



# Reduction Fisheries:

## SFP Fisheries Sustainability Overview 2018



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## PHOTO CREDITS

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## KEYWORDS

$B_{MSY}$ ; fisheries; FishSource;  $F_{MSY}$ ; forage; improvement; low trophic level; ecosystem-based fisheries management; reduction; stock status; supply chain; sustainability; target

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## DISCLAIMER

This report was mainly prepared with information available from [FishSource.org](http://FishSource.org)<sup>TM</sup>, a program of Sustainable Fisheries Partnership (SFP). The findings summarized in the report are based on information that the authors accessed from FishSource in July 2018. SFP updates FishSource regularly, but the report may not capture the most recent data for all the stocks. Always check [FishSource.org](http://FishSource.org) for the most updated information SFP has for any given stock and fishery. Given the large number of existing fisheries for a given sector, this report evaluates the strategically most important stocks worldwide at the time (based on criteria such as the volume of catch or interest for SFP partners, for example). The current *scoring* and *ranking categories* provided in the report do not take into account the environmental impacts of the fisheries (i.e., are based solely on the quality of management/degree of fishers' compliance and the status of the stock). However, the main environmental issues are considered at a high resolution, based on information already captured in the respective narrative "Environment and Biodiversity" sections of FishSource.org, and also in other sources of information.



## EXECUTIVE SUMMARY

This report represents the ninth edition of the SFP global sustainability overview of the main Pacific and Atlantic fish stocks used for reduction purposes (to produce fishmeal and fish oil). This year, we have also added the first stocks in Asian waters – the Indian oil sardine – because of the strategic importance of this species. The fisheries are rated according to the sustainability assessment presented on Fishsource (<http://www.fishsource.org>), the SFP public database of fisheries information. The assessments are based on the most recently available public data as of July 2018 and generally represent a snapshot of the position in 2017 with regard to management quality and stock status indicators and in 2016<sup>1</sup> for catch statistics.

The report is only concerned with fisheries that provide whole fish to the fishmeal and oil industry and does not cover fisheries that generate trimmings. The report also avoids Asian fisheries (with the exception of Indian oil sardine), both small pelagics and mixed-species trawl fisheries, because of the current difficulty in establishing management and catch data. This omission is significant, because the fisheries of Asia provide very large quantities of fishmeal; it is hoped that future editions of the report will be able to extend coverage to at least some of these fisheries. Nonetheless, we are confident that the report covers approximately 50 percent of global fishmeal and oil production.

In summary, for the 26 stocks analyzed, the report concludes that:

- There has been an overall improvement in the sustainability status of the fisheries covered in the report compared to the previous year. This builds on the improvements described in the report from last year and represents a very positive trend in fisheries management.
- **Three percent** of the total catch volume of the reduction fisheries in this analysis comes from stocks in very good condition (**Category A**) (**Figure 1**). As in the three previous editions, this corresponds to a single fishery: Antarctic krill - Atlantic Southern Ocean. This stock is managed by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), and has had MSC-certified fisheries since 2010. Recently, a new fleet has joined the MSC program and is currently under assessment (**Appendix E**). It is important to note, however, that this does not mean that ecosystem monitoring should be ignored. Future ecosystem effects (such as warming of the Antarctic by anthropogenic climate change) and the relationship to fishery management are not taken into account in this overview.
- **Ninety-one percent** of the total catch volume in this analysis comes from stocks that are reasonably well-managed (or better) (i.e., that score 6 or above on all five FishSource criteria), **an 8 percent increase compared to last year**. The stock with the largest contribution to this category continues to be the **Anchoveta - Peruvian northern-central stock**, which **represented approximately one third (33 percent)** of the total catch, compared to 35 percent in the previous overview.

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<sup>1</sup> Although catch data for 2017 is already available for some fisheries, most is only available up to 2016; thus, we have used the 2016 catch across all fisheries.



- The catch volume from reasonably well-managed fisheries with the stocks in good condition (**Category B1**) also increased by **12 percent** compared to last year. This was mostly due to management improvements in the NE Atlantic blue whiting fishery (14 percent of total catch; now with the stock at healthy levels), but was also due to the Chilean jack mackerel - SE Pacific and the Araucanian herring - Central-South Chile fisheries, where both stocks are showing signs of recovery from the low levels of recent years (**Table 4**).
- **Nine percent** (0.8 million tonnes) of the total catch for reduction purposes comes from poorly managed fisheries (**Category C**), a **drop of 7 percent compared to last year**. The volume coming from poorly managed fisheries has been decreasing since 2016, and is currently the lowest percentage since this overview began publication (**Figure 2**).
- Of the fisheries analyzed, **changes in sustainability categories from last year** were observed in **five fisheries** (details on the specific changes for each of the fisheries can be found in **Table 4**).
  - **Four fisheries improved** their status:
    - Chilean jack mackerel - Southeast Pacific (B2 to B1)
    - Araucanian herring - Central-South Chile (B2 to B1)
    - Anchoveta - Southern Peru/Northern Chile (regions XV-I-II) (C to B2)
    - Capelin - Barents Sea (C to B2)
  - **One fishery decreased** in its sustainability category:
    - European pilchard - Northwest Africa southern stock (Mauritanian management unit) (B1 to C).
- Progress toward improvements and certification continues, in particular for the Atlantic and Eastern Pacific reduction fisheries. Out of the Atlantic and Pacific stocks covered in this overview, 11 have fisheries that are already covered by the MSC program, 18 have fisheries that are covered by the IFFO Responsible Sourcing program (either as approved whole raw material or by-product), and two are covered by fishery improvement projects (FIPs) that are making good progress. For more information on certification and fisheries improvement projects, see **section 3.2**.



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## 1 INTRODUCTION

Sustainable Fisheries Partnership (SFP) applies a sectoral approach to its mission of making actionable information available to the supply chain in order to leverage market forces to achieve improvements in fisheries. Seafood sectors may be defined in terms of the shared biological characteristics of harvested species, as well as their role in defined markets (for instance, krill and anchovy share few biological characteristics, but they are both important in the same fishmeal and fish oil markets). In 2017, SFP announced a new sector-based initiative, called [Target 75](#) (SFP 2017), which aims to get 75 percent of the world's seafood produced in a sustainable manner, or demonstrating improvement toward sustainability, by 2020. The reduction fisheries are one of the strategic seafood sectors covered by this initiative.

SFP created an online database in 2007, [FishSource.org](#), to track individual stock and fishery performance within each sector against the [FishSource sustainability criteria](#) for management quality and stock status, environmental impacts, and improvement needs of individual fisheries. As of July 2018, FishSource covered 3,073 fisheries from more than 2,190 stocks or assessment units and 450 marine and freshwater wild-capture species (SFP 2017b). Since 2008, analyses of FishSource data (in the form of "sector reports") have been performed for the many strategic seafood sectors. The sector reports assess the sustainability performance of individual stocks and aggregate data in order to reflect the status of the overall sector. This information can provide useful guidance to those parts of the fishing and seafood industries that need to incorporate sustainability criteria into procurement policies. This report focuses on the reduction fisheries sector, with particular emphasis on fisheries from the Atlantic and eastern Pacific oceans.

Reduction fisheries for the fishmeal and fish oil industry in the Atlantic and eastern Pacific oceans are largely dominated by low trophic level species. Also known as forage species, these are small, short-lived species that occupy a low trophic level (LTL) in the ecosystem (e.g., krill, anchovy, herring, pilchard, sprat, sardine, sandeel, and menhaden) and can be found in large shoals in specific regions (e.g., southeast Pacific). Due to their specific population biology and dynamics (e.g., high fecundity, early maturity, and short life span), these species are frequently resilient to fishing pressure if catches are well-managed, but overfishing is always a possibility without effective controls. The proportion of any given catch that is used for reduction purposes (as opposed to human consumption) will vary over time depending on market conditions, with fish destined for consumers tending to attract higher prices. The forage species are also extremely important to the wider ocean ecology, because they are a critical food source for many species of fish, marine mammals, and seabirds and act as the foundation for many food webs. 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.

This latest SFP Fisheries Sustainability Overview analyzes reduction fisheries from 26 different stocks (most targeting forage species) and assesses the sustainability of the current management regimes. As in previous years, only a subset of the global catch that is used for reduction is covered; fisheries that are used exclusively as fish trimmings are excluded from this sustainability analysis. Southeast





Asian fisheries that are used principally for reduction (mainly from “trash fish”<sup>2</sup> fisheries, but also from fisheries targeting small pelagics) are also very relevant to the global catch supply for fishmeal, fish oil, and agriculture fertilizers, but are not included in this report.



European pilchard (*Sardina pilchardus*). © SFP 2018

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<sup>2</sup> “Trash fish” is the term commonly used for fish that have generally very low or no direct commercial value; these are usually fish that are small in size or species with very low consumer preference. Trash fisheries are of great importance in the Asian region, representing more than one fourth of the total marine capture production in several Southeast Asian countries (FAO 2005). Trash fish are mostly used as fishmeal in aquaculture, but also for human consumption (as a cheap source of animal protein in coastal areas).





## 2 SOURCES OF INFORMATION AND ASSESSMENT CRITERIA

Our overview is based on information from [FishSource.org](http://fishsource.org), SFP's online information resource about the status of fish stocks and fisheries. FishSource scores (Cannon 2006) consist of a suite of criteria to assess key aspects of management and stock status of fisheries and fish stocks. **Table 1**, below, provides a brief explanation of the five FishSource scoring criteria (full details of the FishSource scoring methodology can be found at: <https://www.fishsource.org/how/scores>).

**Table 1.** Current rationale for each of the five FishSource scoring criteria

	Score/Criterion	Rationale	Rationale (description)
<b>Management quality</b>	<b>Management strategy (1):</b> Is management precautionary?	$F_{at\ low\ biomass} / F_{target}$ OR $F_{current} / F_{target}$	How does the adopted limit and/or target reference point for fishing mortality rate compare to the stock's fishing mortality rate at low biomass, as an index of whether the management strategy is precautionary? The higher the ratio, the lower the score.
	<b>Managers' compliance (2):</b> Do fishery managers follow scientific advice?	Set TAC / Advised TAC	How does the adopted total allowable catch (TAC) level compare to the scientific advice on measures needed to meet stock management objectives, as an index of whether fishery managers follow scientific advice? The higher the ratio, the lower the score.
	<b>Fishers' compliance (3):</b> Do fishers comply?	Catches / Set TAC	How did the catch level in the most current year for which data are available compare to the adopted TAC level, as an index of whether harvest control rules were met? The higher the ratio, the lower the score.
<b>Stock health</b>	<b>Current health (4):</b> Is the stock biomass healthy?	$B_{current} / B_{target}$	How does stock biomass in the most current year for which data are available compare to the biomass level that is predicted to support maximum sustainable yields, or similar biological reference point, as an index of whether the stock biomass is healthy? The higher the ratio, the higher the score.
	<b>Future health (5):</b> Will the stock be healthy in the future?	$F_{current} / F_{target}$	How does the fishing mortality rate in the most current year for which data are available compare to the rate that is predicted to support maximum sustainable yields, or similar biological reference point, as an index of whether the stock will be healthy in the future? The higher the ratio, the lower the score.

Source: Cannon 2006

For profiles assessed using the FishSource quantitative criteria, FishSource scores each criterion on a scale of 0 to 10, with 0 being the lowest and 10 the highest possible score. Preserving comparability with quantitative scores, qualitative scores are obtained by using the cut-off points as used in applications of the Marine Stewardship Council (MSC) fishery assessment method, where "< 6" indicates a high risk and a negative assessment finding, "≥ 6" indicates a medium risk and that improvements are required, and "≥ 8" indicates a low risk and that the fishery meets the criterion conditions.



The scores are based on the most recently available public data as of July 2018 and generally represent a snapshot of the position in 2017 with regard to management quality and stock status indicators and in 2016<sup>3</sup> for catch statistics.

In order to create simple and accessible assessments of the stocks, FishSource scores are used to place fisheries into one of five ranked sustainability categories (A, B1, B2, DD, and C). The categorization is based on the quality of management (scores 1 to 3) and status of the target stock (scores 4 and 5). While information on environmental impacts of fishing activities is also captured in the narrative sections of the FishSource fishery profiles, it is not currently captured by the scoring system. **Table 2**, below, shows the criteria for the five SFP sustainability categories used in the overview.

**Table 2.** Criteria for the five SFP sustainability categories used in this 2018 fisheries overview

Categories	Criteria
<b>Category A:</b> Very well managed fisheries	Score 8 and above across all FishSource scores
<b>Category B1:</b> Reasonably managed fisheries with stock in good condition	Score $\geq 6$ across all FishSource scores, and score $\geq 8$ in terms of biomass (i.e., current health of the stock)
<b>Category B2:</b> Reasonably managed fisheries	Score 6 or above across all FishSource scores
<b>Category DD:</b> Fisheries with high uncertainty in terms of their stock status or management	Score 6 or above across all FishSource scores, except that at least one FishSource score is data deficient (DD) <sup>4</sup>
<b>Category C:</b> Poorly managed fisheries	At least one FishSource score is below 6.

