

Offline Authors' Guide for FishSource Profiles of Marine Capture Fisheries

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i. Introduction

The Sustainable Fisheries Partnership Systems Division has produced this guide for the offline contribution of information to existing or the creation of new marine capture fishery profiles for <http://www.fishsource.com/>.

This guide is intended for consultants who will be developing fishery profiles and submitting their contributions to the FishSource (FS) development team, rather than using the FishSource.com online editing system. A brief style guide is provided as Annex I and should be consulted prior to starting work. Annex II is a table of ‘Parameters’, which are criteria on elements of the ecological sustainability of a fishery unrelated to stock status. This guide is an integral part of a three-document set, and should be used in conjunction with both the [FishSource profile template](#) document and [data template spreadsheet](#).

ii. Profile Structure

Profiles on FishSource are, as a general rule, structured around a biological stock of a single species, as this is the level at which the sustainability status can be reliably evaluated, and are named according to an “English FAO species name – name of stock unit” rule, e.g.:

Atlantic cod – Baltic Sea Western

Stock-based profiles describe all fisheries which are conducted on a particular stock of a species. Nested under these stock-based profiles are fishery-based profiles that describe a specific fishery operating on this stock, defined by combinations of the fishing country/ies and the gear(s) used, and named as “English FAO species name¹ – name of stock unit (fishery),” e.g.:

Atlantic cod – Baltic Sea Western (Country: Denmark; Gears: gillnet)²

Special cases of fishery-based profiles include MSC profiles, which describe a fishery either in MSC assessment or already assessed, e.g.:

¹ FAO’s ASFIS list is at <http://www.fao.org/fishery/collection/asfis/en>

² Note that at the date of publication of this guide, acronyms for countries and gears are still being used in profile names, but they are to be replaced by spelled-out words.

Atlantic cod - Baltic Sea Eastern (Country: Denmark; Gear: bottom otter trawl, longline; MSC-Client: DFPO; MSC-Status: MSC Certified)

Profiles may occasionally cover just a part of the MSC unit of certification (UC), in cases where the UC covers more than one stock or species.

Occasionally, profiles need to be defined at a higher resolution, due to significant differences in management within a particular stock and country/gear combination. In these situations, the name may include the management area, e.g.:

Common blacktip shark - N Australia (Country: Australia; Mgmt Area: Ocean trap and line fishery; Gear: Hooks and lines)

In cases where information is particularly scarce and no improvement to this situation is foreseen in the short term, the pooling of several species in a single profile may be unavoidable, namely when neither separate catch data nor separate assessments are available. At present, these profiles are named according to the lowest taxonomic group that includes all the required species, employing the FAO common name of the genus, order, family, or other from FAO's ASFIS, e.g., Marine crabs nei.³ FAO's [FishStatJ](#) may be of use in finding the FAO common name for the higher taxonomic levels.

Examples of multispecies profile names include:

Common squids nei (multispecies) - stock units undefined (Country: Indonesia; Gear: Lift nets)

Snappers nei (multispecies) - stock units undefined (Country: Thailand; Gear: Gillnets, Traps)

The FS team strongly encourages new contributors to consult the [Atlantic cod – Baltic Sea Eastern](#) profile for reference.

Please direct queries to Susana Segurado, FishSource Director, at susana.segurado@sustainablefish.org.

³ nei = not elsewhere included

iii. Profile Development Levels

Each FishSource profile can be thought of as presenting information in three distinct formats at varying levels of detail via the different sections:

1. The Data Summary section contains the numerical data from the fishery, with scores and summary statistics for select measures of sustainability.
2. The Overview section intends to present judgment calls on the strengths and weaknesses of the fishery and present options for improving the fishery.
3. The other Sustainability Analysis sections contain descriptive content organized into sections under the general topics of management quality, stock status, and environmental impacts.

Authors are requested to develop a new profile or update a current profile to one of four levels of completeness, which can also be seen as progressive steps in the development of a full profile. Table 1 specifies which elements a profile contains at each of these four levels. Please ensure you have received instructions on the required development level.

Table 1. Content requirements for five levels of profile development.

FishSource profile components	Level of completeness of profile			
	Level 1	Level 2	Level 3	Level 4
ID page	Develop complete sections; for level 4, 2000 words target for whole			
Scores	Develop complete sections; for level 4, 2000 words target for whole			
Summary	SWO	Develop complete sections; for level 4, 2000 words target for whole		
	Stock Assessment	Develop complete sections; for level 4, 2000 words target for whole		
	Scientific Advice	Develop complete sections; for level 4, 2000 words target for whole		
	Managers' Decisions	Develop complete sections; for level 4, 2000 words target for whole		
	Compliance	Develop complete sections; for level 4, 2000 words target for whole		
	Reference Points	Develop complete sections; for level 4, 2000 words target for whole		
	Current Status	Develop complete sections; for level 4, 2000 words target for whole		
	Trends	Develop complete sections; for level 4, 2000 words target for whole		
	Recovery Plans	*	*	Develop complete sections; for level 4, 2000 words target for whole
	PET Species	Develop complete sections; for level 4, 2000 words target for whole		
	Other target / Bycatch	Develop complete sections; for level 4, 2000 words target for whole		
	Habitat	Develop complete sections; for level 4, 2000 words target for whole		
	Marine Reserves	Develop complete sections; for level 4, 2000 words target for whole		
Parameters	**	Develop complete sections; for level 4, 2000 words target for whole		
Sources	Develop complete sections; for level 4, 2000 words target for whole			

	At least 50 words required per summary sub-section
*	Develop this section if applicable given stock condition
**	Rapid research on only "high-risk" parameters required – those in Annex II with a code suffixed by an "R"
	Develop complete sections; for level 4, 2000 words target for whole

text (excluding Parameters and Sources)

iv. Navigating the FishSource Website

Prior to starting the development of content for FishSource, check if a profile for the required fishery already exists on the website. If it already exists, please contact susana.segurado@sustainablefish.org to coordinate the update.

