

MSC BRIEFING 01 (2021)

SMALL PELAGIC FISHERIES

Meeting future challenges

Climate change is prompting small pelagic fish stocks to move and adapt. So too must the seafood industry if we are to protect this vital marine resource. **Identifying sustainably managed small pelagic fisheries through MSC certification is key to supporting this change.**

Stronger sourcing

The MSC Program demonstrates that small pelagic fisheries can be managed sustainably. **Stronger commitments to sustainable sourcing from processors, retailers and brands will incentivise further improvement.**

Sustainable aquafeed

Small pelagic fish are a major source of fishmeal and fish oil to the aquaculture sector. As this sector continues to grow, **it is vital that aquafeed is sustainably sourced.**



FOREWORD



Camiel Derichs, MSC Global Program Development Director

Small pelagic fish are the unsung heroes of the ocean. Fast growing and short lived, they underpin marine food webs and support livelihoods from the frozen Southern Ocean to the North Atlantic.

But this important group of species faces a complex range of pressures. Climate change is leading stocks of herring, mackerel and sardine – some of the world’s most heavily traded fish – to shift their distributions toward the north and south poles¹. This presents new challenges to fisheries governance and management¹. Where it occurs, overfishing is posing a threat to delicate marine ecosystems including the birds and other animals that rely on small pelagic species for food. While a surge in demand for fishmeal and fish oil is prompting heavy pressure to keep landings high and a greater share to shift to reduction, in some cases this diverts nutritionally important fish away from vulnerable coastal communities².

The need for sustainable fishing has never been so important for small pelagic fisheries. The MSC program can play a key role in turning the tide.

The MSC is a mission-driven non-profit organisation. Our mission is to use our ecolabel and fishery certification program to contribute to the health of the world’s oceans by recognising and rewarding sustainable fishing practices. By working with our partners we hope to transform the seafood market to a sustainable basis and influence the choices people make when buying seafood.

As of 2020, 56 fisheries targeting small pelagic species are engaged with the MSC Program*. These fisheries collectively land over five million tonnes a year, around a fifth of the global small pelagic catch¹.

The MSC’s history with small pelagic fisheries began 20 years ago when Thames Blackwater herring became one of the first fisheries to ever enter the MSC Program. Over the next decade a number of European herring and

sardine fisheries gradually followed suit with Antarctic krill joining the program in 2010. However, the last five years have seen a surge in the number and diversity of small pelagic fisheries entering the program. Certified small pelagic fisheries now include menhaden in the USA, sand eel and pout in the North Sea, anchovy in Cantabria and Argentina, Baltic herring in Finland and sardines in Australia and Mexico. With many more small pelagic fisheries in comprehensive Fishery Improvement Projects, this trend is expected to continue.

Certification of small pelagic fisheries is driving positive change both on the water and on land. To reach sustainability performance levels where the MSC Fisheries Standard can be met, small pelagic fisheries around the world have strengthened management systems and have adjusted onboard practices and operations.

Many such fisheries have gained market benefits as a result of certification³. Others have seen a boost to their reputation among commercial partners or opened productive dialogues with conservation groups and governments during the assessment process⁴. Examples of these environmental and commercial impacts can be found in the case study section of this report ([Pages 17 to 20](#)).

Around the world, demand for fish oil as a nutritional supplement is rising; aquaculture feed mills are increasingly sourcing MSC certified ingredients; while independent research⁵ suggests that seafood consumers are buying a more diverse range of species and products, including nutritional supplements, in the name of sustainability. New market opportunities exist for fisheries that can demonstrate their sustainability to both consumers and supply chain partners.

With so many small pelagic fisheries in our program around the world, the MSC has built deep expertise in their unique characteristics and challenges. This briefing consolidates some of this experience, celebrates the ecological, social and economic successes that certified small pelagic fisheries have realised so far, and explains how working in collaboration with stakeholders can help to address some of the challenges that small pelagic fisheries face.

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* Engaged includes fisheries that are either certified, suspended or in assessment.

SMALL PELAGIC FISHERIES

Small pelagic fisheries: A background

Small pelagic species such as herring, anchovy and sardine are some of the world's most caught and traded fish¹, making up 28% of global wild capture fish production²⁵. A key destination is human consumption, however combined with the by-products from the remaining global catch, a considerable proportion is used to produce fishmeal and fish oil for aquaculture feeds. An estimated 19% (18 million tonnes) of global marine catch ends up as fishmeal or fish oil¹. While high demand has seen prices for fishmeal and fish oil rise¹, some of the raw ingredients used in aquaculture feed come from poorly managed stocks or unreported landings⁶.

Although small pelagic fisheries management has generally become more precautionary over the past decade, many stocks are still subject to overfishing⁷. The use of unsustainable stocks is exacerbated by the natural population fluctuations and environmental sensitivity seen in small pelagic fish. They support delicate marine ecosystems, underpinning major marine food webs. Unsustainable fishing can have a knock-on effect to the surrounding ecology if left unchecked.

In addition to supporting marine ecosystems, small pelagic fish provide critical nutrition for many vulnerable coastal communities in the Global South². Yet the growth of reduction for fishmeal and fish oil in some countries is seeing small pelagic fish diverted away from human consumption, posing a risk to food security¹.

Our oceans face a multitude of threats from climate change to pollution, and around 46% of small pelagic fish stocks are currently overfished^{7,8}. Stocks have begun to adapt to climatic changes by shifting their distributions poleward. The seafood industry must now adapt too if we are to secure the future of these valuable marine resources.

Aquaculture has been the fastest growing food production sector over the past 50 years and is expected to provide 59% of fish for human consumption by 2030¹. As the sector grows so too will opportunities for small pelagic fisheries supplying sustainably sourced ingredients.

If the future of these valuable marine resources is to be secured, it is vital that alongside small pelagic and reduction fisheries committing to becoming sustainable,

the global aquaculture sector also commits to sustainable sourcing. Identifying the small pelagic fisheries that are operating sustainably through MSC certification is critical in supporting this change.

Overview of production and consumption

In 2018, global fish production was estimated at 179 million tonnes, with wild-capture fisheries contributing 96.4 million tonnes (54%)¹. An estimated 19% of wild capture production was reduced to produce fishmeal and fish oil, including both whole fish (60% of fish oil production; 78% of fishmeal production) and trimmings (40% of fish oil production, 22% of fishmeal production)¹. Small pelagic fish collectively contributed 28% of wild-capture landings with Peruvian anchoveta alone contributing seven million tonnes (7% of global wild-capture landings)^{1,25}. In 2018, the global value of the fishmeal and fish oil markets totalled USD \$4.91 billion⁹ and \$2.02 billion¹⁰, respectively.

In 2020 landings from small pelagic species engaged in the MSC Program totalled over five million tonnes, representing around 20% of small pelagic landings worldwide^{1,25}, up from 8% of small pelagic landings in 2016. The number of ecolabelled fish oil products also increased dramatically over the past decade from four in 2008 to over 450 in 2020. Now, 9% of all MSC ecolabelled products are made up of small pelagic species.

**IN 2018, 19% OF GLOBAL
WILD CAPTURE FISH
PRODUCTION WAS USED
TO PRODUCE FISHMEAL
AND FISH OIL**

CONSERVATION CHALLENGES

Climate change

One major challenge to the future of small pelagic fisheries is climate change. Warming seas are prompting species to shift their distributions poleward at a rate of 30–130km/decade¹¹. While environmental science isn't always clear cut, the IPCC (Intergovernmental Panel on Climate Change) indicate that Antarctic krill is already shifting southwards in the Southern Ocean and Atlantic mackerel stocks have shifted northwards since 2007¹². Elsewhere, Peruvian anchoveta, the largest single-species fishery on Earth¹, experiences significant natural yo-yos in stock abundance tracing El Niño conditions¹. The migration of fish stocks across Exclusive Economic Zones (EEZs) can result in disputes between coastal states making quota negotiations and supply projections challenging.