Given the important ecological role of most of the featured species within marine ecosystems (e.g., Peruvian anchoveta, Antarctic krill), particular emphasis is placed on biomass (hence the split into categories B1 and B2 to distinguish fisheries with high biomass). 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 MSC Fisheries Assessment Methodology with regard to low trophic level (LTL) fisheries.

<sup>3</sup> Although catch data for 2017 is already available for some fisheries, most is only available up to 2016; thus we have used the 2016 catch across all fisheries.

<sup>4</sup> A data-deficient (DD) score is determined when there is high uncertainty or lack of information, which prevents a given score to be determined for that specific criteria. For more information, please consult <https://www.fishsource.org/faq>



### 3 RESULTS

#### 3.1 Overview of management quality and the current status of the stocks

Overall, the main results from the assessment of the 26 reduction stocks included in the current overview, in terms of management quality and stock status, are as follows:

- **Almost half (49 percent)** of the catch supply for reduction purposes, and covered in the current overview, comes from South American fisheries (FAO area 87), followed by European (FAO area 27; 29 percent of total catch supply) and northwest African fisheries (FAO area 34; 11 percent of total catch) (**Appendix A**).
- Compared to last year, there was a **16 percent decrease in the total catch supplied by the reduction fisheries** included in this overview (**Appendix A**). This was related to a considerable decrease in catches of the South American reduction fisheries, in particular of anchoveta — the species with generally the highest catches in the world (FAO 2017).
- Anchoveta (*Engraulis ringens*) remains by far the most important species for reduction purposes, accounting for more than two thirds (3.4 million tonnes; 39 percent) of the total catch covered in this overview. The two other most-captured species remain blue whiting from NE Atlantic (1.2 million tonnes; 14 percent) and European pilchard from NW Africa (1.0 million tonnes; 12 percent) (**Appendix B**). **Together, these three species continue to account for more than 60 percent of the total reported catches** of the fisheries analyzed in this report.
- **As in previous editions, almost all reduction fisheries covered in this overview continue to target low trophic level (LTL) species.** It is important that the management of these fisheries focuses on an ecosystem-based (rather than single-species) approach, given the key role of some of these species as a source of food for upper levels of the food chain.
- As in previous editions, most of the catch comes from a few very important stocks: the **top five stocks** accounted for **two thirds of the total catch in this analysis**. These are a mix of large South American, European, and NW African reduction fisheries (**Table 3**).
- A noteworthy change, compared to previous editions, is the inclusion of one of the most important Asian reduction fisheries, Indian oil sardine, which is currently evaluated and managed as six distinct units. This is the first time a reduction fishery from Asia is included in the overview.
- Antarctic reduction fisheries seem to have the highest assessments (relative proportion of A, B1, B2, DD, and C fisheries), followed by North America, Europe, and then South America. (**Figure 3**).
- **Three percent** of the total catch volume of the reduction fisheries in this analysis comes from stocks in very good condition (**Category A**) (Error! Reference source not found.). As in the three previous editions, this corresponds to a single fishery: Antarctic krill - Atlantic



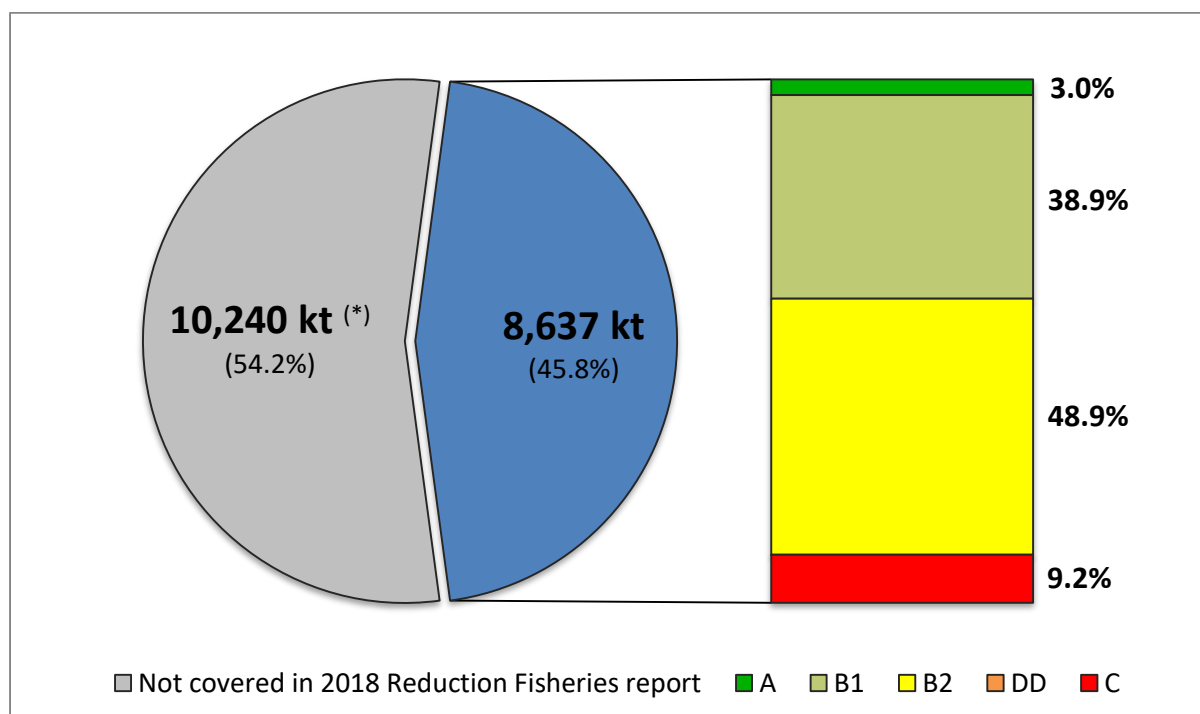
Southern Ocean. This stock is managed by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and has had MSC-certified fisheries since 2010. Recently a new fleet has joined the MSC program and is currently under assessment (**Appendix E**). It is important to note, however, that this does not mean that ecosystem monitoring should be ignored. Future ecosystem effects (such as warming of the Antarctic by anthropogenic climate change) and the relationship to fishery management are not taken into account in this overview.

- Progress toward improvements and certification continues, in particular for the Atlantic and Eastern Pacific reduction fisheries. Out of the 26 stocks covered in this overview, 11 have fisheries that are already covered by the MSC program, 18 have fisheries that are covered by the IFFO Responsible Sourcing scheme (either as approved whole raw material, or by-product), and two are covered by fishery improvement projects (FIPs) that are making good progress. For more information on certification and FIPs, see **section 3.2**.
- **Ninety-one percent** of the total catch volume in this analysis comes from stocks that are reasonably well-managed (or better) (i.e., that score 6 or above on all five FishSource criteria), **an 8 percent increase compared to last year**. The stock with the largest contribution to this category continues to be the **Anchoveta - Peruvian northern-central stock**, which **represented approximately one third (33 percent)** of the total catch, compared to 35 percent in the previous overview.
- The catch volume from reasonably managed fisheries with the stocks in good condition (**Category B1**) **increased by 12 percent** compared to last year. This was mostly due to management improvements in the NE Atlantic blue whiting fishery (14 percent of total catch; now with the stock at healthy levels); but was also due to the Chilean jack mackerel - SE Pacific and Araucanian herring - Central-South Chile fisheries, where both stocks are showing signs of recovery from the low levels of recent years (**Table 4**).
- **Nine percent** (0.8 million tonnes) of the total catch for reduction purposes comes from poorly managed fisheries (**Category C**), **a drop of 7 percent compared to last year**. The volume coming from poorly managed fisheries has been decreasing since 2016 and is currently the lowest percentage since this overview began publication (**Figure 2**).
  - Currently, some of the **C-rated** fisheries are already relatively well-managed (i.e., score 6 or above on the FishSource criteria related to management quality), but either the stock is in a seriously depleted condition, or fishing pressure remains too high. Examples are the European sprat - North Sea and Anchoveta - Chilean Central-Southern (regions V-X) stocks (**Table 3**). In these cases, efforts should be made to continue adequate management in order to allow the stock and exploitation status to improve.
  - Three Latin American fisheries (Frigate tuna - Ecuador, Pacific chub mackerel - Ecuador, and Anchoveta - Chilean Central-Southern (regions V-X)), remain in very bad shape both in terms of management and stock status (current biomass is either

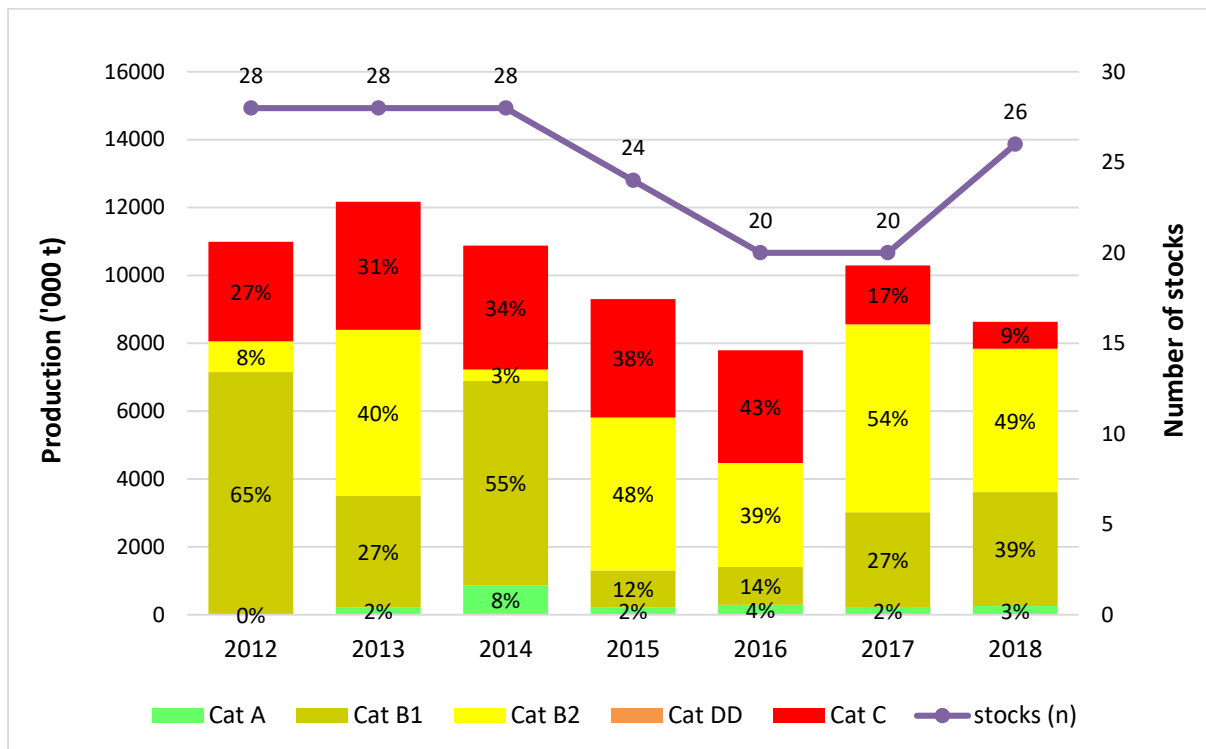


unknown or at very low levels). In Asia, all the Indian oil sardine fisheries included in the current overview are also facing considerable management challenges, and have high levels of uncertainty around the current stock condition and fishing pressure. In all these fisheries, improvements are needed in the management strategy to ensure management is precautionary, to allow for stock recovery and long-term sustainable yield.

- A more detailed analysis of why each of these fisheries scores badly (i.e., less than 6 across one or more criteria) in one or more of the specific FishSource sustainability criteria is provided in **Appendix C**.
- Of the fisheries analyzed, **changes in sustainability categories from last year** were observed in **five fisheries** (details on the specific changes for each of the fisheries can be found in **Table 4**).
  - **Four fisheries improved** their status:
    - Chilean jack mackerel - Southeast Pacific (B2 to B1)
    - Araucanian herring - Central-South Chile (B2 to B1)
    - Anchoveta - Southern Peru/Northern Chile (regions XV-I-II) (C to B2)
    - Capelin - Barents Sea (C to B2)
  - **One fishery decreased** in its sustainability category:
    - European pilchard - Northwest Africa southern stock (Mauritanian management unit) (B1 to C).



**Figure 1.** Catch volume ('000 t) and percentage of global reduction fisheries supply covered in this report, and percentage of catch by SFP sustainability category compared to the combined reported catch of the 26 stocks covered in this report (column chart). **Notes:** (\*) Includes estimated global supply from other Southeast Asian reduction fisheries (~8.5 million tonnes) (FAO 2012).



**Figure 2.** Number of stocks covered in this report and percentage of the total volume per year for each SFP sustainability category (A, B1, B2, DD, C), for reporting periods 2012 through 2018. **Note:** The data deficient (DD) category was only added in the current edition of the report.





**Table 3.** Current FishSource scores, SFP sustainability category, and latest catch ('000 t) data for the 26 main stocks used for reduction purposes and assessed in this overview (as of July 2018). Catches refer to 2016 and are in thousand tonnes.

