Global Sustainability Overview of South American and Atlantic Fish Stocks Used for Fishmeal and Fish Oil

May 2013

Executive Summary

This briefing represents the fourth edition of the SFP global sustainability overview of South American and Atlantic fish stocks used for fishmeal and fish oil and covers the most recent assessment period for which comparable data is available as of April 2013. The table consists of the 28 principal reduction fish stocks around the Atlantic and South America, rated according to the sustainability assessment presented on FishSource (www.fishsource.com).

Not all of the stocks cited are currently used for fishmeal and oil – for instance, some herring stocks from the northwest Atlantic have not been processed for meal or oil in recent times. The proportion of any given species/stock being utilized for meal and oil will be a function of market demand and can change from year to year.

In summary, the briefing concludes that for Atlantic and South American reduction fish stocks:

- One stock featured in the survey scores 8 or above across all FishSource criteria (category A – the top category): Atlantic herring – North Sea autumn spawners.
- 27.2% of the catch comes from stocks that score 6 or above in all criteria AND the score for biomass is at least 8 or more, meaning biomass is at or above target levels (category B1). These stocks are in very good shape, although may merit some improvements in management regime.
- 40.3% of the catch comes from stocks that score 6 or above across all criteria but not 8 or above for biomass (category B2). These stocks are in good shape but would benefit from improvements in management regime.

- 30.6% of the catch comes from stocks that score below 6 on at least one of the criteria (category C). These stocks have not been effectively managed or are currently in bad condition and significant improvements are required.
- Cumulatively, 69.4% of the catch comes from stocks that score 6 or above on all five criteria – this is broadly in line with the requirements of existing and proposed aquaculture feed sustainability standards.
- Although 14 stocks are in category C, only 4 of these score less than 6 for biomass (score 4) – at least where data is available. Biomass is a crucial factor in determining the sustainability of fisheries management, so the relatively small number of stocks that score below 6 is to be welcomed.
- Fishery improvement projects (FIPs) are present in 15 of the 28 stocks – 6 of these FIPs are making progress, while 9 are making insufficient progress in the opinion of SFP.
- Four of the stocks assessed contain fisheries that are certified according to the Marine Stewardship Council or in full assessment. Twelve of the stocks are used as sources of fishmeal that is certified under the International Fishmeal and Oil Organisation Responsible Supply (IFFO RS) program.
- 77% of the total catch comes from stocks that either contain at least one MSC certified fishery or a FIP. 13% of the catch comes from a stock that contains at least one fishery that is MSC certified, 46.7% of the catch comes from stocks that contain at least one FIP that is making progress, 19.7% of the catch comes from stocks that contain at least one FIP that is making insufficient progress.
- No reduction fish stock is currently managed within an ecosystem-based fisheries management (EBFM) regime. This situation needs to improve significantly. Fisheries that have established a successful single species stock management regime should now be looking to evolve an ecosystem-based approach to ensure sustainability in the future.
- Changes for specific fish stocks 2010–2011 can be summarized as:

Stock	**Change in category**
Improving Grade	
Atlantic herring – North Sea autumn spawners	B_1 to A
Atlantic herring – Icelandic summer spawners	C to B_1
European pilchard – NW Africa southern stock	C to B_1
European pilchard – Iberian	C to B_2
Falling Grade	
Anchoveta – Peruvian northern-central stock	B_1 to B_2
Lesser sandeel – Dogger Bank area	B_1 to C
Atlantic horse mackerel – NE Atlantic western stock	B_2 to C

Introduction

The fish that provide fishmeal and oil are typically the so-called forage species – small, short-lived, pelagic (mid-water) species that can be found in large shoals in specific regions and occupy a low trophic level in the ecosystem (e.g., anchovy, herring, pilchard, sprat, sardine, and menhaden). These species are frequently resilient to fishing pressure if catches are well managed, but overfishing is always a possibility without effective controls. These stocks are also extremely important to wider ocean ecology because they are a critical food source for many species and act as the foundation for many food webs. Consequently, it is of the utmost importance that these stocks are well managed with adequate safety margins and a healthy respect for the wider ecological implications of commercial exploitation.

