

MSC 2019-20 ANNUAL REPORT SUPPLEMENTARY INFORMATION

This document details the methods and data sources for the figures and graphs included in the Annual Report 2019-20, as well as providing supplementary figures and tables.

INDEX AND DATA SOURCES

Where external data sources are cited, data can be independently verified by accessing those sources. For internal MSC datasets, these are generated by the MSC Strategic Research team extracting information from MSC Fishery and Chain of Custody certificate reports and provided by label license holders. Accuracy of the data extraction is assured by the MSC with sample-based verification. Details on this process are available on request.

Reports are authored by and based on assessments carried out by accredited third party certification bodies, and as such the certification bodies take full responsibility for the accuracy and truthfulness of their contents, including fishery assessment scores given.

If using any data, kindly acknowledge the MSC as the source and provide a download date and website link. When citing elements of this report, please cite as:

MSC (2020) *Supplementary Materials to the MSC Annual Report*. Marine Stewardship Council, London, UK.

FOR GENERAL QUERIES PLEASE CONTACT: info@msc.org

FOR TECHNICAL ISSUES PERTAINING TO THE DATA PLEASE CONTACT: research@msc.org

LIST OF OUTPUTS AND DATA

All data used to generate the plots and maps in the report are downloadable from <https://www.msc.org/docs/default-source/default-document-library/about-the-msc/supplementary-data-to-the-msc-annual-report-2019-20.xlsx>

OUTPUT	EXCEL TAB	DATA SOURCE(S)
MSC engaged catch at the end of the 2018/2019 and 2019/20 financial years as a total and by different species groups (Page 12)	msscach	MSC 2020 ³ , FAO ASFIS ²
Fisheries in the global south as proportions of catch (Page 27)	msscach	MSC 2020 ³ , FAO Global Capture Production ⁵ , UN M49 ¹
Of all wild marine catch engaged with the MSC (Page 12)	msscach	MSC 2020 ³ , FAO Global Capture Production ⁵
Map of MSC certified marine catch compared with total marine catch in each FAO major fishing area. (Page 13)	faomap	MSC 2020 ³ , FAO Capture Global Production ⁵ , FAO Major Fishing Areas ⁶
Principle scores for MSC fisheries at initial assessment and first reassessment (Page 14)	scoreimprove	MSC 2020 ³
Improvements made in MSC fisheries by the end of 2019	improvement	MSC 2020 ³
Number of Certificate Holders (Page 34)	chainofcustody	MSC 2020 ³
'Volume' of MSC-labelled certified seafood sales (Page 35)	liveproductvolume	MSC 2020 ³

Number of Live MSC labelled consumer Products (Page 35)	liveproductcount	MSC 2020 ³
---	------------------	-----------------------

GLOSSARY OF TERMS AND ACRONYMS

LIST OF ACRONYMS AND GLOSSARY OF TERMS USED THROUGHOUT THE REPORT

ACRONYM - TERM	DEFINITION
Assessment	Assessment is used to refer to the initial certification and recertifications of fisheries.
ASI - Assurance Services International	Assurance Services International, provider of accreditation services for the MSC program.
CAB - Conformity Assessment Body	Organization that performs conformity assessment services against the MSC Fisheries and CoC standards.
Catch	In this annual report, the total live weight of a target species caught. The weight at the time of catch, before processing for the species that can carry the MSC ecolabel.
Certificate holder	An entity which holds a certificate issued by an MSC accredited CAB.
CoC - Chain of Custody	The procedures implemented by organisations purchasing or handling certified products in the supply chain. These procedures ensure conformity with the MSC Chain of Custody Standard and provide assurance that throughout the supply chain, certified products are segregated from noncertified products and are traceable back to a certified source.
Condition	A requirement to achieve outcomes in order to achieve a score of 80 or above.
Default tree	All versions of the MSC Fishery certification requirements since FAM v1 was released in 2008.
Enhanced fishery	A fishery that includes in its operations some aquaculture methods such as 'catch and grow', i.e., juveniles are captured from the wild stock in the same geographic region and allowed to settle and grow in a relatively controlled environment, e.g., rope-grown mussels, or 'hatch and catch', i.e., juveniles reared in a hatchery and then released in the wild for sport fishing, such as hatchery-reared salmon.
FAO - United Nations Food and Agriculture Organization	
FAM – Fishery Assessment Methodology	The methodology followed by CABs when assessing conformity against the fisheries standard.
Fishery	The group of harvesters associated with an MSC fishery certificate targeting one stock with a certain gear type/method/vessel type in a specified area. Note that an MSC certificate may include more than one species or harvest method, and thus more than one fishery, according to this definition, and the term 'fishery' may be used differently in other MSC publications or external sources.
Global South	Refers to countries listed as developing regions in the Standard country or area codes for statistical use (M49) ¹ .
Green weight	The weight of fish landed before any processing is done
Improvement	Improvements are the changes recorded that allow a fishery that had received a condition to achieve a score of 80 or above.
ISSCAAP	International Standard Statistical Classification of Aquatic Animals and Plants ²