Changes to the distribution of small pelagic stocks can lead to disputes between governments over how to share fishery resources. A challenge that was recently faced by a number of fisheries for mackerel, herring and blue whiting in the MSC Program in the Northeast Atlantic¹³. Effective fisheries management under climate change will require better international cooperation between governments, however this is a significant challenge for many countries balancing economic and environmental interests. Effective collaboration between governments, scientists and the fishing industry will be key to delivering and maintaining sustainable stocks. The MSC offers a global benchmark which brings stakeholders together to deliver credible long-term solutions.

Overfishing

Fisheries are more resilient to these changes if they operate sustainably with effective management in place. Yet in recent years, many small pelagic fisheries have been overfished^{6,7}. Northeast Atlantic mackerel was overfished by 33%, the Norwegian spring spawning herring by 35%, and blue whiting by 29% relative scientific catch advice from the International Council for the Exploration of the Sea (ICES)⁸.

Impacts on marine food webs

Given their importance as a food source to many marine animals, the impact of fishing for small pelagic species on the wider marine food webs can be a source of concern. The MSC Fisheries Standard requires that, for all fisheries,

the management of the target species should in some way take into account its trophic level and the role it plays in the ecosystem. This is especially important for fisheries that target 'key low trophic level' species, such as many small pelagic species. The Standard has an additional requirement that these key stocks are not fished below the point where serious ecosystem impacts could occur (see Hot Topics on [Page 10](#)).

REDUCTION FISHERIES

What is a reduction fishery?

The MSC defines a reduction fishery as one that predominantly targets a particular species for the production of fishmeal or fish oil, as opposed to selling it for direct human consumption. These fisheries typically target small pelagic (midwater) species like anchoveta, sardines, blue whiting, menhaden, krill, and capelin.

What is fishmeal?

Fishmeal is a protein-rich flour-like product, that is produced by milling and drying fish, or fish parts. It is used to supplement feed for livestock and as a key ingredient for aquaculture feeds.

What is fish oil?

Fish oil is obtained through the pressing of cooked fish and separation of the liquid obtained into oil and water. It is considered the richest available source of long-chain polyunsaturated fatty acids, which perform a wide range of critical functions for human health¹.

Fish oils are a valuable by-product in the production of fishmeal, and are widely used in aquaculture feeds. Crude fish oil can be further refined, purified and concentrated to become suitable for human consumption, usually in the form of omega-3 supplements or nutraceutical products or medicines.

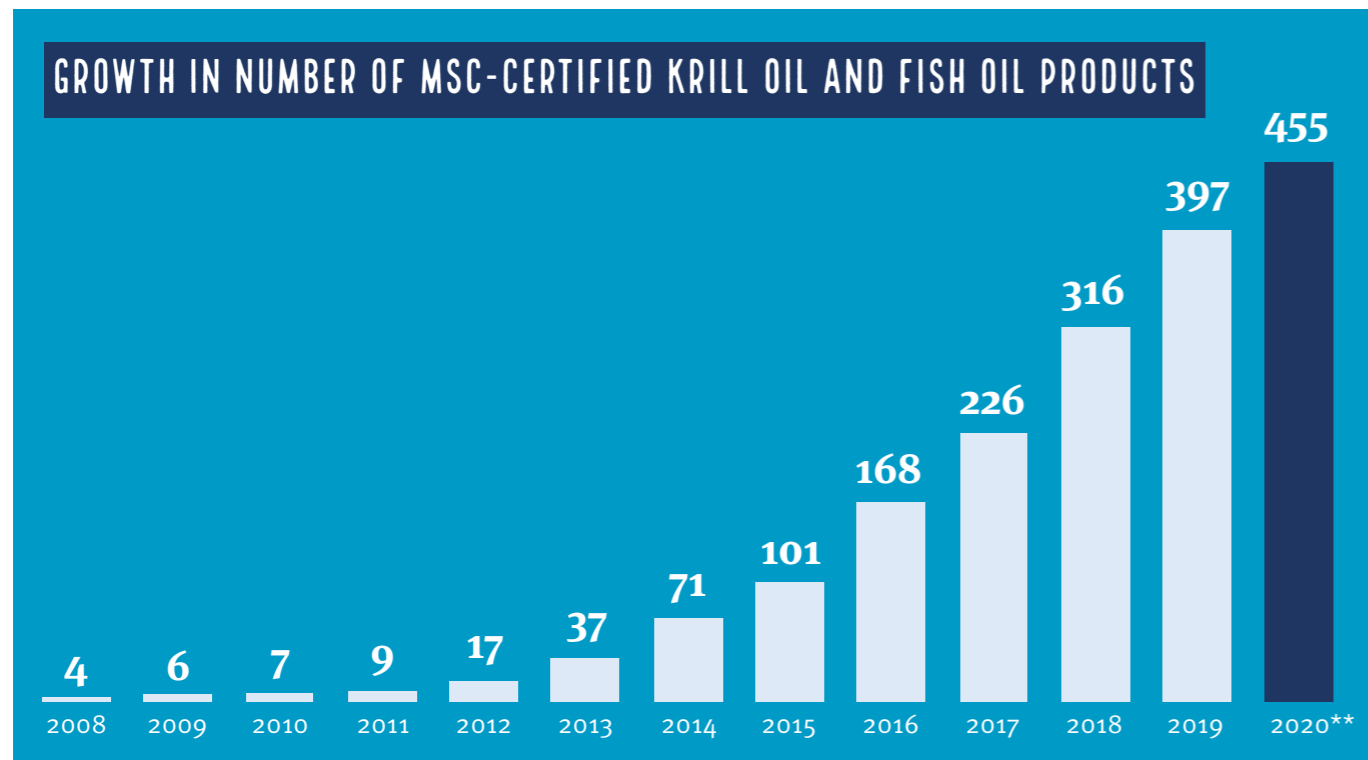
Can aquaculture be sustainable if it relies on reduction fisheries? See Hot Topics on [Page 11](#).

MARKET OPPORTUNITIES

International trade in small pelagic fish

In 2016, the top five exporting nations of small pelagic fish for human consumption (including frozen fillets, fresh, chilled) as well as fish oil and fish meal were Peru (9% of global exports; 800,000 tonnes), Norway (8% of exports; 700,000 tonnes), the Netherlands (7% of global exports; 600,000 tonnes), Denmark (7%, 600,000 tonnes) and Morocco (6% of global exports, 500,000 tonnes)¹⁴. The majority of Peru’s exports (84%) were from fishmeal, followed by fish oil (12%) and frozen mackerel (3%)¹⁴.

In the same year, the top importers of small pelagic fish were China (15% of imports, 1.1 million tonnes), Nigeria (6% of imports, 500,000 tonnes), Norway (6% of imports, 500,000 tonnes), Ghana (4% of imports, 400,000 tonnes) and Japan (3% of imports, 300,000 tonnes)¹⁴. The majority of China’s imports were fishmeal (77%) followed by frozen herring (8%) and frozen mackerel (7%)¹⁴.



