MarinTrust Standard V2

Gulf of California small pelagics fishery Mexico

MarinTrust Programme
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Table 1 Application details and summary of the assessment outcome

Application details and summary of the assessment outcome			
Name: Sardinas de Sonora S.A. de C. V, Guaymas Protein, Maz Industrial			
Address:			
Country: Mexico		**Zip:**	
Tel. No.		**Fax. No.**	
Email address:		**Applicant Code**	
Key Contact:		**Title:**	
Certification Body Details			
Name of Certification Body:		**Global Trust Certification**	
Assessor Name	**CB Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-approval**
Virginia Polonio	Geraldine Criquet	3	Surveillance 2
Assessment Period	From October 2021 to October 2022		
Scope Details			
Management Authority (Country/State)		Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food SAGARPA, Mexico	
Main Species		Monterrey (Pacific) sardine (*S. sagax*) Thread Herring (*Opisthonema spp*)	
Fishery Location		Eastern Central Pacific FAO 77: Baja California, México	
Gear Type(s)		Purse Seine	
Outcome of Assessment			
Overall Outcome		PASS when sardine is included as category A	
Clauses Failed		MSC VT3 verification MAZ industrial vessel list MSC MSC VT4 Sardine (*Sardinops sagax*) not covered by P1 requires MT assessment	
CB Peer Review Evaluation		Approve	
Fishery Assessment Peer Review Group Evaluation		Approve see Peer Review report	
Recommendation		PASS	

Table 2. Assessment Determination

Assessment Determination
If any species is categorised as Endangered or Critically Endangered on IUCN's Red List, or if it appears in the CITES appendices, it cannot be approved for use as Marin Trust raw material. Pacific sardine (*Sardinops sagax*) and Thread herring (*Opisthonema spp*); do not appear as Endangered or Critically Endangered on IUCN's Red List, nor does it appear in CITES; therefore, the two main species are eligible for approval for use as Marin Trust Whole-fish raw material. Small pelagic species being assessed in this surveillance audit are Californian anchovy/Anchoveta, Monterey (Pacific) Sardine, Thread Herring, Mackerel, Bocona Sardine, Japanese Sardine and Leatherjackets. Within the species which represents more than 5 % of the total catches, two species, Monterey Sardine and Thread Herring are fall under Category A because they are managed under a Fishery Management Plan, while the rest of the species are assessed under Category C and D as they represent less than 5% of the total catch and they are actively or passively managed under the Fisheries Management Plan (FMP) for small pelagics. Despite the category in which the species were assessed, all seven species were assessed accordingly and passed. This surveillance audit presents some difference in respect to the previous process used in assessing the fishery. This Surveillance 2 has been done following the Verification process tool developed by Marin Trust (https://www.marin-trust.com/news/marintrust-unveils-new-verification-tool-fishmeal-plants-claiming-be-receiving-msc-certified). As per guidelines, when the verification tool is used to evaluate a fishery against Marin Trust Fisheries standard V2.0 the clauses M and F are not scored as they are already assessed and scored in the relevant MSC report. In the case of this fishery the relevant MSC certified fisheries are: • Southern Gulf of California Thread Herring; the fishery was certified in 2016. The fourth surveillance audit was posted on October 2021 and currently the fishery is under re-assessment. The target species assessed under P1 is a thread herring stock complex (*Opisthonema spp.),* made up of three subspecies (*O. libertate, O. medirastre and O. bulleri*), or sardina crinuda and arenque de hebra in Spanish. Caught by purse seines in n the Mexican territorial waters of the states of Sinaloa and Nayarit, Mexico. • Small Pelagic fishery in Sonora (Gulf of California); the fishery was certified in 2011. The first re-assessment was performed in 2016 and currently the 3rd surveillance audit was posted on November 1st. The target species are Northern/Central Gulf of California Pacific sardine (*Sardinops sagax*) and Northern/Central Gulf of California thread herring complex (*Opisthonema spp.*) Both fisheries have one of the main species in common and the fleets operates in the same area. Therefore, as per guidance, in this report the main species classified as category A have been included in the report as MSC verification elements and the species classified as C and D have been included in whole fish report where applicable as usual in the whole fish reports. As mentioned above, general clauses are not evaluated in this surveillance as they are part of the MSC verification tool and there is no need to re-assess the management plan or impact on the ecosystem as these clauses are included in the Principle 2 and P3 of the MSC certified fisheries. In both MSC fisheries certificate P2 and P3 meet the requirement and they have an overall score >80. Having that in mind, the assessor can assume that all the M and F clauses are met for this fishery. The assessor recommends the approval of Pacific sardine (*Sardinops sagax*) as category A species and Thread herring (*Opisthonema spp*) as MSC VT. Mackerel (*Scomber japonicus*) as category C and Anchoveta (*Engraulis mordax*) Bocona Sardine (*Cetengraulis mysticetus*) Japanese sardine (*Etremeus teres*) Leatherjackets (*Oligoplites sp*) as category D and therefore, they can be used for the production of fishmeal and/or fish oil under the current Marin Trust Whole fish and by-product Standard (v 2.0).
Fishery Assessment Peer Review Comments

Notes for On-site Auditor

Table 3 General Results

General Clause	Outcome (Pass/Fail)
M1 - Management Framework	As MSC verification used – default pass
M2 - Surveillance, Control and Enforcement	As MSC verification used – default pass
F1 - Impacts on ETP Species	As MSC verification used – default pass
F2 - Impacts on Habitats	As MSC verification used – default pass
F3 - Ecosystem Impacts	As MSC verification used – default pass

