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IFFO RS  
Global Standard for Responsible Supply  
of Marine Ingredients

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# Global Standard for Responsible Supply of Marine Ingredients Fishery Assessment Methodology and Template Report V2.0



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<b>Fishery Under Assessment</b>	<b>Mackerel <i>Scomber scombrus</i> Northeast Atlantic</b>
<b>Date</b>	<b>October 2019</b>
<b>Assessor</b>	<b>Jim Daly</b>

Application details and summary of the assessment outcome				
<b>Name: FF Skagen</b>				
<b>Address:</b>				
<b>Country: Denmark</b>		<b>Zip:</b>		
<b>Tel. No.:</b>		<b>Fax. No.:</b>		
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<b>Key Contact:</b>		<b>Title:</b>		
Certification Body Details				
<b>Name of Certification Body:</b>		<b>SAI Global Ltd</b>		
<b>Assessor Name</b>	<b>Peer Reviewer</b>	<b>Assessment Days</b>	<b>Initial/Surveillance/Re-approval</b>	<b>Whole fish/ By-product</b>
Jim Daly	Vito Romito	0.5	Surveillance 1	By-product
<b>Assessment Period</b>	2018-2019			

Scope Details	
<b>Management Authority (Country/State)</b>	EU, Denmark
<b>Main Species</b>	Mackerel <i>Scomber scombrus</i>
<b>Fishery Location</b>	Northeast Atlantic
<b>Gear Type(s)</b>	All
Outcome of Assessment	
<b>Overall Outcome</b>	Pass
<b>Clauses Failed</b>	None
<b>Peer Review Evaluation</b>	APPROVE
<b>Recommendation</b>	PASS

### Assessment Determination

Norway's special request for revised 2019 advice on mackerel (*Scomber scombrus*) in Subareas I-VIII and XIV and in Division IX a (the Northeast Atlantic and adjacent waters) was published by ICES on 15.05.19 (R2).

Spawning-stock biomass (SSB) is estimated to have increased in the late 2000s, reaching a maximum in 2014. It has declined since but has remained above MSY Btrigger since 2008. Fishing mortality (F) has declined from high levels in the mid-2000s but remains above FMSY. There has been a succession of large year classes since the early 2000s, with year classes since 2012 estimated to be above average. ICES assess that fishing pressure on the stock is above FMSY but below Fpa and Flim, while spawning stock size is above MSY Btrigger, Bpa, and Blim.

The fishery has a species –specific management regime in place under the EU's Common Fisheries Policy so it is assessed under Clause C. Fishery removals are included in the stock assessment process and the species is considered, in its most recent stock assessment, to have a biomass above the limit reference point.

Atlantic Mackerel in the NE Atlantic is listed as of least concern on the IUCN Red list of Threatened Species and is not listed by CITES. (accessed 27.09.19)

This fishery by-product is recommended for approval under the IFFO RS Standard v 2.0 for by-products.

### Peer Review Comments

The mackerel fishery has a species –specific management regime in place under the EU's Common Fisheries Policy. Fishery removals are included in the stock assessment process and the species is considered. ICES has assessed in 2019 that fishing pressure on the mackerel stock is above FMSY but below Fpa and Flim, while spawning stock size is above MSY Btrigger, Bpa, and Blim.

The Peer Reviewer agrees that this fishery by-product should be recommended for approval under the IFFO RS Standard v 2.0 for by-products.

### Notes for On-site Auditor

## Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A			A1	
			A2	
			A3	
			A4	
Category B				
Category C	Mackerel <i>Scomber scombrus</i>	N/A	Pass	
Category D				

[List all Category A and B species. List approximate total % age of landings which are Category C and D species; these do not need to be individually named here]

## HOW TO COMPLETE THIS ASSESSMENT REPORT

This assessment template uses a modular approach to assessing fisheries against the IFFO RS standard.