The SFP Global Sustainability Overview is a ranking exercise which analyses the 28 largest stocks of forage species suitable for fishmeal and fish oil and assesses the sustainability of the current management regimes. This information can provide useful guidance to those parts of the fishing and seafood industries that need to incorporate sustainability criteria into procurement policies.

However, the FishSource rating of any individual fishery is based on its status at a certain point in time (usually more than a year in the past), which is not necessarily the time of purchase of the raw material used in fishmeal and fish oil production. Consequently, the analysis presented in this briefing cannot be used as a practical, 'real-time' purchasing guide but rather as a source of information in assessing performance trends over a period of several years.

The Global Sustainability Overview

Table 1, below, represents the 28 principal reduction fish stocks for South America and the Atlantic as they are currently scored on the FishSource database – full details of these stocks can be seen at www.fishsource.com. The five FishSource scoring criteria (all scored 0 – 10) are:

Score 1 - Is management precautionary?
Score 2 - Do fishery managers follow scientific advice?
Score 3 - Do fishers comply?
Score 4 - Is the stock biomass healthy?
Score 5 - Will the stock be healthy in the future?

Full details of the FishSource scoring methodology can be found at:
http://www.fishsource.com/faqs.

Further details on these stocks, for instance catch data and comparisons from previous years, can be found in Annex 1 - the Excel file that accompanies this briefing and is available at http://www.sustainablefish.org.

The scores are based on the most recently available public data in April 2013 and generally represent a snapshot of the position in 2012 with regard to management quality and stock status indicators and, in 2011, catch statistics. Catch data for 2010 has been used for Gulf menhaden – Gulf of Mexico; European pilchard – Iberian; and Atlantic horse mackerel – NE Atlantic southern stock. Catch data for 2009 has been used for European pilchard – NW Africa southern stock and European

pilchard – NW Africa central stock. More recent data can be obtained from the FishSource database but this cannot be consistently achieved across all 28 stocks.

The stocks are ranked from the highest scoring category (A) at the top to the lowest scoring category (C) at the bottom. The stocks are ranked within categories according to the value of the score for criteria 4 (biomass). The definitions of the categories are:

Category A - All scores ≥ 8
Category B1 - All scores ≥ 6, and biomass score ≥ 8
Category B2 - All scores ≥ 6, biomass score <8
Category C - One or more scores < 6

Particular emphasis is placed on biomass when creating categories. This reflects the crucial role of this criterion in determining the quality of management of a fishery and is closely aligned with recent developments in the Marine Stewardship Council Fisheries Assessment Methodology with regard to low trophic level fisheries.

Table 1 shows the FishSource scores achieved by each of the stocks across the five criteria along with the categories for the 2013 analysis. The table also shows the categories for the 2012 analysis, for comparison.

Table 1. FishSource scores for South American and Atlantic reduction fish stocks

Stock	Score 1	Score 2	Score 3	Score 4	Score 5	Cat. 2013 report	Cat. 2012 report
Atlantic herring – North Sea autumn spawners	8.5	9.7	9.9	10	10	A	B1
Blue whiting – NE Atlantic	8.9	10	≥ 6	10	10	B1	B1
Atlantic herring – Baltic Sea Bothnian Sea stock	≥ 6	8.5	10	10	9.5	B1	B1
Gulf menhaden – Gulf of Mexico	≥ 6	≥ 6	≥ 6	10	10	B1	B1
European pilchard – NW Africa southern stock	≥ 6	≥ 8	≥ 6	10	10	B1	C
Atlantic herring – Icelandic summer spawners	6	10	9	9.9	8.9	B1	C
Atlantic herring – NE Atlantic spring spawners	8.4	10	9.9	8.9	7.7	B1	B1
Norway pout – North Sea	≥ 6	10	10	8.5	≥ 6	B1	B1
Baltic sprat – Baltic Sea	≥ 6	10	10	≥ 8	9.1	B1	B1
Araucanian herring – Chilean	≥ 6	10	10	≥ 8	≥ 6	B1	B1
Anchoveta – Peruvian northern-central stock	≥ 6	10	≥ 6	6.2	8	B2	B1