Table 4 Species Specific Results

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

Category	Species	% landings	Outcome (Pass/Fail)	
Category A	Monterrey (Pacific) sardine *Sardinops sagax*	30	A1 A2 A3 A4	Pass The stock is also assessed under category A because MAZ fleet is not equivalent with the MSC certified fisheries
Category A	Thread Herring (*Opisthonema spp*)	50	A1 A2 A3 A4	Pass
Category C	Mackerel (*Scomber japonicus*)	<5	PASS	
Category D	Anchoveta (*Engraulis mordax*)	<5	PASS	
Category D	Bocona Sardine (*Cetengraulis mysticetus*)	<5	PASS	
Category D	Japanese sardine (*Etremeus teres*)	3	PASS	
Category D	Leatherjackets (*Oligoplites sp*)	2	PASS	

Table 5 Species Categorisation Table

Common name	Latin name	Stock	IUCN Redlist Category[1]	% of landings	Management	Category
Monterrey (Pacific) sardine	*Sardinops sagax*	FAO 77 Pacific Southeast	LC	30	SAGARPA	A
Thread Herring	*Opisthonema spp*	FAO 77 Pacific Southeast	LC	50	SAGARPA	A
Mackerel	*Scomber japonicus*	FAO 77 Pacific Southeast	LC	<5	SAGARPA	C
Anchoveta	*Engraulis mordax*	FAO 77 Pacific Southeast	DD	<5	SAGARPA	D
Bocona Sardine	*Cetengraulis mysticetus*	FAO 77 Pacific Southeast	LC	<5	SAGARPA	D
Japanese sardine	*Etremeus teres*	FAO 77 Pacific Southeast	LC	3	SAGARPA	D

[1] https://www.iucnredlist.org/

Leatherjackets	*Oligoplites sp*	FAO 77 Pacific Southeast	LC	2	SAGARPA	D

Species categorisation rationale
The information used to classify the species has been the observer catch reported by INAPESCA and included in the MSC certified fisheries. No information on catch composition has been provided by MT and / or the client for this surveillance 2 audit. Therefore, the information is from this source: *2015-2010 observed catch in tons from the Sinaloa thread herring fishery (Inapesca 2015-2020)*

***Note that as a part of the verification tool report the M clauses are not assessed herein. They are covered under section P3 PIs of the MSC certified fisheries and it is assumed that they are equivalent to M clauses in MarinTrust whole fish report.**

CATEGORY A SPECIES

Table 6. Results of verification of MSC P1 species: View Small Pelagics Fishery in Sonora, Gulf of California - MSC Fisheries

Verification	**MSC Report**	**MarinTrust applicant**	**Results**
1. Scope (Species and Area)	Northern/Central Gulf of California Pacific sardine (Sardinops sagax) (2) Northern/Central Gulf of California thread herring complex (Opisthonema spp.)	Northern/Central Gulf of California Pacific sardine (Sardinops sagax) (2) Northern/Central Gulf of California thread herring complex (Opisthonema spp.)	Equivalent
2. Stock	FAO 77 Pacific Southeast stock defined as Central-northern Gulf of California, in NW Mexico	FAO 77 Pacific Southeast stock defined as Central-northern Gulf of California, in NW Mexico	Equivalent
3. Vessel list	46 purse seine vessels member of CANAINPES	8 purse seine MAZ Sardina S.A	CANAIPES – Equivalent Maz industrial – not equivalent The vessels part of Maz Industrial were not considered as other eligible fisher in the CANAINPES fishery certificate, therefore the fleets are not equivalent.

Determination
View Small Pelagics Fishery in Sonora, Gulf of California - MSC Fisheries The fisheries have the same target species and scope, however, there is a mismatch with the fleets. The assessor recommends that Marin Trust provides clarifications on the fisheries to compare with. Information provided by the client does not match with the fishery to compare with provided by MT.

Both MSC certified fisheries have identical component, scope of the fisheries is the same however the only different is the client group. This fishery includes CANAINPES fleet and no other eligible fishers have been included in the certificate. The verification tool is pending on clarification on how to assess the MAZ fleet in relation with the CANAINPES certificate. Therefore, the fisheries cannot be equivalent due to the vessels included in the MSC certificates.
Notes for On-site Auditor

Table 7: Results of verification of MSC P1 species: Certificates Southern Gulf of California Thread Herring - MSC Fisheries

Verification	MSC Report	MarinTrust applicant	Results
1. Scope (Species and Area)	Thread herring complex (*Opisthonema spp.*)	Northern/Central Gulf of California Pacific sardine (*Sardinops sagax*) (2) Northern/Central Gulf of California thread herring complex (*Opisthonema spp.*)	One of the species is equivalent, the thread herring complex however in this MSC report Pacific sardine is not a target species and it is not assessed under P1.
2. Stock	FAO 77 Pacific Southeast stock defined in the waters off the coast of the States of Sinaloa and Nayarit, Gulf of California, Mexico:	FAO 77 Pacific Southeast stock defined in the Gulf of California, Mexico	Equivalent
3. Vessel list	8 purse seine MAZ Sardina S.A	8 purse seine MAZ Sardina S.A	Equivalent.
Determination			
Certificates Southern Gulf of California Thread Herring - MSC Fisheries The assessor recommends the approval of this verification process for one of the species, which is seeking the comparation with MSC certified fisheries, Thread Herring complex. However, for the other main species, Central Gulf of California Pacific sardine (*Sardinops sagax*), the assessor recommends that MT provides clarifications on how to assess this species as is not evaluated under P1 in the MSC fishery to compare with.			
Notes for On-site Auditor			

Species Name	Monterrey (Pacific) sardine *Sardinops sagax*	
A1	**Data Collection - Minimum Requirements**	
A1.1	Landings data are collected such that the fishery-wide removals of this species are known.	Yes
A1.2	Sufficient additional information is collected to enable an indication of stock status to be estimated.	Yes
	Clause outcome:	**PASS**

A1.1 Landings data are collected such that the fishery-wide removals of this species are known.

