



RESPONSIBLE  
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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>Chub Mackerel <i>Scomber japonicus</i> Mexico FAO 77 Pacific Ocean East Central</b>
<b>Date</b>	<b>January 2019</b>
<b>Assessor</b>	<b>Jim Daly</b>

Application details and summary of the assessment outcome				
Name: Sardinas de Sonora S.A. de C.V				
Address:				
Country: Mexico		Zip:		
Tel. No.:		Fax. No.:		
Email address:		Applicant Code		
Key Contact:		Title:		
Certification Body Details				
Name of Certification Body:		SAI Global		
Assessor Name	Peer Reviewer	Assessment Days	Initial/Surveillance/Re-approval	Whole fish/ By-product
Jim Daly	Vito Romito	0.5	Surveillance YR 1	By-product
Assessment Period	2018			

Scope Details	
Management Authority (Country/State)	Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food <b>SAGARPA Mexico</b>
Main Species	Chub Mackerel <i>Scomber japonicus</i>
Fishery Location	Gulf of California FAO 77 (Eastern Central Pacific)
Gear Type(s)	Purse Seine
Outcome of Assessment	
Overall Outcome	PASS
Clauses Failed	NONE
Peer Review Evaluation	APPROVE
Recommendation	PASS

### Assessment Determination

The Government body with responsibility for fisheries management in Mexico including the small pelagics fishery is the Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, SAGARPA). Scientific advice is provided by the National Fisheries Institute (Instituto Nacional de Pesca, INP or INAPESCA) through which the National Fisheries Charter (Carta Nacional Pesquera) was developed. The Charter is an annually-updated summary of the status and scientific understanding of all commercial fishery resources in federal waters.

The Fisheries Management Plan (FMP 2012) for small pelagic species in the assessment area (Plan de manejo pesquero para la pesquería de pelágicos menores) aims to set out actions to develop the fisheries in a sustainable manner based on current knowledge of ecological, environmental, economic, cultural, social and biological aspects of the fisheries. A relevant insertion in the FMP is the definition of guidance to establish biological reference points. The latest model (2015 data) estimated MSY for the fishery in the assessment area at 70,000t.

The latest survey was undertaken in March 2018. Total biomass estimated was 265,714t, around 74% of the previous estimation. The species is highly dependent on environmental changes and its dynamic very much influenced by El Niño and La Niña natural events being considering as bio-indicators, according to studies carried out by INP. In 2014/15 total recorded landings of Chub Mackerel in the assessment area amounted to 35,503t.

Chub mackerel is designated by SAGARPA under the active management category. For species actively managed, the FMP has added an MSY-based control rule which, based on the application of a harvest rate, requires the catch to be reduced if biomass declines. Eventually, if a biomass threshold is reached, the fishery stops operating.

Fishery removals of the species in the fishery under assessment are included in the stock assessment process. The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy).

Chub Mackerel (Pacific Ocean Eastern Central) has not yet been assessed for the IUCN Red List and is not on the current list of CITES endangered species (websites accessed 16.01.19)

Chub Mackerel (Pacific Ocean Eastern Central) is approved by the assessment team for the production of fishmeal and fish oil (by-product) under the IFFO-RS v 2.0 standard.

### Peer Review Comments

Estimates of abundance independent of the fishery have been obtained from hydroacoustic surveys carried out in the Gulf of California from 2008-2016. Stock assessments, since 2000, have been conducted using a stochastic age-structured model with density dependent recruitment and catch and effort data, estimating the number of individuals at age using Virtual Populations Analysis (VPA) and a Shepherd's stock-recruitment model. Fishery removals of the species in the fishery under assessment are included in the stock assessment process.

Kobe plots for the assessment of chub mackerel show positive results in terms of exploitation and current state of the population, with all years indicating that estimated biomass is above BMSY and average fishing mortality rate remains below FMSY, thus there is no risk of overfishing. The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point.

The Peer Reviewer agrees with the Assessor's determination that Chub Mackerel (Pacific Ocean Eastern Central) should be approved for the production of fishmeal and fish oil (by-product) under the IFFO-RS v 2.0 standard.

### Notes for On-site Auditor

Note: This table should be completed for whole fish assessments only.

## Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A			A1	
			A2	
			A3	
			A4	
Category B				
Category C	Chub Mackerel <i>Scomber japonicus</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** of 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
Chub Mackerel	<i>Scomber japonicus</i>	FAO 77	N/A	SAGARPA	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.