To locate a fishery on the FishSource website [homepage](#), you can search:

- via the search box, which searches all content that appears on the identification tab of live profiles
- via the search filters on the top left-hand side of the home page
- by scrolling down the list of all live profiles on the bottom left-hand side
- by zooming into the required area of the map.

1. Identification

The information that characterizes a profile appears under the Identification tab on live profiles, and requires completion of the following fields:

- **Stock unit:** Each profile should be built around a single stock unit – distinct from neighboring units in terms of population parameters, spawning areas, and/or genetics, as defined by stock assessment scientists. If you are creating a profile that does not yet exist on FishSource, your first task is to determine the stock structure. This information should be available in the stock assessment report, if these are produced, but most often a search through scientific papers is needed. It is crucial that the profile is created around a correct stock unit. If the stock unit is unknown, select “Stock units undefined” – in this case, the profile will need to be fishery-based.

- **Common names of fishery:** Common local name of fishery used by managers and scientists, followed by other names if more than one name is used for the fishery and/or names in local language, e.g.:

Gulf of Mexico Red Snapper; arenque de hebra (Spanish)

- **Primary species:** Enter the scientific and English common names of the species, following the [FAO ASFIS List of Species for Fishery Statistics Purposes](#).
- **Jurisdiction authority:** Either the countries in whose EEZ the fishery lies or international organizations with authority, e.g., NAFO, ICCAT. All EU fisheries

(outside 12 nm) should be entered under “EU”. Note that neither the Faroe Islands nor Greenland is part of the EU.

- **Map:** In most cases, the map is intended to represent the spatial distribution of the **stock** (not fishery). Authors should provide a map with geographical coordinates showing the distribution of the stock, including a reference. In cases where the stock unit cannot be identified, the map should be the overlap of the distribution of the species with the management areas of the fishing country/ies being considered in the profile. For multi-species profiles, either the stock of the most abundant species should be represented, or the overall stock distribution of all species should be represented. In any of the above cases, the Identification note should explain what the map is representing.
- **Gear types:** The gears used by the **target** fisheries. [FAO](#) standards and (currently but temporarily) acronyms are used, but additional gear categories may be created when needed – check the list [here](#). For stock-based profiles, **all** target gears that operate on the stock should be added.
- **Management areas:** As designated by ICES, NAFO, or another international organization, where available, e.g., ICES Division Va, NAFO 5Z; or by national authorities otherwise, e.g., Chilean fishery units III-IV; or using a geographical description, with coordinates if necessary, when none of the previous options exist, e.g., “Senegalese coast from Bay of Gorée to Saint Louis (14°43'N to 16°02'N).” Besides this high-resolution definition of areas, the [FAO area\(s\)](#) where they are located should also be added, e.g., FAO 51.
- **Source of origin:** The flag of the vessels conducting the fishery. For stock-based profiles, it should include all countries that fish on the stock. For MSC profiles, the nationality of the MSC client should be used instead.
- **Identification note:** A paragraph may be added here as the forefront of the fishery profile if there are any special characteristics from the fishery/stock(s), e.g., whether this is a multispecies fishery. If there is uncertainty surrounding the definition of the stock unit, summarize it here and include references to, e.g., genetic studies. If the profile describes one of several stocks within a fishery, this should be mentioned with links to the other profiles via their names, e.g., Anchoveta - Peruvian northern-central stock (note: the URL to use is the permalink, e.g.: http://www.fishsource.com/site/goto_profile_by_uuid/64694f4c-2687-11dd-a4e9-daf105bfb8c2). If the profile is management area-based, or if the map needs an explanation, details should also be added.

2. Data Summary: Quantitative data from the fishery

2.a. Quantitative Scores

FishSource scores are based on MSC's sustainability standards, and are calculated from quantitative statistics taken from the fishery. The current statistics used are defined in Table 2.

Table 2. Statistics required for the calculation of profile scores.

SSB	Spawning stock biomass (in thousand tons). In the absence of spawning biomass, other estimates of biomass may be used, or even other estimates of population abundance, such as number of eggs, in which case the heading of the column in the spreadsheet should be amended. The biomass reference points B_{lrp} and B_{trp} should be set accordingly and a very brief note should be added to the scores page. Projections of future biomass should not be used.
B_{lrp}	Lower limit threshold biological reference point (in thousand tons). Common proxies for this are B_{lim} or $B_{20\%}$.
B_{trp}	Target biological reference point (in thousand tons), such as B_{MSY} or B_{pa} or $B_{40\%}$. If there's an official target biomass level set by managers, use that. If there's no management target but there is a target level advised by assessors, that should be used. Occasionally, only SSB estimates relative to targets are available, and not absolute values, because B_{MSY} is re-estimated periodically and thus a relative value standardizes status across years. In this case, the spreadsheet should be adapted: 1 (target) should be entered in column C, while column J should contain annual estimates of B/B_{MSY} . In this case, an explanatory note should be added to the Scores Notes field.
F	Fishing mortality rate, or a proxy such as weight-based harvest rates (catch in weight divided by biomass estimate) or age-modeling-based fishing mortality estimates such as the ratio between catch in numbers and abundance over a given age range (e.g., C_{4-7} / N_{4-7}). If an alternative to F is employed, F_{trp} and $F_{at\ low\ biomass}$ units should be set accordingly and a very brief note should be added to the scores page.
F_{trp}	Target fishing mortality rate. If there's a management plan in place which anticipates a target F, it should be used; if not, use any proxy from stock assessments such as F_{MSY} . If, as above, a relative F is provided, column D should be set = 1 and the relative index, e.g., F/F_{MSY} , entered in column I, and an explanatory note added.
$F_{at\ low\ biomass}$	F anticipated by the management plan if biomass is at/drops to B_{lrp} . If there is a target fishing mortality and no harvest rule in place anticipating a reduction of this type, then the target F should be used as $F_{at\ low\ biomass}$ as well. Sometimes referred to as $F_{rebuild}$ in US fisheries, this is the fishing mortality needed to restore the stock to a target level within a specified time frame. Generally it's less than F_{MSY} . Also see #10 in the additional guidelines, below.
Advised TAC	Report in thousand tons. Given that scientific bodies that advise management authorities are often tasked with providing a range of alternative management measures, identify if this is the case or not in a note on the scores page.

