www.sustainablefish.org/publications/2015/07/25/sfp-reduction-fisheries-sector-report-2015

- Following the 2016 FSS assessment, 20% and 21% of the world volume of FM and FO is category A-B2 compliant and thereby ASC-compliant only with the ASC Pangasius Standard and Tilapia Standard.

Summary

Although the relevant standards have been released from January 2012 onwards, the development of the marine raw material requirements of the various standards were developed before that date (e.g. ASC Tilapia Standard was finalized in 2009). In the intervening years two key factors have repercussions for compliance to these requirements:

1. The progress of forage fisheries becoming certified against an ISEAL member scheme is slower than expected and thereby we are now confronted with fishmeal and fishoil volumes lagging behind what is needed.
2. The forage fishery "Anchoveta – Peruvian northern-central stock" has shifted from category B1 in the Fish Source Score to category B2. This has sharply reduced the availability of approved raw material complying to the interim requirements.

When combined, these two factors have resulted in the needed solution as set out under "Interim solution" (page 3).

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Interim solution – auditor guidance

The following table provides guidance for CABs assessing farms on their Marine Raw Material compliance.

	Current requirement:	Interim solution (marked in yellow):
ASC Abalone Standard v1.0	**Indicator 5.2.2:** >95 percent of fish meal and fish oil component in feed originating from fisheries deemed sustainable by an ISEAL compliant certification scheme for sustainable forage fisheries **Requirement:** Within five years of commercial availability in the region	*No changes.*
ASC Freshwater Trout Standard v1.0	**Indicator 5.2.1:** Percentage of fishmeal and fish oil used in feed that comes from fisheries certified under a scheme that is ISEAL-accredited and has guidelines that specifically promote responsible environmental management of small pelagic fisheries **Requirement:** 10% within three years of publication of the ASC Freshwater Trout Standard and 100% within five years	**Indicator 5.2.1:** Percentage of fishmeal and fish oil used in feed that comes from fisheries certified under a scheme that is ISEAL-accredited and has guidelines that specifically promote responsible environmental management of small pelagic fisheries **Requirement:** Not required.
	Indicator 5.2.2: Prior to 100% achievement of 5.2.1, the Fishsource score required for the fisheries from which marine raw material in feed is derived (excluding trimming and by-products) **Requirement:** All individual scores ≥ 6, and biomass score ≥ 8	**Indicator 5.2.2:** Prior to 100% achievement of 5.2.1, the Fishsource score required for the fisheries from which marine raw material in feed is derived (excluding trimming and by-products) **Requirement:** All individual scores ≥ 6, and biomass score ≥ 6
	Indicator 5.2.3: Prior to 100% achievement of 5.2.1,	*No changes.*

	demonstration of chain of custody and traceability for fisheries products in feed through an ISEAL-accredited or ISO 65-compliant certification scheme that incorporates the United Nations Food and Agriculture Organization's "Code of Conduct for Responsible Fisheries" **Requirement:** Yes	
ASC Pangasius Standard v1.0	**Indicator 5.1.5:** ISEAL-certified fishmeal and fish oil products must be used in feed **Requirement:** Within 3 years of becoming available in a region **Indicator 5.1.6:** ISEAL-certified fishmeal and fish oil products must be used in feed **Requirement:** Within 5 years from the publication date of the ASC Pangasius Standard	**Indicator 5.1.5:** ISEAL-certified fishmeal and fish oil products must be used in feed **Requirement:** Not required. **Indicator 5.1.6:** ISEAL-certified fishmeal and fish oil products must be used in feed **Requirement:** Not required.
	Indicator 5.1.7a: Interim Option A: Fishmeal or fish oil products used in feed have been sourced from fisheries with an average FishSource (FS) score **Requirement:** ≥ 6.0 with no individual score < 6.0 or an N/A in the stock assessment category	*No changes.*
	Indicator 5.1.7b: Interim Option B: Fish Products used in feed have been sourced from facilities certified as being in compliance with Sections 11 (Responsible Sourcing), 2 (Traceability), and 3 (Responsible Manufacturing) of the International Fishmeal and Fish Oil Organisation's (IFFO) "Responsible	*No changes.*