Capelin – Barents Sea	≥ 8	10	10	≥ 6	≥ 6	B2	B2
Capelin – Icelandic	≥ 6	10	10	≥ 6	n/a	B2	B2
European pilchard – Iberian	≥ 6	≥ 6	≥ 6	≥ 6	≥ 6	B2	C
European pilchard – NW Africa central stock	≥ 6	<6	<6	8.7	8.5	C	C
Lesser sandeel – Dogger Bank area	≥ 6	10	0	7	≥ 8	C	B1
Lesser sandeel – SE North Sea	≥ 6	10	0.2	6.6	≥ 6	C	C
Atlantic horse mackerel – NE Atlantic western stock	≥ 6	2.8	8.6	≥ 6	6.8	C	B2
Atlantic horse mackerel – NE Atlantic southern stock	<6	7.5	10	≥ 6	≥ 6	C	C
Anchoveta – Chilean regions xv-i-ii/southern Peruvian stock	≥ 6	0.4	≥ 6	≥ 6	≥ 6	C	C
European sprat – North Sea	<6	5.7	10	≥ 6	≥ 6	C	C
Lesser sandeel – central eastern North Sea	≥ 6	10	10	5.3	≥ 6	C	C
Anchoveta – Chilean regions V-X	<6	10	10	<6	<6	C	C
Chilean jack mackerel	<6	0	≥ 6	<6	4.8	C	C
Atlantic menhaden – NW Atlantic	0	≥ 6	≥ 8	2.6	0	C	C
Pacific anchoveta – Gulf of Panama	<6	n/a	n/a	n/a	n/a	C	C
Pacific thread herring – Panama	<6	n/a	n/a	n/a	n/a	C	C
Pacific bumper – Panama	<6	n/a	n/a	n/a	n/a	C	C

The percentage of the total catch (of the 28 stocks) for each category is described in Table 2.

Table 2

Evaluation category	2011 catch ('000 tonnes)	Percentage of total catch for this category in 2011	Cumulative percentage catch for 2011	Percentage of total catch for this category in 2010	Cumulative percentage catch for 2010
A	218	1.8%	1.8%	0%	0%
B1	3,296	27.2%	29%	65.1%	65.1%
B2	4,882	40.3%	69.4%	8.3%	73.4%
C	3,706	30.6%	100%	26.7%	100%

Observations from the tables

- One stock featured in the survey scores 8 or above across all FishSource criteria (category A – the top category): Atlantic herring – North Sea Autumn spawners. This fishery represents 1.8% of the total catch from the 28 stocks and is an improvement on the 2012 analysis when no stock achieved this grade.

- 27.2% of the catch comes from stocks that score 6 or above on all criteria AND the score for biomass is 8 or more, meaning biomass is at or above target levels (category B1). The high biomass indicates that these stocks are in very good shape but only viewed from a single species perspective. The fact that the other criteria score less than 8 indicates that there is room for improvements in the management regime. There has been a significant fall in the percentage of catch from stocks of this grade – from 65.1% in the 2012 report to 27.2% in the 2013 report. This fall is almost entirely attributable to the downgrading of Peruvian anchoveta (northern-central) from B1 to B2.

- 40.3% of the catch comes from stocks that score 6 or above across all criteria but not at or above 8 on biomass (category B2). This represents a respectable score and is broadly in line with many of the sustainable feed standards contained within existing and proposed aquaculture certification schemes. These stocks are in good shape but will need to adopt further improvements in management regime to reach a score of 8 for all criteria. There has been a significant increase in the percentage of catch from stocks of this grade – from 8.3% in the 2012 report to 40.3% in the 2013 report. This increase is almost entirely attributable to the downgrading of Peruvian anchoveta (northern-central) from B1 to B2.