Set TAC	Report in thousand tons.
Actual Catch	Report in thousand tons. Note that if catches or TACs are presented in official documents by fishing year spanning two years, e.g., 2012–2013, they should be entered in the table line corresponding to the later year (2013). Also see #9 in the additional guidelines, below.

The data used to calculate the scores should be entered by year into a spreadsheet template (pictured in Figure 1) provided, and the scores are calculated when the spreadsheet is uploaded and processed. Certain rules should be followed to allow the calculation of scores to be automated:

1. The data used to determine the scores must be in the first datasheet (must be the leftmost one on the lower bar). Additional sheets may be added to the right of this one.
2. The name of the fishery must be in cell A1.
3. Row 3 must contain column headers.
4. Data must be in the area from A-J 4 downwards.
5. This sheet must contain no numeric/text info other than the above.
6. If data is missing for one or more years in the middle of the time-series, the cells should be left blank but the years in column A should be continuous.
7. Units should be as specified in Table 2 and not adjusted.

Figure 1. Blank data template.

	A	B	C	D	E	F	G	H	I	J
1	Profile name									
2										
3	Year	B20% or Blim	B40% or Bpa or Bmsy	Ftrp	Fproposed or Fadvised at low biomass	Advised TAC	Set TAC/000	Actual Catch	F	SSB/000 t
4	1980									
5	1981									
6	1982									
7	1983									
8	1984									
9	1985									
10	1986									
11	1987									
12	1988									

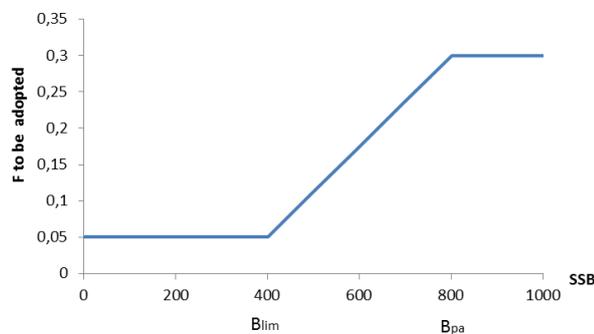
Please also note the following guidelines:

8. If there are several sources for the values added to the datasheet, please include these sources as comments in the respective datasheet cells.
9. If data is only available in graph form, [Plot Digitizer](#) can be used to digitize values. The significant figures should be reduced in the spreadsheet.

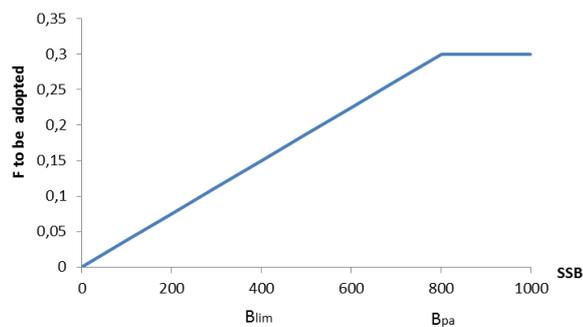
10. Note on catch and landings – Managers can set quotas or harvest limits in one of two ways: as either a total allowable catch (TAC) or total allowable landings (TAL). In the case of the former, this represents total removals from the stock, but requires some estimates of discards or bycatch. Also, TACs are directly transferable from estimates of fishing mortality. In the case of the latter, managers set landings limits, but often do not have good estimates of discards or removals by un-managed fisheries (such as a recreational fishery). The author is cautioned to use the appropriate terms in the spreadsheet headings and in the notes as well as to enter the correct data. If the quota is as a TAL, then the corresponding removals should be as landings. Authors are also cautioned that often catch and landings may not be in the same units as quotas in different reports. This is particularly true, for example, when researching bivalve fisheries, where landings can be in the form of volume (i.e., bushels), but the quotas are in terms of meat weights. If only incomplete catches or landings are available for the most recent years, please do not add them.

11. Note on $F_{\text{at low biomass}}$ – If a harvest control rule is given in terms of biomass and fishing mortality, $F_{\text{at low biomass}}$ is determined as follows:

Example 1. If the harvest control rule is as represented here, $F_{\text{at low biomass}}$ is simply 0.05



Example 2. $F_{\text{at low biomass}}$ can be found by interpolation to be $= 0.3/800*400 = 0.15$



12. Note that the SSB and F series are frequently re-estimated yearly. When this occurs, the entire most recent series should be used. Reference points should be extended back over the time series if assessment scientists do so, and/or if they have been determined from the same assessment as the entire data series.

The single, most recent, year for which complete data are available is used to calculate FishSource scores, as opposed to, e.g., using an average of recent years. The reasoning behind the FishSource scores is provided for reference in Table 3, but these are generated automatically from the datasheet, so no calculations are required from the author. If any of the five scores cannot be calculated due to lack of the necessary statistics (note that both statistics used in the ratio need to be available for the same year to enable a score to be calculated so it possible that different years of the same statistic may be used for different scores, e.g. Set TAC in scores 2 and 3), an attempt should be made to determine qualitative scores as described in section 6.b below. If additional notes are needed to explain the data, these should be added to the “Notes” field.

Table 3. Underlying principles behind FishSource scores.