There was not a new stock assessment in 2021. In 2019, INAPESCA carried out a population analysis of Monterey sardine (Sardinops sagax) and thread herring (Opisthonema libertate) from the Gulf of California considering the period 1971/72 to 2018/19 (Morales Bojórquez and Hernández Rivas, 2020a,b). The Age-Structured Assessment Program (ASAP) was used in both cases which did not imply a change in the stock assessment methodology in relation to previous years. It is an updated approach and well accepted method to assess populations under commercial exploitation due to the realistic outcome of the dynamic of the population, and allows an interpretation of the stocks' status, producing biological reference points and biologically acceptable biomass. The following fishery-independent indexes were used:

• Annual Relative Abundance Index of Evaluation Survey Data (kg of Pacific sardines/thread herring per haul hour (kg / hour), from the historical series (1990 - 2019)

• Annual relative abundance index of acoustic surveys data (Tons per year (t / year), of the cruise series (2008 - 2019)

• Relative abundance index of ichthyoplankton cruise data (number of Pacific sardine/thread herring eggs and larvae per 10 m2)

• Probability index of sardine spawning

• Index of the proportion of sardines in the diet of birds. The indexes 1 -3 were used in both species whereas the indexes 4 and 5 were used only for Pacific sardine Landings data are collected such that the fishery-wide removals of this species are known.

A1.2 Sufficient additional information is collected to enable an indication of stock status to be estimated.

INAPESCA conducts the stock assessment and computes the BAC based on the status of the stock; the results are communicated to other stakeholders including the fishers and the management branch of the government (CONAPESCA) and procedures can be agreed to start operations on the base of the limit established with the BAC. Landings data are collected such that the fishery-wide removals of this species are known. In 2020 BAC was set up at 206.48 mt and the landings were reported as 114.92mt. Management has made important progress towards sustainability, such as a Vessel Monitoring System and onboard and port observers' programs. Other measures are being proposed to ensure the stock status is well known.

References

Fisheries Management Plan (Oct 2012) 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

Small Pelagics fishery in Sonora, gulf of California: MSC Fishery Assessment Report 2018 SCS Global Services pdf 363pp https://fisheries.msc.org/en/fisheries/small-pelagics-fishery-insonora-gulf-of-california/@@assessment

Molina, J. J., C. H. Hernández-López, R. Villaseñor-Talavera, and J. J. García-Meléndez. 2020. Management strategies proposal for reducing the abundance of small organisms in the small pelagic fishery catch from the Gulf of California. HIDROBIOLÓGICA 30(1).
https://hidrobiologica.izt.uam.mx/index.php/revHidro/article/view/1471

Links

MARINTRUST Standard clause	1.3.2.1.1, 1.3.2.1.2, 1.3.2.1.4, 1.3.1.2

FAO CCRF	7.3.1, 12.3
GSSI	D.4.01, D.5.01, D.6.02, D.3.14

A2	**Stock Assessment - Minimum Requirements**		
	A2.1	A stock assessment is conducted at least once every 3 years (or every 5 years if there is substantial supporting information that this is sufficient for the long-term sustainable management of the stock), and considers all fishery removals and the biological characteristics of the species.	Yes
	A2.2	The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.	Yes
	A2.3	The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.	Yes
	A2.4	The assessment is subject to internal or external peer review.	Yes
	A2.5	The assessment is made publicly available.	Yes
		Clause outcome:	**PASS**

A2.1 A stock assessment is conducted at least once every 3 years (or every 5 years if there is substantial supporting information that this is sufficient for the long-term sustainable management of the stock), and considers all fishery removals and the biological characteristics of the species.

The 2016 assessment used information including a series of CPUE values from scientific cruises, the indices of abundance from acoustic surveys, an index of egg and larvae, an index representing spawning probability and the proportion of sardines in the diet of seabirds. INAPESCA staff opted for using the Age Structured Assessment Program (ASAP) model to reconstruct biomass trajectory and estimate parameters relevant to make management decisions. Data on catch and effort is collected from the official 'Aviso de Arribo' or landing notification forms provided and collected by regional offices of CONAPESCA. Data are processed and analysed by INAPESCA and results presented in official reports of fishery catch and effort. Annual estimates of biomass in the Gulf of California are obtained with hydroacoustic methods. Abundance is used as relative indices in stock assessments. The most recent stock assessment reports indicate that the stock has been stable in the last 3 years, spawning stock biomass (SSB) around Bmsy (533,000 tonnes) In 2019, INAPESCA carried out a population analysis of Monterey sardine (Sardinops sagax) and thread herring (Opisthonema libertate) from the Gulf of California considering the period 1971/72 to 2018/19 (Morales Bojórquez and Hernández Rivas, 2020a,b). The Age-Structured Assessment Program (ASAP) was used in both cases which did not imply a change in the stock assessment methodology in relation to previous years. It is an updated approach and well accepted method to assess populations under commercial exploitation due to the realistic outcome of the dynamic of the population, and allows an interpretation of the stocks' status, producing biological reference points and biologically acceptable biomass.

The following fishery-independent indexes were used:

• Annual Relative Abundance Index of Evaluation Survey Data (kg of Pacific sardines/thread herring per haul hour (kg / hour), from the historical series (1990 - 2019)

• Annual relative abundance index of acoustic surveys data (Tons per year (t / year), of the cruise series (2008 - 2019)

• Relative abundance index of ichthyoplankton cruise data (number of Pacific sardine/thread herring eggs and larvae per 10 m2)

• Probability index of sardine spawning

• Index of the proportion of sardines in the diet of birds.

• The indexes 1 -3 were used in both species whereas the indexes 4 and 5 were used only for Pacific sardine.

During the recent MSC surveillance audit, a Kobe diagram being presented to the audit team, showed that the Pacific sardine population is in good condition and the fishing effort has been below the recommended maximum, so there is no overfishing. A stock assessment is conducted at least once every 3 years; annual biomass estimates are obtained.