- 30.6% of the catch comes from stocks that score below 6 on at least one criterion. These stocks have not been effectively managed or are currently in bad condition and significant improvements are required immediately.

- Cumulatively, 69.4% of the catch comes from stocks that score 6 or above on all five criteria – this is broadly in line with the requirements of existing and proposed aquaculture feed standards. This figure represents a decrease on the 2012 analysis when the percentage of the catch from stocks that scored 6 or above across all criteria was 73.4%.

- Although 14 stocks are in category C, only 4 of these score less than 6 for biomass (score 4) – at least where data is available. The four fisheries are: lesser sandeel – central eastern North Sea; anchoveta – Chilean regions V-X; Chilean jack mackerel; and Atlantic menhaden – NW Atlantic. Biomass is a crucial factor in determining the sustainability of fisheries management, so the relatively small number of stocks that score below 6 is to be welcomed.

- 15 of the 28 stocks are currently engaged in fishery improvement projects – 6 of these FIPs are making progress, while 9 are considered to be making insufficient progress in the opinion of SFP.

- 77% of the total catch comes from stocks that either contain at least one MSC certified fishery or a FIP. 13% of the catch comes from a stock that contains at least one fishery that is MSC certified, 46.7% of the catch comes from stocks that contain at least one FIP that is making progress, 19.7% of the catch comes from stocks that contain at least one FIP that is making insufficient progress. [For more information see Table 1 in the Annex]

- No reduction fish stock is currently managed within an ecosystem-based fisheries management regime. This situation needs to improve significantly. Stocks that have established a successful single species fishery management regime should now be looking to evolve an ecosystem-based approach to ensure sustainability in the future.

- There are two changes of note when comparing the 2013 analysis to that from 2012. Firstly, the overall percentage of the catch coming from stocks that score 6 or more across all FishSource criteria has decreased by 5.5%. Secondly, there has been a significant movement of volume from category B1 to B2 as a result of Peruvian anchoveta (northern-central) scoring less than 8 on biomass (score 4).

- Changes for specific fisheries from 2012 to 2013 can be summarized in Table 3 as:

Table 3

Fishery	**Change in category 2012 to 2013**
Improving Grade	
Atlantic herring – North Sea autumn spawners	B_1 to A
Atlantic herring – Icelandic summer spawners	C to B_1
European pilchard – NW Africa southern stock	C to B_1
European pilchard – Iberian	C to B_2
Falling Grade	
Anchoveta – Peruvian northern-central stock	B_1 to B_2
Lesser sandeel – Dogger Bank area	B_1 to C
Atlantic horse mackerel – NE Atlantic western stock	B_2 to C

Category C fisheries – comments, FIPs, and progress

Some of the specific problems associated with fisheries in category C along with recent FIP progress are described in Table 4:

Table 4

Stock	Comments	FIP lead?	Progress?
European pilchard – NW Africa central stock	Scientific advice has been ignored, public information is out-dated and illegal fishing is considered severe	None	n/a
Lesser sandeel – Dogger Bank area	A formal management plan has yet to be implemented. Catches in 2011 were almost two times the final TAC for this management area	EU Fishmeal & Oil Users Group	Insufficient progress
Lesser sandeel – SE North Sea	Set TAC in 2012 was reduced considerably resulting in catches 60% higher than TAC	EU Fishmeal & Oil Users Group	Insufficient progress
Atlantic horse mackerel – NE Atlantic western stock	No biomass reference points defined since 2010. Fishing mortality has been increasing and currently above Fmsy. TAC set in 2013 is well above (45%) advised levels	None	n/a
Atlantic horse mackerel – NE Atlantic southern stock	No management goals set. Reference points still to be defined. With the exception of in 2012, TAC has been set above the advised by ICES	None	n/a
Anchoveta – Chilean regions xv-i-ii/southern Peruvian	TAC 2010 set 60% above advised levels. Advised	SFP	Making progress