Score	Underlying principle	Ratio	Score value		
1: Is the management strategy precautionary?	Determine whether harvest rates are reduced at low levels	$If B_{current} \geq B_{lim}, F_{at\ low\ biomass} / F_{target}$	0	10	
			0.5	8	
			1	6	
		$If B_{current} < B_{lim}, F_{current} / F_{target}$	0	10	
			0.5	8	
			1	6	
2: Do managers follow scientific advice?	Determine whether the catch limits set by the managers are in line with the advice in the stock assessment	Set TAC/Advised TAC	1	10	
			1.125	8	
			1.25	6	
3: Do fishers comply?	Determine whether the actual catches are in line with the catch limits set by managers	Catches/Set TAC	1	10	
			1.125	8	
			1.25	6	
4: Is the fish stock healthy?	Determine if current biomass is at long-term target levels	$B_{current} / B_{target}$	1.5	10	
			1	8	
			- if no B_{lim} exists, $B_{current} / B_{target}$:	0.5	6
			- if B_{lim} exists, $B_{current} / B_{lim}$:	1	6
5: Will the fish stock be healthy in the future?	Determine if current fishing mortality is at the long-term target level	$F_{current} / F_{target}$	0.5	10	
			1	8	
			1.5	6	

2.b. Qualitative Scores

When scores cannot be calculated numerically, either due to a lack of publicly available data or due to an unusual assessment or management system, information may still be available which will allow a qualitative response to each of the scores' underlying questions. Preserving comparability with quantitative scores, qualitative scores are obtained by using the same cut-off points that are [used in MSC assessments](#): “< 6” → high-risk condition, indicating a negative reply to the specific question being asked; “≥ 6” → medium-risk condition, indicating that although not “high risk”, improvements are required on the specific matters being addressed by the question; “≥ 8” → low-risk condition, indicating an affirmative reply to the specific underlying question. Qualitative scores may also be appropriate if a quantitative score should be overridden. An example of this is when official landings are below a TAC so Score 3 is calculated as 10, but there is known to be a serious IUU problem in the fishery. Another example is when the scientific advice is emitted for the biological stock but the TAC is set for a management area that is not aligned with the stock distribution.

Reliable, publicly available information such as stock assessment reports and official regulations, either accessible online (preferably) or correctly referenced if a live link is not available, should be used to produce the scores by answering the questions in Table 4 in reference to the fishery's single most recent year. The ratios in Table 3 should also be kept in mind when attributing qualitative scores. To assign a qualitative score, note that only three options are available: < 6, ≥ 6, or ≥ 8. A short justification, based on the specificities of the fishery and the rationale in Table 5, should also be developed for each score assigned – this justification will appear on the website by *mousing over* the score.

Note that Table 4 is intended to be used as guidance and not as a set of inflexible rules, given that stocks/fisheries operate under very distinct conditions.

If there is a severe lack of information on the fishery, and many of the scores cannot even be assigned qualitatively, then we may be facing a data-deficient situation. Check Section 9 for information on how to proceed.

A separate qualitative scoring framework has been developed for particular use in FishSource Pacific salmon fishery profiles. See Section 10 for detailed instructions on the development of Pacific salmon fishery profiles.

Table 4: Criteria for determining qualitative scores.

FishSource scores: underlying questions	Why a qualitative score might be applicable	Qualitative Score		
		< 6	≥ 6	≥ 8
1. Is the harvest management strategy precautionary?	<p>Either</p> <p>(1) There is no specific target fishing mortality rate (or equivalent) set at the managerial level.</p> <p>OR</p> <p>(2) Current fishing mortality rates (or equivalent) are not publicly available or have not been estimated from stock assessments.</p>	<p>Either</p> <p>(1) There are no management objectives for the stock.</p> <p>OR</p> <p>(2) The scientific body that officially conducts regular stock assessments recognizes the management plan as NOT precautionary.</p>	<p>Either</p> <p>(1) There are management objectives set for this stock AND the scientific body that officially conducts regular stock assessments DOES NOT recognize the management plan as NOT precautionary, but there is no harvest control rule that anticipates reducing F target if biomass drops to B_{trp} or equivalent.</p> <p>OR</p> <p>(2) There are no specific management plans in place but managers make use of real-time monitoring for deploying in-year management measures, taking into account the spatial distribution of the resource or sensitive habitats that may require temporary closures.</p> <p>OR</p> <p>(3) There are no specific management plans in place but Score 2 AND Score 4 have been equal to or above 6 in recent years.</p>	<p>Either</p> <p>(1) The scientific body that officially conducts regular stock assessments recognizes the management plan as precautionary.</p> <p>OR</p> <p>(2) There is a harvest control rule in place that anticipates dropping F target by, at least, 50%, if biomass drops to B_{trp} or equivalent.</p>

FishSource scores: underlying questions	Why a qualitative score might be applicable	Qualitative Score		
		< 6	≥ 6	≥ 8
2. Do managers follow scientific advice?	<p>Either</p> <p>(1) The scientific body that assesses the stock does not issue quantitative advice on catch.</p> <p>OR</p> <p>(2) The stock is NOT managed through quotas or TACs.</p>	<p>Either</p> <p>(1) Managers are recognizably (i.e., by means of publicly available information) not following scientific recommendations on adopting specific area closures, juvenile protection measures, temporal closures, fishing effort caps, or other conservation measures.</p> <p>OR</p> <p>(2) Total catch exceeds advised levels by over 25%.</p>	<p>Either</p> <p>(1) Some but not all of the key recommendations made by the scientific organization responsible for the stock assessments are being taken into account by the management bodies via tangibly implemented conservation measures.</p> <p>OR</p> <p>(2) The results from stock assessments are explicitly considered in management decisions.</p>	<p>All key recommendations made by the scientific organization responsible for the stock assessments are being taken into account by the management bodies via tangibly implemented conservation measures.</p>
3. Do fishers comply?	<p>The stock is NOT managed through quotas or TACs.</p>	<p>The scientific body that officially conducts regular stock assessments highlights that the magnitude of IUU fishing is unknown or flags it as a real problem for the stock.</p>	<p>Total estimated catch, including estimates for non-reported landings, are below an advised TAC issued by the scientific body conducting the stock assessments.</p>	<p>The scientific body that officially conducts regular stock assessments highlights that the magnitude of IUU activities is small and does not hinder management goals for the stock nor undermine stock condition.</p>