Growth in fish oil for human consumption

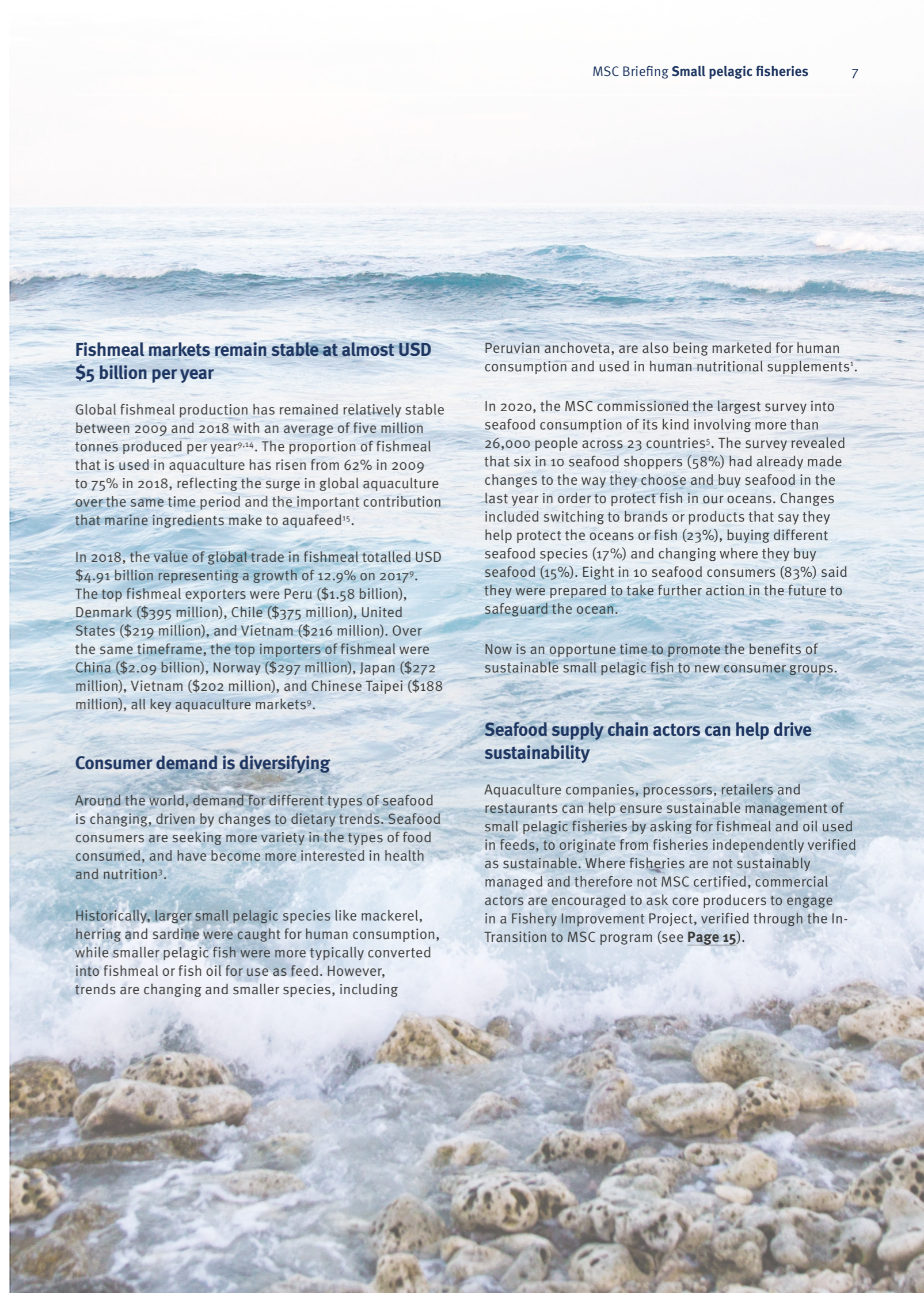
Between 2009 and 2018, global fish oil production remained relatively stable at around one million tonnes per year¹⁰. However, markets for fish oil have shifted over that period. In 2009, 83% of fish oil produced was used in aquaculture (691,000 tonnes) with only 12% directed to human consumption. By 2018, the proportion used for human consumption grew to 20% while the proportion used in aquaculture dropped to 73% (579,000 tonnes)¹⁵.

Total trade in fish oil totalled USD \$2.02 billion* in 2018, a growth of 51% on 2017. In 2018, the top fish oil exporters

were Peru (\$379 million), USA (\$161 million), Norway (\$159 million), Denmark (\$140 million), and Chile (\$135 million) while the top importers of fish oil were Norway (\$269 million), Denmark (\$205 million), United States (\$128 million), China (\$122 million), and Canada (\$117 million)¹⁰.

Increasing demand for fish oil for human consumption has been reflected in the growth of MSC certified fish oil products over the past decade. In 2008 only four MSC labelled fish oil supplements were available. This has grown to over 450 MSC labelled products in 2020.

* All values are provided in US Dollars unless otherwise stated. ** up to 30.09.2020



Fishmeal markets remain stable at almost USD \$5 billion per year

Global fishmeal production has remained relatively stable between 2009 and 2018 with an average of five million tonnes produced per year^{9,14}. The proportion of fishmeal that is used in aquaculture has risen from 62% in 2009 to 75% in 2018, reflecting the surge in global aquaculture over the same time period and the important contribution that marine ingredients make to aquafeed¹⁵.

In 2018, the value of global trade in fishmeal totalled USD \$4.91 billion representing a growth of 12.9% on 2017⁹. The top fishmeal exporters were Peru (\$1.58 billion), Denmark (\$395 million), Chile (\$375 million), United States (\$219 million), and Vietnam (\$216 million). Over the same timeframe, the top importers of fishmeal were China (\$2.09 billion), Norway (\$297 million), Japan (\$272 million), Vietnam (\$202 million), and Chinese Taipei (\$188 million), all key aquaculture markets⁹.

Consumer demand is diversifying

Around the world, demand for different types of seafood is changing, driven by changes to dietary trends. Seafood consumers are seeking more variety in the types of food consumed, and have become more interested in health and nutrition³.

Historically, larger small pelagic species like mackerel, herring and sardine were caught for human consumption, while smaller pelagic fish were more typically converted into fishmeal or fish oil for use as feed. However, trends are changing and smaller species, including

Peruvian anchoveta, are also being marketed for human consumption and used in human nutritional supplements¹.

In 2020, the MSC commissioned the largest survey into seafood consumption of its kind involving more than 26,000 people across 23 countries⁵. The survey revealed that six in 10 seafood shoppers (58%) had already made changes to the way they choose and buy seafood in the last year in order to protect fish in our oceans. Changes included switching to brands or products that say they help protect the oceans or fish (23%), buying different seafood species (17%) and changing where they buy seafood (15%). Eight in 10 seafood consumers (83%) said they were prepared to take further action in the future to safeguard the ocean.

Now is an opportune time to promote the benefits of sustainable small pelagic fish to new consumer groups.

Seafood supply chain actors can help drive sustainability

Aquaculture companies, processors, retailers and restaurants can help ensure sustainable management of small pelagic fisheries by asking for fishmeal and oil used in feeds, to originate from fisheries independently verified as sustainable. Where fisheries are not sustainably managed and therefore not MSC certified, commercial actors are encouraged to ask core producers to engage in a Fishery Improvement Project, verified through the In-Transition to MSC program (see [Page 15](#)).

