

Global Sustainability Overview of Fisheries Used for Fishmeal and Fish Oil June 2012

Executive Summary

This briefing represents the third edition of the SFP global sustainability overview of fisheries used for fishmeal and fish oil (previously known as the “Reduction Fisheries League Table”) and covers the most recent assessment period for which comparable data is available as of May 14, 2012. The table consists of the 28 principal reduction fisheries around South America and across the Atlantic, rated according to the sustainability assessment presented on FishSource (www.fishsource.com).

Not all of the fisheries cited are currently used for fishmeal and oil. 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 fisheries:

- No fishery featured in the survey scores more than 8 across all FishSource criteria (category A – the top category).
- 65.1% of the catch comes from fisheries that score above 6 in all criteria AND the score for biomass is 8 or above meaning biomass is above target levels (category B₁). These stocks are in very good shape although may merit some improvements in management regime.
- 8.3% of the catch comes from fisheries that score 6 or above across all criteria but do not score above 8 for biomass (category B₂). These fisheries are in good shape but would benefit from improvements in management regime.
- 26.7% of the catch comes from fisheries that score below 6 on at least one of the criteria. These fisheries have not been effectively managed and significant improvements are required.
- Cumulatively, 73.3% of the catch from these fisheries score 6 or above on all five criteria – this is broadly in line with the requirements of existing and proposed aquaculture feed sustainability standards.
- No reduction fishery is currently managed within an ecosystem-based fisheries management 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 in fishery scores from 2009 to 2010 indicate a small decline in the overall scores. There were reductions in the volumes of catch in category A and an associated rise in volume of catch in category B₂ and practically no change to categories B₁ and C. It cannot be concluded from the data that the sustainability status of reduction fisheries is in decline, but it is unlikely to have improved.
- Changes for specific fisheries from 2009 to 2010 can be summarized as:

Fishery	Change in category
Gulf menhaden – Gulf of Mexico	B ₂ to B ₁
Atlantic herring – North Sea	A to B ₁
Blue whiting – northeast Atlantic	C to B ₁
Capelin - Icelandic	C to B ₂
Lesser sandeel – southeast North Sea	B ₁ to C
Atlantic horse mackerel – northeast Atlantic western stock	B ₁ to C
European pilchard – Iberian	B ₂ to C

Introduction

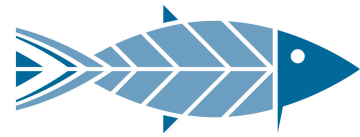
The fish that provide fishmeal and oil are typically the so-called forage species – small, short-lived, pelagic (mid-water) species that can be found in large shoals in specific regions and occupy a low trophic level in the ecosystem (e.g., anchovy, herring, pilchard, sprat, sardine, and menhaden). These species are frequently resilient to fishing pressure if catches are well managed but overfishing is always a possibility without effective controls. These fisheries 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 fisheries 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 that analyzes the 28 largest fisheries of forage species suitable for fishmeal and 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 – for instance, manufacturers of aquaculture feed.

The Global Sustainability Overview

The 28 principal reduction fisheries for South America and the Atlantic have been scored by FishSource and are summarized in the annex, Table A-1. Their full details can be seen at www.fishsource.com. The five FishSource scoring criteria (all scored 1–10) 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>.

The scores are based on the most recent public data available as of May 14, 2012, and generally represent a snapshot of the position in 2010. More recent data for some fisheries can be obtained from the FishSource database, but is not consistently available for all 28 fisheries.

The fisheries are ranked from the highest-scoring category (A) at the top to the lowest-scoring category (C) at the bottom. The definitions of the categories are:

Category A - All scores ≥ 8

Category B₁ - All scores ≥ 6 , and biomass score (Score 4) ≥ 8

Category B₂ - All scores ≥ 6 , biomass score < 8

Category C - One or more scores < 6

Our ranking categories are solely based on the quality of management (score 1 to 3) and the status of the stock (scores 4 and 5), although we capture the environment status and issues on FishSource (in progress for the majority of the fisheries analyzed here). We have, however, taken into account the importance that the biomass status has for low trophic level fisheries by separating further the middle rating B into B₁ (biomass at or above target, which is equivalent to Score 4 ≥ 8) and B₂ (biomass between lower limit and target, which is equivalent to Score 4 between 6 and 8).