FishSource scores: underlying questions	Why a qualitative score might be applicable	Qualitative Score		
		< 6	≥ 6	≥ 8
4. Is the fish stock healthy?	<p>Either</p> <p>(1) There are no biological reference points set for the stock.</p> <p>OR</p> <p>(2) Biomass estimates (or equivalent) are not publicly available or have not been estimated from stock assessments.</p>	<p>Either</p> <p>(1) The stock is recognizably (i.e., highlighted as such by the scientific body responsible for conducting stock assessments) below a limit where its reproductive capacity may be compromised and/or stock dynamics may no longer be reliably predicted (i.e., below an equivalent to B_{lrp}).</p> <p>OR</p> <p>(2) The stock is recognizably in poor (i.e., severely overfished, unhealthy, depleted) condition.</p>	<p>Either</p> <p>(1) The stock is not below a limit where its reproductive capacity may be compromised (i.e., is not below an equivalent to B_{lrp}) but is recognizably below a level that would sustain long-term catches.</p> <p>OR</p> <p>(2) Biomass estimates or relative abundance indices from scientific surveys indicate that current status is at or above historical average or median statistics.</p> <p>OR</p> <p>(3) The scientific body conducting stock assessments notes that recent catch levels do not constitute a problem for stock condition.</p> <p>OR</p> <p>(4) The scientific body conducting stock assessments reports positive indicators of size-at-age, age structure, spatial distribution, or any other related variables.</p>	<p>Either</p> <p>(1) There are currently no official biological reference points in place but stock is above former B_{lrp} or equivalent, or above proposed B_{lrp} or a proxy of it.</p> <p>OR</p> <p>(2) The official stock assessment reports state explicitly that the stock is in good condition (or equivalent).</p>

FishSource scores: underlying questions	Why a qualitative score might be applicable	Qualitative Score		
		< 6	≥ 6	≥ 8
5. Will the fish stock be healthy in future?	<p>Either</p> <p>(1) There are no fishing mortality reference points set for the stock.</p> <p>OR</p> <p>(2) Estimates of current fishing mortality (or equivalent) are not publicly available or have not been estimated from stock assessments.</p>	<p>Either</p> <p>(1) The stock is recognizably being harvested at levels that would lead to, or maintain, the stock at or below B_{lrp} (F_{lim} reference point, or any of its proxies, should be used, if available, as the threshold above which the condition is triggered).</p> <p>OR</p> <p>(2) The scientific body that conducts stock assessments flags up that fishing pressure is too high, or an equivalent term.</p> <p>OR</p> <p>(3) Score 1 and 4 are both below 6.</p> <p>OR</p> <p>(4) The scientific body that conducts stock assessments anticipates that in the short term the stock will decline to below B_{lrp} or equivalent.</p>	<p>Either</p> <p>(1) The stock is recognizably being harvested at a level between F_{trp} (or, in the absence of F_{trp}, F_{MSY} or equivalent, or F_{pa}) and F_{lim}, the level that if maintained will lead the stock to B_{lrp} (or equivalent, such as B_{lim}).</p> <p>OR</p> <p>(2) The harvest levels are recognizably NOT unsustainable but fishing pressure is regarded as still high.</p>	<p>The stock is recognizably being harvested at levels that would sustain long-term catch and assure long-term continued supply from the stock (i.e., at or below F_{MSY}, or F_{trp} IF Score 1 ≥ 8).</p>

3. Sustainability Analysis

The initial Overview (Strengths, Weaknesses, and Options) section is intended to evaluate the fishery by listing its strengths, weaknesses, and advised actions to improve any deficiencies. It should be completed when you have completed all other sections.

Each of the three main descriptive sections – Management Quality, Stock Status, and Environment and Biodiversity – is divided into four sub-sections. The sub-sections' target word count is defined in Table 1 according to the assigned profile development level. Graphs, maps, and tables may be included as part of the Summary text but will appear in profiles as embedded links. An exception is made for small tables of reference points.

3.1. Overview (Strengths/Weaknesses/Options analysis)

The Overview – Strengths/Weaknesses/Options information should summarize the positive aspects of the fishery status and effects, assessment process or management strategy under “Strengths”; the weaknesses of these aspects under “Weaknesses”, including, unfailingly, the sections for which information is lacking; and under “Options” the improvements needed in the fishery. For MSC fisheries, conditions defined may be summarized under “Improvements” and also in other relevant sections of the profile, but do not need to be exhaustively listed as they also appear under the Improvements tab.

3.2 Management Quality

3.2.1 Stock Assessment

Describe the framework for stock assessment – who conducts the assessments, how often, and are they peer reviewed? Is the current advice based on a full peer-reviewed assessment or an update of an older model? Provide a brief description of the stock assessment method and model and the key sources of input data. Discuss the quality of the assessment and note the key sources of uncertainty (e.g. data quality or quantity, assumptions in the model, retrospective patterns in the output etc.) and how they are evaluated (e.g. by sensitivity analyses, a probabilistic framework etc.).

3.2.2 Scientific Advice

Describe the framework for providing scientific advice – who provides it and on basis of what kind of harvest policy (e.g. management plan, precautionary approach, MSY approach, other)? Is it provided independent of managing bodies? Describe any recent changes in the harvest policy, if any, and note whether it has changed the level of precaution in the advice. How does the advice account for uncertainty in the assessment or current stock status and stock projections (e.g. if there is a retrospective pattern in the assessment)? Has the advice been followed and if so has it been successful at keeping the stock within desired limits?