GLOBAL SMALL PELAGIC FISHERIES

MSC certified catch made up of small pelagic species*

39%

Proportion of global wild capture production comprising small pelagic species²⁵

28%

20%

Proportion of small pelagic catch that is MSC certified^{25*}

1,793

Number of small pelagic products carrying the MSC ecolabel

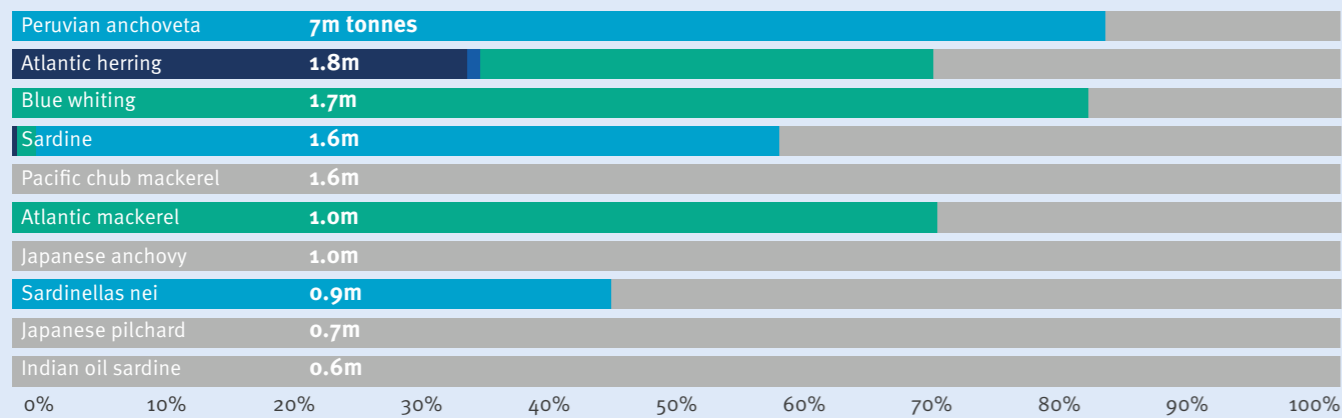


SMALL PELAGIC FISHERIES

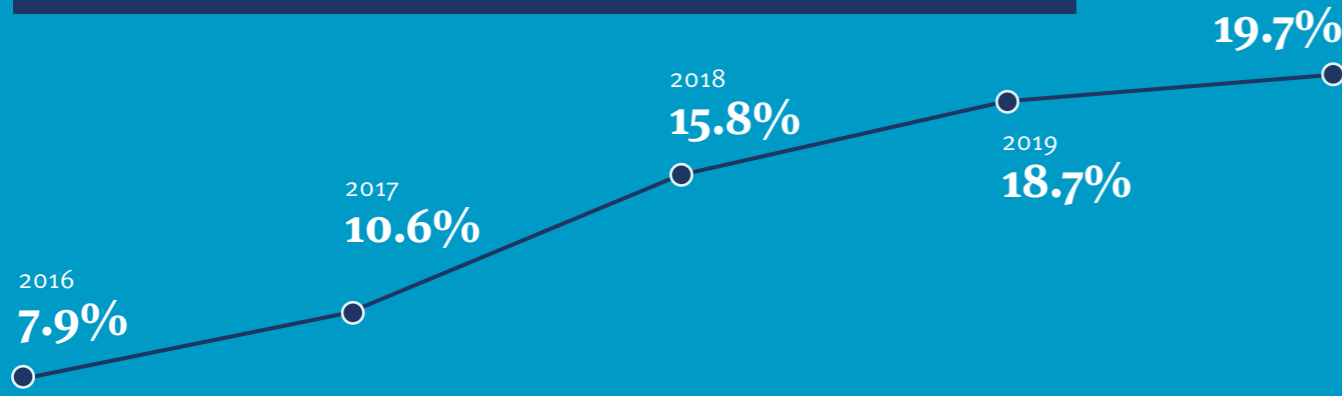
ENGAGED WITH THE MSC PROGRAM

TOP 10 SMALL PELAGIC SPECIES CAUGHT BY VOLUME (2018)²⁵

● % MSC certified ● % suspended ● % in assessment ● % in a FIP ● % other



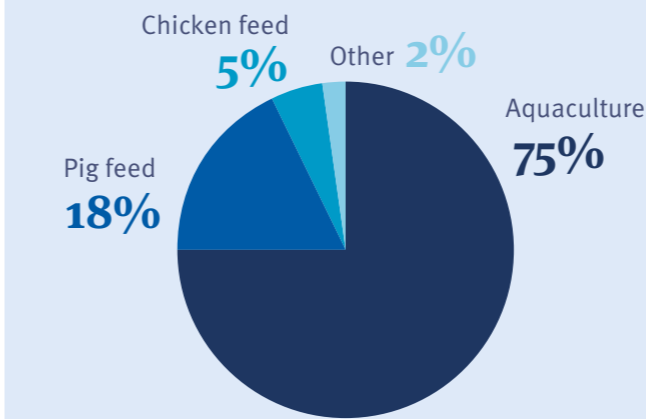
% OF SMALL PELAGIC WILD CAPTURE PRODUCTION THAT IS MSC CERTIFIED BY VOLUME^{25*}



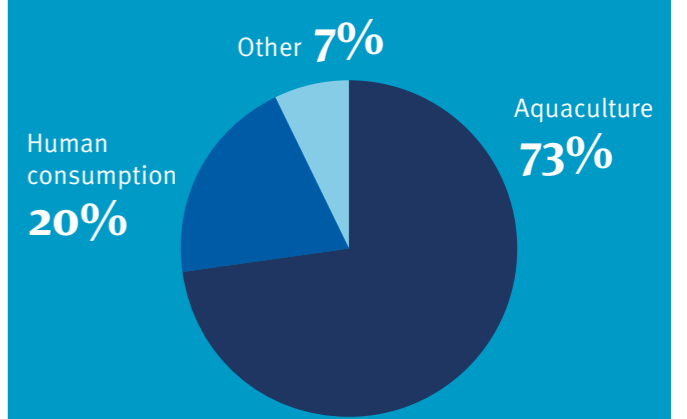
* MSC certified catch includes certified and suspended fisheries, MSC fisheries data (2020)