	Sourcing Program for Certification of Responsible Practice for Fishmeal and Fish Oil Production **Requirement:** Yes	
ASC Salmon Standard v1.0	**Indicator 4.3.1:** Timeframe for all fishmeal and fish oil used in feed to come from fisheries certified under a scheme that is an ISEAL member and has guidelines that specifically promote responsible environmental management of small pelagic fisheries **Requirement:** < 5 years after the date of publication of the ASC Salmon Standard	**Indicator 4.3.1:** Timeframe for all fishmeal and fish oil used in feed to come from fisheries certified under a scheme that is an ISEAL member and has guidelines that specifically promote responsible environmental management of small pelagic fisheries **Requirement:** Not required.
	Indicator 4.3.2: Prior to achieving 4.3.1, the FishSource score for the fishery(ies) from which all marine raw material in feed is derived **Requirement:** All individual scores ≥ 6, and biomass score ≥ 8	**Indicator 4.3.2:** Prior to achieving 4.3.1, the FishSource score for the fishery(ies) from which all marine raw material in feed is derived **Requirement:** All individual scores ≥ 6, and biomass score ≥ 6
	Indicator 4.3.3: Prior to achieving 4.3.1, demonstration of third- party verified chain of custody and traceability for the batches of fishmeal and fish oil which are in compliance with 4.3.2. **Requirement:** Yes	*No changes.*
ASC Seriola and Cobia Standard v1.0	**Indicator 4.3.1:** Timeframe for at least 90% fishmeal or fish oil used in feed to come from fisheries19 certified under an ISEAL member's accredited certification whose primary goal is to promote	**Indicator 4.3.1:** Timeframe for at least 90% fishmeal or fish oil used in feed to come from fisheries19 certified under an ISEAL member's accredited certification whose primary goal is to promote

	ecological sustainability. **Requirement:** Within 5 years following the date of the publication of the SCAD standards.	ecological sustainability. **Requirement:** Not required.
	Indicator 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, plus (and) an 8 in the biomass category or show evidence of being engaged in a credible and time bound fisheries improvement project (FIP). **Requirement:** At least 80% of the fish meal and fish oil used in feed (excluding fishmeal and oil from byproducts) must meet this criteria.	**Indicator 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, plus (and) an 6.0 in the biomass category or show evidence of being engaged in a credible and time bound fisheries improvement project (FIP). **Requirement:** At least 80% of the fish meal and fish oil used in feed (excluding fishmeal and oil from byproducts) must meet this criteria.
ASC Shrimp Standard v1.0	**Indicator 7.2.1a:** Timeframe for 100% (mass balance) fishmeal and fish oil used in feed to come from fisheries certified by a full ISEAL member that has guidelines specifically promoting ecological sustainability of forage fisheries. **Requirement:** Within five years following the date of standards publication.	**Indicator 7.2.1a:** Timeframe for 100% (mass balance) fishmeal and fish oil used in feed to come from fisheries certified by a full ISEAL member that has guidelines specifically promoting ecological sustainability of forage fisheries. **Requirement:** Not required.
	Indicator 7.2.1b: FishSource score, for the fishery(ies) from which a minimum of 80% of the fishmeal and fish oil by volume is derived (See Appendix IV, subsection 3 for explanation of FishSource scoring): a. for Fishsource Criteria 4 (spawning biomass assessment) b. for Fishsource Criteria 1, 2, 3 and 5	**Indicator 7.2.1b:** FishSource score, for the fishery(ies) from which a minimum of 80% of the fishmeal and fish oil by volume is derived (See Appendix IV, subsection 3 for explanation of FishSource scoring): a. for Fishsource Criteria 4 (spawning biomass assessment) b. for Fishsource Criteria 1, 2, 3 and 5

	Requirement: a. 8 b. 6 or compliance with alternative interim proposal 7.2.1c	**Requirement:** a. 6 b. 6 or compliance with alternative interim proposal 7.2.1c
	Indicator 7.2.1c: Lacking a FishSource assessment a fishery could be engaged in an Improvers Program. (transparent and public Fisheries Improvement Project (FIP) with periodic public reporting (refer to Appendix VII). **Requirement:** See Appendix VII for details on compliance.	*No changes.*
ASC Tilapia Standard v1.0	**Indicator 5.1.3:** Timeframe for producers to source feed containing fishmeal or fish oil originating from fisheries deemed sustainable by an ISEAL member's accredited certification scheme **Requirement:** 5 years following the date of the ASC Tilapia Standard publication	**Indicator 5.1.3:** Timeframe for producers to source feed containing fishmeal or fish oil originating from fisheries deemed sustainable by an ISEAL member's accredited certification scheme **Requirement:** Not required.
	Indicator 5.1.4: Prior to achievement of 5.1.3, the average FishSource score characterizing the fishery(ies) from which the fishmeal or fish oil is derived. See Appendix V for explanation of FishSource Scoring **Requirement:** ≥ 6.0 with no individual score < 6.0 or an N/A in the stock assessment category	*No changes.*

Annex 1: Current Marine Raw Material Requirements within the ASC Farm Standards

ASC Species:	ISEAL requirement:	Intermediate 1:	Intermediate 2:
Abalone	**Indicator 5.2.2:** >95 percent of fish meal and fish oil component in feed originating from fisheries deemed sustainable by an ISEAL compliant certification scheme for sustainable forage fisheries **Requirement:** Within five years of commercial availability in the region	-	-
Freshwater Trout	**Indicator 5.2.1:** Percentage of fishmeal and fish oil used in feed that comes from fisheries certified under a scheme that is ISEAL-accredited and has guidelines that specifically promote responsible environmental management of small pelagic fisheries **Requirement:** 10% within three years of publication of the ASC Freshwater Trout Standard and 100% within five years	**Indicator 5.2.2:** Prior to 100% achievement of 5.2.1, the Fishsource score required for the fisheries from which marine raw material in feed is derived (excluding trimming and by-products) **Requirement:** All individual scores ≥ 6, and biomass score ≥ 8	**Indicator 5.2.3:** Prior to 100% achievement of 5.2.1, demonstration of chain of custody and traceability for fisheries products in feed through an ISEAL- accredited or ISO 65-compliant certification scheme that incorporates the United Nations Food and Agriculture Organization's "Code of Conduct for Responsible Fisheries" **Requirement:** Yes