## Whole Fish

The process for completing the template for a **whole fish** assessment is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table, to determine which categories of species are present in the fishery.
2. ALL ASSESSMENTS: Complete clauses M1, M2, M3: Management.
3. IF THERE ARE CATEGORY A SPECIES IN THE FISHERY: Complete clauses A1, A2, A3, A4 for **each** Category A species.
4. IF THERE ARE CATEGORY B SPECIES IN THE FISHERY: Complete the Section B risk assessment for **each** Category B species.
5. IF THERE ARE CATEGORY C SPECIES IN THE FISHERY: Complete clause C1 for **each** Category C species.
6. IF THERE ARE CATEGORY D SPECIES IN THE FISHERY: Complete Section D.
7. ALL ASSESSMENTS: Complete clauses F1, F2, F3: Further Impacts.

A fishery must score a pass in **all applicable clauses** before approval may be recommended. To achieve a pass in a clause, the fishery/species must meet **all** the minimum requirements.

## By-products

The process for completing the template for **by-product raw material** is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table with the names of the by-product species and stocks under assessment. The ‘% landings’ column can be left empty; all by-products are considered as Category C and D.
2. IF THERE ARE CATEGORY C BYPRODUCTS UNDER ASSESSMENT: Complete clause C1 for **each** Category C by-product.
3. IF THERE ARE CATEGORY D BYPRODUCTS UNDER ASSESSMENT: Complete Section D.
4. ALL OTHER SECTIONS CAN BE DELETED. Clauses M1 - M3, F1 - F3, and Sections A and B do not need to be completed for a by-product assessment.

By-product approval is awarded on a species-by-species basis. Each by-product species scoring a pass under the appropriate section may be approved against the IFFO RS Standard.

## SPECIES CATEGORISATION

The following table should be completed as fully as the available information permits. Any species representing more than 0.1% of the annual catch should be listed, along with an estimate of the proportion of the catch each species represents. The species should then be divided into Type 1 and Type 2 as follows:

- **Type 1 Species** can be considered the ‘target’ or ‘main’ species in the fishery. They make up the bulk of annual landings and are subjected to a detailed assessment.
- **Type 2 Species** can be considered the ‘bycatch’ or ‘minor’ species in the fishery. They make up a small proportion of the annual landings and are subjected to relatively high-level assessment.

**Type 1 Species must represent 95% of the total annual catch. Type 2 Species may represent a maximum of 5% of the annual catch (see Appendix B).**

Species which make up less than 0.1% of landings do not need to be listed (NOTE: ETP species are considered separately). The table should be extended if more space is needed. Discarded species should be included when known.

The ‘stock’ column should be used to differentiate when there are multiple biological or management stocks of one species captured by the fishery. The ‘management’ column should be used to indicate whether there is an adequate management regime specifically aimed at the individual species/stock. In some cases, it will be immediately clear whether there is a species-specific management regime in place (for example, if there is an annual TAC). In less clear circumstances, the rule of thumb should be that if the species meets the minimum requirements of clauses A1-A4, an adequate species-specific management regime is in place.

NOTE: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in the CITES appendices, it **cannot** be approved for use as an IFFO RS raw material. This applied to whole fish as well as by-products.

**TYPE 1 SPECIES (Representing 95% of the catch or more)**

**Category A:** Species-specific management regime in place.

**Category B:** No species-specific management regime in place.

**TYPE 2 SPECIES (Representing 5% OF THE CATCH OR LESS)**

**Category C:** Species-specific management regime in place.

**Category D:** No species-specific management regime in place.

Common name	Latin name	Stock	% of landings	Management	Category
Mackerel	<i>Scomber scombrus</i>	NEA	N/A	EU (Common Fisheries Policy)	C

**CATEGORY C SPECIES**

In a whole fish assessment, Category C species are those which make up less than 5% of landings, but which are subject to a species-specific management regime. In most cases this will be because they are a commercial target in a fishery other than the one under assessment. In a by-product assessment, Category C species are those which are subject to a species-specific management regime and are usually targeted species in fisheries for human consumption.