GLOBAL FISHMEAL AND FISH OIL

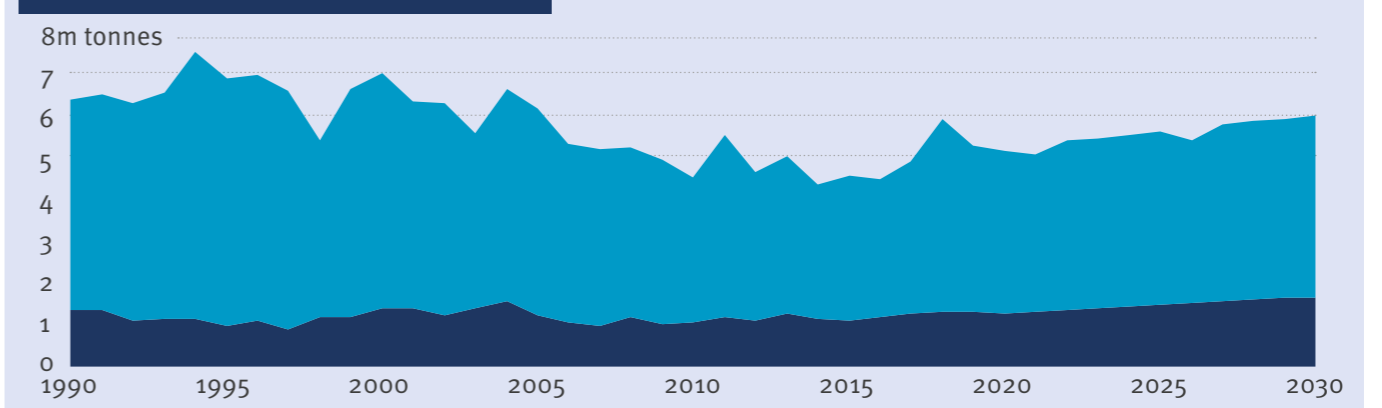
WORLD FISHMEAL USE BY SECTOR¹⁵



WORLD FISH OIL USE BY SECTOR¹⁵



WORLD FISHMEAL PRODUCTION, 1990-2030¹



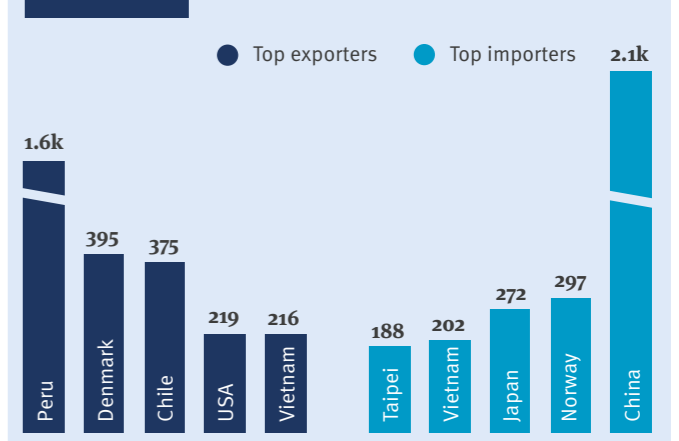
TOP FIVE EXPORTERS AND IMPORTERS OF FISH OIL

2018, USDM¹⁰



TOP FIVE EXPORTERS AND IMPORTERS OF FISHMEAL

2018, USDM⁹



HOT TOPICS

01 • CAN FORAGE FISHERIES

BE SUSTAINABLE?

Yes, if those fisheries are managed and operate responsibly. Forage fisheries often target species close to the bottom of the marine food chain, known as low trophic level species. They include ‘forage fish’ such as anchovy, menhaden, and capelin but also invertebrate species such as krill¹⁵.

Due to their population biology and life history traits (fast growing, highly productive and short lived) these species are resilient to fishing pressures if catches are well-managed⁶. However, overfishing low trophic level species can have significant impacts on an entire ecosystem, particularly higher up the food chain, where many predatory fish, seabirds and marine mammals rely on them as their main food source.

While there are legitimate concerns about the management and practices of some forage fisheries, the MSC is committed to ensuring MSC certified fisheries are operating for long term sustainability and are recognised for their efforts.

How does the MSC Program help?

The MSC Fisheries Standard recognises the importance of low trophic level species to the entire marine ecosystem. It has specific and rigorous requirements that must be met by fisheries targeting species with particularly critical roles in their local ecosystems. These species are referred to as **key LTL species** in the Standard.

We define key LTL species using the following criteria:

- 1. Connectivity:** A large proportion of the trophic connections in the ecosystem involve this species, so there is a significant predator dependency.
- 2. Energy transfer:** A large volume of energy passing between lower and higher trophic levels passes through this stock.
- 3. Uniqueness:** Few if any other species are a conduit for the energy between trophic levels in that ecosystem.

MSC certified fisheries that target key LTL species must adopt a management approach that is focused on limiting the ecosystem impacts caused by the commercial harvest of these important species. This often means catching a lower proportion of the stock compared to fisheries for other species. Specifically, the Standard requires that key LTL fisheries should maintain their target stock as high as a default 75% of the unexploited level unless there is sophisticated ecosystem modelling to allow lower levels, compared to 40% as a default in non-LTL fisheries. This ensures that stocks remain abundant and can sustain healthy predator populations. Key LTL fisheries must also provide evidence that their catches are not having detrimental impacts further up the food chain and demonstrate that their catch is used as fully as possible, minimising waste.

02 • ARE TRIMMINGS A MORE

SUSTAINABLE ALTERNATIVE?

Owing to a drop in the supply of small pelagic landings from 30 million tonnes in 1994 to 18 million tonnes in 2018, trimmings have been increasingly used to produce fishmeal and oil. An estimated 25-35% of annual global fish oil and fishmeal production originates from fish trimmings or by-products⁵.

The fact that fish are used in their entirety is to be applauded. Yet with around a third of the world’s fish stocks overfished; illegal, unreported and unregulated fishing posing a threat to fish populations; and destructive fishing practices damaging marine ecosystems means not all trimmings are sourced responsibly.

How does the MSC Program help?

The MSC Program helps producers of fish oil and fishmeal to identify fisheries that have been certified as sustainable. By sourcing from MSC certified fisheries, producers can ensure that the trimmings they buy have been sourced from well managed fisheries with sustainable fish stocks and minimal impact on the wider marine environment. Their actions contribute to a virtuous circle, helping to protect the productivity and health of our oceans.



03 • IS AQUACULTURE SUSTAINABLE

IF FISH MEAL AND OIL IS REQUIRED?

The answer isn’t straightforward. The feed used in aquaculture farms or ‘aquafeed’ represents a major component of the environmental and social footprint of aquaculture. A large proportion of fishmeal produced by reduction fisheries is used by the aquaculture industry as aquafeed. This is because many species of fish and crustaceans grown in aquaculture are piscivorous i.e. eat primarily other fish in the wild.

A lot of research and development is being undertaken by the aquaculture and aquafeed industries to find ‘fish free’ alternatives to fishmeal e.g. from algae, plants or even insects. This is not only to improve sustainability, but also to reduce costs. Microalgae especially offers a tremendous new source of omega-3 rich oil for the feed industry. The company Veramaris obtained MSC-ASC certification in January 2021, as the first major algae based omega-3 oil producer. A significant part of the global demand for omega-3 oil in salmon feed can now be sustainably supplied.

Yet species including salmon, yellowtail, seabass and seabream usually demonstrate better growth and health in aquaculture when they are fed with diets containing a small proportion of marine raw materials¹⁹. The amount of fishmeal used to feed aquaculture species has reduced over time but owing to its nutritious and digestible nature, fish remains an important aquafeed ingredient¹⁹.

While fish continues to be used in aquafeed, it is critical to ensure it is being supplied by fisheries that are operating sustainably, whether they are reduction fisheries or fisheries supplying trimmings for conversion to fishmeal and oil. Over recent years, aquaculture certification programs have been developing standards to ensure the sustainable sourcing of aquafeed ingredients by feed mills, and by aquaculture facilities themselves²⁰. The Aquaculture Stewardship Council (ASC) will soon launch the global ASC Feed Standard which defines requirements for the responsible sourcing of marine and terrestrial animal and plant ingredients for use in aquafeed²⁰. The new ASC Feed Standard will address marine ingredients through a global improvement model that

requires feed mills to source marine ingredients from fisheries demonstrating increasing levels of sustainability and eventually MSC certification²⁰. This means that ASC certified fish feed will ultimately contain MSC certified marine ingredients from sustainable reduction fisheries.

How does the MSC Program help?