Pangasius	**Indicator 5.1.5:** ISEAL-certified fishmeal and fish oil products must be used in feed **Requirement:** Within 3 years of becoming available in a region **Indicator 5.1.6:** ISEAL-certified fishmeal and fish oil products must be used in feed **Requirement:** Within 5 years from the publication date of the ASC Pangasius Standard	**Indicator 5.1.7a:** Interim Option A: Fishmeal or fish oil products used in feed have been sourced from fisheries with an average FishSource (FS) score **Requirement:** ≥ 6.0 with no individual score < 6.0 or an N/A in the stock assessment category	**Indicator 5.1.7b:** Interim Option B: Fish Products used in feed have been sourced from facilities certified as being in compliance with Sections 11 (Responsible Sourcing), 2 (Traceability), and 3 (Responsible Manufacturing) of the International Fishmeal and Fish Oil Organisation's (IFFO) "Responsible Sourcing Program for Certification of Responsible Practice for Fishmeal and Fish Oil Production **Requirement:** Yes
Salmon	**Indicator 4.3.1:** Timeframe for all fishmeal and fish oil used in feed to come from fisheries certified under a scheme that is an ISEAL member and has guidelines that specifically promote responsible environmental management of small pelagic fisheries **Requirement:** < 5 years after the date of publication of the ASC Salmon Standard	**Indicator 4.3.2:** Prior to achieving 4.3.1, the FishSource score for the fishery(ies) from which all marine raw material in feed is derived **Requirement:** All individual scores ≥ 6, and biomass score ≥ 8	**Indicator 4.3.3:** Prior to achieving 4.3.1, demonstration of third- party verified chain of custody and traceability for the batches of fishmeal and fish oil which are in compliance with 4.3.2. **Requirement:** Yes

Seriola and Cobia	**Indicator 4.3.1:** Timeframe for at least 90% fishmeal or fish oil used in feed to come from fisheries19 certified under an ISEAL member's accredited certification whose primary goal is to promote ecological sustainability. **Requirement:** Within 5 years following the date of the publication of the SCAD standards.	**Indicator 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, plus (and) an 8 in the biomass category or show evidence of being engaged in a credible and time bound fisheries improvement project (FIP). **Requirement:** At least 80% of the fish meal and fish oil used in feed (excluding fishmeal and oil from byproducts) must meet this criteria.	-
Shrimp	**Indicator 7.2.1a:** Timeframe for 100% (mass balance) fishmeal and fish oil used in feed to come from fisheries certified by a full ISEAL member that has guidelines specifically promoting ecological sustainability of forage fisheries. **Requirement:** Within five years following the date of standards publication.	**Indicator 7.2.1b:** FishSource score, for the fishery(ies) from which a minimum of 80% of the fishmeal and fish oil by volume is derived (See Appendix IV, subsection 3 for explanation of FishSource scoring): a. for Fishsource Criteria 4 (spawning biomass assessment) b. for Fishsource Criteria 1, 2, 3 and 5 **Requirement:** a. 8 b. 6 or compliance with alternative interim proposal 7.2.1c	**Indicator 7.2.1c:** Lacking a FishSource assessment a fishery could be engaged in an Improvers Program. (transparent and public Fisheries Improvement Project (FIP) with periodic public reporting (refer to Appendix VII). **Requirement:** See Appendix VII for details on compliance.

Tilapia	**Indicator 5.1.3:** Timeframe for producers to source feed containing fishmeal or fish oil originating from fisheries deemed sustainable by an ISEAL member's accredited certification scheme **Requirement:** 5 years following the date of the ASC Tilapia Standard publication	**Indicator 5.1.4:** Prior to achievement of 5.1.3, the average FishSource score characterizing the fishery(ies) from which the fishmeal or fish oil is derived. See Appendix V for explanation of FishSource Scoring **Requirement:** ≥ 6.0 with no individual score < 6.0 or an N/A in the stock assessment category	-

Annex 2: Demand for ASC complaint Marine Raw Materials

1.1 Species specific FCR*	
ASC Species:	**FCR:**
Abalone	2
Freshwater Trout	1.2
Pangasius	1.68
Salmon	1.2
Shrimp	1.7
Seriola/Cobia	2.5
Tilapia	1.6