Stock / nested jurisdiction (when applicable) <sup>(1,2)</sup>	Management quality			Stock health		Sustainability category	Latest Catch	% of total	Changes from last year
	Management strategy (S1)	Managers' compliance (S2)	Fishers' compliance (S3)	Current health (S4)	Future health (S5)				
<a href="#">Antarctic krill - Atlantic Southern Ocean</a>	≥ 8	10	10	≥ 8	≥ 8	A	260.2	3.0%	-
<a href="#">Blue whiting - NE Atlantic</a>	9.4	10	7.4	10	7.0	B1	1180.8	13.7%	-
<a href="#">Gulf menhaden - Gulf of Mexico</a>	≥ 6	≥ 8	≥ 6	10	10	B1	618.7	7.2%	-
<a href="#">European sprat - Baltic Sea <sup>(3)</sup></a>	≥ 8	9.8	10	10	7.7	B1	247.0	2.9%	-
<a href="#">Norway pout - North Sea</a>	≥ 6	10	10	10	≥ 8	B1	63.4	0.7%	-
<a href="#">Sandeels nei - Central Eastern North sea</a>	≥ 6	10	10	10	7.2	B1	44.1	0.5%	-
<a href="#">Sandeels nei - Dogger Bank area</a>	≥ 6	10	10	10	7.3	B1	15.3	0.2%	-
<a href="#">Chilean jack mackerel - Southeast Pacific</a>	≥ 6	≥ 8	10	8.1	10	B1	388.6	4.5%	B2 to B1
<a href="#">Araucanian herring - Central-South Chile</a>	≥ 6	10	≥ 6	≥ 8	7.8	B1	278.9	3.2%	B2 to B1
<a href="#">Atlantic menhaden - NW Atlantic</a>	≥ 6	≥ 6	10	7.2	9.4	B2	180.5	2.1%	-
<a href="#">Anchoveta - Peruvian Northern-Central</a>	≥ 6	≥ 8	10	≥ 6	≥ 6	B2	2878.3	33.3%	-
<a href="#">European pilchard - NW Africa central</a>	≥ 6	≥ 6	≥ 6	≥ 6	≥ 6	B2	440.5	5.1%	-
<a href="#">Anchoveta - Southern Peru/Northern Chile (regions XV-I-II)</a>	≥ 6	≥ 8	≥ 8	≥ 6	≥ 6	B2	425.4	4.9%	C to B2
<a href="#">Capelin - Icelandic</a>	≥ 6	10	9.9	≥ 6	≥ 6	B2	300.0	3.5%	-
<a href="#">Capelin - Barents Sea</a>	≥ 8	10	10	≥ 6	≥ 8	B2	0.0	0.0%	C to B2
<a href="#">European pilchard - NW Africa southern <sup>(4)</sup></a>							-	na	-
<a href="#">Moroccan management unit</a>	≥ 6	≥ 6	≥ 6	≥ 8	≥ 6	B1	519.4	6.0%	-
<a href="#">Mauritanian management unit</a>	≥ 6	≥ 6	< 6	≥ 8	≥ 6	C	79.2	0.9%	B1 to C
<a href="#">European sprat - North Sea</a>	≥ 6	9.5	10	10	2.2	C	255.5	3.0%	-
<a href="#">Indian oil sardine - Kerala <sup>(3)</sup></a>	< 6	≥ 6	< 6	≥ 8	DD	C	46.0	0.5%	-
<a href="#">Indian oil sardine - Andhra Pradesh <sup>(3)</sup></a>	< 6	≥ 6	DD	≥ 8	≥ 8	C	13.0	0.1%	-
<a href="#">Indian oil sardine - Tamil Nadu <sup>(3)</sup></a>	< 6	≥ 6	DD	≥ 6	DD	C	81.0	0.9%	-
<a href="#">Indian oil sardine - Goa <sup>(3)</sup></a>	< 6	≥ 6	DD	≥ 6	DD	C	25.0	0.3%	-
<a href="#">Indian oil sardine - Maharashtra <sup>(3)</sup></a>	< 6	≥ 6	DD	≥ 6	DD	C	11.5	0.1%	-
<a href="#">Frigate tuna - Ecuador <sup>(3)</sup></a>	< 6	≥ 6	DD	DD	DD	C	51.9	0.6%	-
<a href="#">Pacific chub mackerel - Ecuador <sup>(3)</sup></a>	< 6	≥ 6	DD	< 6	< 6	C	96.7	1.1%	-
<a href="#">Indian oil sardine - Karnataka <sup>(3)</sup></a>	< 6	≥ 6	DD	< 6	< 6	C	62.6	0.7%	-
<a href="#">Anchoveta - Chilean Central-Southern (regions V-X)</a>	≥ 6	10	≥ 6	< 6	7.4	C	73.6	0.9%	-

**Notes:** (1) Shading in stock name: white means no change from 2016; light green means rise in sustainability category; light orange means a drop in the sustainability category. (2) Stocks are ordered according to the SFP sustainability category, from A (the highest) to C (the lowest). The Criteria for the four sustainability categories used in this 2018 reduction fisheries overview are presented in Table 2 above. (3) New fishery added in the 2018 overview. (4) The [European pilchard - NW Africa southern](#) stock have different score outcomes for *Fishers' compliance* (Score 3) depending on the management unit; score outcomes for this stock are thus presented separately for each of the management units (Morocco and Mauritania). Sardine catches from the Senegalese management unit are very small (less than 1% of overall sardine catch in the zone) and available information is limited. This management unit was thus not evaluated in the current overview. Score outcomes in terms of management quality have thus not been developed and are not included in the current evaluations. (4) 'DD', Data Deficient: score assigned when there is a severe lack of information on the fishery, and a score cannot be determined, even qualitatively, for the current situation (or for any point in the past). For a detailed explanation for each 'DD' in each of the fisheries, consult the respective FishSource profiles or [Appendix C](#).

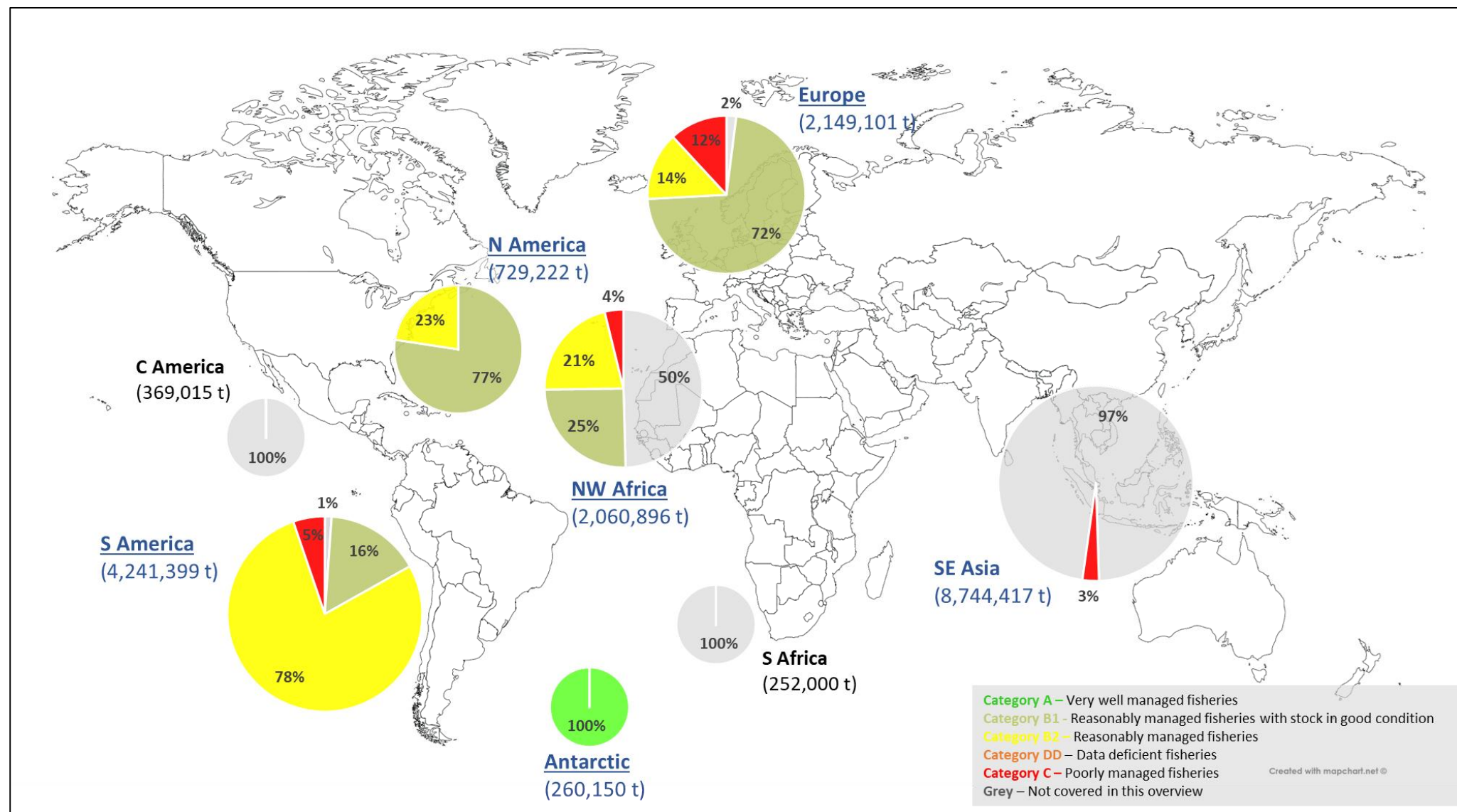
**Table 4.** Changes in SFP sustainability categories across the stocks evaluated in the 2018 overview

Stock	Change in the SFP sustainability category <sup>(1)</sup>	Notes
<a href="#">Chilean jack mackerel - Southeast Pacific</a>	B2 to B1	<b>Spawning stock biomass has been steadily increasing since 2010 and is currently above the target biomass level.</b> Fishing mortality has been decreasing and is below the target reference point since 2012.
<a href="#">Araucanian herring - Central-South Chile</a>	B2 to B1	<b>According to the latest stock assessment, the stock is currently at healthy levels and overfishing is not occurring.</b> Spawning stock biomass inverted the decreasing trend of recent years and is currently estimated at slightly (5%) above the target reference point ( $B_{MSY}$ ). Fishing mortality has decreased compared to last year and is now just below ( $F=0.26$ ) the target level ( $F_{MSY}=0.29$ ).
<a href="#">Anchoveta - Southern Peru/Northern Chile (regions XV-I-II)</a>	C to B2	The stock is perceived to have improved compared to last year. Results from an alternative stock assessment conducted in 2017 <b>suggest that spawning biomass has increased and is at target <math>B_{MSY}</math> levels and fishing mortality rates are sustainable.</b> However, there is still considerable uncertainty around the stock status due to an accelerated growth rate and early maturity observed in recent years.
<a href="#">Capelin - Barents sea</a>	C to B2	Following the historical lows of the two previous years – which resulted in closing the fishery – <b>the stock appears to have recovered and is currently estimated at healthy levels.</b> If 2018 catches are adhered to, projections point to spawning stock biomass of 462,000 t at the end of the fishing season, i.e. well above the escapement biomass limit reference point.
<a href="#">European pilchard - Northwest Africa southern stock (Mauritanian management unit)</a>	B1 to C	There is no national TAC for sardine or small pelagics in Mauritania, and no fishery management plan. There has been some improvement in monitoring, control and surveillance (MCS) capabilities to reduce illegal, unreported and unregulated (IUU) fishing in Mauritania. <b>However, a variety of IUU fishing activities are still persistent and unquantified in the region; complex foreign fishing arrangements may exacerbate the problem.</b>

Notes: <sup>(1)</sup> Light green means a rise in the sustainability category; light orange means a drop in the sustainability category.



**Figure 3.** Percentage of reduction fisheries supply by SFP sustainability category for the eight major production regions



**Notes:** (1) Pie chart sizes are presented in a four-size scale depending on the catch class: < 500 kt (Antarctic, Central America, South Africa); 500–1,500 kt (N America); 1,501–3,500 kt (Europe, NW Africa); > 3,500 kt (SE Asia, S America). (2) Regions in the scope of this overview are in blue font. (3) Grey refers to capture production not covered by this overview.