¹ United Nations Statistics Division. "Standard country or area codes for statistical use (M49)", 2020. <https://unstats.un.org/unsd/methodology/m49>



ACRONYM - TERM	DEFINITION
ISSCAAP Division/Group	Grouping of commercial species based on their taxonomic, ecological and economic characteristics.
Live Products	Products sold that have sales recorded against them for the reported year.
MSC - Marine Stewardship Council	
N - Number	Number of elements or sample size.
P1 - Principle 1	Principle 1 of the MSC Fisheries standard, i.e. stock status.
P2 - Principle 2	Principle 2 of the MSC Fisheries standard, i.e. environmental status.
P3 - Principle 3	Principle 3 of the MSC Fisheries standard, i.e. fishery governance.
PCR - Public Certification Report	The final version of the assessment report, after stake-holder comments to the PCDR have been taken into account.
Stock	A wild population of a marine (or freshwater) species that is harvested by fishers. A stock ideally corresponds to a biological unit that has its distinctive demographic dynamics and thus it is assessed separately from other populations belonging to the same species. In reality, exact information on the genetic structure of the catch is often missing, which sometimes leads to erroneously aggregating more than one population of the same species under the same stock. As more knowledge is accumulated, stock definitions can be revised, and consequently their stock assessments.
UoA - Unit of Assessment	The sum of all the elements that are assessed for awarding a given certificate. For fisheries evaluated against the MSC Fisheries standard, this includes the target stock(s) being certified, combined with any fleets, or groups of vessels, or individual fishing operators or other eligible fishers pursuing that same stock using different methods/gears/practices, as well as the species and ecosystem in the area where the fishery is active.
UoC - Unit of Certification	The target stock(s) and any fleets, groups of vessels, or individual fishing operators, defined by the fishing method/gear/practice for pursuing that stock, covered by an MSC fishery certificate.
Year	Calendar year (i.e., from 1 st January of the year to 31 st December of the same year)
Fiscal year	Fiscal year (i.e., from April 1 st of the year to March 31 st of the following solar year)

METHODS FOR THE ANNUAL REPORT

If any interpretative issues arise in relation to the MSC Fisheries and Chain of Custody Standards, the text of the English MSC scheme documents will prevail in all instances:

- [MSC FISHERY CERTIFICATION REQUIREMENTS.](#)
- [MSC CHAIN OF CUSTODY CERTIFICATION REQUIREMENTS.](#)

PROGRESS IN THE YEAR

MSC ENGAGED CATCH AT THE END OF THE 2018/2019 AND 2019/20 FINANCIAL YEARS AS A TOTAL AND BY DIFFERENT SPECIES GROUPS (PAGE 12)

In order to show change in time and scope of what MSC fisheries catch, all MSC engaged catch was extracted and summed from the most recently available data for each snapshot in time.

The total sum of engaged catch for each year included all UoA/ UoC that were either Certified, Suspended or In Assessment. Each UoA/UoC is associated with a single species assigned from the ASFIS² list of species that is associated with an ISSCAAP division/group, e.g. cod is part of the 'cod, hake, haddock' group.