**) Latest update: February 2016*

1.2 Species specific FM/FO diet content**		
ASC Species:	**FM-level:**	**FO-level:**
Abalone	0.2	
Freshwater Trout	0.2	0.08
Pangasius	0.075	0.05
Salmon	0.15	0.08
Shrimp	0.3	0.08
Seriola/Cobia	0.45	0.2
Tilapia	0.075	0.05

***) Latest update: February 2016*

1.3 Average production volume ASC Certified Farm (t)***	
Abalone	200
Freshwater Trout	500
Pangasius	4400
Salmon	3800
Shrimp	2100
Seriola/Cobia	500
Tilapia	5000

****) Based on certified volumes known to ASC by February 2016*

2.1 Estimation of feed demand by ASC certified farms (2015-2020)

	2015			2016 *(estimate)*			2017 *(estimate)*			2018 *(estimate)*			2019 *(estimate)*			2020 *(estimate)*		
	ASC certified farms (No.)	Farmed production volume (t)	Feed volume demand (t)	ASC certified farms (No.)	Farmed production volume (t)	Feed volume demand (t)	ASC certified farms (No.)	Farmed production volume (t)	Feed volume demand (t)	ASC certified farms (No.)	Farmed production volume (t)	Feed volume demand (t)	ASC certified farms (No.)	Farmed production volume (t)	Feed volume demand (t)	ASC certified farms (No.)	Farmed production volume (t)	Feed volume demand (t)
Abalone	2	400	800	3	600	1,200	4	800	1,600	9	1,800	3,600	10	2,000	4,000	12	2,400	4,800
Freshwater Trout	15	7,500	9,000	20	10,000	12,000	30	15,000	18,000	40	20,000	24,000	50	25,000	30,000	60	30,000	36,000
Pangasius	40	176,000	295,680	45	198,000	332,640	55	242,000	406,560	60	264,000	443,520	75	330,000	554,400	84	369,600	620,928
Salmon	80	304,000	364,800	100	380,000	456,000	175	665,000	798,000	250	950,000	1,140,000	320	1,216,000	1,459,200	400	1,520,000	1,824,000
Shrimp	36	75,600	128,520	45	94,500	160,650	90	189,000	321,300	140	294,000	499,800	160	336,000	571,200	180	378,000	642,600
Seriola/Cobia	0	0	0	10	5,000	12,500	20	10,000	25,000	30	15,000	37,500	45	22,500	56,250	60	30,000	75,000
Tilapia	36	180,000	288,000	40	200,000	320,000	50	250,000	400,000	60	300,000	480,000	80	400,000	640,000	100	500,000	800,000
TOTAL	**209**	**743,500**	**1,086,800**	**263**	**888,100**	**1,294,990**	**424**	**1,371,800**	**1,970,460**	**589**	**1,844,800**	**2,628,420**	**740**	**2,331,500**	**3,315,050**	**896**	**2,830,000**	**4,003,328**

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2.2 Estimation of FM/FO demand by ASC certified farms (2015-2020)																		
	2015			2016 *(estimate)*			2017 *(estimate)*			2018 *(estimate)*			2019 *(estimate)*			2020 *(estimate)*		
	Feed volume demand (t)	FM volume demand (t)	FO volume demand (t)	Feed volume demand (t)	FM volume demand (t)	FO volume demand (t)	Feed volume demand (t)	FM volume demand (t)	FO volume demand (t)	Feed volume demand (t)	FM volume demand (t)	FO volume demand (t)	Feed volume demand (t)	FM volume demand (t)	FO volume demand (t)	Feed volume demand (t)	FM volume demand (t)	FO volume demand (t)
Abalone	800	160	0	1,200	240	0	1,600	320	0	3,600	720	0	4,000	800	0	4,800	960	0
Freshwater Trout	9,000	1,800	720	12,000	2,400	960	18,000	3,600	1,440	24,000	4,800	1,920	30,000	6,000	2,400	36,000	7,200	2,880
Pangasius	295,680	22,176	14,784	332,640	24,948	16,632	406,560	30,492	20,328	443,520	33,264	22,176	554,400	41,580	27,720	620,928	46,570	31,046
Salmon	364,800	54,720	29,184	456,000	68,400	36,480	798,000	119,700	63,840	1,140,000	171,000	91,200	1,459,200	218,880	116,736	1,824,000	273,600	145,920
Shrimp	128,520	38,556	10,282	160,650	48,195	12,852	321,300	96,390	25,704	499,800	149,940	39,984	571,200	171,360	45,696	642,600	192,780	51,408
Seriola/Cobia	0	0	0	12,500	5,625	2,500	25,000	11,250	5,000	37,500	16,875	7,500	56,250	25,313	11,250	75,000	33,750	15,000
Tilapia	288,000	21,600	14,400	320,000	24,000	16,000	400,000	30,000	20,000	480,000	36,000	24,000	640,000	48,000	32,000	800,000	60,000	40,000
TOTAL	**1,086,800**	**139,012**	**69,370**	**1,294,990**	**173,808**	**85,424**	**1,970,460**	**291,752**	**136,312**	**2,628,420**	**412,599**	**186,780**	**3,315,050**	**511,933**	**235,802**	**4,003,328**	**614,860**	**286,254**