**Table 5.** Information about improvement and certification programs for the 26 main stocks used for reduction purposes covered in this overview (as of July 2018)

Stock	FIP information <sup>(3)</sup>			Certifications				MBAq Seafood watch (Year assessment) <sup>(7)</sup>
	FIP name	FIP start (Year)	FIP prog. rating	IFFO RS	MSC <sup>(4)</sup>	Date 1st MSC Certification	# of MSC fisheries <sup>(5)</sup>	
<a href="#">Antarctic krill - Atlantic Southern Ocean</a>	-	-	-	-	Cert, FA,	Jun-10	3	Good alt. (2017)
<a href="#">Blue whiting - NE Atlantic</a>	-(1)	-	-	Yes	Cert	Jun-16	4	-
<a href="#">Gulf menhaden - Gulf of Mexico</a>	-	-	-	Yes	FA	-	1	Good alt.(2015)
<a href="#">European sprat - Baltic Sea <sup>(2)</sup></a>	-(1)	-	-	Yes	Cert, FA,	May-17	3	-
<a href="#">Norway pout - North Sea</a>	-(1)	-	-	Yes	Cert	Mar-17	2	-
<a href="#">Sandeels nei - Central Eastern North Sea</a>	-(1)	-	-	Yes	Cert, Sus	Mar-17	2	-
<a href="#">Sandeels nei - Dogger Bank area</a>	-(1)	-	-	Yes	Cert, FA	Mar-17	2	-
<a href="#">Chilean jack mackerel - Southeast Pacific</a>	-(1)	-	-	Yes	FA	-	1	-
<a href="#">Araucanian herring - Central-South Chile</a>	-(1)	-	-	Yes	-	-	-	-
<a href="#">Atlantic menhaden - NW Atlantic</a>	-	-	-	Yes	FA	-	1	Good alt. (2015)
<a href="#">Anchoveta - Peruvian Northern-Central (4)</a>	<a href="#">Peruvian anchovy - industrial purse-seine</a>	2017	A	Yes	-	-	-	-
	<a href="#">Peruvian anchovy - small scale purse-seine</a>	2017	A	-(6)	-	-	-	-
<a href="#">European pilchard - NW Africa central</a>	<a href="#">Morocco management unit</a>	<a href="#">Morocco sardine - pelagic trawl and seine</a>	2014	A	Yes <sup>(2)</sup>	-	-	-
	<a href="#">Mauritania management unit</a>	-	-	-	-	-	-	-
	<a href="#">Anchoveta - Southern Peru/Northern Chile (regions XV-I-II)</a>	-	-	-	Yes	-	-	-
<a href="#">Capelin - Barents Sea</a>	-	-	-	Yes	-	-	-	-
<a href="#">Capelin - Icelandic</a>	-	-	-	Yes	Cert	Apr-17	1	-
<a href="#">European pilchard - NW Africa southern</a>	<a href="#">Morocco sardine - pelagic trawl and seine</a>	2014	A	Yes <sup>(2)</sup>	-	-	-	-
<a href="#">European sprat - North Sea</a>	-	-	-	Yes	Cert, Wdrn	Mar-17	4	-
<a href="#">Indian oil sardine - Kerala</a>	-(1)	-	-	-	-	-	-	-
<a href="#">Indian oil sardine - Andhra Pradesh</a>	-	-	-	-	-	-	-	-
<a href="#">Indian oil sardine - Tamil Nadu</a>	-	-	-	-	-	-	-	-
<a href="#">Indian oil sardine - Goa</a>	-	-	-	-	-	-	-	-
<a href="#">Indian oil sardine - Maharashtra</a>	-	-	-	-	-	-	-	-
<a href="#">Frigate tuna - Ecuador <sup>(2)</sup></a>	-	-	-	-	-	-	-	-
<a href="#">Pacific chub mackerel - Ecuador <sup>(2)</sup></a>	-	-	-	Yes <sup>(2)</sup>	-	-	-	-
<a href="#">Indian oil sardine - Karnataka</a>	-	-	-	-	-	-	-	-
<a href="#">Anchoveta - Chilean Central-Southern (regions V-X)</a>	-(1)	-	-	Yes	-	-	-	-

**Notes:** (1) The previous improvement programs in these fisheries no longer meet the criteria for a fishery improvement project (FIP). (2) Certified by IFFO as “by-product” fishery (for more information visit the IFFO Responsible Supply (RS) website) (IFFO 2018). (3) For more information on the currently active FIPs please visit the respective FIP public reports in Fishery Progress (FishChoice 2018). (4) MSC Status: Cert = Certified; FA = Full Assessment; Sus = Suspended; Wdrn = Withdrawn. (5) Refers to the number of fisheries that are in the MSC program and that are relevant to the stock (source: SFP 2018; MSC 2018). (6) In Peru, the artisanal fishery for anchoveta must be used for human direct consumption only, thus it is outside of the scope of IFFO and the current overview. (7) Monterey Bay Aquarium Seafood Watch categories (MBAq 2018): Best Ch. = Best Choice; Good Alt. = Good alternative; Av = Avoid. Year assessment refers to the year the latest Seafood watch assessment was conducted for the respective fishery.



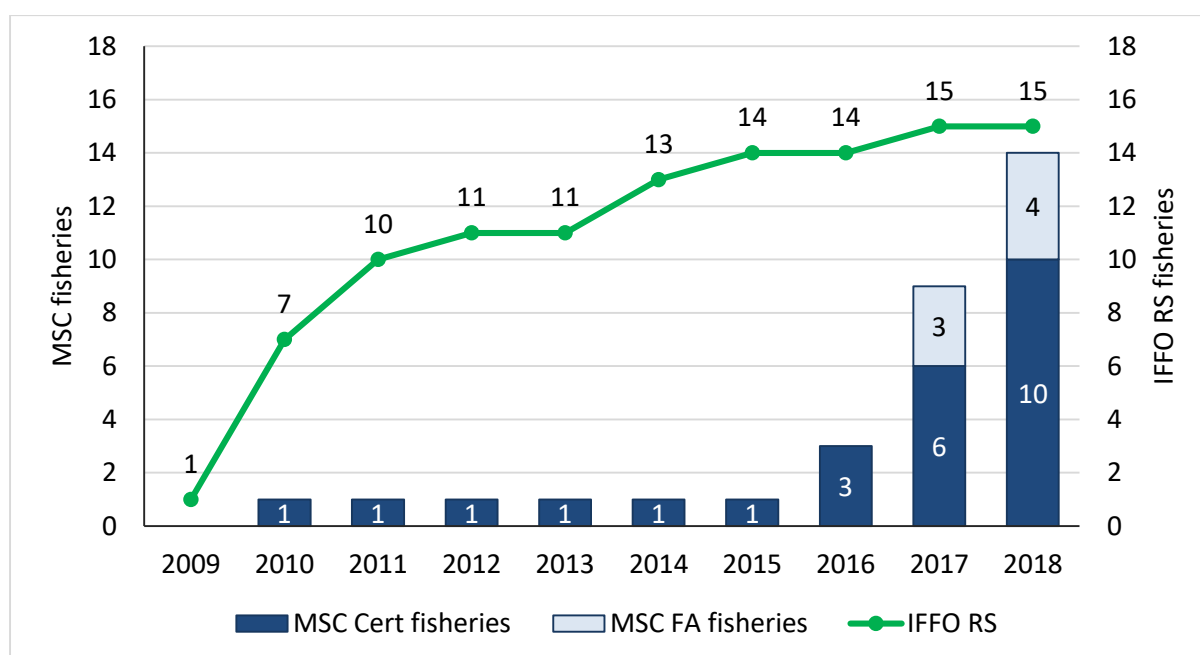
## 3.2 Certification and fishery improvement projects

### 3.2.1 Fisheries certification

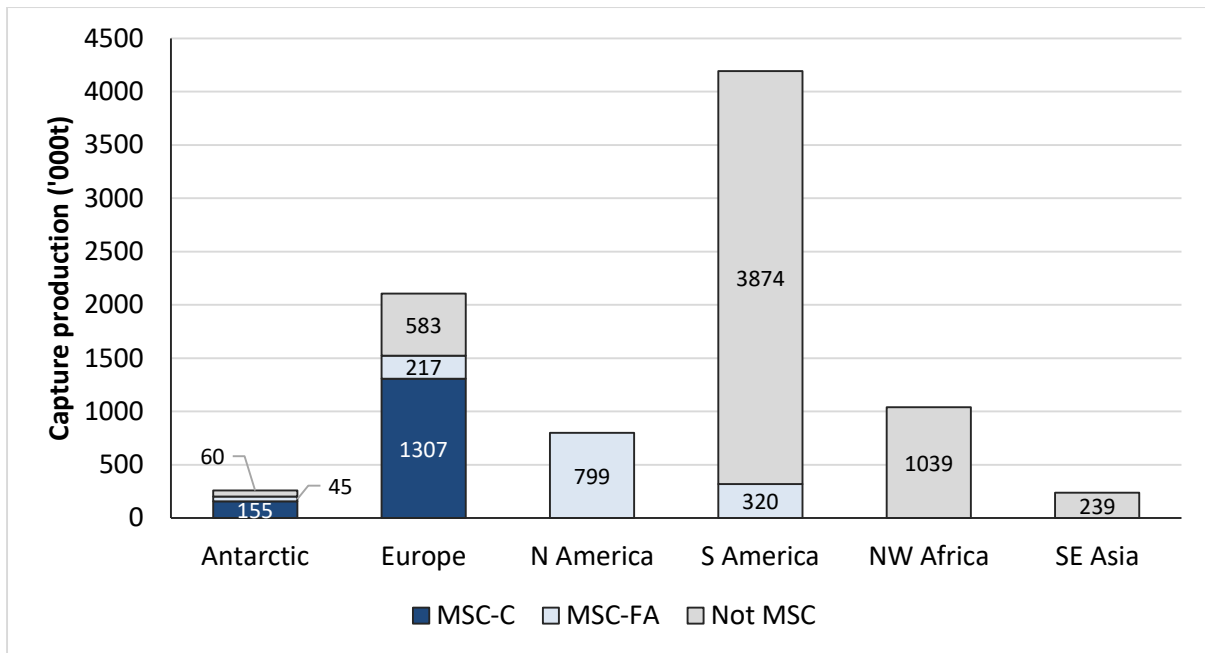
There is a growing demand for certified raw material for fish feed and fish oil, which has likely influenced the positive trends that have been observed in terms of fisheries certification and fishery improvement projects (FIPs).

The number of MSC-certified fisheries has been increasing steadily, with a number of additional fisheries entering the program and becoming certified in 2018 (**Figure 4**). For the fisheries included in the current overview, the production coming from Europe, North America, and the Antarctic already represents from 75 to 100 percent of the total production for those regions (**Figure 5**). The same pattern is observed with fisheries in the IFFO RS program, with most of the fisheries (and respective) production in South America, Europe, and North America already covered and approved by this program (**Figure 6**).

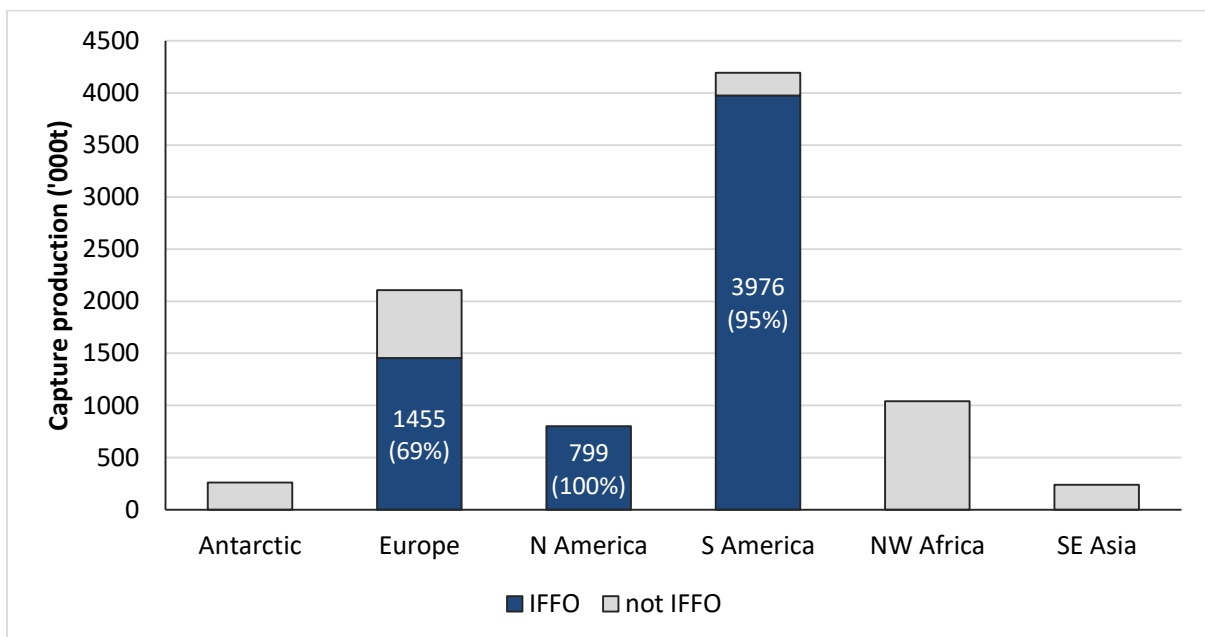
There has also been a continuing interest in FIPs (**Table 5**) and there is now a formalized program – the IFFO RS Improver Programme – for fisheries to achieve recognition when undertaking systematic improvements toward reaching the IFFO RS standard.



**Figure 4.** Number of fisheries in the MSC (MSC certified and in assessment) and the IFFO RS programs (from 2009 to 2018), for the reduction fisheries included in the current overview. Source of data: MSC 2018.



**Figure 5.** Estimated production ('000 t) coming from reduction fisheries in the MSC program (MSC certified and in assessment) by major region. Source of data: MSC 2018. Note: Only reduction fisheries included in the current overview are considered.