Using the evaluation results

The ultimate goal of evaluating source fisheries for fishmeal and fish oil production is to identify and trigger improvement needs and activities. The FishSource rating is, however, based on the status of the fishery at a certain point in time, which is not necessarily the time of the purchase of raw material used in fishmeal and fish oil production. Furthermore, fishfeed producers often enter into raw material purchase contracts many months ahead of harvest, shipment, or delivery. These contracts provide operational continuity and thus benefit planning, price, and supply. As such, seafood buyers should not request their fishfeed suppliers to refrain from certain sources of raw material (e.g., those in category C), but rather to monitor the situation over time and engage actively in improvements of their raw material source fisheries.

Table 1 – FishSource C-rated reduction fisheries. Catch data refers to 2010 (except African stocks of European pilchard for which the most recent catch data available is for 2008). Fisheries are ranked from low (at the top of the table) to high severity considering the underlying problems (see “Comments” column for details).

Fishery profile	Score 1	Score 2	Score 3	Score 4	Score 5	Evaluation category	Comments
Lesser sandeel - Central Eastern North Sea	≥ 6	≥ 6	10	7.1	< 6	C	No fishing mortality target, current fishing mortality deemed too high as biomass decreases.
Lesser sandeel - SE North Sea	≥ 6	10	10	6.9	< 6	C	No fishing mortality target, current fishing mortality deemed too high as biomass decreases.
Atlantic menhaden - NW Atlantic	6	≥ 6	≥ 6	8.0	0	C	Fishing mortality more than 3 times above target.
Atlantic horse mackerel - NE Atlantic southern stock	< 6	10	10	≥ 6	≥ 6	C	No management goals set, no reference points in place.
Atlantic herring - Icelandic summer-spawning	6	0	8.4	6.4	≥ 6	C	Advice is for closing the direct fishery; yet, a TAC has been set
Anchoveta - Chilean regions xv-i-ii / Southern Peruvian stock	≥ 6	0.4	10	≥ 6	≥ 6	C	TAC set 60% above advised levels.
European pilchard - Northwest Africa southern stock	≥ 6	≥ 6	< 6	10	10	C	Public information is outdated and illegal fishing is considered severe.
European pilchard - Northwest Africa central stock	≥ 6	< 6	< 6	8.6	9	C	Scientific advice has been ignored, public information is outdated and illegal fishing is considered severe.
European pilchard - Iberian	6	≥ 6	≥ 6	5.8	8	C	–Biomass decreasing for the 5 th year and now below limit. Fishing mortality at target but sharply increasing.
European sprat - North Sea	< 6	≥ 6	10	N/A	< 6	C	No management goals, no reference points, no biomass estimates, and fishing mortality considered too high.
Anchoveta - Chilean regions V-X	8.4	10.0	3.8	4.2	10	C	Depleted stock and landings exceed TAC.
Chilean jack mackerel	< 6	4.3	10	1.0	< 6	C	No management goals, scientific advice ignored, stock depleted and at lowest historical levels, fishing mortality is too high.
Pacific anchoveta - Gulf of Panama	< 6	N/A	N/A	N/A	N/A	C	No management plan is in place and no target or limit reference points have been defined. The fishery is not managed by TACs or quotas.
Pacific thread herring - Gulf of Panama	< 6	N/A	N/A	N/A	N/A	C	No management plan is in place and no target or limit reference points have been defined. The fishery is not managed by TACs or quotas.
Pacific bumper - Gulf of Panama	< 6	N/A	N/A	N/A	N/A	C	No management plan is in place and no target or limit reference points have been defined. The fishery is not managed by TACs or quotas.



Table 2 – The percentage of the total catch (of the 28 fisheries) for each evaluation category

Evaluation category	Evaluation category scores	2010 catch (thousands of tonnes)	Percentage of total catch for this category in 2010	Percentage of total catch for this category in 2009	Change in percentage 2009–2010
A	All scores ≥ 8	0	0	1.2%	-1.2%
B₁	All scores ≥ 6 , and biomass score ≥ 8	7,149	65.1%	65.2%	-0.1%
B₂	All scores ≥ 6 , and biomass score < 8	910	8.3%	6.9%	1.4%
C	One or more scores < 6	2,931	26.7%	26.7%	0%