stock	TACs for 2011-2013 not publicly available. An integrated management plan is lacking for this fishery	CeDePesca	
European sprat – North Sea	No management goals and no reference points. Set TAC for 2012 well above ICES advice	EU Fishmeal & Oil Users Group	Insufficient progress
Lesser sandeel – central eastern North Sea	Biomass decreasing since 2010, and in 2013 estimated at below limit reference point	EU Fishmeal & Oil Users Group	Insufficient progress
Anchoveta – Chilean regions V-X	No management plan or reference points adopted. Excessive fishing mortalities and poor recruitments have led the stock to a depleted condition	SFP CeDePesca	Insufficient progress
Chilean jack mackerel	No management goals, scientific advice ignored, stock depleted and at lowest historical levels, fishing mortality is too high. Catches within set TAC, but above recommended levels	SFP CeDePesca	Making progress
Atlantic menhaden – NW Atlantic	Fishing mortality remains too high – currently more than 7 times above the recently adopted target. Biomass keeps decreasing Although it is estimated at well below the adopted biomass limit, results are uncertain	SFP	Insufficient progress
Pacific anchoveta – Gulf of Panama	No management plan is in place and no target or limit reference points have been defined. No information on stock and exploitation status. The fishery is not managed by	SFP CeDePesca	Making progress

	TACs or quotas		
Pacific thread herring – Panama	No management plan is in place and no target or limit reference points have been defined. No information on stock and exploitation status. The fishery is not managed by TACs or quotas	SFP CeDePesca	Making progress
Pacific bumper – Panama	No management plan is in place and no target or limit reference points have been defined. No information on stock and exploitation status. The fishery is not managed by TACs or quotas	SFP CeDePesca	Making progress

In fact, analysis of all the stocks in Annex 1 shows that 15 of the 28 stocks are currently engaged in fishery improvement projects – 6 of these FIPs are making progress while 9 are considered to be making insufficient progress in the opinion of SFP.

Fisheries Improvements

All of the reduction fish stocks featured in this assessment would benefit from improvements in management. Table 5 indicates the current priority improvements required for some of the stocks where such an assessment can be made.

Table 5

Fishery	Improvement needs
North Sea sandeel	Promote catch and effort reporting, primarily by the seven management areas Support the development of long-term management objectives and measures Support the implementation of ecosystem-based fisheries management
North Sea sprat	Promote research and improve biological data Improve catch reporting, particularly the by-catch of herring Support long-term management objectives

	Support the implementation of ecosystem-based fisheries management (EBFM)
Baltic Sea sprat	Improve catch reporting, particularly herring by-catch Support the development of a spatial management plan with long term objectives Support the implementation of ecosystem-based fisheries management
Blue whiting – NE Atlantic	Studies on the impact of this fishery on PET species should be developed Support long-term management objectives Support the implementation of ecosystem-based fisheries management (EBFM)
Peruvian anchovy, northern-central stock	Transparency must be increased: status of the stock seems to be good and over its limit reference points, but this information is not regularly publicly available because IMARPE did not launch its results as a public stock assessment. This information would also allow the fishing industry to improve management in their fishing operations and benefit stock sustainability. Reference points are not clearly established, particularly in regard to the impacts on the trophic chain and the target reference point. It is claimed that current limit reference point empirically takes into consideration the whole trophic chain, but that needs to be demonstrated. Direct and indirect impacts on the ecosystem components are not well enough known. Small-scale fleet landings for direct human consumption have neither catch limits nor effective controls and often are misused for reduction.
Peruvian/Chilean anchovy	Implement coordinated management and research plan between Peru and Chile; define limit and target reference points and a recovery plan in both countries Improve the robustness of fisheries science common approach Establish limits for anchovy harvest by the Peruvian artisanal fleet and strict controls to avoid deviation from direct human consumption to fishmeal factories