By improving the sustainability of their operations and becoming certified as sustainable against the MSC Fisheries Standard, reduction fisheries across the world will be able to maintain and maximise access to the aquafeed market and supply the wider aquaculture industry with responsibly sourced marine ingredients. In addition, aquafeed mills and aquaculture farms that source aquafeed ingredients from MSC certified fisheries will go a long way to ensuring the aquaculture industry is operating as responsibly as possible.

The global demand for sustainably farmed seafood is helping to create a pull for more sustainably managed wild fisheries which will create an overall benefit for ocean health.

04 • HOW WILL CLIMATE CHANGE

AFFECT SMALL PELAGIC FISHERIES?

Climate change is having a profound impact on our oceans and marine life. The impacts include shifts in temperature, acidification, deoxygenation and changes in ocean currents¹⁰.

These changes can affect the distribution of fish stocks and their food, posing a risk to the fishing industry. For example, areas of the tropics are predicted to see declines in potential seafood catch of up to 40% by 2050⁹. In contrast, areas in higher latitudes, such as the North Atlantic and North Pacific, are already seeing increases in the range of species, leading to new fishing opportunities at the expense of areas closer to the equator where landings have reduced.

Warming-induced range shifts can pose a particular challenge to fisheries governance when the distribution of a fish stock shifts across a political or management boundary¹⁶. For example, there has been a rapid change in Atlantic mackerel distribution since 2007. Stocks have moved northward as sea temperatures have risen, resulting in disputes between coastal states over how to share fishery resources¹⁷.

In these changing times, governments and the fishing industry have found it difficult to agree how best to manage changing fish stocks. The current lack of internationally accepted, well-defined, harvest control rules can make the management and certification of migratory species that straddle multiple jurisdictions more complex¹⁷.

How does the MSC Program help?

Sustainable fisheries that meet the MSC Fisheries Standard are well-managed and are generally more prepared for the impacts of climate change. Certified fisheries have effective monitoring and management in place to reduce their effects on the environment and science-based plans for responding to likely environmental changes. They demonstrate best practice when it comes to balancing economic and environmental priorities to safeguard our oceans and seafood supplies.

Effective fisheries management often requires international cooperation between governments, because many fish stocks straddle multiple Exclusive Economic Zones. As the impacts of climate change influence the range and size of stocks, it will become ever more important for governments to work together more effectively.

Existing international fisheries legislation is insufficient in governing shared stocks with many such stocks subject to overfishing. In absence of effective legislation, credible standards and market-oriented certification systems offer a key tool to incentivise management agencies to deliver sustainable outcomes through better cooperation.

The MSC Fisheries Standard offers a best-practice framework which can be used to help stakeholders manage shared stocks sustainably. It includes requirements to set harvest control rules and to allocate catches across fishery participants, prompting dialogue and decision-making between stakeholders. Such conversations may not be easy and may take time, but to manage fishing sustainably requires collaborating and adapting to whatever issues climate change brings.

CHALLENGES UNDER CLIMATE CHANGE: THE SITUATION IN THE NORTHEAST ATLANTIC

Northeast Atlantic mackerel, herring and blue whiting fisheries have undergone major changes in the past decade. Shifts in the distribution of stocks in response to climate change have seen stocks migrate to more westerly and northerly fishing grounds. Although this has created new fishing opportunities, a lack of agreement on quota allocations between new and existing fisheries has seen stocks become fished beyond a sustainable limit. As a result, all three fisheries were suspended from the MSC Program in 2019 and 2020¹³.

The result of the suspensions is far-reaching. Retailers and processing companies that were previously able to demonstrate sustainable sourcing that had been independently verified by MSC certification can no longer do so, resulting in impacts to reputation and market advantage.

Stakeholders are keen to see improvements in the sustainability of these fisheries, not least because overfishing by some of the most affluent and well-

resourced countries in the world is setting a poor example for international fisheries management. The North Atlantic Pelagic Advocacy Group ([NAPA](#)) was formed by retailers, processors and aquafeed companies from across the UK (and some in the EU) to consider how supply chain actors could advocate for and incentivise timebound improvements in the management of these fisheries.

Elsewhere, situations like this have been resolved through multilateral agreements, providing hope for the Northeast Atlantic. A coastal states agreement was formed between Iceland, Greenland and Norway in 1998 to ensure stocks of Icelandic capelin, a stock that straddles the fishing grounds of the three nations, was not overfished.

The agreement details how the quotas should be shared between the three coastal states and is still going strong today with ISF Icelandic capelin becoming MSC certified in 2017.

THE MSC'S APPROACH

We recognise that small pelagic fisheries can face unique challenges as they improve towards sustainability. The MSC assessment process can provide a valuable framework to better understand and demonstrate the ecological impacts of the fishery. It can also open important conversations with conservation groups and other stakeholders.

The MSC Fisheries Standard

The MSC Fisheries Standard brings together over 20 years of collaboration with scientists, the fishing industry and conservation groups. It reflects internationally accepted fisheries science and best practice management.

The three principles of the MSC Fisheries Standard

Principle 1: Sustainability of the stock: Fisheries must operate in a way that allows fishing to continue indefinitely, without over exploiting the resource.

Principle 2: Ecosystem impacts: Fishing operations need to be managed to maintain the structure, productivity, function and diversity of the ecosystem upon which the fishery depends, including other species and habitats.

Principle 3: Effective management: All fisheries need to meet all local, national and international laws and have an effective management system in place.

How does the scoring process work?

There are 28 performance indicators in the Fisheries Standard that sit under the three principles.

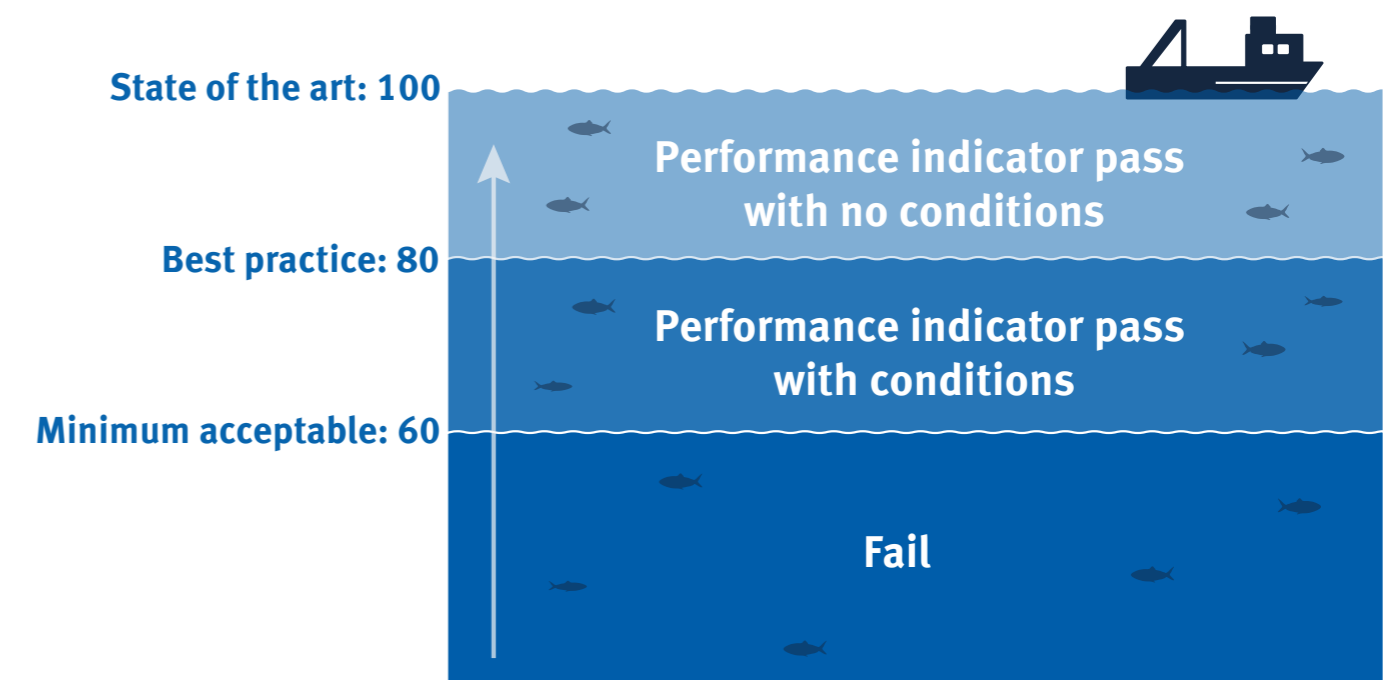
A fishery is given a score for each performance indicator. The minimum acceptable performance score is 60, while 80 is global best practice. A score of 100 is state of the art.