A2.2 The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.

The Age-Structured Assessment Program (ASAP) was used in both cases which did not imply a change in the stock assessment methodology in relation to previous years. It is an updated approach and well accepted method to assess populations under commercial exploitation due to the realistic outcome of the dynamic of the population, and allows an interpretation of the stocks' status, producing biological reference points and biologically acceptable biomass. During the recent MSC surveillance audit, a Kobe diagram being presented to the audit team, showed that the Pacific sardine population is in good condition and the fishing effort has been below the recommended maximum, so there is no overfishing

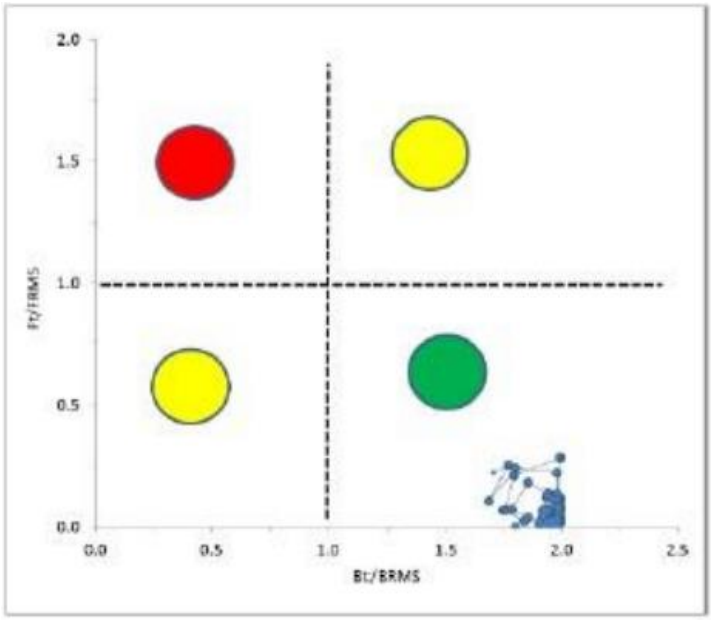

Figure 1. Kobe plot of biomass and fishing mortality rate relative to their respective levels producing MSY for the Monterrey sardine in the central/northern Gulf of California. Biomass is SSB. Reproduced from Nevarez-Martinez et al. (2019b). The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy

A2.3 The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.

The last results of the stock assessment, showed that between 2008/09 and 2013/14 the trend in the abundance series (in number and weight) was downward, however in recent years there was an upward trend: the spawning biomass increased from around 432,000 t in 2014 / 15 to almost 1,020 million tons in 2017 / 18-2018 / 19, while the exploitable biomass behaves the same way as the spawners, but the values in 2014/15 were almost 409,000 tons while this value increased to approximately 876,000 tons in 2016 / 17 and an average of 1,288 million tonnes in 2017 / 18-2018 / 19. The annual fishing mortality rate and the exploitation rate (E = 1-exp (-F)) show values below 0.15 / year for almost the entire time period, with some seasons where these values were between 0.16 and 0.23, with a maximum peak in 1988/89 and the second highest peak in 2008/09. A similar trend presents E = Ctotal / Bexp, although higher values are observed with respect to E = 1-exp (-F), but the peaks occur in the same stations. Fishing mortality and E in the MSY (FMSY = 0.309 and EMSY = 0.266), were much higher than the Fcurrent= 0.107 / year and Ecurrent = 0.101 year. On the other hand, the estimate of the spawning biomass in the MSY was BMSY = 557,053 t, biomass lower than that estimated for the last years. When applying the control rule (BAC = (Bexp - BMIN) * FRACTION) stipulated in the Fisheries Management Plan, considering that BMIN = 120,000 t and FRACTION = 1-exp (-FMSY), it was found that the population of Pacific the sardine it has been exploited below the estimated BAC in the period of time analysed. Considering the current trend in the biomass of the Pacific sardine, as well as an exploitation level of 0.266, the BAC for the 2019-2020 period would be 206,480 tons. The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.

A2.4 The assessment is subject to internal or external peer review.

The Carta Nacional Pesquera (CNP) is a binding instrument for the fisheries authorities' decision- making process. This Charter includes diagnosis and assessment of a fishery, fisheries and conservation indicators, and recommendations by INAPESCA for the management of fisheries included in the CNP.

Updates of CNP are prepared by INAPESCA every two or three years, but before updates are published in the Offical Gazette (Dario Oficial, DOF), the draft update undergoes a public review process by means of publication in the DOF. This allows the public, non-governmental organizations and the academic sector, among others, to give an opinion of the fisheries status. The assessment is subject to internal or external peer review.

A2.5 The assessment is made publicly available.

Updates of CNP are prepared by INAPESCA every two or three years, but before updates are published in the Official Gazette (Dario Oficial, DOF), the draft update undergoes a public review process by means of publication in the DOF. This allows the public, non-governmental organizations and the academic sector, among others, to give an opinion of the fisheries status The assessment is made publicly available.

References

Fisheries Management Plan (Oct 2012) 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

Small Pelagics fishery in Sonora, gulf of California: MSC Fishery Assessment Report 2018 SCS Global Services pdf 363pp https://fisheries.msc.org/en/fisheries/small-pelagics-fishery-insonora-gulf-of-california/@@assessment

Links

MARINTRUST Standard clause	1.3.2.1.2, 1.3.2.1.4, 1.3.1.2
FAO CCRF	12.3
GSSI	D.5.01, D.6.02, D.3.14

A3	**Harvest Strategy - Minimum Requirements**		
	A3.1	There is a mechanism in place by which total fishing mortality of this species is restricted.	Yes
	A3.2	Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Where a specific quantity of removals is recommended, the actual removals may exceed this by up to 10% ONLY if the stock status is above the limit reference point or proxy.	Yes
	A3.3	Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy (small quotas for research or non-target catch of the species in other fisheries are permissible).	Yes
		Clause outcome:	**PASS**

A3.1 There is a mechanism in place by which total fishing mortality of this species is restricted.