**Figure 6.** Estimated production ('000 t) coming from reduction fisheries in the IFFO RS program ([Approved Whole Fish](#)) by major region. Source of data: MSC 2018. Note: Only reduction fisheries included in the current overview are considered.





### 3.2.2 Aquaculture certifications

The feed requirements of aquaculture certifications have developed over recent years. For the purposes of the Global Aquaculture Alliance Best Aquaculture Practices standard, 50 percent of fishmeal and fish oil must come from fisheries that are certified to the MSC standard, in a credible FIP, or approved for use under the IFFO RS standard. A review of the fisheries featured in this report clearly shows that the vast majority are suitable for this purpose.

The Aquaculture Stewardship Council (ASC) is currently in a state of transition with its feed requirements. The current operational requirement is that fisheries used for fishmeal and fish oil should achieve a minimum of 6 across all five FishSource scores (so, effectively, A-, B1-, and B2-rated fisheries are all acceptable) (ASC 2017a; ASC 2017b). The standard is understood to be changing, and it is likely that a new feed standard will accept fisheries that are in FIPs, MSC certified, or approved by IFFO RS, but that there will be an obligation on aquaculture feed manufacturers to improve the sustainability of their marine ingredients over time.

### 3.3 Asian reduction fisheries

South East Asian reduction fisheries represent almost half of the global catch for the reduction sector and fall into two categories: the “trash fish” fisheries and the directed fisheries for small pelagics; neither is covered in this report. *Trash fish* are usually generated as a component of the catch from multi-species trawling, where species suitable for direct consumption are separated from unpalatable, juvenile, and poorly preserved fish (used for fishmeal) after the catch has been brought aboard the fishing vessel or landed. Recent reports indicate trash fish may compose a significant portion (e.g., >20 percent) of all landings in many SE Asian countries, including >50 percent of landings in Thailand and China<sup>5</sup>.

The directed fisheries that target small pelagic species are potentially more discerning in catch composition, although the actual levels of bycatch remain uncharacterized. Both of these types of reduction fisheries mostly still take place in regions with low levels of governance, where fishing pressure can be very high and ecological impacts may be extreme.

SE Asian countries comprised six of the top 15 countries for fishmeal production in 2015 (SEAFISH 2016), accounting for nearly 40 percent of production among the top 15. The volumes of fishmeal generated by local fisheries (as opposed to other sources, such as trimmings from aquaculture and tuna processing) in SE Asia can be substantial; exact figures are hard to calculate, but SFP estimates that the annual catch of fish used for reduction may represent close to half of the global catch for this sector. The fishmeal generated in South East Asia is crucial to the aquaculture industries of the region and particularly for farmed shrimp. But the data in terms of production is scarce and outdated for most countries.

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<sup>5</sup> Sources: China ([https://secured-static.greenpeace.org/eastasia/Global/eastasia/publications/reports/oceans/2017/Investigation%20into%20China's%20marine%20trash%20fish%20fisheries\\_GPEA%20Media%20Briefing.pdf](https://secured-static.greenpeace.org/eastasia/Global/eastasia/publications/reports/oceans/2017/Investigation%20into%20China's%20marine%20trash%20fish%20fisheries_GPEA%20Media%20Briefing.pdf)); Thailand ([http://www.rebyc-cti.org/countries-profiles/doc\\_download/52-thailand-national-report-on-bycatch-management-and-reduction-of-discard](http://www.rebyc-cti.org/countries-profiles/doc_download/52-thailand-national-report-on-bycatch-management-and-reduction-of-discard)); Other Asian countries (<http://www.rebyc-cti.org/countries-profiles>)



The persistent challenges that reduction fisheries in Asia face include data deficiency, low governance, and severe environmental impacts. For most of these fisheries, the information on the amount of catches, species captured, size composition, main fishing grounds and effort, are scarce and not systematically collected. For most of the species known to be captured, there is no information on the stock condition or the exploitation status. There are also well-established negative social impacts from these fisheries, such as labor abuses (particularly associated with Thailand).

With increasing aquaculture production, the demand for fish feed is also likely to continue rising in the future. If nothing is done, this will result in increased fishing pressure on already overexploited fish stocks in the region (FAO 2005). Reduction fisheries in South East Asia urgently need to adopt improvement programs to meet accepted global norms for fishery management and environmental/social impacts, but there has been relatively little progress so far.

#### **4 CONCLUSIONS**

This report clearly identifies a positive trend among the reduction fisheries of the North Atlantic and Eastern Pacific, although there is still significant room for improvement with some fisheries. The proportion of fisheries achieving higher sustainability ratings has increased significantly; this builds on improvements identified in the previous report for 2017. These results clearly represent a good news story for the fishmeal and fish oil industry and show that it is becoming ever more responsible with regards to fisheries management. Congratulations should also be extended to the aquaculture feed industry, which has played a leading role in promoting sustainability and supporting FIPs.

However, the industry is still confronted by the realities of Asian reduction fisheries. This report features some Asian fisheries – the Indian oil sardine – for the first time, and although it reveals an inadequate level of management, it is important that these fisheries have been assessed (at least partially). There is significant interest in generating improvements within the Indian oil sardine fishery, and it is to be hoped that a formal fishery improvement project will be implemented shortly.

The next challenge for the fishmeal/oil industry and the users of those products will be to catalyze improvements in Asian fisheries – whether so-called “trash fish” or targeted small pelagics fisheries. Only through creating and supporting fishery improvement projects can we expect to see the kind of progress currently experienced in the Atlantic and eastern Pacific and eventually build a fishmeal/oil industry that is 100-percent sustainable.



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## ACKNOWLEDGMENTS

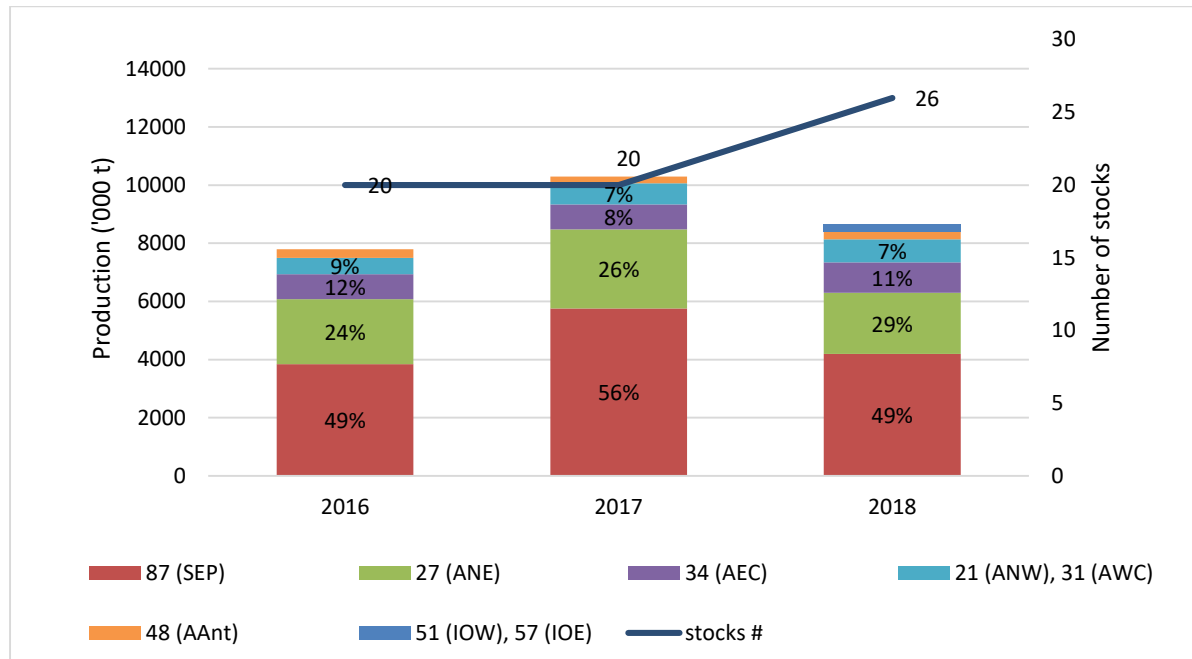
We are thankful to the FishSource development team (Christie Hendrich, David Villegas, Mariana Bock, Marina Mendes, Matthew Cieri, Patrícia Amorim, and Susana Segurado) for their great work in developing, reviewing, and maintaining up-to-date FishSource profiles, which were the main source of information for this report. We would also like to thank Pedro Sousa for all his assistance, scientific advice, ideas, and input during the production of this report. We are also thankful for the great work by Megan Westmeyer in coordinating and overseeing the update of the SFP Public Improvement Recommendations of the respective FishSource profiles, and to the SFP colleagues involved in updating the Improvement Recommendations. We acknowledge the advice and support of Braddock Spear, who helped steer the work development process. We thank Amy Sweeting for her careful copyediting of the report. We thank Instituto Fomento Pesquero (IFOP, Chilean Fisheries Development Institute) for the useful information provided for specific FishSource profiles. We are very thankful to the external reviewers for their suggestions and constructive criticism that improved the report.

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## APPENDICES

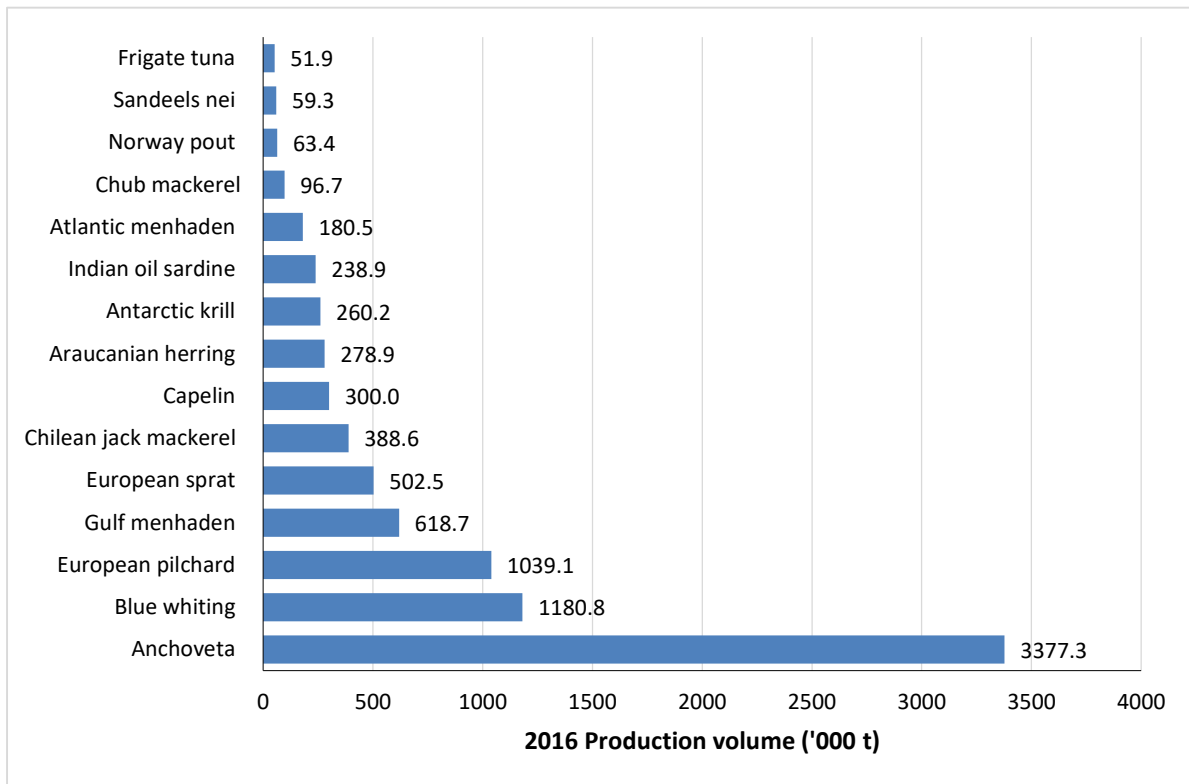
**Appendix A.** Total reported catch ('000 t) by FAO area, and relative contribution to the total catch for the three top FAO areas, for the reduction fisheries included in the 2016, 2017, and 2018 overviews.