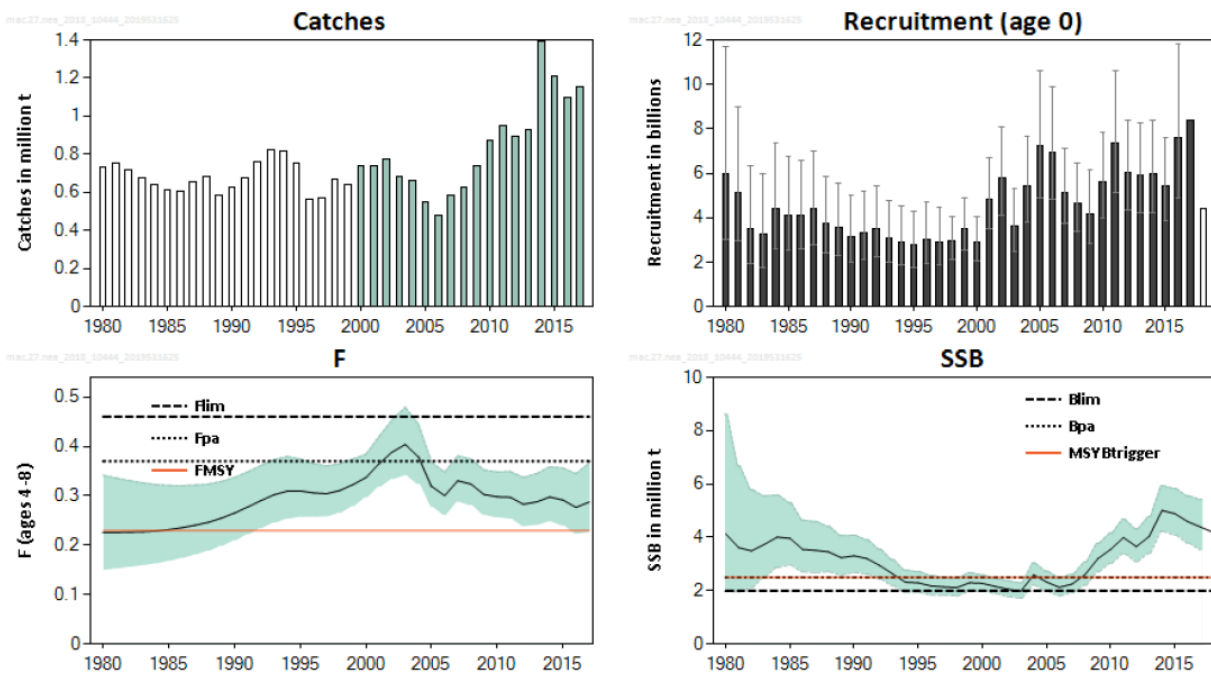
Clause C1 should be completed for **each** Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. A Category C species does not meet the minimum requirements of clause C1 should be re-assessed as a Category D species.

<b>Species Name</b>		Mackerel <i>Scomber scombrus</i>	
<b>C1</b>	<b>Category C Stock Status - Minimum Requirements</b>		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	Pass
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	Pass
<b>Clause outcome:</b>			<b>Pass</b>
<b>Evidence:</b>			
<b>C 1.1:</b>			
Catch data, coded wire tagging data (1980–2006) and RFID tagging data (2014–2017) from three survey indices:			
<ul style="list-style-type: none"> <li>• SSB index from the triennial egg survey (1992–2016)</li> <li>• Abundance indices from the IBTS survey (combined Q1 and Q4; age 0, 1998–2017)</li> <li>• IESSNS survey (ages 3–11, 2010, 2012–2018).</li> </ul>			

Catches prior to 2000 are given a very low weight in the assessment. Natural mortality (0.15 for all ages and years) is based on tagging studies from the early 1980s. The stock was benchmarked in 2017 by the ICES Working group on Widely Distributed Stocks; all biological reference points were evaluated and updated. Fishery removals of the species in the fishery under assessment are included in the stock assessment process; the species passes Clause C1.1.