Updates of CNP are prepared by INAPESCA every two or three years, but before updates are published in the Offical Gazette (Dario Oficial, DOF), the draft update undergoes a public review process by means of publication in the DOF. This allows the public, non-governmental organizations and the academic sector, among others, to give an opinion of the fisheries status The assessment is made publicly available.

A3.2 Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Where a specific quantity of removals is recommended, the actual removals may exceed this by up to 10% ONLY if the stock status is above the limit reference point or proxy.

Between 2008/09 and 2013/14 the trend in the abundance series (in number and weight) was downward, however in recent years there was an upward trend: the spawning biomass increased from around 432,000 t in 2014 / 15 to almost 1,020 million tons in 2017 / 18-2018 / 19, while the exploitable biomass behaves the same way as the spawners, but the values in 2014/15 were almost 409,000 tons while this value increased to approximately 876,000 tons in 2016 / 17 and an average of 1,288 million tonnes in 2017 / 18-2018 / 19. The annual fishing mortality rate and the exploitation rate (E = 1-exp (-F)) show values below 0.15 / year for almost the entire time period, with some seasons where these values were between 0.16 and 0.23, with a maximum peak in 1988/89 and the second highest peak in 2008/09. A similar trend presents E = Ctotal / Bexp, although higher values are observed with respect to E = 1-exp (-F), but the peaks occur in the same stations. Fishing mortality and E in the MSY (FMSY = 0.309 and EMSY = 0.266), were much higher than the Fcurrent=

0.107 / year and Ecurrent = 0.101 year. On the other hand, the estimate of the spawning biomass in the MSY was BMSY = 557,053 t, biomass lower than that estimated for the last years. When applying the control rule (BAC = (Bexp - BMIN) * FRACTION) stipulated in the Fisheries Management Plan, considering that BMIN = 120,000 t and FRACTION = 1-exp (-FMSY), it was found that the population of Pacific the sardine it has been exploited below the estimated BAC in the period of time analysed. Considering the current trend in the biomass of the Pacific sardine, as well as an exploitation level of 0.266, the BAC for the 2019-2020 period would be 206,480 tons. A Kobe diagram presented in the last MSC Surveillance audit showed that the Pacific sardine population is in good condition and the fishing effort has been below the recommended maximum, so there is no overfishing.

Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Where a specific quantity of removals is recommended, the actual removals may exceed this by up to 10% ONLY if the stock status is above the limit reference point or proxy

A3.3 Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy (small quotas for research or non-target catch of the species in other fisheries are permissible).

During the 2018 revision of the NOM it was recommended that restrictions on vessel movements between zones should be put in place in particular to avoid fleets operating in Baja California moving into the Gulf. Vessel registers that specify maximum capacity in each of the following areas will be published: 40 vessels in Sonora, 21 in Baja California (including 2 in Isla Cedros; 5 in Baja California South and 12 in Sinaloa). Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy.

References

Small Pelagics fishery in Sonora, gulf of California: MSC Fishery Assessment Report 2018 SCS Global Services pdf 363pp https://fisheries.msc.org/en/fisheries/small-pelagics-fishery-insonora-gulf-of-california/@@assessment
Reglamento de la Ley de Pesca NOM-003-SAG/PESC- 2018 https://vlex.com.mx/vid/nom003-sag-pesc-773892697

Standard clause 1.3.2.1.3

Links	
MARINTRUST Standard clause	1.3.2.1.3, 1.3.2.1.4
FAO CCRF	7.2.1, 7.22 (e), 7.5.3
GSSI	D3.04, D6.01

A4	**Stock Status - Minimum Requirements**		
	A4.1	The stock is at or above the target reference point, OR IF NOT: The stock is above the limit reference point or proxy and there is evidence that a fall below the limit reference point would result in fishery closure OR IF NOT: The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.	Yes
		Clause outcome:	**PASS**

A4.1 The stock is at or above the target reference point, OR IF NOT:

The stock is above the limit reference point or proxy and there is evidence that a fall below the limit reference point would result in fishery closure OR IF NOT:

The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.

Between 2008/09 and 2013/14 the trend in the abundance series (in number and weight) was downward, however in recent years there was an upward trend: the spawning biomass increased from around 432,000 t in 2014 / 15 to almost 1,020 million tons in 2017 / 18-2018 / 19, while the exploitable biomass behaves the same way as the spawners, but the values in 2014/15 were almost 409,000 tons while this value increased to approximately 876,000 tons in 2016 / 17 and an average of 1,288 million tonnes in 2017 / 18-2018 / 19. The annual fishing mortality rate and the exploitation rate (E = 1-exp (-F)) show values below 0.15 / year for almost the entire time period, with some seasons where these values were between 0.16 and 0.23, with a maximum peak in 1988/89 and the second highest peak in 2008/09. A similar trend presents E = Ctotal / Bexp, although higher values are observed with respect to E = 1-exp (-F), but the peaks occur in the

same stations. Fishing mortality and E in the MSY (FMSY = 0.309 and EMSY = 0.266), were much higher than the Fcurrent= 0.107 / year and Ecurrent = 0.101 year. On the other hand, the estimate of the spawning biomass in the MSY was BMSY = 557,053 t, biomass lower than that estimated for the last years. When applying the control rule (BAC = (Bexp - BMIN) * FRACTION) stipulated in the Fisheries Management Plan, considering that BMIN = 120,000 t and FRACTION = 1-exp (-FMSY), it was found that the population of Pacific the sardine it has been exploited below the estimated BAC in the period of time analysed. Considering the current trend in the biomass of the Pacific sardine, as well as an exploitation level of 0.266, the BAC for the 2019-2020 period would be 206,480 tons. A Kobe diagram presented in the last MSC Surveillance audit showed that the Pacific sardine population is in good condition and the fishing effort has been below the recommended maximum, so there is no overfishing. Evidence that stock availability has shifted rather than declined and that catch has historically remained below BAC supports the conclusion that it is highly likely that the stock is at or above target reference point.