Notes: SEP = Southeast Pacific, AAnt = Antarctic Atlantic, ANE = Northeast Atlantic, IOW = Western Indian Ocean, IOE = Eastern Indian Ocean, AEC = Eastern Central Atlantic, ANW = Northwest Atlantic, AWC = Western Central Atlantic



**Appendix B.** Total production ('000 t) by species, for the stocks included in the 2018 reduction fisheries overview






**Appendix C. SFP sustainability category C stocks in the 2018 evaluation and the reasons for Fishsource scores below 6**

Stock	Management strategy (1)	Managers' compliance (2)	Fishers' compliance (3)	Current health (4)	Future health (5)	Comments
<b>European pilchard - NW Africa southern stock</b> <a href="#">(Mauritanian management unit)</a>	≥ 6	≥ 6	< 6	≥ 8	≥ 6	There is no national TAC for sardine or small pelagics in Mauritania, and no fishery management plan. There has been some improvement in monitoring, control, and surveillance (MCS) capabilities to reduce illegal, unreported, and unregulated (IUU) fishing in Mauritania. <b>However, a variety of IUU fishing activities are still persistent and unquantified in the region; complex foreign fishing arrangements may exacerbate the problem.</b>
<b>European sprat - North Sea</b>	≥ 6	9.5	10.0	10.0	2.2	The North Sea sprat stock remains in a good condition, but fishing mortality (F) remains too high. <b>Fishing mortality decreased in 2017 compared to the previous year but remains well above the <math>F_{MSY}</math> proxy, <math>F_{CAP}</math> (0.7).</b>
<b>Indian oil sardine - Kerala</b>	< 6	≥ 6	< 6	≥ 8	DD	Even though there are already some management measures in place for the fishery (e.g., closed seasons and areas, gear and mesh size restrictions), <b>specific management objectives are not defined, and output controls such as TACs (or fish quotas) and minimum landing sizes are also not used. The magnitude of IUU fishing and compliance with current fishing regulations are also currently unknown.</b> Although the latest assessment considered the population off Maharashtra as "underexploited," the assessment is from 2013 (i.e., five years old). <b>There are also uncertainties around the quality of the "rapid stock assessment" conducted, and also on the stock structure of oil sardine along the Indian coast.</b> The current levels of fishing mortality are unknown.



Stock	Management strategy (1)	Managers' compliance (2)	Fishers' compliance (3)	Current health (4)	Future health (5)	Comments
Indian oil sardine - Andhra Pradesh	< 6	≥ 6	DD	≥ 8	≥ 6	Even though there are already some management measures in place for the fishery (e.g., closed seasons and areas, gear and mesh size restrictions), <b>specific management objectives are not defined, and output controls such as TACs (or fish quotas) and minimum landing sizes are also not used. The magnitude of IUU fishing and compliance with current fishing regulations are also currently unknown.</b> Latest available information (2016) indicates that the resource is underexploited (CMFRI 2016-2017 Annual Report), suggesting that current catch rates would be sustainable in the long term. <b>However, the quality of that stock assessment cannot be evaluated based on the information provided in the CMFRI report. In addition, the stock structure of oil sardine along the Indian coast is not clearly understood, which may affect the quality of the stock assessment.</b> The levels of fishing effort are presently unknown.
Indian oil sardine - Tamil Nadu	< 6	≥ 6	DD	≥ 6	DD	Even though there are already some management measures in place for the fishery (e.g., closed seasons and areas, gear and mesh size restrictions), <b>specific management objectives are not defined, and output controls such as TACs (or fish quotas) and minimum landing sizes are also not used. The magnitude of IUU fishing and compliance with current fishing regulations are also currently unknown.</b> Although the latest information (2016) indicates that the resource is underexploited (CMFRI 2015-2016 Annual Report), <b>the assessment is from 2015, and quality of the stock assessment cannot be evaluated.</b> The current levels of fishing mortality are unknown.



Stock	Management strategy (1)	Managers' compliance (2)	Fishers' compliance (3)	Current health (4)	Future health (5)	Comments
Indian oil sardine - Goa	< 6	≥ 6	DD	≥ 6	DD	Even though there are already some management measures in place for the fishery (e.g., closed seasons and areas, gear and mesh size restrictions), <b>specific management objectives are not defined, and output controls such as TACs (or fish quotas) and minimum landing sizes are also not used. The magnitude of IUU fishing and compliance with current fishing regulations are also currently unknown.</b> Although the latest information (2016) indicates that the resource is underexploited (CMFRI 2016-2017 Annual Report), <b>the quality of that stock assessment cannot be evaluated.</b> In addition, the levels of fishing effort and fishing mortality are presently unknown.
Indian oil sardine - Maharashtra	< 6	≥ 6	DD	≥ 6	DD	Even though there are already some management measures in place for the fishery (e.g., closed seasons and areas, gear and mesh size restrictions), <b>specific management objectives are not defined, and output controls such as TACs (or fish quotas) and minimum landing sizes are also not used. The magnitude of IUU fishing and compliance with current fishing regulations are also currently unknown.</b> Although the latest assessment considered the population off Maharashtra as "underexploited," the assessment is from 2014 (i.e., four years old). There are also some uncertainties around the quality of the "rapid stock assessment" conducted, and the stock structure of oil sardine along the Indian coast. The current levels of fishing mortality are unknown.



Stock	Management strategy (1)	Managers' compliance (2)	Fishers' compliance (3)	Current health (4)	Future health (5)	Comments
Frigate tuna - Ecuador	< 6	≥ 6	DD	DD	DD	Only some of the recommended management measures (e.g., minimum mesh sizes, seasonal and spatial closures) have been adopted so far by the management entity. <b>Specific management objectives are not defined, and output controls such as TACs (or fish quotas) and minimum landing sizes are also not used.</b> Although catches have been increasing, <b>the stock status and fishing mortality are presently unknown.</b> There is no information on the stock structure and no stock assessment has been conducted. The magnitude of IUU fishing and compliance with current fishing regulations are also currently unknown.
Pacific chub mackerel - Ecuador	< 6	≥ 6	DD	< 6	< 6	Only some of the recommended management measures (e.g., minimum mesh sizes, seasonal and spatial closures) have been adopted so far by the management entity. <b>Specific management objectives are not defined, and output controls such as TACs (or fish quotas) and minimum landing sizes are also not used.</b> On stock status and exploitation levels, <b>previous studies have reported the stock as overfished and at a high risk of collapse, and catches have been increasing since 2008. However, the latest available stock assessment is from the year 2000, and the current status of the stock and fishing mortality levels are unknown.</b>



Stock	Management strategy (1)	Managers' compliance (2)	Fishers' compliance (3)	Current health (4)	Future health (5)	Comments
Indian oil sardine - Karnataka	< 6	≥ 6	DD	< 6	< 6	Even though there are already some management measures in place for the fishery (e.g., closed seasons and areas, gear and mesh size restrictions), <b>specific management objectives are not defined, and output controls such as TACs (or fish quotas) and minimum landing sizes are also not used. The magnitude of IUU fishing and compliance with current fishing regulations are also currently unknown. The latest information (2016) indicates that catches in Karnataka have drastically declined in recent years and the population status has been recognized as "less abundant" in 2016.</b> These results are based on a "rapid stock assessment," for which the quality cannot be evaluated based on the information available. The levels of fishing effort are presently unknown.
Anchoveta - Chilean Central-Southern (regions V-X)	≥ 6	10.0	≥ 6	< 6	7.4	Spawning biomass continues slowly recovering from the historical low in 2011, but <b>the stock remains in a depleted condition.</b> According to the latest assessment, <b>spawning biomass is estimated at 50% of the target reference point (B<sub>MSY</sub>).</b> Fishing mortality has been on a sharp decreasing trend from the historical high values in 2010 (probably related to the recent improvements at the management level) and is currently just above the target reference point. Fishers' compliance with set TACs has improved, but <b>artisanal catches remain above their catch limit.</b>

Notes: "DD" means Data Deficient. For more information on data deficient scores please consult [FishSource.org/faq](http://FishSource.org/faq)



## Appendix D. Current SFP sustainability category and suggested improvement actions for the 26 stocks used for reduction purposes assessed in the 2018 overview

**Notes:** 1) The existing suggested improvement actions for 2018 are still preliminary, and most not yet published in FishSource.org. 2) The updates of suggested improvement actions for particular species are still underway. These are identified in the table below. 3) Improvement actions for specific components of a stock (identified with the country and respective fishing gear) are also included.

<b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report	<b>SFP Sustainability Category</b>	<b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b>
<b>Antarctic krill - Atlantic Southern Ocean</b>	<b>A</b>	<ol style="list-style-type: none"> <li>1. Monitor fishery and management system for any changes that could jeopardize MSC re-certification.</li> <li>2. Support efforts to manage this fishery at a finer spatial scale, as enabled by current catch reporting, to further reduce risks of local area depletion of krill.</li> <li>3. Support efforts to enable an updated multi-national krill biomass survey.</li> </ol>
<b>Blue whiting - NE Atlantic</b>	<b>B1</b>	<ol style="list-style-type: none"> <li>1. Ensure that the total allowable catch (TAC) for the entire northeast Atlantic blue whiting stock is set in accordance with scientific advice and that fishing mortality is reduced to no more than the fishing mortality reference point.</li> <li>2. Conduct research to fully define the stock structure and develop stock specific assessments, reference points, and harvest strategies.</li> <li>3. Encourage the adoption of ecosystem-based fisheries management, namely consider the importance of blue whiting as forage species when setting reference points and catch limits.</li> <li>4. Collect comprehensive information on bycatch (species, quantities, areas, seasonality).</li> </ol>
<b>Gulf menhaden - Gulf of Mexico</b>	<b>B1</b>	<ol style="list-style-type: none"> <li>1. Ensure the data inputs to the stock assessment (e.g. abundance survey, catch sampling, age data, bait fishery landings) are of sufficient quality (quantity, accuracy, precision, lack of bias, and timeliness) to support a high-quality stock assessment.</li> <li>2. Companies owning vessels in the Gulf menhaden fleet obtain and release the bycatch data from the government observer program (not releasable by the government because of the low number of vessels/companies observed). Engage with scientists and catchers to analyze and publish the scale and trends of ETP bycatch.</li> </ol>





<p><b>Stock</b></p> <p>Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report</p>	<p><b>SFP Sustainability Category</b></p>	<p><b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b></p>
		<p>3. Conduct outreach to the Gulf States Marine Fisheries Commission to encourage them to implement a precautionary annual quota based on scientific advice.</p> <p>4. Conduct outreach to the Gulf States Marine Fisheries Commission to encourage them to set biomass and fishing mortality targets that account for the ecosystem services provided by menhaden as prey for many species.</p>
<p><b>European sprat - Baltic Sea</b></p>	<p><b>B1</b></p>	<p>1. Work with managers to develop a spatially explicit management plan for the fisheries that catch Baltic sprat, ensuring there are adequate amounts of sprat in all areas to serve as prey for cod stocks and other ecosystem needs.</p> <p>2. Improve catch, discard, and bycatch data reporting. Catch and discard data should be reported at a species-specific level, and bycatch data collection should include interactions with birds and mammals, especially for the gillnet fleet.</p> <p>3. Ensure future TACs are set in accordance with scientific advice.</p> <p>4. Ensure these recommendations are represented to the EU Pelagic Advisory Council (<a href="https://www.pelagic-ac.org/">https://www.pelagic-ac.org/</a>) directly or through one of the General Assembly members.</p>
<p><b>Norway pout - North Sea</b></p>	<p><b>B1</b></p>	<p>1. Engage with ICES and fishery management authorities in the EU and Norway to develop a long-term management plan and harvest control rule that considers the impacts of this fishery on the overall ecosystem structure and function.</p> <p>2. Work with scientists to conduct research to better understand the influence of natural factors, such as temperature and predation, on recruitment and population size.</p> <p>3. Implement monitoring to determine the direct and indirect impacts of this fishery on sensitive habitats and endangered, threatened, and protected (ETP) species, particularly marine mammals and seabirds.</p> <p>4. Work with scientists and managers to define fishing mortality reference points.</p>



<b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report	<b>SFP Sustainability Category</b>	<b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b>
<b>Sandeels nei - Central Eastern North sea</b>	<b>B1</b>	<ol style="list-style-type: none"> <li>1. Press regional advisory bodies, national fisheries administrations, and the European Commission to develop a multi-species, ecosystem-based management plan for North Sea pelagic fisheries, including a harvest control rule(s).</li> <li>2. Ensure these recommendations are represented to the EU Pelagic Advisory Council (<a href="https://www.pelagic-ac.org/">https://www.pelagic-ac.org/</a>) directly or through one of the General Assembly members.</li> <li>3. Engage as a stakeholder in all MSC certifications for this stock and support the MSC Client groups to ensure all conditions attached to the certifications are fully addressed.</li> </ol>
<b>Sandeels nei - Dogger Bank area</b>	<b>B1</b>	<ol style="list-style-type: none"> <li>1. Press regional advisory bodies, national fisheries administrations, and the European Commission to develop a multi-species, ecosystem-based management plan for North Sea pelagic fisheries, including a harvest control rule(s).</li> <li>2. Ensure these recommendations are represented to the EU Pelagic Advisory Council (<a href="https://www.pelagic-ac.org/">https://www.pelagic-ac.org/</a>) directly or through one of the General Assembly members.</li> <li>3. Engage as a stakeholder in all MSC certifications for this stock and support the MSC Client groups to ensure all conditions attached to the certifications are fully addressed.</li> </ol>
<b>Chilean jack mackerel - Southeast Pacific</b>	<b>B1</b>	<ol style="list-style-type: none"> <li>1. Work with scientists to support the continuous improvements underway in stock assessment and research on stock structure and especially the effects of environmental variability on the population.</li> <li>2. Encourage the South Pacific Regional Fishery Management Organization (SPRFMO) to set biological reference points and harvest control rules that consider the species role in the ecosystem.</li> <li>3. Encourage SPRFMO members and cooperating non-members to fully implement and comply with SPRFMO's Conservation and Management Measures.</li> <li>4. Push the government of Peru to set their domestic TAC within the agreed catch limit for coastal countries.</li> </ol>