Aquaculture Stewardship Council

Annex 3: Supply of ISEAL certified Marine Raw Material

1.1 Average fish meal and -oil yields*		
	Fish meal yield:	**Fish oil yield:**
Whole fish		
Anchovy	0.24	0.06
Blue Whiting	0.24	0.06
Capelin	0.24	0.06
Herring	0.24	0.06
Krill	0.2	0.03
Mackerels	0.24	0.06
Menhaden	0.24	0.06
Sprat	0.24	0.06
Pilchard	0.24	0.06
Pollock	0.24	0.06
Pout	0.24	0.06
Sand eel	0.24	0.06
Sardines	0.24	0.06
Trimmings/byproduct		
Herring	0.25	0.05
Mackerels	0.25	0.05
Whitefish	0.25	0.05
Salmon	0.25	0.05
Tuna	0.25	0.05

**) Yied rates provided by IFFO*

Aquaculture Stewardship Council

2.1 Estimation of fish meal and -oil *supply* from MSC certified sources (2016-2020)**

			2015 (by end Nov. '15)			2016 *(estimate)*			2017 *(estimate)*			2018 *(estimate)*			2019 *(estimate)*			2020 *(estimate)*		
			Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)
Whole-fish reduction fishery																				
Region:		**Species:**																		
Atlantic	North East	Blue Whiting	-	-	-	200,000	48,000	12,000	300,000	72,000	18,000	500,000	120,000	30,000	500,000	120,000	30,000	500,000	120,000	30,000
		Danish reduction (sprat, pout, sand eel).	-	-	-	200,000	48,000	12,000	300,000	72,000	18,000	400,000	96,000	24,000	400,000	96,000	24,000	400,000	96,000	24,000
		Krill (2 Norwegian fisheries).	150,000	30,000	4,500	150,000	30,000	4,500	150,000	30,000	4,500	200,000	40,000	6,000	250,000	50,000	7,500	250,000	50,000	7,500
		Sardine Morocco	-	-	-	-	-	-	-	-	-	175,000	42,000	10,500	350,000	84,000	21,000	350,000	84,000	21,000
		Capelin Iceland-Greenland	-	-	-	-	-	-	100,000	24,000	6,000	200,000	48,000	12,000	200,000	48,000	12,000	200,000	48,000	12,000
		Baltic Sprat and Herring	-	-	-	-	-	-	100,000	24,000	6,000	300,000	72,000	18,000	300,000	72,000	18,000	300,000	72,000	18,000
	South East	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	North West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	South West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific	North East	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	South East	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	North West	Mexican Sardine	80,000	19,200	4,800	80,000	19,200	4,800	80,000	19,200	4,800	80,000	19,200	4,800	80,000	19,200	4,800	80,000	19,200	4,800
	South West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indian Ocean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antartic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimmings/by-product																				
Region:		**Species:**																		
Atlantic	North East	Herring (all fisheries)	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000
		Mackerel	-	-	-	100,000	25,000	5,000	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000
		Whitefish Iceland	80,000	20,000	4,000	80,000	20,000	4,000	80,000	20,000	4,000	80,000	20,000	4,000	80,000	20,000	4,000	80,000	20,000	4,000
		Whitefish Norway	40,000	10,000	2,000	40,000	10,000	2,000	40,000	10,000	2,000	40,000	10,000	2,000	40,000	10,000	2,000	40,000	10,000	2,000
	South East	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	North West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	South West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific	North East	Alaska Salmon	40,000	10,000	2,000	40,000	10,000	2,000	40,000	10,000	2,000	40,000	10,000	2,000	40,000	10,000	2,000	40,000	10,000	2,000
		Pollock (all fisheries)	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000	200,000	50,000	10,000
	South East	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	North West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	South West	Skipjack Tuna	60,000	15,000	3,000	60,000	15,000	3,000	60,000	15,000	3,000	60,000	15,000	3,000	60,000	15,000	3,000	60,000	15,000	3,000
Indian Ocean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antarctic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other			50,000	12,500	2,500	50,000	5,000	1,000	50,000	5,000	1,000	50,000	12,500	2,500	75,000	18,000	3,750	90,000	21,600	4,500
SUBTOTAL - Supply fish meal and -oil from MSC-certified reduction fishery:			230,000	**49,200**	**9,300**	630,000	**145,200**	**33,300**	1,030,000	**241,200**	**57,300**	1,855,000	**437,200**	**105,300**	2,080,000	**489,200**	**117,300**	2,080,000	**489,200**	**117,300**
SUBTOTAL - Supply fish meal and -oil from MSC-certified trimmings:			670,000	**167,500**	**33,500**	770,000	**185,000**	**37,000**	870,000	**210,000**	**42,000**	870,000	**217,500**	**43,500**	895,000	**223,000**	**44,750**	910,000	**226,600**	**45,500**
TOTAL fish meal and -oil from MSC-certified sources *(estimate)*			900,000	**216,700**	**42,800**	1,400,000	**330,200**	**70,300**	1,900,000	**451,200**	**99,300**	2,725,000	**654,700**	**148,800**	2,975,000	**712,200**	**162,050**	2,990,000	**715,800**	**162,800**