	Enforce the 5-mile exclusion zone for the industrial fleet in both countries as a precautionary approach, while scientific and consensual research demonstrates possibilities for another less precautionary approach.
Chilean anchovy v – x region	Develop and implement recovery plan for anchovy stock since this fishery is under SSB limit Implement a management plan including a harvest strategy Establish size closures Conduct ecosystem impact research
Chilean jack mackerel	Conduct research to clarify identification of Chilean jack mackerel stocks Minimize juvenile portion of catches in both national and international jurisdictions. Implement an effective recovery plan at RFMO level with target and limit reference points, a harvest strategy and a time frame for recovery; align management measures with precautionary scientific advice. Accomplish all South Pacific Regional Fisheries Management Organization (SPRFMO) interim measures relating to fishing mortality and catch reporting

Certification

The 28 stocks were also examined for participation in certification programs. More information can be found at www.fishsource.com

Four stocks contain fisheries that are certified by the Marine Stewardship Council:

- Atlantic herring – North Sea autumn spawners (7 certified fisheries)
- Atlantic herring – NE Atlantic spring spawners (5 certified fisheries, 1 in full assessment)
- Baltic sprat – Baltic Sea (1 fishery in full assessment)
- European pilchard (Iberian) (1 certified fishery)

Twelve of the stocks are used as sources of fishmeal that is certified under the International Fishmeal and Oil Organisation Responsible Supply (IFFO RS) program. These stocks are:

- Blue whiting – NE Atlantic
- Gulf menhaden – Gulf of Mexico
- Atlantic herring – Icelandic summer spawners

- Norway pout – North Sea
- Araucanian herring – Chilean
- Anchoveta – Peruvian north-central stock
- Capelin – Barents Sea
- Capelin – Icelandic
- Lesser sandeel – Dogger Bank area
- Lesser sandeel – SE North Sea
- Lesser sandeel – central eastern North Sea
- Anchoveta – Chilean regions V-X

Ecosystem-based fisheries management (EBFM)

One of the most striking aspects of the management regimes currently in place for reduction fish stocks is the weakness of ecosystem-based fisheries management (EBFM), and the complete absence of EBFM methods in setting target reference points for biomass.

EBFM represents an approach that goes beyond a focus on single stocks of target species and includes other elements of the ecosystem in the management framework. The Food and Agriculture Organisation Code of Conduct for Responsible Fisheries states that: "Management measures should not only ensure the conservation of target species but also of species belonging to the same ecosystem or associated with or dependent upon the target species." This approach is particularly important for species that are at a low trophic level – such as forage fish – because of the importance of such species as food for species at higher levels.

Examples of an EBFM approach could include:

- Maintaining biomass above levels needed to prevent significant change to the ecosystem
- Using "no take" zones to maintain prey abundance in areas of importance to predators (e.g., the intent of Steller sea lion protection measures in Alaska)
- Adjusting the seasonal pattern of fishing to prevent any seasonal depletions of prey abundance (e.g., seasonal measures used in the North Sea sandeel fishery to maintain prey for seabirds)
- Protecting habitats of importance to fisheries and other marine life (e.g., defining areas that are off limits to bottom trawling)
- Defining and monitoring thresholds and limits for impacts on marine life other than target stocks and implementing measures, such as by-catch reduction techniques/technologies, that ensure that such limits are respected.

Given the importance of maintaining healthy stocks of forage fish and the ecosystems which they inhabit it is inevitable that elements of an EBFM approach will begin to be adopted in some regions. It is also likely that retailers, aquaculture producers, and aquaculture feed manufacturers will call for such measures both as a way of protecting the sustainability of a vital resource and as an important element of corporate reputation.

SFP plans to help promote EBFM globally by:

1. Documenting best practices that have already been applied with success in other fisheries and regions.

2. Engaging the seafood supply chain to encourage priority fisheries to adopt best practices in EBFM and enhance fisheries performance.

3. Communicating the lessons learned in fisheries that adopt EBFM practices and continuing to encourage adoption worldwide.

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Contacts

- Blake Lee-Harwood, Strategy Director
  Blake.lee-harwood@sustainablefish.org

- Doug Beveridge, Improvements Director, SFP Improvements Division
  Doug.beveridge@sustainablefish.org

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