<b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report	<b>SFP Sustainability Category</b>	<b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b>
		5. Encourage the government of Ecuador to publish their scientific advice
<b>Araucanian herring - Chilean</b>	<b>B1</b>	<ol style="list-style-type: none"> <li>1. Engage with managers and IFOP to ensure that catch recommendations and scientific reports are publicly available in a timely manner.</li> <li>2. Support the work of scientists and managers to improve reporting of catches, discards, and bycatch, including expansion of the observer program, as well as defining the scale of interactions with benthic habitats.</li> <li>3. Monitor implementation of the new discard reduction plan (July 2017).</li> <li>4. Work with scientists to conduct research on and develop new stock assessment models that take into account environmental variables.</li> <li>5. Support the implementation of the Anchoveta-Araucanian herring management plan (2016), and ensure further revisions of the plan include a specific recovery plan with explicit harvest control rules, considering the mixed nature of this fishery.</li> </ol>
<b>Atlantic menhaden - NW Atlantic</b>	<b>B2</b>	<ol style="list-style-type: none"> <li>1. Support research to improve understanding of the role of menhaden in the ecosystem.</li> <li>2. Encourage the Atlantic States Marine Fisheries Commission to continue considering the ecological role of menhaden as an important prey species in the ecosystem when updating reference points and management measures.</li> <li>3. Advocate for improvement in the reporting of catches by area for the bait sector to reduce uncertainty in understanding removals.</li> </ol>
<b>Anchoveta - Peruvian Northern-Central</b> Peruvian anchovy - industrial purse-seine   2017   A   CeDePesca   <a href="https://fisheryprogress.org/fip-profile/peruvian-anchovy-industrial-purse-seine">https://fisheryprogress.org/fip-profile/peruvian-anchovy-industrial-purse-seine</a> Peruvian anchovy – small scale purse-seine   2017   A   CeDePesca   <a href="https://fisheryprogress.org/fip-profile/peruvian-anchovy-small-scale-purse-seine">https://fisheryprogress.org/fip-profile/peruvian-anchovy-small-scale-purse-seine</a>	<b>B2</b>	<ol style="list-style-type: none"> <li>1. Request the government of Peru to develop a long-term management plan for the fishery with an explicit harvest strategy and reference points that take into account the key role of anchoveta in the ecosystem.</li> </ol>



<b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report	<b>SFP Sustainability Category</b>	<b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b>
		<ol style="list-style-type: none"> <li>2. Advocate for the development of annual stock assessments that incorporate improved catch data (landings and discards) and consider the effects of environmental variability on the population. Stock assessment results should be peer reviewed and publicly reported.</li> <li>3. Encourage the Peruvian authorities to make public the process by which the artisanal sector TAC is determined, and to assign each stock a specific quota based on scientific advice.</li> <li>4. Encourage the Peruvian research authorities to assess the status of minor species (e.g. longnose anchovy (<i>Anchoa nasus</i>)) and develop management/rebuilding plans as appropriate.</li> <li>5. Work with scientists and managers to improve reporting of catches, discards, and all bycatch; analyze the data and publish the results on bycatch quantities and trends.</li> <li>6. Develop and implement bycatch reduction measures for the industrial and artisanal fleets based on increased knowledge from the IMARPE observer program.</li> <li>7. Work with scientists to define the scale of interactions with benthic habitats.</li> </ol>
<p><b>European pilchard - NW Africa central</b>            Moroccan sardine   2014   A   Industry Steering Group    <a href="https://fisheryprogress.org/fip-profile/morocco-sardine-pelagic-trawl-and-seine-maroc-sardine-chalut-p%C3%A9lagique-et-senne">https://fisheryprogress.org/fip-profile/morocco-sardine-pelagic-trawl-and-seine-maroc-sardine-chalut-p%C3%A9lagique-et-senne</a></p>	<b>B2</b>	<ol style="list-style-type: none"> <li>1. Push the Moroccan National Fisheries Research Institute (INRH) and the FAO to publish annual scientific advice in a timely manner.</li> <li>2. Push fishery managers to further develop and fully implement the management plan, including catch limits and appropriate harvest control rules for all species.</li> <li>3. Work with managers to improve catch and discard information and better define the scale of any IUU fishing for all fleets.</li> <li>4. Work with scientists to understand the uncertainties in the stock assessment and improve the assessment model and input data (catches, discards, biological data) to reduce the level of uncertainty in the assessment.</li> <li>5. Work with scientists to conduct studies to clarify the stock structure of northwest African pilchard/sardine.</li> </ol>



<b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report	<b>SFP Sustainability Category</b>	<b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b>
		<p>6. Press managers to implement a recovery strategy for other target species in this multi-species fishery to ensure that all such species are at least above biologically based limit reference points (or proxies for the point of recruitment impairment), especially Cunene horse mackerel and Atlantic horse mackerel.</p> <p>7. Work with scientists and managers to expand the at-sea observer program to provide representational coverage of all components of the fishery to better understand catches and discards, as well as interactions with habitats and all types of bycatch.</p>
<b>Anchoveta - Southern Peru/Northern Chile (regions XV-I-II)</b>	<b>B2</b>	<ol style="list-style-type: none"> <li>1. Support the work of the governments of Peru and Chile to establish coordinated fishery research and management plans in line with the objectives of the agreed Strategic Action Programme between both countries.</li> <li>2. Support the implementation of the recently approved management plan for the Chilean portion of the fishery.</li> <li>3. Work with scientists to increase robustness of stock assessment models, ensuring they take into account environmental variables and the needs of dependent predators.</li> <li>4. Support the work of scientists and managers in both countries to improve reporting of catches and discards, as well as interactions with habitats and all types of bycatch.</li> <li>5. Encourage the Peruvian authorities to make public the process by which the artisanal sector TAC is determined, and to assign each stock a specific quota based on scientific advice.</li> <li>6. Encourage the Peruvian and Chilean research authorities to assess the status of minor species (e.g. longnose anchovy (<i>Anchoa nasus</i>) and South American pilchard (<i>Sardinops sagax</i>)) and develop management/rebuilding plans as appropriate.</li> </ol>
<b>Capelin - Icelandic</b>	<b>B2</b>	<ol style="list-style-type: none"> <li>1. Work with scientists and managers to review the existing harvest strategy, harvest control rule, and TAC setting procedures to ensure</li> </ol>



<b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report	<b>SFP Sustainability Category</b>	<b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b>
		<p>that these are appropriately precautionary, especially considering the importance of capelin as a forage species.</p> <p>2. Encourage the Icelandic Marine Research Institute to commission a peer review of the stock assessment, including evaluation of the current acoustic monitoring survey to ensure optimal coverage and minimization of uncertainty.</p>
<b>Capelin - Barents Sea</b>	<b>B2</b>	<ol style="list-style-type: none"> <li>1. Contact the Joint Russian-Norwegian Fisheries Commission (JRNFC) and request that they adopt ecosystem-based fisheries management that specifically considers the importance of juvenile capelin as prey.</li> <li>2. Ensure future TACs continue to be set in accordance with scientific advice.</li> <li>3. Work with scientists and managers to develop an appropriate target reference point.</li> </ol>
<b>European pilchard - NW Africa southern</b> Moroccan sardine   2014   A   Industry Steering Group   <a href="https://fisheryprogress.org/fip-profile/morocco-sardine-pelagic-trawl-and-seine-maroc-sardine-chalut-p%C3%A9lagique-et-senne">https://fisheryprogress.org/fip-profile/morocco-sardine-pelagic-trawl-and-seine-maroc-sardine-chalut-p%C3%A9lagique-et-senne</a>	<b>B1 to C</b>	<ol style="list-style-type: none"> <li>1. Support the Sub-Regional Fisheries Commission and Morocco in their efforts to develop a strategic plan for management of the small pelagics fisheries in the region. The management plan should include species-specific TACs, joint setting of TACs, and consideration of how environmental variability may affect stocks.</li> <li>2. Encourage management authorities to improve the speed of release of stock assessment results and transparency of subsequent management actions, including the setting of catch or effort limits.</li> <li>3. Ask the government/regional authorities to improve catch and discard reporting and to publish fishery compliance information, especially for Mauritania.</li> <li>4. Work with scientists to conduct studies to clarify the stock structure of northwest African pilchard/sardine.</li> <li>5. Press managers to implement a recovery strategy for other target species in this multi-species fishery to ensure that all such species are at least above biologically based limit reference points (or proxies for the point of recruitment impairment), especially for Cunene horse mackerel, Atlantic horse mackerel, and round sardinella.</li> </ol>



<b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report	<b>SFP Sustainability Category</b>	<b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b>
		6. Work with scientists and managers to expand the at-sea observer program to provide representational coverage of all components of the fishery to better understand catches and discards, as well as interactions with habitats and all types of bycatch.
<b>European sprat - North Sea</b>	<b>C</b>	<ol style="list-style-type: none"> <li>1. Press for further scientific research to fully define stock structure to improve management.</li> <li>2. Press regional advisory bodies, national fisheries administrations, and the European Commission to develop a multi-species, ecosystem-based management plan for North Sea pelagic fisheries, including a harvest control rule(s).</li> <li>3. Ensure that managers continue to set the TAC in line with scientific advice.</li> <li>4. Ensure these recommendations are represented to the EU Pelagic Advisory Council (<a href="https://www.pelagic-ac.org/">https://www.pelagic-ac.org/</a>) directly or through one of the General Assembly members.</li> <li>5. Engage as a stakeholder in all MSC certifications for this stock and support the MSC Client groups to ensure all conditions attached to the certifications are fully addressed.</li> </ol>
<b>Indian oil sardine - Kerala</b>	<b>C</b>	<ol style="list-style-type: none"> <li>1. Support current improvement efforts and encourage development of a formal, national Indian oil sardine fishery improvement project (FIP), including the following activities:</li> <li>2. Ask regulators to commission research to better define the biological stock structure and then conduct stock assessments at the appropriate spatial scale.</li> <li>3. Ask managers to publish historic annual catch data by gear type for each state.</li> <li>4. Work with managers to develop and agree on long-term objectives for the fishery, and develop a management plan, including biological reference points, a harvest strategy, and a harvest control rule for each stock.</li> <li>5. Encourage managers to immediately implement management measures to prevent the capture of juvenile fish, as advised by relevant</li> </ol>





<p><b>Stock</b></p> <p>Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report</p>	<p><b>SFP Sustainability Category</b></p>	<p><b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b></p>
		<p>scientific bodies, on a state-by-state basis.</p> <p>6. Work with scientists to research the environmental impacts of the fishery, especially with regard to effective monitoring of the incidental capture of endangered, threatened, and protected species.</p> <p>7. Support and encourage enhanced surveillance and enforcement to reduce illegal, unreported, and unregulated (IUU) fishing.</p>
<p><b>Indian oil sardine - Andhra Pradesh</b></p>	<p><b>C</b></p>	<ol style="list-style-type: none"> <li>1. Support current improvement efforts and encourage development of a formal, national Indian oil sardine fishery improvement project (FIP), including the following activities:</li> <li>2. Ask regulators to commission research to better define the biological stock structure and then conduct stock assessments at the appropriate spatial scale.</li> <li>3. Ask managers to publish historic annual catch data by gear type for each state.</li> <li>4. Work with managers to develop and agree on long-term objectives for the fishery, and develop a management plan, including biological reference points, a harvest strategy, and a harvest control rule for each stock.</li> <li>5. Encourage managers to immediately implement management measures to prevent the capture of juvenile fish, as advised by relevant scientific bodies, on a state-by-state basis.</li> <li>6. Work with scientists to research the environmental impacts of the fishery, especially with regard to effective monitoring of the incidental capture of endangered, threatened, and protected species.</li> <li>7. Support and encourage enhanced surveillance and enforcement to reduce illegal, unreported, and unregulated (IUU) fishing.</li> </ol>



<p><b>Stock</b></p> <p>Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report</p>	<p><b>SFP Sustainability Category</b></p>	<p><b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b></p>
<p><b>Indian oil sardine - Tamil Nadu</b></p>	<p><b>C</b></p>	<ol style="list-style-type: none"> <li>1. Support current improvement efforts and encourage development of a formal, national Indian oil sardine fishery improvement project (FIP), including the following activities:</li> <li>2. Ask regulators to commission research to better define the biological stock structure and then conduct stock assessments at the appropriate spatial scale.</li> <li>3. Ask managers to publish historic annual catch data by gear type for each state.</li> <li>4. Work with managers to develop and agree on long-term objectives for the fishery, and develop a management plan, including biological reference points, a harvest strategy, and a harvest control rule for each stock.</li> <li>5. Encourage managers to immediately implement management measures to prevent the capture of juvenile fish, as advised by relevant scientific bodies, on a state-by-state basis.</li> <li>6. Work with scientists to research the environmental impacts of the fishery, especially with regard to effective monitoring of the incidental capture of endangered, threatened, and protected species.</li> <li>7. Support and encourage enhanced surveillance and enforcement to reduce illegal, unreported, and unregulated (IUU) fishing.</li> </ol>
<p><b>Indian oil sardine - Goa</b></p>	<p><b>C</b></p>	<ol style="list-style-type: none"> <li>1. Support current improvement efforts and encourage development of a formal, national Indian oil sardine fishery improvement project (FIP), including the following activities:</li> <li>2. Ask regulators to commission research to better define the biological stock structure and then conduct stock assessments at the appropriate spatial scale.</li> <li>3. Ask managers to publish historic annual catch data by gear type for each state.</li> <li>4. Work with managers to develop and agree on long-term objectives for the fishery, and develop a management plan, including biological reference points, a harvest strategy, and a harvest control rule for each stock.</li> <li>5. Encourage managers to immediately implement management</li> </ol>