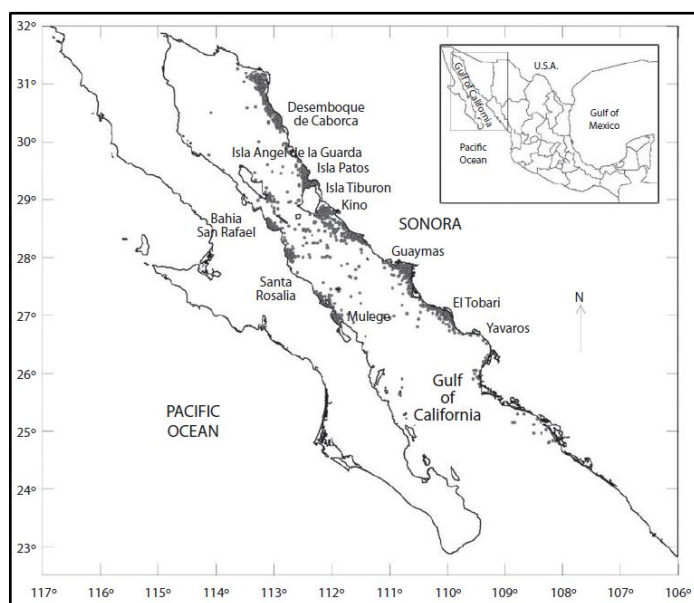
Species Name		Chub Mackerel <i>Scomber japonicus</i>	
C1	Category C Stock Status - Minimum Requirements		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	PASS
	C1.2	The species 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
Clause outcome:			PASS

### Evidence

#### C1.1:

The Government body with responsibility for fisheries management in Mexico including the small pelagics fishery is the Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, SAGARPA).

Scientific advice is provided by the National Fisheries Institute (Instituto Nacional de Pesca, INP or INAPESCA), through which the National Fisheries Charter (Carta Nacional Pesquera) was developed. The Charter is an annually-updated summary of the status and scientific understanding of all commercial fishery resources in federal waters. The Charter is broadly divided between Pacific and Gulf of Mexico fisheries (**Figure 1**):



**Figure 1.** Landing distribution (dark grey points) of small pelagic fishery in the Gulf of California from 2002 to 2007. **R4**

The Fisheries Management Plan (FMP) for small pelagic species in the assessment area (Plan de manejo pesquero para la pesquería de pelágicos menores) aims to set out actions to develop the fisheries in a sustainable manner based on current knowledge of ecological, environmental, economic, cultural, social and biological aspects of the fisheries. A relevant insertion in the FMP is the definition of a guidance to establish reference points.

Data on catch and effort is collected from the official 'Aviso de Arribo' or landing notification forms provided and collected by regional offices of the National Commission on Aquaculture and Fisheries (Comisión Nacional de Acuacultura y Pesca, CONAPESCA). Data are processed and analysed by INAPESCA and results presented in official reports of fishery catch and effort.

Estimates of abundance independent of the fishery have been obtained from hydroacoustic surveys carried out in the Gulf of California from 2008-2016. Stock assessments, since 2000, have been conducted using a stochastic age-structured model with density dependent recruitment and catch and effort data, estimating the number of individuals at age using Virtual Populations Analysis (VPA) and a Shepherd's stock-recruitment model.

Fishery independent data collected has more recently included the following indices of relative abundance:

- Number of fish caught per squared km in tows, during prospective and acoustic surveys (1990-2014).
- Indices of biomass obtained by means of acoustic detection of fish (2008-2014).
- Abundance of eggs and larvae (number/10 m<sup>2</sup>) (1971-1988).
- An environmentally based index specifying the spawning probability (1979-1996).
- An index based on the proportion of sardine in the diet of sea birds.

Fishery removals of the species in the fishery under assessment are included in the stock assessment process  
**R2-R5**

### **C1.2:**

The latest survey was undertaken in March 2018. Total biomass estimated was 265,714t, around 74% of the previous estimation. The species is highly dependent on environmental changes and its dynamic is very influenced by El Niño and La Niña natural events being considering as a bio-indicators, according to studies carried out by INP.

Chub mackerel is designated under the active management category. For species actively managed, the FMP has added an MSY-based control rule which, based on the application of a harvest rate, requires the catch to be reduced if biomass declines. Eventually, if a biomass threshold is reached, the fishery stops operating.