3.2.3 Managers' Decisions

If there is a management plan in place, summarise its objectives and the actions proposed to achieve them. Describe the targets and limits (reference points or other) set for the fishery, and the harvest control rule, if any. Consider whether reference points are set at an appropriate level and whether the harvest control rule is precautionary (e.g. in relation to the actions that are foreseen if the fishery is assessed to be on the wrong side of reference points). Describe the management measures in place for the fishery (e.g. TAC, area/seasonal closures, minimum landing size, gear restrictions etc.). Assess whether managers have followed scientific advice in setting the level of the TAC and/or in setting other regulations. If there is a TAC in place, quote the most recent TAC and associated fishing year, describe any trends in set TAC vs. advised TAC, note whether managers have accounted for discards and multispecies considerations in the level of the TAC, if applicable, and assess whether the rationale for setting the TAC is clearly explained. Describe any measures to address discarding in the fishery, if necessary.

3.2.4 Compliance

Review how catch trends compare to Set TACs. If there is IUU fishing or discarding, what are the sources? How is compliance enforced and what forms of surveillance are used, if any? How stiff are penalties for violations? If measures to reduce discarding are in place, how strong is fishers' compliance with these?

3.3 Stock Status

3.3.1 Reference Points

List and describe the reference points in place, if any, and the use to which they are put in management (limit, target, other), if any. Note if other reference points have been proposed (e.g. in the scientific literature) and if so what and why. Are existing reference points based on an analytic model with uncertainty estimates? Can they be reliably estimated by stock assessment scientists? If applicable, relate them to the stock-recruit curve and evaluate whether they are precautionary in relation to potential impairment of recruitment. Ensure the source document for the reference points is cited.

3.3.2 Current Status

Give the most recent estimates of biomass and fishing mortality, or proxies such as harvest levels (with years), and compare to target and limit levels, if applicable. Review the current age structure, if available, and evaluate whether it is strongly truncated or dependent on a particular year class or classes. Review information on recent vs historical recruitment to evaluate whether recruitment may be impaired – if so, consider whether this may be due to spawning stock biomass or for other reasons (e.g. environmental). Are any discarding issues affecting the stock?

3.3.3 Trends

Give a history of the key "current status" measures – if available, certainly biomass, maybe others (e.g., spawning biomass or escapement, etc., as well as recruitment, catch/landings, fishing mortality). Use graphs, if useful in representing trends. If formal biomass estimates are not available, provide any survey indices that might explain the population trend.

3.3.4 Recovery Plans

Give details, if appropriate – i.e., if stock is depleted, what is the recovery plan? Time frame for rebuilding, what is rebuilding target biomass, what is F relative to F_{trp} during recovery, etc.? Refer to the harvest control rule, if one is in place, but describe it in more detail under Managers' Decisions.

3.4 Environment and Biodiversity

3.4.1 PET Species

List all locally and globally protected, endangered and threatened (PET) species in the area of the fishery which may be interacting with the fishery (if in doubt, give a quick overview of the scientific debate). If known, explain which specific vessels/gears are involved, specify where the impacts are significant (see criteria below). Describe what is being done to fix the situation. If responses include some forms of spatial protection that specifically protect PET species then describe those (e.g., exclusion zones around Steller sea lion haulouts). If general marine reserves are helping mitigate problems, then describe how here (but just summarize the marine reserves and describe them in full in Marine Reserves section 3.4.4).

Describe whether or not target and/or limit reference points or Potential Biological Removals have been adopted by management authorities for PET species.

PET species used in the SFP fisheries assessment method are defined as those designated either through national legislation and/or internationally recognized lists including IUCN's [Red List](#) and [CITES Appendices](#).

3.4.2 Other Target and Bycatch Species

List all target (in the case of a multispecies fishery) and bycatch species taken in the fishery. Is the fishing mortality of these other species in the fishery jeopardizing the population viability of any species that are relatively vulnerable to fishing mortality due to their life history characteristics and susceptibility to capture in fisheries? What is the ratio of bycatch of all species to catches of target species? Are measures in place to mitigate problematic bycatch and, if so, are they effective in meeting explicit or otherwise implicit performance standards of the measures?

Note if target and/or limit reference points have been adopted by management authorities for non-PET bycatch species.

3.4.3 Habitat

If possible, describe the known habitats within the EEZ/fishing zone (ideally with map showing benthic habitats). Are impacts of fishing upon habitats known (i.e., have any comprehensive evaluations been conducted)? If possible overlay trawl and other fishing gear tracks, describe known impacts of the gear type on different habitat types. Describe which are threats to marine biodiversity and the ecosystem as a whole and which threaten the viability of the fish stock itself (i.e., through damage to essential fish habitat (EFH)). Describe technological steps taken to reduce impacts, describe fishing technique/pattern changes to reduce impacts. If marine reserves (e.g., no trawl zones) are being used, describe those in detail here. If general marine reserves are helping to mitigate problems, then describe how here (but just summarize the marine reserves and describe them in full in Marine Reserves section 3.4.4).

3.4.4 Marine Reserves

Describe all spatial management measures, dividing into those being taken (a) as either year-round closed areas or seasonal/spawning closures, protection of EFH, etc.; (b) to reduce specific impacts on PET species and habitats (see 3.4.1 and 3.4.3 above), and (c) to institute national park-style marine reserves that exist for reasons other than fisheries or fisheries impacts (e.g., national marine sanctuaries in areas of high biological importance).

4. Parameters

Ecosystem effects of marine capture fisheries are captured through ‘parameters’, which are associated with statements on environmental effects requiring a Boolean response (true/false). Parameters are grouped into five categories: (i) Protected, Endangered and Threatened Species; (ii) Bycatch; (iii) MPA Network; (iv) Habitat Impact; and (v) Ecosystem Impact. An explanation for the response should be added, as should the URL of a source backing up the response. Parameters do not yet appear publicly on FishSource, but are used to determine a relative ecological risk level. The Parameter codes for each environment statement (condition) are listed in Annex II.