A single MSC fishery can have many UoA or UoC that target one or many different species. When extracting catch data, it was assigned against the UoA/UoC for that fishery to enable different aggregation to be applied (e.g. against the target species, the fishing method/gear or major ocean area(s)). In cases where a report provided a grouped catch, such as a single figure for many species, the catch was divided equally.

When certificate holders decide to form a new group, a fishery that previously appeared in a separate assessment will now be scored as part of a joint assessment. In these cases, at the moment of re-assessment, appears under a new assessment under a new client group or combines with a larger assessment, the original UoA/UoC can exist in new assessments, these were tracked and the most current data chosen to remove duplication.

DATA SOURCE(S): MSC 2020³

OF ALL WILD MARINE CATCH ENGAGED WITH THE MSC

To understand the reach of MSC and provide a sense of scale, engaged marine catch is shown relative to the FAO Global Capture Production dataset to measure proportion of MSC global marine catch by species and major ocean areas. Using the certificate status of the MSC UoA/UoC, a combined % of FAO along with a breakdown by status is shown. (Page 12)

When assigning catch from MSC reports to all UoA/UoC, it was matched to the target species and major ocean areas. In cases where a report provided a grouped catch, such as a single figure for many species, the catch was divided equally. To provide a comparable snapshot in time, catch from MSC fisheries was associated with the date a report was submitted. In order to make a comparison between MSC and FAO data, several rules were applied to each dataset and both contain only;

- Marine catch. As a marine Standard, the MSC program would not be expected to grow in reach and have the same impact on freshwater seafood sustainability. Inland and freshwater species are excluded as they dilute the ability to measure progress on the

² Food and Agriculture Organization of the United Nations. "ASFIS List of Species for Fishery Statistics Purposes": FAO, 2020. <http://www.fao.org/fishery/collection/asfis/en>

³ Marine Stewardship Council, Supplementary Materials to the MSC Annual Report 201920.xlsx, 2020. <http://www.msc.org>

program's goals and key strategies. However, freshwater fisheries do remain in scope and they accounted for approx. 9,500mt engaged catch.

- Wild capture. Enhanced MSC fisheries that report at a country level as aquaculture and would exist in the FAO Global Aquaculture Production dataset⁴ are excluded
- ISSCAAP division/groups². Those that are not measured by MSC are excluded from the FAO Global Capture data, these are 'Aquatic plants', 'Freshwater fishes', 'Miscellaneous aquatic animal products', 'Miscellaneous aquatic animals' & 'Whales, seals and other aquatic mammals'.

When a record in the MSC data did not explicitly match the FAO data on the assigned UoA/UoC, manual mapping was applied. Where, for example, a species was recorded in 2 adjacent ocean areas in the MSC record and only 1 ocean area in the FAO record, the catch was mapped to the FAO record.

DATA SOURCE(S): MSC 2020³, FAO GLOBAL CAPTURE PRODUCTION 2018⁵

FISHERIES IN THE GLOBAL SOUTH AS PROPORTIONS OF CATCH

The proportion of MSC engaged catch from the Global South and proportion as a percentage of all wild marine catch. (Page 27)

Fisheries can have many UoA and UoC that can be associated with one or many countries. To determine proportions of catch to the Global North and Global South, each UoA/UoC are assigned countries based on the best-known vessel flag states. Attribution of MSC catch uses the same methods applied to all catch measures in the report, i.e. in cases where a single catch figure has many vessel flag countries, the catch is divided equally. When comparing against the FAO Global Capture data the same rules were applied (i.e. only marine, wild and specific ISSCAAP division/groups).

DATA SOURCE(S): MSC 2020³, FAO GLOBAL CAPTURE PRODUCTION 2018⁵.

PROPORTION OF GLOBAL CATCH THAT IS MSC CERTIFIED

MAP OF MSC CERTIFIED MARINE CATCH COMPARED WITH TOTAL MARINE CATCH IN EACH FAO MAJOR FISHING AREA.