<b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report	<b>SFP Sustainability Category</b>	<b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b>
		measures to prevent the capture of juvenile fish, as advised by relevant scientific bodies, on a state-by-state basis. 6. Work with scientists to research the environmental impacts of the fishery, especially with regard to effective monitoring of the incidental capture of endangered, threatened, and protected species. 7. Support and encourage enhanced surveillance and enforcement to reduce illegal, unreported, and unregulated (IUU) fishing.
<a href="#">Indian oil sardine - Maharashtra</a>	<b>C</b>	1. Support current improvement efforts and encourage development of a formal, national Indian oil sardine fishery improvement project (FIP), including the following activities: 2. Ask regulators to commission research to better define the biological stock structure and then conduct stock assessments at the appropriate spatial scale. 3. Ask managers to publish historic annual catch data by gear type for each state. 4. Work with managers to develop and agree on long-term objectives for the fishery, and develop a management plan, including biological reference points, a harvest strategy, and a harvest control rule for each stock. 5. Encourage managers to immediately implement management measures to prevent the capture of juvenile fish, as advised by relevant scientific bodies, on a state-by-state basis. 6. Work with scientists to research the environmental impacts of the fishery, especially with regard to effective monitoring of the incidental capture of endangered, threatened, and protected species. 7. Support and encourage enhanced surveillance and enforcement to reduce illegal, unreported, and unregulated (IUU) fishing.
<a href="#">Frigate tuna - Ecuador</a>	<b>C</b>	1. Develop a research program aimed at defining the stock structure and its distribution (EEZ and international waters) and develop



<p><b>Stock</b> Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report</p>	<p><b>SFP Sustainability Category</b></p>	<p><b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b></p>
		<p>adequate stock assessment models that take into consideration environmental variables</p> <p>2. On the basis of stock status, develop a management strategy and, in the case of transboundary stocks, harmonize management measures with concerned countries or through the IATTC —responsible for the conservation and management of tuna species.</p> <p>3. Develop formal decision-making frameworks, which should establish: a) sources of information and scientific research for decision making; b) consultation and inclusion of relevant stakeholders, institutions, and organizations in decision making; c) transparent reporting of research outcomes and consultation processes; and d) a strategy to implement decisions.</p> <p>4. Develop a consistent system for regular data collection from all fleet segments of the fishery, especially the artisanal fleet, and for all gears (gillnets, unregulated purse seines locally called “rizos,” etc.).</p> <p>5. Improve the MSC and enforcement mechanism to ensure compliance.</p> <p>6. Review both the process and scientific basis used to establish temporal closures and evaluate the results of this measure’s implementation, and adopt management measures (closures, etc.) based on sound scientific facts/data.</p> <p>7. Establish a minimum landing size as advised by the National Institute of Fisheries of Ecuador (INP).</p> <p>8. Support the work of observers to improve reporting on impacts of the fishery with ecosystems, with a special focus on the interactions with ETP species (mainly turtles).</p>
<p><b>Indian oil sardine - Karnataka</b></p>	<p><b>C</b></p>	<p>1. Support current improvement efforts and encourage development of a formal, national Indian oil sardine fishery improvement project (FIP), including the following activities:</p> <p>2. Ask regulators to commission research to better define the biological stock structure and then conduct stock assessments at the appropriate spatial scale.</p>



<p><b>Stock</b></p> <p>Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report</p>	<p><b>SFP Sustainability Category</b></p>	<p><b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b></p>
		<ol style="list-style-type: none"> <li>3. Ask managers to publish historic annual catch data by gear type for each state.</li> <li>4. Work with managers to develop and agree on long-term objectives for the fishery, and develop a management plan, including biological reference points, a harvest strategy, and a harvest control rule for each stock.</li> <li>5. Encourage managers to immediately implement management measures to prevent the capture of juvenile fish, as advised by relevant scientific bodies, on a state-by-state basis.</li> <li>6. Work with scientists to research the environmental impacts of the fishery, especially with regard to effective monitoring of the incidental capture of endangered, threatened, and protected species.</li> <li>7. Support and encourage enhanced surveillance and enforcement to reduce illegal, unreported, and unregulated (IUU) fishing.</li> </ol>
<p><b>Pacific chub mackerel - Ecuador</b></p>	<p><b>C</b></p>	<ol style="list-style-type: none"> <li>1. Support current improvement efforts and encourage development of a formal, national Ecuador small pelagic fishery improvement project (FIP), including the following activities:</li> <li>2. Work with scientists to review the stock structure, develop an appropriate stock assessment model, and conduct regular stock assessments.</li> <li>3. Encourage regulators to develop a management plan including biological reference points, a harvest strategy, and harvest control rule.</li> <li>4. Ask managers to implement measures based on the best scientific advice to reduce catches of immature fish and establish appropriate limits for catch and/or effort.</li> <li>5. Work with regulators to implement a consistent system for the regular collection and publication of fisheries and observer data from all fleet segments and gear types, especially for the artisanal fleet.</li> <li>6. Ask managers to review both the process and scientific basis used to implement temporal closures and evaluate the results of this management approach.</li> </ol>



<p><b>Stock</b></p> <p>Year FIP started   (FIP progress rating)   FIP leadership   link to FIP public report</p>	<p><b>SFP Sustainability Category</b></p>	<p><b>Current SFP Suggested Improvement Actions <sup>(1,2,3)</sup></b></p>
		<p>7. Encourage regulators to improve monitoring, control, and surveillance to ensure compliance with regulations.</p> <p>8. Develop formal decision-making frameworks, which should establish: a) sources of information and scientific research for decision making; b) consultation and inclusion of relevant stakeholders, institutions, and organizations in decision making; c) transparent reporting of research outcomes and consultation processes; and d) a public strategy to implement decisions.</p>
<p><b>Anchoveta - Chilean Central-Southern (regions V-X)</b></p>	<p><b>C</b></p>	<p>1. Engage with managers and IFOP to ensure that catch recommendations and scientific reports are publicly available in a timely manner.</p> <p>2. Support the work of scientists and managers to improve reporting of catches, discards, and bycatch, including expansion of the observer program, as well as defining the scale of interactions with benthic habitats.</p> <p>3. Monitor implementation of the new discard reduction plan (July 2017).</p> <p>4. Work with scientists to conduct research on and develop new stock assessment models that take into account environmental variables.</p> <p>5. Support the implementation of the Anchoveta-Araucanian herring management plan (2016), and ensure further revisions of the plan include a specific recovery plan with explicit harvest control rules, considering the mixed nature of this fishery.</p>


**Appendix E.** Fisheries in the MSC program that are relevant to the current 26 stocks included in this overview, as of July 2018. Source: MSC (2018)

FAO area	MSC fishery name	Species covered <sup>(1)</sup>	Stocks covered	MSC status	Certification date	Tonnage ('000 t) <sup>(4)</sup>	Fishing gears
<b>48 (Atlantic, Antarctic)</b>	<a href="#">Aker Biomarine Antarctic krill</a>	Antarctic krill ( <i>Euphausia superba</i> )	Antarctic krill - Atlantic Southern Ocean	Certified	15-Jun-10	155.3	Midwater trawls
	<a href="#">Deris S.A. - Pesca Chile - Antarctic krill fishery</a>	Antarctic krill ( <i>Euphausia superba</i> )	Antarctic krill - Atlantic Southern Ocean	In Assessment	na	45.0 <sup>(2)</sup>	Midwater trawls
	<a href="#">Rimfrost Antarctic krill</a>	Antarctic krill ( <i>Euphausia superba</i> )	Antarctic krill - Atlantic Southern Ocean	Suspended	20-Aug-15	11.0	Midwater trawls
<b>21 (Northwest Atlantic)</b>	<a href="#">Omega Protein Corporation U.S. Gulf of Mexico menhaden purse seine</a>	Gulf menhaden ( <i>Brevoortia patronus</i> )	Gulf menhaden - Gulf of Mexico	In Assessment	na	618.7 <sup>(3)</sup>	Two boats operated purse seines
	<a href="#">Omega Protein Corporation U.S. Atlantic menhaden purse seine</a>	Atlantic menhaden ( <i>Brevoortia tyrannus</i> )	Atlantic menhaden - NW Atlantic	In Assessment	na	180.5 <sup>(3)</sup>	Two boats operated purse seines
<b>27 (Northeast Atlantic)</b>	<a href="#">Faroese Pelagic Organization North East Atlantic blue whiting</a>	Blue whiting ( <i>Micromesistius poutassou</i> )	Blue whiting - NE Atlantic	Certified	15-Jun-16	218.8	Midwater trawls
	<a href="#">PFA, DPPO, KFO, SPSG &amp; Compagnie des Pêches St Malo Northeast Atlantic blue whiting Pelagic Trawl</a>	Blue whiting ( <i>Micromesistius poutassou</i> )	Blue whiting - NE Atlantic	Certified	3-Feb-16	190.4	Midwater trawls
	<a href="#">Iceland North East Atlantic blue whiting</a>	Blue whiting ( <i>Micromesistius poutassou</i> )	Blue whiting - NE Atlantic	Certified	11-Jan-18	183.1	Bottom and Midwater trawls
	<a href="#">Norway spring spawning herring</a>	Blue whiting ( <i>Micromesistius poutassou</i> )	Blue whiting - NE Atlantic	Certified with component(s) in assessment	02-Jan-18	309.3	Purse seines; Bottom and Midwater trawls



FAO area	MSC fishery name	Species covered <sup>(1)</sup>	Stocks covered	MSC status	Certification date	Tonnage ('000 t) <sup>(4)</sup>	Fishing gears
<b>27 (Northeast Atlantic) (cont.)</b>	<a href="#">DFPO and DPPO North Sea, Skagerrak and Kattegat sandeel, sprat and Norway pout</a>	Lesser sand-eel ( <i>Ammodytes marinus</i> ), Sandeels nei ( <i>Ammodytes</i> spp)	Sandeels nei - Dogger Bank area, Sandeels nei - Central Eastern North sea, Sandeels nei - SE North Sea	Certified with component(s) in assessment	23-Mar-17	73.4	Purse seines; Midwater trawls
		European Sprat ( <i>Sprattus sprattus</i> )	European sprat - North Sea			220.0	
		Norway pout ( <i>Trisopterus esmarkii</i> )	Norway pout - North Sea,			25.9	
	<a href="#">Norway sandeel, pout and North sea sprat</a>	Sandeels nei ( <i>Ammodytes</i> spp.)	Sandeels nei - Central Eastern North Sea, Sandeels nei - Dogger Bank area	Certified	23-Feb-18	40.9	Purse seines
		European sprat ( <i>Sprattus sprattus</i> )	European sprat - North Sea			20.2	
		Norway pout ( <i>Trisopterus esmarkii</i> )	Norway pout - North Sea			36.3	
	<a href="#">ISF Iceland capelin</a>	Capelin ( <i>Mallotus villosus</i> )	Capelin - Icelandic	Certified	18-Apr-17	101.0	Seine Nets Trawls - Midwater trawls
	<a href="#">LFPO pelagic trawl sprat (<i>Sprattus sprattus</i>)</a>	European sprat ( <i>Sprattus sprattus</i> )	European sprat - Baltic sea	Certified	22-May-17	19.7	Trawls - Midwater trawls - otter trawls
	<a href="#">Finland Baltic herring &amp; sprat</a>	European sprat ( <i>Sprattus sprattus</i> )	European sprat - Baltic sea	In Assessment	na	10.5	Traps, Trawls - Other
	<b>87 (Southeast Pacific)</b>	<a href="#">Chile Purse Seine jack mackerel jurel</a>	Chilean jack mackerel ( <i>Trachurus murphyi</i> )	Chilean jack mackerel - SE Pacific	In Assessment	na	319.8 <sup>(3)</sup>

**Notes:** (1) Only species/stocks covered in this overview are included here. (2) This is a new fishery; the volume included is an estimate based on the expected level of catch for the 2017/18 fishing season (MSC 2018) (3) No specific volume is still available for the MSC-FA fishery; we assumed the entire catch for this species and country in the respective stock as covered by the MSC fishery. (4) MSC tonnage refers to 2016, with the exceptions of LFPO pelagic trawl sprat (*Sprattus sprattus*) (2015), Rimfrost Antarctic krill (2015), and Deris S.A. - Pesca Chile - Antarctic krill fishery (2018).