Data Deficiency

For data-deficient fisheries, where insufficient information is publicly available to enable an assessment against one or more of the three main principles (Management Quality, Stock Status, and Environment and Biodiversity), then the relevant data-deficient parameter should be answered as “true”. To determine whether a fishery is data deficient in terms of each of the three principles, the following decision trees should be applied after all possible other parameters and scores have been added:

Parameter “DD_TS” (Target Stock):

- If NEITHER Score 4 nor 5 can be determined, answer DD_TS as “true”
- If Score 4 IS determined AND 5 is NOT:
 - IS Score 4 < 6?
 - If yes, this is a “high-risk” fishery (do not answer DD_TS)
 - If not, then answer DD_TS as “true”
- If Score 5 is determined AND 4 is NOT, then answer DD_TS as “true”

Parameter “DD_GQ” (Governance Quality):

- If NONE of Scores 1, 2, or 3 are determined, answer DD_GQ as “true”
- If Score 3 cannot be determined, then answer DD_GQ as “true”
- If Score 3 is determined AND:
 - Both Scores 1 and 2 cannot be determined, then answer DD_GQ as “true”
 - Any other combination of Scores 1 and 2 is present, then no further action is required

Parameter “DD_E” (Environment):

If after researching the environmental impacts (for profiles at completion level 3 or above), there are more than two of the five Environment categories (PET, Bycatch, Habitat, MPAs or

Ecosystem, identifiable in the Codes in Annex II by their abbreviations: PET, BC, HA, MPA and ECO,) for which **no parameters** can be added due to lack of information, then this indicates that it is a data-deficient fishery with regard to Environment. In these cases, reply “true” to the parameter “DD_E” (Environment), providing a brief justification.

5. Resources

References

All sources of information should be cited in the text and a list of references provided in the Harvard style (check Annex I for details), followed by a URL where they may be accessed. Sources used should be public and sources without direct URLs should only exceptionally be used. A scientific paper's URL may be a link to the paper on the publisher's website, even if it is not free to access.

Acknowledgements may be added to the Credits section following the Resources section on the template.

6. Salmon Fishery Profiles

Due to the specificities of salmon fishery management, reflected in MSC's development of a salmon-specific default assessment tree, FishSource is applying a separate qualitative assessment method to the scoring of salmon fisheries. SFP conducted a [statistical analysis](#) of MSC scoring of salmon fisheries in the effort to maximize correspondence between its assessment framework and MSC's approach to salmon fisheries.

FishSource contributors focused upon development of profiles for Pacific salmon fisheries should first consult the [salmon assessment method](#). Note that the method contains two sets of scores: one that is applicable to "stock-directed management" (most) salmon fisheries, and a slightly modified set of scores for "mixture-pool management" salmon fisheries (open-ocean, predominantly preseason-managed salmon fisheries for which management is focused on a stock aggregate rather than achievement of objectives for individual stocks). An appendix to the salmon assessment method is also available upon request to Nicole Portley, FishSource Salmon Species Coordinator (nicole.portley@sustainablefish.org). The appendix provides more details on approaching Scores 4 and 5, which involve quantitative components.

The salmon-specific scoring method maintains the five-score framework of the general FishSource method, as illustrated in Table 6 below. Additionally, 14 sub-scores are nested within each of the five scores. The salmon assessment method describes how wild stocks within a salmon fishery receive scores for each of the 14 sub-scores. Overall sub-scores generally represent the lowest of the nested per-stock scores. Overall scores represent the lowest of nested sub-scores.

Table 6: Scoring of salmon fisheries.

Issue /Score (FishSource general method)	Issue/Score (FishSource salmon method)	Nested Sub-Scores
1. Is the management strategy precautionary?	1. Is management responsive?	1.1 In-season responsiveness 1.2 Multi-season responsiveness 1.3 Responsiveness to habitat issues
2. Do managers follow scientific advice on output controls?	2. Are the management guidelines appropriate?	2.1 Escapement goal development and implementation
3. Does the fishery comply?	3. Are the management guidelines and responses based on adequate data?	3.1 Illegal harvest and deviation between reported and actual catch 3.2 Harvest monitoring 3.3 Escapement monitoring
4. Is the fish stock healthy?	4. Has stock productivity been maintained?	4.1 Escapement trends 4.2 Harvest trends
5. Will the fish stock be healthy in the future?	5. Are hatcheries or other enhancement activities negatively affecting wild stocks?	5.1 Hatchery contribution to fishery 5.2 Wild stock management 5.3 Straying magnitude and measurement 5.4 Hatchery: wild stock mixing 5.5 Hatchery policies

The first four scores in the adapted salmon method align with the general method's scores in their overall focus, although Score 3 is expanded to explore overall accuracy of data, including deviance in harvest data that results from illegal fishing. As with the general FishSource method, Score 4 of the salmon method addresses current stock health, although escapement and harvest trends, rather than spawning biomass (a parameter that is not used on a standardized basis in management of salmon fisheries), are used as the indicators of stock status. As hatcheries are of particular importance in salmon fishery management, the focus of Score 5 was adapted to particularly address hatchery impacts upon wild stocks.

Due to the mixed-stock nature of most salmon fisheries, salmon fishery profiles in FishSource are delineated according to “district fishery” management boundaries. Each district fishery⁴ receives a profile in FishSource (e.g., Fraser River sockeye salmon). Additionally, scores from district fishery profiles are summarized in region-scale⁵ salmon profiles (e.g., British Columbia sockeye salmon). As described above, the wild stock⁶ is the basic unit of scoring within salmon profiles.