In order to show where MSC certified fisheries operate around the world compared against FAO global capture, MSC certified catch was mapped to each FAO major ocean area⁶ alongside pins indicating the approximate location of each MSC fishery. (Page 13)

The method for handling data was the same as used in the indicators for all wild marine catch engaged with the MSC at the end of the 2019/20 financial year. The data was filtered to include only MSC Certified and Suspended catch; in assessment catch was excluded. Suspended was included in the sum of certified catch, as the fishery can still reacquire their certificate if they address the causes of their suspension. Each pin on the map provides an approximate location of the fishing activity for each MSC certified fishery.

⁴ Food and Agriculture Organization of the United Nations. "Global Aquaculture Production." Fishery Statistical Collections. 2020. <http://www.fao.org/fishery/statistics/global-aquaculture-production/en>

⁵ Fisheries and aquaculture software. FishStatJ - Software for Fishery and Aquaculture Statistical Time Series. In: FAO Fisheries Division [online]. Rome. <http://www.fao.org/fishery/>

⁶ Food and Agriculture Organization of the United Nations. "FAO Major Fishing Areas." Search Geographical Information. 2020. <http://www.fao.org/fishery/area/search/en>

DATA SOURCE(S): MSC 2020³, FAO GLOBAL CAPTURE PRODUCTION 2018⁵

FISHERIES IMPROVING,

PRINCIPLE SCORES FOR MSC FISHERIES AT INITIAL ASSESSMENT AND FIRST REASSESSMENT

In order to measure how the scores of MSC certified fisheries change through a certificate cycle, i.e. 5 years in the program, Principle 1, 2 and 3 scores received at initial assessment (P1 n = 227, P2 n = 297, P3 n = 191) and first re-assessment (P1 n = 228, P2 n = 243, P3 n = 132) were contrasted using boxplots. (Page 14)

While fisheries might still be making improvements to close conditions by the 5th year surveillance report (end of the certification cycle), comparing scores at the start of a second certification cycle ensures most improvements are complete, except for particular cases for which additional time is allowed. This provides a conservative estimate of improvements accomplished by the fishery as there could be new conditions opened at re-assessment due to improved information available or new Standard requirements.

To ensure the same fisheries were represented in both the initial assessment and first re-assessment data, only fisheries that passed certification at both assessments were included. This approach also ensured that Units of Assessment that did not make the necessary improvements (and thus dropped out of the MSC program) were also excluded so as to avoid artificially inflating the difference between the initial scores and the scores at re-assessment.

The scores were extracted from 135 initial assessment reports and 119 first re-assessment reports. The number of reports decreased on re-assessment due to some fisheries deciding to share the same certificate and thus be evaluated as part of a joint report.

To determine if scores changed significantly by the end of the first assessment cycle, scores per fishery report were grouped by Principle and assessment stage (i.e. 1st assessment or re-assessment) and Shapiro-Wilks tests were used to test for normality. Where data were normally distributed (P3), an ANOVA was used to test for statistically significant differences between assessments. Where data were non-normal (P1 and P2), Kruskal-Wallis tests were used.

SENSITIVITY TEST OF COMBINING SCORES FROM DIFFERENT ASSESSMENT TREES

As the MSC Fishery Standard is revised and updated every 5 years, most fisheries were assessed on different versions of the Standard at initial and first re-assessment. With each revision of the Standard, the assessment tree (collection of performance indicators) used is revised slightly. Therefore, the data were split by assessment tree to account for the effects of Standard version used on scores received at full assessment (Figure S1). However, there was a very uneven spread of scores across assessment trees and sample sizes were often very small (Table S1). As such, the final plot used in the main text of the annual report showed values from combined Standard versions. To check that this did not cause spurious effects, sensitivity tests were run exploring if patterns remained consistent when separating by Assessment tree.