***) Numbers provided & verified by MSC*

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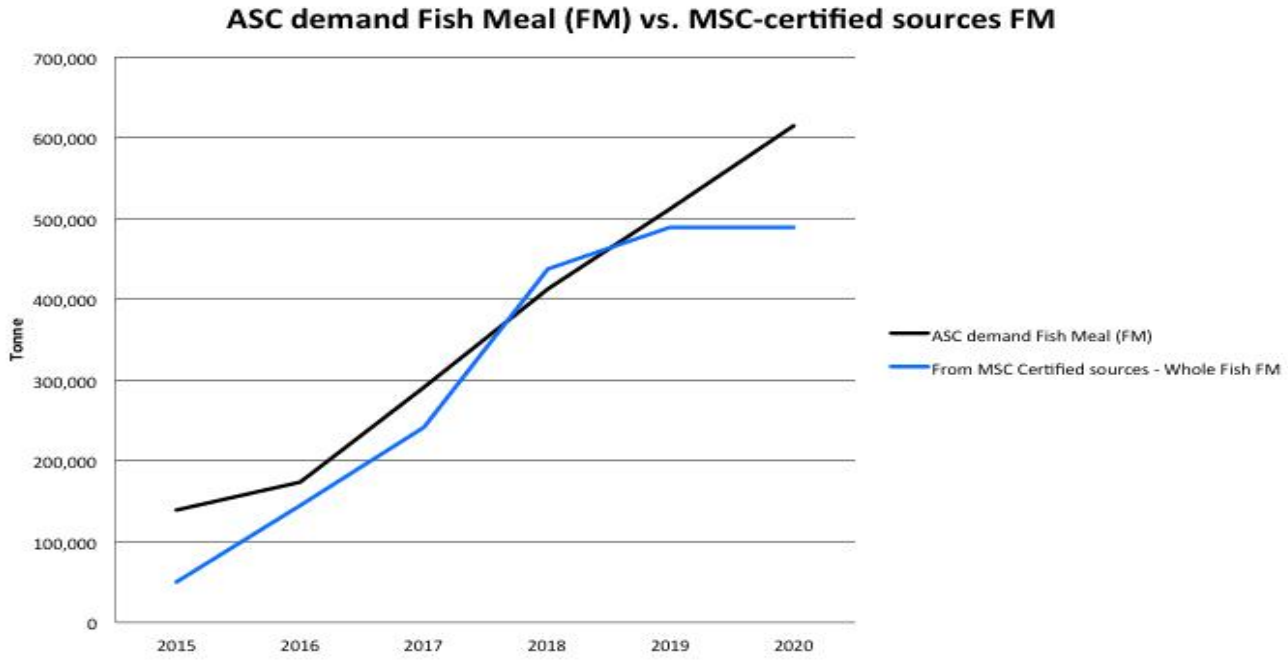
2.2 Estimation of IFFO RS compliant fish meal and -oil *supply* (2016-2020)***																				
			2015 (by end Nov. '15)			2016 *(estimate)*			2017 *(estimate)*			2018 *(estimate)*			2019 *(estimate)*			2020 *(estimate)*		
			Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)	Wet weight volume (t)	Fish meal volume (t)	Fish oil volume (t)
Whole-fish reduction fishery																				
Region:		**Species:**																		
Atlantic	North East	Blue Whiting, Boarfish, Sprat, Norway Pout, Sandeel, Herring and Capelin, Anchovy, Sardines.	-	417,461	47,533	-	400,000	45,000	-	400,000	45,000	-	420,000	46,000	-	430,000	47,000	-	440,000	48,000
	South East	Anchovy, Redeye Herring.	-	34,903	5,760	-	35,000	6,000	-	40,000	6,750	-	42,000	7,000	-	42,000	7,000	-	42,000	7,000
	North West	Atlantic and Gulf Menhaden.	-	150,110	50,385	-	150,000	50,000	-	150,000	50,000	-	150,000	50,000	-	150,000	50,000	-	150,000	50,000
	South West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific	North East	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	South East	Anchovy, Sardines.	-	959,998	131,455	-	800,000	120,000	-	1,000,000	140,000	-	1,200,000	160,000	-	1,200,000	160,000	-	1,200,000	160,000
	North West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	South West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indian Ocean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antartic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimmings/by-product																				
Region:		**Species:**																		
Atlantic	North East	57species of fish.	-	251,691	25,008	-	260,000	30,000	-	270,000	35,000	-	280,000	36,000	-	280,000	36,000	-	290,000	37,000
	South East	Sardines.	-	5,081	683	-	5,000	680	-	5,000	680	-	5,000	680	-	5,000	680	-	5,000	680
	North West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	South West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific	North East	Herring, Anchovy, Yellowfin, Skate, Rockfish and Perch.	-	16,081	700	-	16,000	700	-	16,000	700	-	16,000	700	-	16,000	700	-	16,000	700
	South East	Jack Mackerel	-	50,952	5,106	-	45,000	5,000	-	45,000	5,000	-	45,000	5,000	-	45,000	5,000	-	50,000	5,000
	North West	Albacore, Bigeye, Skipjack, Longtail and Yellowfin Tuna, Herring.	-	33,597	3,733	-	40,000	4,000	-	40,000	4,000	-	45,000	4,500	-	50,000	5,000	-	60,000	6,000
	South West	-	-			-			-			-			-			-		
Indian Ocean		Albacore, Bigeye, Skipjack and Yellowfin Tuna.	-	14,130	1,571	-	15,000	1,600	-	15,000	1,600	-	15,000	1,600	-	15,000	1,600	-	15,000	1,600
Antartic		-	-			-			-			-			-			-		
SUBTOTAL - IFFO RS compliant reduction fishery:			**-**	**1,562,472**	**235,133**	**-**	**1,385,000**	**221,000**	**-**	**1,590,000**	**241,750**	**-**	**1,812,000**	**263,000**	**-**	**1,822,000**	**264,000**	**-**	**1,832,000**	**265,000**
SUBTOTAL - IFFO RS compliant trimmings/byproduct:			**-**	**371,532**	**36,801**	**-**	**381,000**	**41,980**	**-**	**391,000**	**46,980**	**-**	**406,000**	**48,480**	**-**	**411,000**	**48,980**	**-**	**436,000**	**50,980**
TOTAL IFFO RS compliant supply *(estimate)*			**-**	**1,934,004**	**271,934**	**-**	**1,766,000**	**262,980**	**-**	**1,981,000**	**288,730**	**-**	**2,218,000**	**311,480**	**-**	**2,233,000**	**312,980**	**-**	**2,268,000**	**315,980**