Therefore, The stock is above the biomass target level, and fishing mortality is well below the target and it passes the clauseA 4.1

References

Reglamento de la Ley de Pesca NOM-003-SAG/PESC- 2018 https://vlex.com.mx/vid/nom003-sag-pesc-773892697
CS Global Services Report. 2020. SMALL PELAGICS FISHERY IN SONORA, GULF OF CALIFORNIA. Second Surveillance Audit Report. 70 pp. SCS global services.
https://sardinagolfodecalifornia.org/wp-content/uploads/2021/02/2020-Segundo-Informe-Auditoria-Vigilancia.pdf
Nevarez-Martínez, M., M. Martínez Zavala, A. E. Lopez-Lagunas, J. P. Santos-Molina, C. I. Navarro-Bojórquez, J. Álvarez-Trasviña, A. Valdéz Pelayo, V. González-Máynez, D. I. Arizmendi-Rodriguez, J. J. Avilés-Hernández, and H. Villalobos-Ortíz. 2019. La pesquería de peces pelágicos menores, su variabilidad y su relación con la variabilidad ambiental y la pesca. 74 pp. INAPESCA, CRIP-Guaymas, Sonora.
SCS Global Services Report. 2019. SMALL PELAGICS FISHERY IN SONORA, GULF OF CALIFORNIA. First Surveillance Audit Report. 83 pp.
https://sardinagolfodecalifornia.org/wp-content/uploads/2021/02/2019-Primer-Informe-Auditoria-Vigilancia.pdf

Links	
MARINTRUST Standard clause	**1.3.2.1.4**
FAO CCRF	**7.2.1, 7.2.2 (e)**
GSSI	**D6 01**

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.

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. Where a species fails this Clause, it may be assessed as a Category D species instead, EXCEPT if there is evidence that it is currently below the limit reference point.

Species Name		**Mackerel, *Scomber japonicus***	
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.	Yes
	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.	Yes
		Clause outcome:	Pass

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.

The landing notification forms are provided and collected by regional offices of CONAPESCA. Data are processed and analysed by INAPESCA; results presented in official reports of fishery catch and effort. Landings data for Mackerel have been recorded since 1999. Mackerel present trends of variable abundance. Peaks appear to be on an approximate five-year cycle.

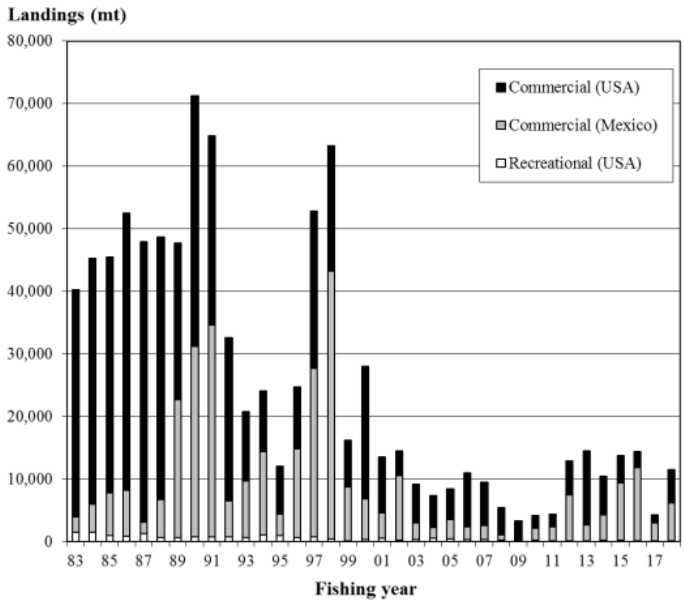

Figure 2. Landings of Pacific mackerel by fishery (1983-18). Landings in fishing year 2018 represent average values from 2013-17. Model ALT_19 is based a single, combined (commercial and recreational) fishery. Source: NOAA 2019

Fishery removals of the species in the fishery under assessment are included in the stock assessment process and it PASSES the clause C1.1.

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.

The last stock assessment was carried out in 2019, in this assessment, the spawning stock biomass (SSB) time series along with 95% confidence intervals (CI) are presented in Figure below. The estimated SSB of Pacific mackerel decreased from

2008 to 2016, with SSB increasing recently and into the forecast period, based on relatively high recruitment abundance estimated in 2018.