To be certified, a fishery must score:

- **At least 60 for each of the 28 performance indicators**
- **An average score of 80 across all performance indicators under each of the three principles**

If a fishery scores at least 60 but less than 80 for any performance indicator, they will receive a condition of certification to improve their performance against that indicator so that it scores 80 or above within the five year cycle of an MSC fishery certificate. This improvement is called a condition.

You can find more information in our [Get Certified guide](#) for fisheries.



TRACEABLE SUPPLY CHAINS

The MSC Chain of Custody Standard

The MSC Chain of Custody Standard ensures that products from MSC certified sustainable fisheries are traceable, identifiable, and separated from non-certified products. The range and quantity of products bearing the blue MSC label is growing all the time, and expanding rapidly into new markets including fish oil supplements – creating incentives for more fisheries to strengthen their sustainability.

Does my business need Chain of Custody certification?

Any seafood sold with the blue MSC label can be traced back to a certified source. For this to work, every company along the supply chain, up until the point where products are packed into consumer-ready packaging, needs to be certified to the MSC Chain of Custody Standard.

The MSC Chain of Custody Standard includes different requirements to meet the needs of different types of business. There are three versions of the Standard:

- **Default Chain of Custody** - for companies operating in one or a few locations.
- **Group Chain of Custody** - for businesses with a central office function and many locations distributing, processing, trading or serving MSC certified seafood.
- **Consumer-Facing Organisation Chain of Custody** - for most businesses selling direct to consumers such as restaurants or fish counters.

You can find more detailed information in our Chain of Custody [Get Certified](#) guide.

The MSC Chain of Custody Standard has five principles



PATHWAY TO SUSTAINABILITY

To ensure that the MSC Program and its benefits are accessible to all, we have developed a suite of training, technical and financial tools to support small-scale and data-deficient fisheries, supporting fisheries especially in the Global South.

Pre-assessments

A pre-assessment is an optional* but recommended analysis that determines a preliminary performance against the MSC Fisheries Standard and highlights gaps, to help understand the readiness for a potential certification process.

Action plans

The fishery improvement action plan tool can be used to develop an action plan that will address the gaps identified in a fishery’s pre-assessment. The plan should aim to transform the fishery sufficiently to meet the MSC Standard requirements following the MSC performance indicators.

Benchmarking and tracking

The MSC’s Benchmarking and Tracking tool can be used to consistently and transparently track the actions and environmental performance level set out in the action plan. Progress is measured on an annual basis.

Pathway projects

Pathway projects combine other pathway tools in a strategic and collaborative way to engage with multiple fisheries at the same time, putting fisheries on the pathway to sustainability. At present, 26 of the 130 fisheries in active pathway projects target small pelagic species (20%).

Capacity building program

A training program for fishery clients, managers, scientists, consultants and other stakeholders engaged with fisheries working towards MSC certification. The program has the objective of building technical capacity and knowledge about the MSC Fisheries Standard and its use as a framework for improvement, therefore increasing the accessibility of the MSC Program by any fishery, regardless of its size, geographical location, or socio-economic setting.

In Transition to MSC Program

The MSC’s In-Transition to MSC Program offers a way of independently verifying a fishery’s progress on an annual basis, helping them stay on track to achieve the improvements needed to meet the MSC Fisheries Standard. Participating fisheries can also gain access to tailored technical and financial support on their path towards future certification.

Ocean Stewardship Fund

A portion of the MSC’s Ocean Stewardship Fund is committed to support fisheries willing to improve towards the MSC certification, with a special focus on small scale fisheries and fisheries in the Global South. We will continue to expand this program to support many more fisheries on their journey to sustainability



* A pre-assessment is a compulsory part of the ITM program.

MAKING AN IMPACT

Certification is creating real change on the water: improving management, facilitating dialogue with NGOs and governance bodies, and minimising the impacts of fishing on the wider marine ecosystem. Some certified fisheries have introduced voluntary fishing ground closures while others have modified fishing gear to reduce seabird bycatch.

The ecological benefits of certification are often complemented by social and economic benefits on land, as experienced in the small pelagic fisheries below.



* Personal communication, M Favret, MSC France

CASE STUDY

AUSTRALIAN SARDINE FISHERY

Target species: Australian sardine (*Sardinops sagax*) | **Gear type:** purse seine
Tonnage: 39,071 (2018) **First certified:** 2018



In 2018, South Australia's sardine fishery became the first sardine fishery in the Southern Hemisphere and the third fishery in South Australia to be certified by the MSC. Australian sardines (*Sardinops sagax*) are the prime target of the South Australian Sardine Industry Association (SASIA) and its eight purse seine vessels. Most fishing takes place at night, with schools of sardines located by sonar. The fishery is very selective with sardines making up over 99% of the catch.

Collaborative management

In addition to its use of selective gears, the fishery is managed by a limited entry licensing system with a total allowable commercial catch of between 27,500 to 42,000 tonnes set each year. This makes it the largest fishery by volume in Australia and means that 46% of Australia's wild marine catch is now MSC certified. Due to a successful partnership between the fishing industry and government, the fishery has scaled up from a catch of 5,000 tonnes in 2000 while maintaining sustainable operations.

"The implementation of an Individual Transferable Quota management regime in 2000 provided the framework for a sustainable fishery to develop" said Steve Shanks, who manages the sardine fishery for Primary Industries and Regions South Australia (PIRSA). "The ability of industry

and government to work together to develop the fishery within a sustainable framework led to Marine Stewardship Council certification. PIRSA looks forward to continuing to work with the sardine industry to develop the fishery for the local community and all South Australians."

Supplying domestic aquaculture

The majority of the catch is used as certified fish feed in Port Lincoln's southern bluefin tuna operations while a small proportion is sold to domestic retailers and restaurants as fresh or frozen sardines for human consumption.

"MSC certification demonstrates the effort made by the individuals and organisations involved with the South Australian Sardine Fishery over the past 25 years. By supplying South Australia's bluefin tuna ranching operations with MSC certified product, along with the continued efforts to develop human consumption product lines for the domestic and potential international markets, we are proud to support sustainability initiatives across Australia's wider seafood sector." said Paul Watson, South Australian Sardine Industry Association Executive Officer.