Observations from the tables

- 65.1% of the catch comes from fisheries that score 6 and above in all criteria AND the score for biomass is 8 or above 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 are lower than 8 indicates that there is room for improvements in the management regime.
- 8.3% of the catch comes from fisheries that score 6 or above across all criteria but do not score 8 or above 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 fisheries are in good shape but will need to adopt further improvements in management regime to reach a score of 8 for all criteria.
- 26.7% of the catch comes from fisheries that score below 6 on at least one criterion. These fisheries have not been effectively managed and significant improvements are required immediately.
- Cumulatively, 73.3% of the catch from these fisheries score 6 or above on all five criteria – this is broadly in line with the requirements of existing and proposed aquaculture feed standards.
- No reduction fishery is currently managed within an ecosystem-based fisheries management 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 in fishery scores from 2009 to 2010 indicate a small decline in the overall scores. There were reductions in the volumes of catch in category A and an associated rise in volume of catch in category B₂ and practically no change to categories B₁ and C. It cannot be concluded from the data that the overall sustainability status of reduction fisheries is in decline but it is unlikely to have improved.
- Changes for specific fisheries from 2009 to 2010 can be summarized as:

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Atlantic horse mackerel – northeast Atlantic western stock	B ₁ to C
European pilchard – Iberian	B ₂ to C

Fisheries Improvements

All of the reduction fisheries featured in this assessment would benefit from improvements in management. Table 3 indicates the current priority improvements required for some of the fisheries where such an assessment can be made.

These improvements have been publicly recognized by managers and scientists associated with these fisheries as representing priority actions for enhancing fishery performance. Consequently, the sustainability policies in the seafood market will increasingly demand evidence-based progress on these issues. SFP projects and programs can provide the necessary tools and platforms to assist seafood buyers in realizing these improvements.

Table 3 – Improvement needs by fishery

Fishery	Improvement needs
North Sea sandeel	Improvement in catch & effort reporting by the seven management areas Application of ecosystem-based fisheries management
North Sea sprat	Effective reporting of bycatch Promote research and improve biological data Development of long-term management objectives Application of ecosystem-based fisheries management
Baltic Sea sprat	Effective reporting of bycatch Reduction in fishing pressure Development of long-term management objectives Application of ecosystem-based fisheries management
Blue whiting	Reduction in fishing pressure Application of ecosystem-based fisheries management



Peruvian anchovy, northern-central stock	Transparency of stock assessments Target reference points established in line with ecosystem-based assessment Harvest strategy formalized Artisanal sector under quota and control Increased observer coverage
Peruvian/Chilean anchovy	Transparency of stock assessments Target reference points established in line with ecosystem-based assessment Harvest strategy formalized Artisanal sector under quota and control Increased observer coverage Management and research coordination between Chile and Peru Resolution of conflict with artisanal fleet
Chilean sardine/anchovy v – x region	Peer review of stock assessments Improvement in fishery controls Recovery plan in place for anchovy Harvest strategy formalized
Chilean jack mackerel	RFMO interim measures to reduce fishing pressure enforced National measures by coastal states aligned with those at the RFMO Avoidance of undersized fish Spawning season closures

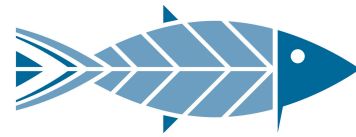
Ecosystem-based fisheries management (EBFM)

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

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 Organization 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 bycatch reduction techniques/technologies, that ensure that such limits are respected.

Developing a robust EBFM regime is not easy and there are reasons why this approach has yet to be widely adopted. EBFM requires significant amounts of ecological data to be effective and cannot always be easily integrated into existing management regimes, so progress has inevitably been slow. However, given the importance of maintaining healthy stocks of forage fish and the need to maintain the ecosystems that 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 as a way of both 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.

Conclusions

An analysis of how the main reduction fisheries around South America and across the Atlantic score using the FishSource methodology reveals that most operate within limits that would be considered consistent with current good industry practice in the context of single species management regimes. However, a few fisheries are experiencing significant difficulties, many could benefit from improvements in single stock management, and all would be enhanced by the incorporation of ecosystem principles into the overall management regime.

Underpinning all of the information and opinion put forward in this briefing is the fundamental requirement for transparency within the supply chain. Fisheries that have no data cannot be assessed by FishSource, or indeed by any methodology or standard setting regime. Retailers, processors, producers, and feed manufacturers should all take responsibility for asking questions of their suppliers about the origins and sustainability of marine ingredients. Even the



most basic data can provide a starting point for an assessment and, if required, the identification of improvement needs.