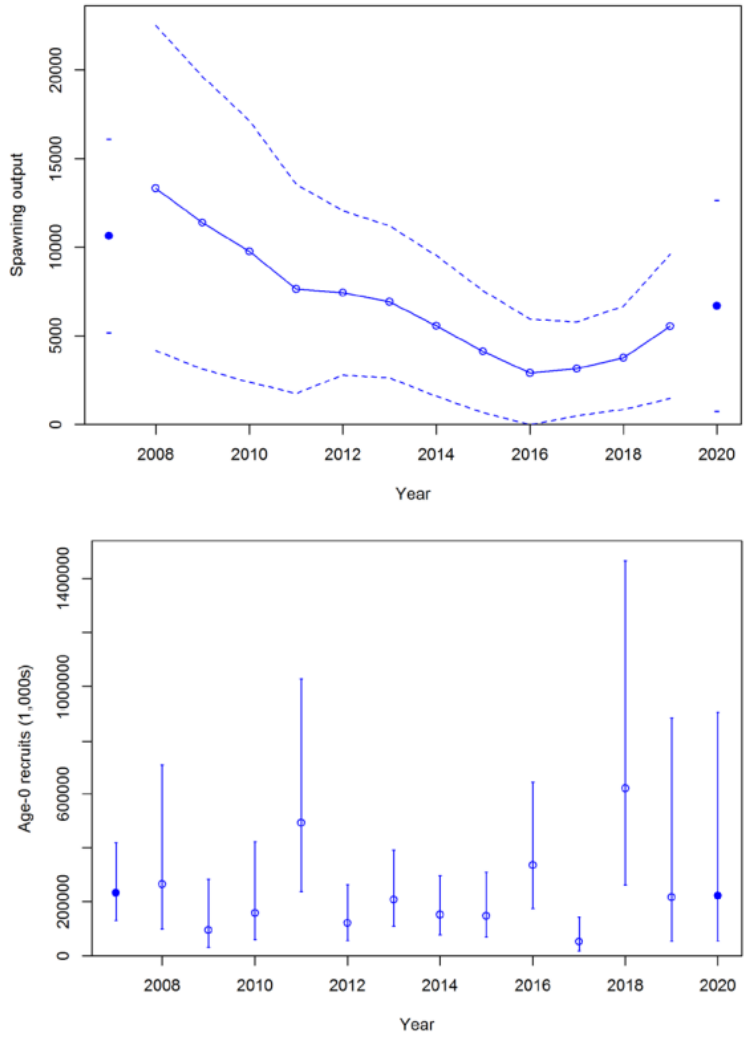

Figure 3. Estimated spawning stock biomass (female SSB, mt, top) and recruitment age-0 fish in 1,000s, bottom) time series with 95% CIs) for final base model ALT_19. Solid dots represent virgin-unfished and forecast year (2020) estimates. Source: NOAA 2019.

The harvest control rules defined for 2021 are detailed in the table below:

Table 1. Pacific mackerel harvest control rules and associated management metrics for final base model ALT_19: 2020-21 fishing year. Source: NOAA 2021.

Harvest Control Rule Formulas					
OFL = BIOMASS * E_{MSY} * DISTRIBUTION					
ABC = BIOMASS * $BUFFER_{P\text{-}star}$ * E_{MSY} * DISTRIBUTION					
HG = (BIOMASS - CUTOFF) * E_{MSY} * DISTRIBUTION					
Harvest Formula Parameters					
BIOMASS (ages 1+, mt)	56,058				
P-star	0.45	0.40	0.35	0.30	0.25
ABC Buffer(Tier 1 Sigma=0.5)	0.935	0.873	0.813	0.754	0.696
ABC Buffer(Tier 2 Sigma=1.0)	0.874	0.762	0.661	0.569	0.484
E_{MSY}	0.3				
CUTOFF (mt)	18,200				
DISTRIBUTION (U.S.)	0.7				
Harvest Control Rule Values (MT)					
OFL =	**11,772**				
ABCTier 1 =	13,960	13,035	12,139	11,258	10,392
ABCTier 2 =	13,050	11,377	9,869	8,496	7,227
HG =	**7,950**				

Since 2008 the landings have been below the HG/ACL, therefore the stock PASSES the clause C1.2.

References

Crone, P.R., Hill. K.T., Zwolinski, J.P., Kinney, M.J. 2019. Pacific mackerel (*Scomber japonicus*) stock assessment for U.S. management in the 2019-20 and 2020-21 fishing years. Pacific Fishery Management Council, Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 101, Portland, OR 97220. 112 p.

Links	
MARINTRUST Standard clause	1.3.2.2
FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

CATEGORY D SPECIES

Category D species are those which make up less than 5% of landings and are not subject to a species-specific management regime. In the case of mixed trawl fisheries, Category D species may make up the majority of landings. The comparative lack of scientific information on the status of the population of the species means that a risk-assessment style approach must be taken.

D1	**Species Name**	**Californian anchovy, Anchoveta norteña, *Engraulis mordax***	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	1.9	1
	Average maximum age (years)	6.9	1
	Fecundity (eggs/spawning)	49,143 [4,025-600,000]	1
	Average maximum size (cm)	24.8	1
	Average size at maturity (cm)	11.6	1
	Reproductive strategy	Non-guarders: open water/substratum egg scatterers	1
	Mean trophic level	3.1	3
		Average Productivity Score	**1.28**
	Susceptibility Attribute	**Value**	**Score**
	Overlap of adult species range with fishery	Between 25 to 50 % of the stock	2
	Distribution	Northeast Pacific: northern Vancouver Island south to Cape San Lucas, Baja California, Mexico.	1
	Habitat	Pelagic	3
	Depth range	0-310 m	2
	Selectivity	Species 1 to 2 times mesh sizes	2
	Post-capture mortality	Most dead	3
		Average Susceptibility Score	**2.33**
		PSA Risk Rating (From Table D3)	**PASS**
		Compliance rating	**PASS**

References

https://www.fishbase.se/summary/Engraulis-mordax.html

Standard clauses 1.3.2.2

D1	Species Name	Bocona sardine, *Cetengraulis mysticetus*	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	0.6	1
	Average maximum age (years)	2.1	1
	Fecundity (eggs/spawning)	No value	Not scored
	Average maximum size (cm)	22	1
	Average size at maturity (cm)	10.9	1
	Reproductive strategy	Non-guarders: open water	1
	Mean trophic level	2.5	1
		Average Productivity Score	**1**
	Susceptibility Attribute	**Value**	**Score**
	Overlap of adult species range with fishery	>50 %	3
	Distribution	Throughout region/global distribution. Eastern Pacific: southwestern coast of Baja California, Mexico and from the Gulf of California to northern Peru (up to the Bay of Sechura).	1
	Habitat	Pelagic	1
	Depth range	0-32 m	3
	Selectivity	1 to 2 times mesh size	2
	Post-capture mortality	Most dead	3
		Average Susceptibility Score	**2.75**
		PSA Risk Rating (From Table D3)	**PASS**
		Compliance rating	**PASS**