CASE STUDY

AKER BIOMARINE ANTARCTIC KRILL

Target species: Antarctic krill (*Euphausia superba*) | **Gear type:** mid-water trawl
Tonnage: 253,000 (2019) | **First certified:** 2010



Credit: Aker Biomarine

The Aker Biomarine fishery operates in the Antarctic waters of the Southern Ocean. The fishery, which was first certified in 2010 and recertified in 2015, targets Antarctic krill (*Euphausia superba*), a tiny shrimp-like creature which is used in fish oil health supplements due to being rich in Omega-3 phospholipids and the naturally occurring antioxidant Astaxanthin.

As a keystone species in the Antarctic ecosystem and a major source of food for seals, penguins and whales, krill is considered a key LTL species. Although fisheries for the species have been at the centre of considerable opposition among environmental groups, some of which want no fishing for Antarctic krill at all, the three assessments against the MSC Fisheries Standard, and the regular audits clearly demonstrate that the fishery is operating to the highest standards of environmental sustainability, assuring that the unique ecosystems and species in the Southern Ocean remain intact.

A highly precautionary approach

The management of all fishing activity in the Antarctic is overseen by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). Formed of 25 member states and the European Union, CCAMLR was established in 1982 to protect and manage the extensive marine resources of Antarctica. It is known for being extremely cautious in its approach to fishing impacts on ecosystems, with management rules and practices closely following precautionary and ecosystem-based principles. Catch limits for krill fishing are set by CCAMLR based on the advice of their scientific committee to minimise risks either to the krill population or to species within the Antarctic ecosystem that rely upon krill as a food source.

Given the vast size of the area, its remoteness and the severe weather conditions, it is not easy or cheap to survey and estimate krill biomass. Surveys are only taking place in smaller parts of the Southern Ocean, and can be far apart in time and place. This is why there is considerable uncertainty on the exact stock size of krill stocks. Nevertheless, broader surveys took place in 2000 and again in 2018/19 on the basis of which biomass in Area 48 (where krill fishing takes place) could be estimated.

In 2000, the scientific committee in CCAMLR estimated the unexploited biomass of krill to be 60.3 million tonnes and considered it safe to set a precautionary catch level of 5.6 million tonnes, representing 9% of overall biomass. In practice, an even more precautionary catch limit of 620,000 tonnes has been used to manage the fishery. This level was based on the highest catch recorded in the 1980s, and in the last decades harvests of krill have never come close to the limit. During the 2019 survey, the total biomass of krill was estimated at 62.6 million tonnes, demonstrating that stocks remain in good health and the impact of the fishery is low.

Aker Biomarine has taken significant steps to protect other species living in the Antarctic Southern Ocean. This includes 100% observer coverage and the use of a bespoke “Eco-Harvesting” method which has a fine mesh, monitored by underwater cameras, to prevent anything larger than krill being caught. Recent research shows that these fisheries are very selective, and bycatch of juveniles of other species is around 0.2% of the total catch. The impacts of this bycatch on the biomass of other species are deemed low by scientific experts. Recently Aker BioMarine further committed to voluntarily avoid fishing in certain areas close to land with breeding penguin colonies.

CASE STUDY

OMEGA ATLANTIC MENHADEN

Target species: Atlantic menhaden (*Brevoortia tyrannus*) | **Gear type:** purse seine
Tonnage: 141,300 (2018) | **First certified:** 2019



Credit: Omega Protein Corporation

The Atlantic menhaden fishery operates along the East coast of the USA and was first certified in 2019. Atlantic menhaden (*Brevoortia tyrannus*) are small, oily fish which appear in estuaries and coastal waters from Nova Scotia to northern Florida. While not traditionally eaten directly, menhaden are used in fishmeal and fish oil for human and animal nutrition, due to their high natural concentration of healthy omega-3 fatty acids.

The Atlantic menhaden fishery has two sectors: a reduction fishery which harvests fish to produce fishmeal and fish oil (80% of catch, MSC certified) and a bait fishery (20% of catch, uncertified) which has been growing since 1985 to supply regional lobster and other pot fisheries. The certified component is harvested by Omega Protein. The company is also a member of the MSC certified Gulf of Mexico menhaden fishery (*Brevoortia patronus*), which was certified in 2019.

Ensuring healthy stocks

Catch is harvested using purse seines with schools of menhaden located by overhead spotter planes. According to the National Oceanic and Atmospheric Administration, menhaden is one of the most selective and effective fisheries with minimal bycatch²⁴.

Sustainable levels of fishing were demonstrated in a recent stock assessment model which estimated that the

current stock of Atlantic menhaden is one of the most abundant on record. Total fishing mortality is much lower than historical levels, much lower than the management reference points, and much lower than the rate of natural mortality. The fishery removes a very small portion of the available population, leaving an abundance of menhaden available for predators higher up the food chain.

To meet the MSC’s specific requirements for key LTL species, the fishery managers approved ecological reference points and set a new total allowable catch this year. This was to explicitly account for the important role of menhaden in the wider ecosystem.

Certified supplier of fishmeal to aquaculture

The majority (80%) of the catch is manufactured into fishmeal and oil and ultimately ends up in the diets of companion animal and aquaculture feed. Supplying MSC certified fishmeal and oil is becoming a standard for aquaculture producers seeking ASC certification.

“The menhaden fishery has continuously operated since the 1870s and the population of menhaden remains robust and abundant. This certification demonstrates the sustainability of our fishery and will differentiate our fishmeal and oil products from competitors on the global market” said Omega Protein President and CEO Bret Scholtes.

CASE STUDY

SONORA SMALL PELAGICS FISHERY

Target species: Pacific thread herring (*Opisthonema libertate*) and Pacific sardine (*Sardinops sagax*)
Gear type: purse seine | **Tonnage:** 124,490 (2016) | **First certified:** 2011



Credit: Productos Pesqueros de Guaymas SA de CV

The Gulf of California small pelagic fishery is Mexico's largest fishery by volume. Its 46 vessels use purse seine nets to catch sardine (a key LTL species) and thread herring in large shoals. Fishing trips usually last 1-2 days and are often guided by aerial surveys and satellite data to locate the schools of fish. All catch for this fleet is landed in the ports of Guaymas and Yavaros in the state of Sonora.

About 85% of the fishery's total production is used for reduction to fish meal. Sardines are also packed in cans for sale into domestic and international markets.

Stakeholder collaboration key to success

During the initial certification, Comunidad y Biodiversidad (COBI) AC, a Mexican marine conservation organisation, raised an objection on behalf of several non-governmental organisations and scientists from the region.

After a series of consultations between the certification body, stakeholders and the fishery, the parties came to agreement about the necessary steps and amendments required to modify the fishery action plan in a way that would satisfy all involved.

The revisions included a commitment from the fishery to allow the objectors to participate in the work to fulfil fishery improvements required as part of the certification.

It also included a more rigorous design of the monitoring and reporting system, as well as higher coverage of the fishing fleet with on-board observers to improve the recordings of bycatch and interactions with endangered, threatened and protected species (ETP) and how to reduce them.

After almost a decade, the fishery continues to collaborate closely with COBI to improve monitoring and address issues around bycatch and interactions with ETP species such as the brown pelican (*Pelecanus occidentalis*), which is threatened in Mexico. Improvements to date have included the installation of bycatch mitigation devices such as pressurised hoses which scare birds away from the nets using water sprays, as well as modifications to prevent birds becoming entangled in net cables. Additional improvements include the collection of fishery independent information to improve the accuracy of the stock assessment, factoring in the ecological role of the stock, a long-term requirement of all MSC certified key LTL fisheries.

What began with an objection has turned into positive and ongoing collaboration between two previously conflicting groups.

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