Score distributions at initial and first re-assessment were compared for each Standard version. The plots showed that in general, even when accounting for Standard version, scores remained the same or increased by re-assessment. An exception to this can be found in the scores received by fisheries assessed on pre-FAM Standard versions. Pre-FAM Standard versions required CABs to develop their own assessment indicators, which resulted in inconsistent interpretations and applications of the Fishery Standard. To address these issues of inconsistency, the FAM with pre-defined performance indicators was designed⁷. Inconsistent application of the Standard may

⁷ Agnew, D. J., Gutierrez, N. L., Stern-Piriot, A., and Hoggarth, D. D. 2014. The MSC experience: developing an operational certification standard and a market incentive to improve fishery sustainability. – ICES Journal of Marine Science, 71: 216–225.

explain why only fisheries assessed on pre-FAM Standard versions did not see an increase in score values at first re-assessment. The FAM approach has been in use from 2010 onward. The increase in scores reflects what is occurring in any of the currently or recently certified fisheries.

DATA SOURCE(S): MSC 2020³.

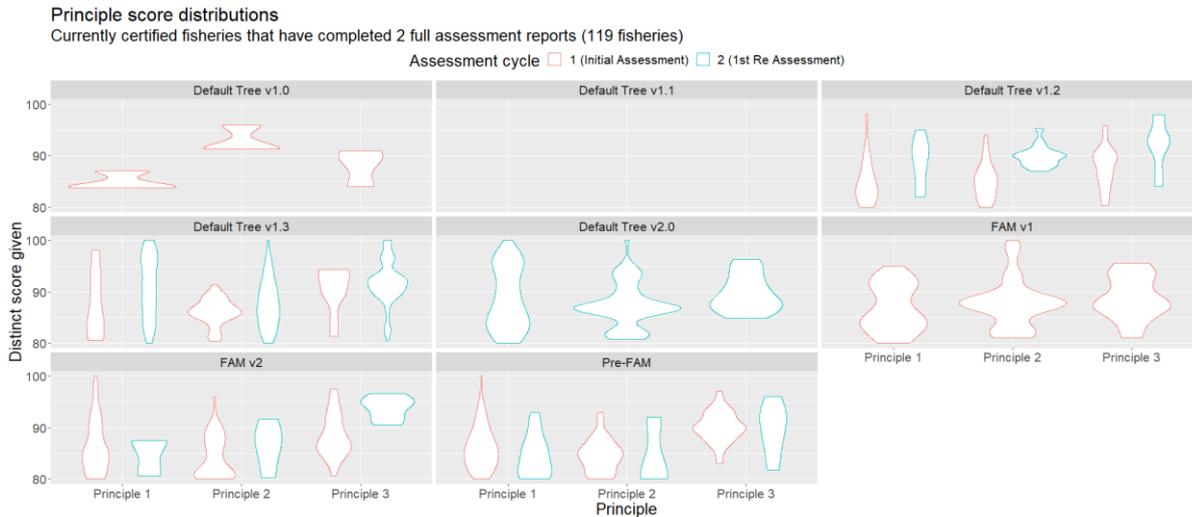


Figure S1. Density of Principle 1, 2 and 3 scores for 119 fisheries at initial assessment (red) and first re-assessment (blue). Sample sizes for each Principle at each full assessment report are shown in Table S1.



Table S1. Score data sample sizes when split by assessment cycle, Principle and assessment tree.

Assessment	Principle	Assessment tree	Count
1 (Initial Assessment)	Principle 1	Default Tree v1.0	3
		Default Tree v1.1	1
		Default Tree v1.2	22
		Default Tree v1.3	12
		FAM v1	32
		FAM v2	90
		Pre-FAM	67
	Principle 2	Default Tree v1.0	3
		Default Tree v1.1	1
		Default Tree v1.2	27
		Default Tree v1.3	36
		FAM v1	46
		FAM v2	108
		Pre-FAM	76
	Principle 3	Default Tree v1.0	3
		Default Tree v1.1	1
		Default Tree v1.2	21
		Default Tree v1.3	10
		FAM v1	30
		FAM v2	59
		Pre-FAM	67
2 (1st Re Assessment)	Principle 1	Default Tree v1.0	1
		Default Tree v1.1	1
		Default Tree v1.2	9
		Default Tree v1.3	108
		Default Tree v2.0	81
		FAM v1	2
		FAM v2	5
	Pre-FAM	21	
	Principle 2	Default Tree v1.0	1
		Default Tree v1.1	1
		Default Tree v1.2	16
		Default Tree v1.3	133
		Default Tree v2.0	79
		FAM v1	2
		FAM v2	5
	Pre-FAM	6	
	Principle 3	Default Tree v1.0	1
		Default Tree v1.1	1
		Default Tree v1.2	9
		Default Tree v1.3	83
		Default Tree v2.0	25
FAM v1		2	
FAM v2		5	
Pre-FAM	6		