****) Numbers provided & verified by IFFO RS*

From the various tables in Annex 3 the following graph on MSC's supply for compliant fishmeal and fish oil can be made:



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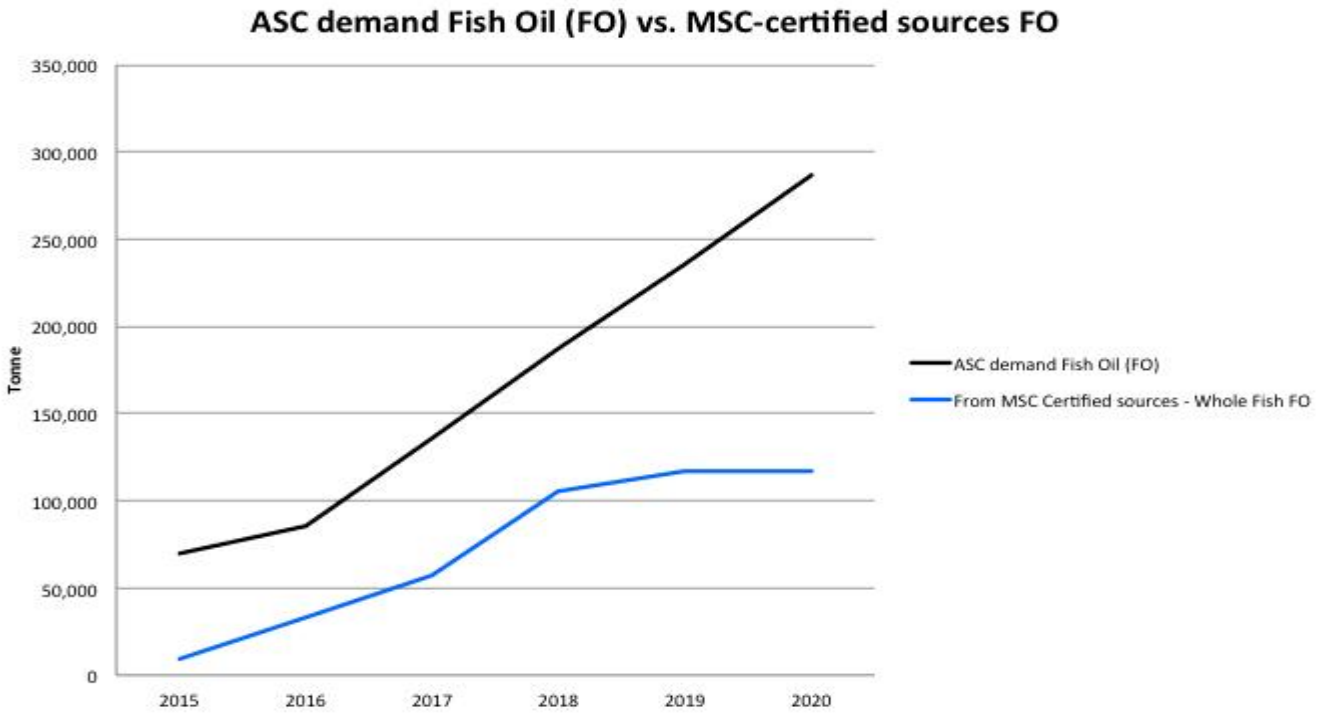