**C1.2:**

The spawning-stock biomass (SSB) is estimated to have increased in the late 2000s, reaching a maximum in 2014. It has declined since but has remained above MSY Btrigger since 2008. The fishing mortality (F) has declined from high levels in the mid-2000s but remains above FMSY. There has been a succession of large year classes since the early 2000s, with year classes since 2012 estimated to be above average (**Figure 1**):



**Figure 1:** Mackerel in subareas 1–8 and 14, and in Division 9.a. Summary of the stock assessment. The catches prior to 2000 are unshaded because of the considerable underreporting that is suspected to have taken place in those years. The recruitment value for 2017 is estimated using the recruitment survey and a model (RCT3), and the recruitment value for 2018 is the geometric mean of the recruitments from 1990 to 2016. Confidence intervals (95%) are included in the recruitment, fishing mortality, and spawning-stock biomass plots. **R2**

ICES assess that fishing pressure on the stock is above FMSY but below Fpa and Flim, while spawning stock size is above MSY Btrigger, Bpa, and Blim: **Table 1**:

**Table 1:** Mackerel in subareas 1-8 and 14, and in Division 9.a. State of the stock and fishery relative to reference points. **R2**

	Fishing pressure				Stock size		
		2015	2016	2017	2016	2017	2018
Maximum sustainable yield	$F_{MSY}$	✘	✘	✘ Above	$B_{trigger}$	✔	✔ Above trigger
Precautionary approach	$F_{pa}, F_{lim}$	✔	✔	✔ Harvested sustainably	$B_{pa}, B_{lim}$	✔	✔ Full reproductive capacity
Management plan	$F_{MGT}$	—	—	— Not applicable	$B_{MGT}$	—	— Not applicable

The revised catch advice for 2019 is higher than that previously issued and the advice for 2018 because:

- There has been an upward revision of the stock size, now estimated to be above MSY Btrigger, and a downward revision of F, now closer to FMSY, compared to the assessment used for the advice issued in 2018. This is based on changes in methodology and time-series of data agreed during the 2019 inter-benchmark process (see Quality of the assessment);
- The new FMSY value (0.23), estimated during the 2019 inter-benchmark process and based on the new assessment, is slightly higher than the value used previously (0.21).

**Quality of the assessment:**

The assessment procedure was modified during an inter benchmark process in 2019 (ICES, 2019). The assessment results are very sensitive to both input data and model settings; minor changes implemented in the assessment model in 2019 have led to a significant upward revision in the estimates of SSB, a downwards revision of the estimates of F in recent years, and a change in the pattern of estimated recruitment in recent years. This, together with previous revisions to stock trends, highlights the instability in the mackerel assessment. The model configuration has been updated to more appropriately reflect the lack of information in catch data about the abundance of younger fish (0- and 1-year-olds). This has resulted in increased influence of the survey index for young fish and an upward revision in recent recruitment estimates.

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy) and passes Clause C1.2.

**References**

**R1** ICES advice (2018)

<http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/mac.27.nea.pdf>

**R2** ICES advice (updated May 2019) Mackerel (*Scomber scombrus*) in subareas 1–8 and 14, and in Division 9.a (the Northeast Atlantic and adjacent waters)

[http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/Special\\_Requests/no.2019.09.pdf](http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/Special_Requests/no.2019.09.pdf)

*Standard clauses 1.3.2.2*

**SOCIAL CRITERION**

In addition to the scored criteria listed above, applicants must commit to ensuring that vessels operating in the fishery adhere to internationally recognised guidance on human rights. They must also commit to ensuring there is no use of enforced or unpaid labour in the fleet(s) operating upon the resource.