**Contact: Lisa Borges, European Fishery Improvement Projects Director,
lisa.borges@sustainablefish.org, +32 476 97 44 51 (Belgium)**

Data used in the current report have been provided by FishSource.com and FisheriesWiki.org, programs of the Sustainable Fisheries Partnership Foundation (SFP). The preparation of scores tables and the oversight of fisheries ratings are due to the SFP Science, Research and Data division team (<http://www.sustainablefish.org/about-us/staff/staff-list>).

Annex

Table A-1 – FishSource scores for global reduction fisheries. Catch data refers to 2010 (except African stocks of European pilchard for which the most recent catch data available is for 2008).

Fishery profile	Score 1	Score 2	Score 3	Score 4	Score 5	Evaluation category	IFFO Responsible Sourcing-approved	Organization leading a FIP	FIP progress
Anchoveta - Peruvian northern-central stock	≥ 6	9.9	10	10	8.0	B ₁	Yes	CeDePesca/SFP	On track
Atlantic herring - Norwegian spring-spawning	8.4	10	10	10	6.9	B ₁	No	–	
Atlantic herring - North Sea	8.4	≥ 6	9.1	9.2	10	B ₁	No	–	
Blue whiting - northeast Atlantic	≥ 8	10.0	10	8.2	8.0	B ₁	Yes	SFP	Better progress needed
Norway pout - North Sea	≥ 6	10	10	10	≥ 6	B ₁	Yes	–	
Lesser sandeel - Dogger Bank area	≥ 6	10	10	8.9	≥ 8	B ₁	Yes	SFP	On track
Atlantic herring - Baltic Sea Bothnian Sea stock	≥ 6	9.7	10	≥ 8	9.5	B ₁	No	–	
Gulf menhaden - Gulf of Mexico	≥ 6	≥ 6	≥ 6	10	10	B ₁	Yes	–	
Baltic sprat - Baltic Sea	≥ 6	10	10	≥ 8	7.9	B ₁	No	SFP	On track
Araucanian herring - Chilean	≥ 6	6.5	10	≥ 8	≥ 6	B ₁	Yes	CeDePesca/SFP	On track
Capelin - Barents Sea	≥ 8	10	10	≥ 6	≥ 6	B ₂	Yes	–	FIP needed
Atlantic horse mackerel - NE Atlantic western stock	≥ 6	10	8.4	≥ 6	7.1	B ₂	No	–	FIP needed
Capelin - Icelandic	≥ 6	10	10	≥ 6	N/A	B ₂	Yes	–	FIP needed

Atlantic menhaden - NW Atlantic	6	≥ 6	≥ 6	8.0	0	C	No	SFP	Better progress needed
Atlantic horse mackerel - NE Atlantic southern stock	< 6	10	10	≥ 6	≥ 6	C	No	–	FIP needed
Atlantic herring - Icelandic summer-spawning	6	0	8.4	6.4	≥ 6	C	Yes	–	FIP needed
Anchoveta - Chilean regions xv-i-ii/ Southern Peruvian stock	≥ 6	0.4	10	≥ 6	≥ 6	C	No	CeDePesca/SFP	On track
Lesser sandeel - Central eastern North Sea	≥ 6	≥ 6	10	7.1	< 6	C	Yes	SFP	On track
Lesser sandeel - SE North Sea	≥ 6	10	10	6.9	< 6	C	Yes	SFP	On track
European pilchard - northwest Africa southern stock	≥ 6	≥ 6	< 6	10	10	C	No	–	FIP needed
European pilchard - northwest Africa central stock	≥ 6	< 6	< 6	8.6	9	C	No	–	FIP needed
European pilchard - Iberian	6	≥ 6	≥ 6	5.8	8	C	No	–	FIP needed
European sprat - North Sea	< 6	≥ 6	10	N/A	< 6	C	No	SFP	On track
Anchoveta - Chilean regions V-X	8.4	10.0	≥ 6	4.2	10	C	Yes	CeDePesca/SFP	On track
Chilean jack mackerel	< 6	4.3	10	1.0	< 6	C	No	CeDePesca/SFP	On track
Pacific anchoveta - Gulf of Panama	< 6	N/A	N/A	N/A	N/A	C	No	CeDePesca/SFP	On track
Pacific thread herring - Gulf of Panama	< 6	N/A	N/A	N/A	N/A	C	No	CeDePesca/SFP	On track
Pacific bumper - Gulf of Panama	< 6	N/A	N/A	N/A	N/A	C	No	CeDePesca/SFP	On track

NOTE: Fisheries are ranked from low (at the top of the table) to high severity within categories considering the underlying problems (see “Comments” column of Table 1).