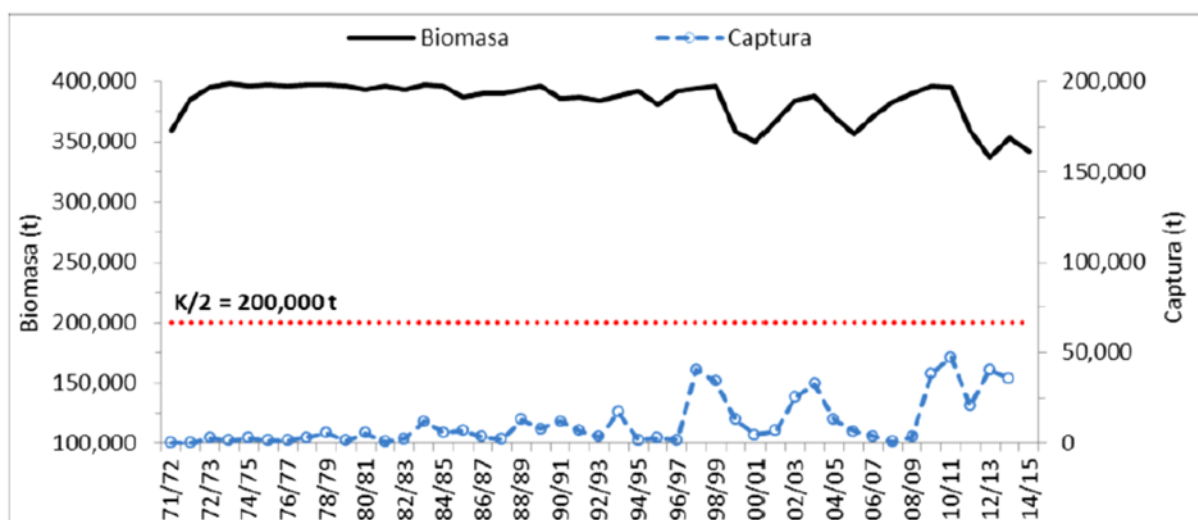
Using a biomass dynamics model Nevárez-Martínez et al. (2016e) calculated biological reference points for Chub mackerel. The fishing mortality rate at MSY was estimated to be 0.350 and MSY at 70,000t. No estimates of fishing mortality rates using the Age Structured Assessment Program (ASAP) approach are available for chub mackerel (**Table 1, Figure 2**):



**Table 1:** Biomass model parameter and biological reference points for chub mackerel (*Scomber japonicus*) in the Central-Northern Gulf of California fishery (2015 data) **R6**

Parameter	Chub mackerel
R	0.700
K	400,000
B <sub>0</sub>	360,000
B <sub>MSY</sub>	200,000
MSY	70,000
F <sub>MSY</sub>	0.350
f <sub>MSY</sub>	1,964
q <sub>med</sub>	1.78E-04

This model pools catch of chub mackerel and indicate that recorded catches are far below the estimated BMSY (red line) for all of its trajectory:



**Figure 2** Biomass trajectories of chub mackerel in the Gulf of California **R6**

Kobe plots for the assessment of chub mackerel show positive results in terms of exploitation and current state of the population, with all years indicating that estimated biomass is above BMSY and average fishing mortality rate remains below FMSY, thus there is no risk of overfishing.

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy) **R6-R7**

#### References

- R1** Programas SAGARPA: <https://www.gob.mx/sader/acciones-y-programas/programas-y-componentes-de-la-sagarpa>
- R2** INAPESCA homepage: <https://www.gob.mx/inapesca>



**R3** Carta Nacional Pesquera (2018) Acuerdo por el que se da a conocer la actualización de la Carta Nacional Pesquera. (Continúa en la Tercera Sección).

[https://www.gob.mx/cms/uploads/attachment/file/334832/DOF - CNP 2017.pdf](https://www.gob.mx/cms/uploads/attachment/file/334832/DOF_-_CNP_2017.pdf)

**R4** Lluch-Belda et al (1995). Atlas Pesquero de México. Pesquerías Relevantes. Secretaría de Pesca/Instituto Nacional de Pesca/Universidad de Colima (Cenedic).

**R5** Fisheries Management Plan for the minor pelagic species (Plan de manejo pesquero para la pesquería de pelágicos menores) [http://dof.gob.mx/nota\\_detalle\\_popup.php?codigo=5276945](http://dof.gob.mx/nota_detalle_popup.php?codigo=5276945)

**R6** Nevarez-Martinez et al 2015 Evaluación poblacional de la sardina monterrey (Sardinops sagax) en el Golfo de California, Mexico, 1971/71 -2014/2015. Informe Técnico del Programa de Pelágico Menores. Instituto Nacional de Pesca, CRIP Guaymas, Sonora, 23pp. [http://www.sardinagolfodecalifornia.org/wp-content/uploads/2015/12/InfTec\\_Evaluaci%C3%B3n-sardina-monterrey\\_2015.pdf](http://www.sardinagolfodecalifornia.org/wp-content/uploads/2015/12/InfTec_Evaluaci%C3%B3n-sardina-monterrey_2015.pdf)

**R7** Fishsource Chub Mackerel Pacific [https://www.fishsource.org/stock\\_page/2280](https://www.fishsource.org/stock_page/2280)

*Standard clauses 1.3.2.2*