## Appendix A - Determining Resilience Ratings

The assessment of Category B species described in this assessment report template utilises a resilience rating system suggested by the American Fisheries Society. This approach was chosen because it is also used by FishBase, and so the resilience ratings for many thousands of species are freely available online. As described by FishBase, the following is the process used to arrive at the resilience ratings:

*“The American Fisheries Society (AFS) has suggested values for several biological parameters that allow classification of a fish population or species into categories of high, medium, low and very low resilience or productivity (Musick 1999). If no reliable estimate of  $r_m$  (see below) is available, the assignment is to the lowest category for which any of the available parameters fits. For each of these categories, AFS has suggested thresholds for decline over the longer of 10 years or three generations. If an observed decline measured in biomass or numbers of mature individuals exceeds the indicated threshold value, the population or species is considered vulnerable to extinction unless explicitly shown otherwise. If one sex strongly limits the reproductive capacity of the species or population, then only the decline in the limiting sex should be considered. We decided to restrict the automatic assignment of resilience categories in the Key Facts page to values of  $K$ ,  $t_m$  and  $t_{max}$  and those records of fecundity estimates that referred to minimum number of eggs or pups per female per year, if these were equivalent to average fecundity at first maturity (Musick 1999). Note that many small fishes may spawn several times per year (we exclude these for the time being) and large live bearers such as the coelacanth may have gestation periods of more than one year (we corrected fecundity estimates for those cases reported in the literature). Also, we excluded resilience estimates based on  $r_m$  (see below) as we are not yet confident with the reliability of the current method for estimating  $r_m$ . If users have independent  $r_m$  or fecundity estimates, they can refer to Table 1 for using this information.”*

Parameter	High	Medium	Low	Very low
Threshold	0.99	0.95	0.85	0.70
$t_{max}$ (1/year)	> 0.5	0.16 – 0.50	0.05 – 0.15	< 0.05
$K$ (1/year)	> 0.3	0.16 – 0.30	0.05 – 0.15	< 0.05
Fecundity (1/year)	> 10,000	100 – 1000	10 – 100	< 10
$t_m$ (years)	< 1	2 – 4	5 – 10	> 10
$t_{max}$ (years)	1 - 3	4 – 10	11 – 30	> 30

Taken from the FishBase manual, “Estimation of Life-History Key Facts”:

<http://www.fishbase.us/manual/English/key%20facts.htm#resilience>

## Appendix B – Background on the 5% catch rule

The proposed fishery assessment methodology uses a species categorisation approach to divide the catch in the assessment fishery into groups. These groups are:

- **Category A:** “Target” species with a species-specific management regime in place.
- **Category B:** “Target” species with no species-specific management regime in place.
- **Category C:** “Non-target” species with a species-specific management regime in place.
- **Category D:** “Non-target” species with no species-specific management regime in place

The distinction between 'target' and 'non-target' species is made to enable the assessment to consider the impact of the fishery on all the species caught regularly, without requiring a full assessment be conducted for each. Thus 'target' species are subjected to a more detailed assessment, while 'non-target' species are considered more briefly. For the purposes of the IFFO RS fishery assessment, 'target' and 'non-target' species are defined by their prevalence in the catch, by weight. Applicants must declare which species are considered 'target' species in the fishery, and the combined weight of these must be at least 95% of the annual catch. The remaining 5% can be made up of 'non-target' species. Note also that ETP species are considered separately, irrespective of their frequency of occurrence in the catch.

The proposed use of 5% as a limit for 'non-target' species is one area in which feedback is being sought via the public consultation. The decision to propose a value of 5% ensures consistency with other fishery assessment programmes, such as the MSC which uses 5% to distinguish between 'main' and 'minor' species (see MSC Standard, SA3.4 and GSA3.4.2); and Seafood Watch, which uses 5% when defining the 'main' species for the assessment (see Seafood Watch Standard, Criterion 2). The value is also consistent with the approach used in Version 1 of the IFFO RS Standard, in which up to 5% of the raw material could be comprised of 'unassessed' species.