FISHERIES IMPROVING

IMPROVEMENTS MADE IN MSC FISHERIES BY THE END OF 2019

To demonstrate the changes MSC fisheries have made to reduce their environmental impacts, all conditions closed, and associated improvements have been counted. To highlight the areas of improvement, the number of these closed in the last 2 years has been counted by elements. (Page 15)

Conditions are set whenever a Performance Indicator (PI) is scored between 60 and 79 during the assessment of a fishery, requiring the fishery to improve the score for that PI to a minimum of 80 within the period of the 5-year certification cycle. A condition is applied to all fishery components (i.e. target stock(s), the fishing method/gear, and practice (including vessel/s) pursuing that stock) that do not meet a score of 80 for each PI. It is a requirement for a fishery to take action to improve performance in order to maintain certification. One condition can impact multiple species and generate multiple improvements.

An improvement is counted when the score of a fishery component (stock, method/gear, practice/vessels) is increased to a minimum score of 80 through closing a condition. One condition can therefore have multiple improvements as numerous fisheries components have made changes to lift their score. Improvements are only counted when a condition has been fully closed.

DATA SOURCE(S): MSC 2020³.

CERTIFIED SUSTAINABLE SEAFOOD CHOICES

NUMBER OF CERTIFICATE HOLDERS

To show how the number of Chain of Custody (CoC) certificate holders has changed over time, the number of certificate holders each fiscal year was counted by their certificate type. Supplemented with the total number of countries with CoC holders and numbers in China and the USA. (Page 34)

Additional sites of Multisite, Group, or Consumer Facing Organisation certificates were excluded so that only main certificate holders were considered. Certificate holders were filtered to those that were valid in the given year, and then grouped by the certificate type. The country associated with the certificate is the country where the company's main office is based. For example, McDonald's Europe certificate is associated with the UK, where it has its main office, although the certificate validity extends to McDonald's restaurants all over Europe. For this reason, the actual number of locations with active certificate-holders is under-estimated, with a bias towards regions where large companies have based their headquarters.

DATA SOURCE(S): MSC 2020³

'VOLUME' OF MSC-LABELLED CERTIFIED SEAFOOD SALES

The weight of MSC labelled seafood products in metric tonnes, was grouped by species and shown by type of product. (Page 35)

The weight of seafood products sold by an MSC licence holder is based on reports by the licence holder to the MSC. This was summed together for the full 2019/20 financial year and then broken down by the type of product and species. Individual species have been grouped together (e.g. Pink salmon and chum salmon are grouped together under the species category "Salmon"). When a product contains species that can't be grouped, e.g. salmon (sockeye-red) and shrimp (Oregon pink), they are grouped into "Mixed/Other". Only products that are consumer-facing have been included. Product weight includes all other ingredients and excludes packaging.

DATA SOURCE(S): MSC 2020³

NUMBER OF LIVE MSC LABELLED CONSUMER PRODUCTS

Plot showing the number of products sold that carry the MSC label by country over a period of 10 years. (Page 35)



The country breakdown is where the products are sold, rather than where the licence holder is located. To report on different markets, products were counted as a unique item in each country. E.g. a tin of tuna sold in France and Germany was counted as 2 distinct products. Live products are products described in the MSCI licence and signed by the Licensee to be sold as MSC-certified that have sales recorded against them for the reported year. Products with no reported sales in the latest year are excluded. This was done to avoid cumulative overestimation over time, as products drop out of the market and are replaced by others, ensuring the values more accurately reflect products 'on the shelf'.

DATA SOURCE(S): MSC 2020³.