References

https://www.fishbase.se/summary/Cetengraulis-mysticetus.html

Standard clauses 1.3.2.2

D1	Species Name	Japanese sardine, *Etrumeus teres ~ e. sardina*	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	0.5	1
	Average maximum age (years)	1.7	1
	Fecundity (eggs/spawning)	No value	Not scored
	Average maximum size (cm)	33	1
	Average size at maturity (cm)	13.8	1
	Reproductive strategy	Non-guarders: open water	1
	Mean trophic level	3.6	3
		Average Productivity Score	**1.33**
	Susceptibility Attribute	**Value**	**Score**
	Overlap of adult species range with fishery	< 25 %	1
	Distribution	Throughout region	Not used
	Habitat	Pelagic	Not used
	Depth range	0-125 m	3
	Selectivity	1 to 2 times mesh size	2
	Post-capture mortality	Most dead	3
		Average Susceptibility Score	**2.25**
		PSA Risk Rating (From Table D3)	**PASS**
		Compliance rating	**PASS**

References

https://www.fishbase.se/summary/Etrumeus-sadina.html

Standard clauses 1.3.2.2

D1	Species Name	Leatherjackets, *Oligoplites sp.*	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	2.2	2
	Average maximum age (years)	9.5	1
	Fecundity (eggs/spawning)	No value	-
	Average maximum size (cm)	58.1	1
	Average size at maturity (cm)	32.1	2
	Reproductive strategy	Egg scatterers	1
	Mean trophic level	4.3	3
		Average Productivity Score	**1.66**
	Susceptibility Attribute	**Value**	**Score**
	Overlap of adult species range with fishery	Not scored	-
	Distribution	Globally	1
	Habitat	Muddy sandy	3
	Depth range	0-50 m	-
	Selectivity	>2 times mesh size	3
	Post-capture mortality	Most retained	3
		Average Susceptibility Score	**2.5**
		PSA Risk Rating (From Table D3)	**PASS**
		Compliance rating	**PASS**

References

https://www.fishbase.de/summary/1001

Standard clauses 1.3.2.2

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	Low productivity/ High risk	Medium productivity/ Medium risk	High productivity/ Low risk
	Score 3	Score 2	Score 1
Average age at maturity (years)	>4	2 to 4	<2
Average maximum age (years)	>30	10 to 30	<10
Fecundity (eggs/spawning)	<1 000	1 000 to 10 000	>10 000
Average maximum size (cm)	>150	60 to 150	<60
Average size at maturity (cm)	>150	30 to 150	<30
Reproductive strategy	Live bearer, mouth brooder or significant parental investment	Demersal spawner "berried"	Broadcast spawner
Mean trophic level	>3.25	2.5–3.25	<2.5

Susceptibility attributes		High susceptibility/ High risk	Medium susceptibility/ Medium risk	Low susceptibility/ Low risk
		Score 3	Score 2	Score 1
Availability	1) Overlap of adult species range with fishery	>50% of stock occurs in the area fished	Between 25% and 50% of the stock occurs in the area fished	<25% of stock occurs in the area fished
	2) Distribution	Only in the country/ fishery	Limited range in the region	Throughout region/ global distribution
Encounterability	1) Habitat	Habitat preference of species make it highly likely to encounter trawl gear (e.g. demersal, muddy/sandy bottom)	Habitat preference of species make it moderately likely to encounter trawl gear (e.g. rocky bottom/reefs)	Depth or distribution of species make it unlikely to encounter trawl gear (e.g. epi-pelagic or meso-pelagic)
	2) Depth range	High overlap with trawl fishing gear (20 to 60 m depth)	Medium overlap with trawl fishing gear (10 to 20 m depth)	Low overlap with trawl fishing gear (0 to 10 m, >70 m depth)
Selectivity		Species >2 times mesh size or up to 4 m length	Species 1 to 2 times mesh size or 4 to 5 m length	Species <mesh size or >5 m length
Post capture mortality		Most dead or retained Trawl tow >3 hours	Alive after net hauled Trawl tow 0.5 to 3 hours	Released alive Trawl tow <0.5 hours

Note: Availability 2 is only used when there is no information for Availability 1; the most conservative score between Encounterability 1 and 2 is used.

D3		Average Susceptibility Score		
		1 - 1.75	1.76 - 2.24	2.25 - 3
Average Productivity Score	1 - 1.75	PASS	PASS	PASS
	1.76 - 2.24	PASS	PASS	TABLE D4
	2.25 - 3	PASS	TABLE D4	TABLE D4

D4	Species Name		
	Impacts On Species Categorised as Vulnerable by D1-D3 - Minimum Requirements		
	D4.1	The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.	
	D4.2	There is no substantial evidence that the fishery has a significant negative impact on the species.	
		Outcome:	

Evidence

D4.1: The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.

D4.2 There is no substantial evidence that the fishery has a significant negative impact on the species.

References

Links	
MARINTRUST Standard clause	1.3.2.2, 4.1.4
FAO CCRF	7.5.1
GSSI	D.5.01

FURTHER IMPACTS

The three clauses in this section relate to impacts the fishery may have in other areas. A fishery must meet the minimum requirements of all three clauses before it can be recommended for approval.

Note that as a part of the verification tool report the clauses F are not assessed herein. They are covered under section P2 PIs of the MSC certified fisheries and it is assumed that they are equivalent to clauses F in MarinTrust whole fish report.

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.

Glossary

Non-target: Species for which the gear is not specifically set, although they may have immediate commercial value and be a desirable component of the catch. OECD (1996), Synthesis report for the study on the economic aspects of the management of marine living resources. AGR/FI(96)12

Target: In the context of fishery certification, the target catch is the catch of stock under consideration by the unit of certification – i.e. the fish that are being assessed for certification and ecolabelling. (GSSI)