Textual rationales supporting each of the 14 sub-scores should be added to the five text-boxes in the Grade Hack section of the Data Summary page. Meanwhile, there are standard tables for display of per-stock scores for sub-scores 2.1 (management objectives), 4.1 (escapement graphs), and 5.3 (straying magnitude and measurement). These tables should be uploaded into the profiles’ Sustainability Analysis section as images. There are also standard graphs used as supporting information for sub-scores 4.2 (wild harvest trends) and 5.1 (hatchery contribution to fishery). These graphs should also be uploaded into the profiles’ Sustainability Analysis section as images. At a later date, all data types displayed in these tables and graphs will be incorporated into the datasheet common to all fishery profiles in FishSource. Once this occurs, contributors will enter the data into salmon-specific columns of the datasheet and upload the sheet into FishSource.

Contributors to salmon profiles are encouraged to explore the following example fishery profiles in order to familiarize themselves with the salmon-specific format:

1. [Prince William Sound pink salmon](#)
2. [Fraser River sockeye salmon](#)
3. [Southeast Alaska troll Chinook salmon](#) (an example of a “mixture-pool management” fishery)

⁴ **District:** a mid-level aggregation of stocks into a larger administrative collection for which statistics are collected and reported.

⁵ **Region:** a large-scale collection of stocks for which statistics are produced under a unified management authority, such as those from Japan, Alaska, British Columbia, and the US Pacific Northwest.

⁶ **Wild Stock:** a group of salmon of the same species (excluding aggregations composed of first-generation hatchery fish) that is geographically and temporally related and is managed as a unit. This is the group of fish for which there is (or could be) a single escapement goal (i.e., the part of a fish population that is under consideration from the point of view of actual or potential utilization).

ANNEX I: Style Guide

Style for profiles is loosely modelled on that of Fish and Fisheries,¹ to whose editors and publishers we are thankful.

If extracting text verbatim from a source, then the text must be in quotes, and the source identified. Similarly, if paraphrasing from a source, identify the source.

Spelling, units, and mathematics

American spelling should be used, e.g., ton not tonne, program not programme. Follow The Concise Oxford Dictionary of the Shorter Oxford English Dictionary for spelling. Define abbreviations when first used unless they are commonly known and internationally accepted (e.g., TAC).

Convert all values to the SI system (from the French, Le Système International d'Unités):

ton = t (not mt or MT)

1 ton = 1 metric ton (1,000 kg), not 2,000 pounds. If data are only available in other units, define those units on first appearance in terms of SI units (online conversions at <http://www.unit-conversion.info/weight.html>). Use negative exponents. Carefully distinguish 0 from O, especially in subscript and superscript. Use the 24-hour clock: 15.00 hours or 15:00. Format dates as, for example, 30 March 2001.

When abbreviating “not available”, use “N/A” (capitals, with slash).

When mentioning MSY, always capitalize, even when in subscript.

Scientific names

On first mention, give common name and italicized scientific name, e.g., Atlantic cod (*Gadus morhua*). Thereafter use the common name.

References

Use Harvard style. Cite references by name and date, e.g., Pickett-Jones (1986), Alverson et al. (1992). Use a, b, etc., to distinguish papers from the same author(s) in the same year, e.g. Howard (1999b). Arrange the reference list alphabetically by the first-named author. Give journal and paper titles in full, including chapter and page information.

Citations of institutions should be as abbreviations in the text and spelled out in the reference list.

Citations from the U.S. Federal Register should be in the format ([Agency], [year]) in the text and treated as a periodical in the references list, e.g., National Marine Fisheries Service. 1995. Suspension of Community Eligibility, Final Rule. Federal Register 60:210 p. 55329. It's important to cite the "final rule" as opposed to a "draft rule" or "notice of rulemaking."

EU legal texts should be cited as (for example): Regulation (EC) no. 2027/95; or Directive 2000/42/EC.

¹ For further details, see: [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1467-2979/homepage/ForAuthors.html](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-2979/homepage/ForAuthors.html)

ANNEX II: Parameters and Conditions on Environmental Effects

Code (parameter name)	Condition
E_PET_R1	The fishery is directly (i.e., by fishing gear) impacting protected, endangered or threatened (PET) species.
E_PET_R2	The fishery is indirectly (i.e., by means of food-web interactions and ecosystem structure) impacting PET species.
E_PET_R3	PET species' populations are failing to rebuild.
E_PET_G1	All significant fishery interactions with the marine environment are understood, monitored, and managed to fall within agreed management targets.
E_PET_G2	There's evidence that both direct and indirect impacts of fishing on PET species are not significant.
E_BC_R1	Bycatch is high.
E_BC_R2	Bycatch is unrecorded.
E_BC_R3	A bycatch species is depleted and the bycatch mortality is preventing rebuilding.
E_BC_G2	All currently known proven best practices and best technologies are being used to minimize and manage fishing impacts (i.e., low-impact fishing gears are being used, and management measures such as seasonal closures, fishing seasons, surveillance, and monitoring are maximizing selectivity and minimizing discarding).
E_MPA_R1	The fishery is having an impact on PET species or habitat.
E_MPA_R2	No spatial protection measures are in place.
E_MPA_G	The fishery is taking place in a marine ecosystem where ecosystem functions and biodiversity have been protected in a representative network of MPAs.
E_HA_R	The fishery is negatively impacting known high-conservation-value habitats.
E_ECO_R	The fishery is causing irreversible or significant ecosystem change (i.e., predator populations declining to unacceptably low levels, in the case of fisheries on low trophic level species, or trophic cascades as a result of fisheries on top predators).
E_ECO_G2	Ecosystem modelling (i.e., Ecosim, Ecopath, and ideally multi-species VPA) exists and shows permanent significant changes in the ecosystem did not occur, or are highly unlikely to occur.
E_ECO_G3	Ecosystem research during historic lows in biomass exists and shows permanent significant changes in the ecosystem did not occur, or are highly unlikely to occur.