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Annex 4: Supply of Fish Source Score compliant Marine Raw Material

	Score 2016	Score 2015	Score 2014
Antarctic krill - Atlantic Southern Ocean	A	A	-
European sprat - North Sea	B1	B1	B1
Lesser sand-eel - Central Eastern North sea	B1	B1	C
Norway pout - North Sea	B1	C	B1
Gulf menhaden - Gulf of Mexico	B1	B1	B1
Lesser sand-eel - Dogger Bank area	B1	C	B2
European pilchard - Northwest Africa southern stock	B1	C	C
Atlantic menhaden - NW Atlantic	B2	B1	C
Anchoveta - Chilean regions III and IV	B2	B2	-
Anchoveta - Peruvian northern-central stock	B2	B2	B1
European pilchard - Northwest Africa central stock	B2	C	C
Capelin - Icelandic	B2	B2	B2
Boarfish - NE Atlantic	B2	B2	-
Blue whiting - Northeast Atlantic	C	C	A
Araucanian herring - Chilean	C	B1	B1
Lesser sand-eel - SE North Sea	C	C	B2
Anchoveta - Chilean regions xv-i-ii / Southern peruvian stock	C	C	B2
Capelin - Barents Sea	C	C	B2
Chilean jack mackerel	C	C	C
Anchoveta - Chilean regions V-X	C	C	C
Lesser Sand-eel - Central Western North Sea	-	B2	-
Lesser Sand-eel - Shetland	-	B2	-
Lesser Sand-eel - Kattegat	-	C	-
Lesser San-eel - Viking and Bergen Banks	-	C	-
Atlantic herring - Icelandic summer-spawning	-	-	A
Atlantic herring - North Sea Autumn spawning	-	-	A
Blatic Sprat - Baltic Sea	-	-	B1
Atlantic herring - Baltic Sea Bothnian Sea stock	-	-	B1
Atlantic herring - NE Atlantic Spring Spawners	-	-	B1
Atlantic Horse Mackerel - NE Atlantic Southern Stock	-	-	C
Atlantic Horse Mackerel - NE Atlantic Western Stock	-	-	C
European Pilchard - Iberian	-	-	C
Pacific Anchoveta - Gulf of Panama	-	-	C
Pacific thread herring - *stock units undefined*	-	-	C
Pacific bumper - *stock units undefined*	-	-	C

	2016	2015	2014
Total world fishmeal (FM) volume	5,000,000	5,000,000	5,000,000
Total world fish oil (FO) volume	1,000,000	1,000,000	1,000,000
Number of fisheries assessed by Fish Source Score (FSS)	20	24	28
Total catch assessed by FSS (tonne)	7,790,900	9,036,800	10,877,840
Estimated FM-production from FSS assessed catch (tonne)*	1,869,816	2,168,832	2,610,682
Estimated FM-production in percentage to world FM-volume	37%	43%	52%
Estimated FO-production from FSS assessed catch (tonne)**	389,545	451,840	543,892
Estimated FO-production in percentage to world FO-volume	39%	45%	54%
ASC Compliant (cat. A-B1) FSS assessed catch (tonne)***	1,117,900	1,087,800	6,889,200
Estimated FM-production from ASC Compliant (A-B1) FSS assessed catch (tonne)	268,296	261,072	1,653,408
Estimated ASC Compliant (A-B1) FM in percentage to world FM-volume	5.4%	5.2%	33.1%
Estimated FO-production from ASC Compliant (A-B1) FSS assessed catch (tonne)	55,895	54,390	344,460
Estimated ASC Compliant (A-B1) FO in percentage to world FO-volume	5.6%	5.4%	34.4%
ASC Compliant (cat. A-B2) FSS assessed catch (tonne)	4,176,300	5,595,100	7,229,800
Estimated FM-production from ASC Compliant (A-B2) FSS assessed catch (tonne)	1,002,312	1,342,824	1,735,152
Estimated ASC Compliant (A-B2) FM in percentage to world FM-volume	20%	27%	35%
Estimated FO-production from ASC Compliant (A-B2) FSS assessed catch (tonne)	208,815	279,755	361,490
Estimated ASC Compliant (A-B2) FO in percentage to world FO-volume	21%	28%	36%

** based on 24% meal yield rate*

*** based on 5% oil yield rate*

**** excluding Antarctic Krill for 2016 and 2015. This fishery was not listed for 2014.*

[end of document]