MarinTrust Standard V2

Reduced Whole Fish Assessment (Category C and/or D) - MSC verification

MSCV19 Mexico - Southern Gulf of California Thread Herring By-Catch assessment - FAO 77, southern Gulf of California (Sinaloa and Nayarit)

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Table 1 Application details and summary of the assessment outcome

Fishery Under Assessment	Species:	Pacific chub mackerel (*Scomber japonicus*) ["*macarela*", in Spanish] Pacific anchoveta/Bocona sardine (*Cetengraulis mysticetus*) ["*sardina bocona*" or "*chuhueco*", in Spanish] Pacific jack mackerel (*Trachurus symmetricus*) ["*Charrito*", in Spanish]
	Geographical area:	Mexican territorial waters in the states of Sinaloa and Nayarit. Fishing occurs between 26° N at Punta Ahome near the northern border of the State of Sinaloa with Sonora and 20.5° N near Cabo Corrientes in the State of Jalisco.
	Country of origin of the product:	Mexico
	Stock:	Pacific chub mackerel in Gulf of California Pacific anchoveta/Bocona sardine in Gulf of California Pacific jack mackerel in Gulf of California
	MSC-certified fishery name:	Southern Gulf of California Thread Herring
Date	November 2024	
Report Code	MSCV19	
Assessor	Ana Elisa Almeida Ayres	
Country of origin of the product - PASS	Pass (Mexico)	
Country of origin of the product – FAIL	N/A	

Application details and summary of the assessment outcome			
Company Name(s): Maz Industrial SA de CV			
Country: Mexico			
Certification Body Details			
Name of Certification Body:		Global Trust Certification/NSF	
Assessor	Peer Reviewer	Assessment Days	Initial/Surveillance/ Re-approval
Ana Elisa Almeida Ayres	Matthew Jew	0.75	Surveillance 1
Assessment Period	November 2024 – November 2025		
Assessment Validity	November 2025		

Scope Details	
Species	Pacific chub mackerel (*Scomber japonicus*) [“*macarela*”] Pacific anchoveta/Bocona sardine (*Cetengraulis mysticetus*) [“*sardina bocona*” or “*chuhueco*”] Pacific jack mackerel (*Trachurus symmetricus*) [“*Charrito*”]
Stock	Pacific chub mackerel in Gulf of California Pacific anchoveta/Bocona sardine in Gulf of California Pacific jack mackerel in Gulf of California
Fishery Location	Mexican territorial waters in the states of Sinaloa and Nayarit. Fishing occurs between 26° N at Punta Ahome near the northern border of the State of Sinaloa with Sonora and 20.5° N near Cabo Corrientes in the State of Jalisco
Management Authority (Country/ State)	Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food SAGARPA, Mexico
Gear Type(s)	Purse seine nets
Outcome of Assessment	
Peer Review Evaluation	Agree with assessor’s determination
Recommendation	**Approved**

Table 2. Assessment Determination

Assessment Determination
Pacific anchoveta/Bocona sardine (*Cetengraulis mysticetus*) ["*sardina bocona*" or "*chuhueco*"], Pacific jack mackerel (*Trachurus symmetricus*) ["*Charrito*"] and Pacific chub mackerel (*Scomber japonicus*) ["*Macarela*"] are secondary minor species of the Southern Gulf of California Thread Herring MSC certified assessment, composing 0.45%, 0.77% and 0.69% of the catches, respectively (MSC, 2022). If any species is categorised as Endangered or Critically Endangered on Union for Conservation of Nature's Red List of Threatened Species – IUCN's Red List, or if it appears in the Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES appendices, it cannot be approved for use as Marin Trust raw material. Pacific anchoveta/Bocona, Pacific jack mackerel, and Pacific chub mackerel are not categorised as Endangered or Critically Endangered on IUCN's Red List and do not appear in CITES appendices; therefore, they are eligible for approval for use as Marin Trust by-product raw material. Pacific anchoveta/Bocona sardine and Pacific jack mackerel are managed passively, while Pacific chub mackerel is managed actively according to the Mexican Management Plan. The active management requires a formal stock assessment with reference points and control rules, as opposed to the passive management that only requires monitoring landings with a maximum percentage of fish smaller than the legal minimum size. Although it is under the passive management status, reference points were available for Pacific anchoveta/Bocona sardine, thus, this species, together with Pacific chub mackerel were assessed under category C and Pacific jack mackerel, under the category D. Fishery removals of the Pacific chub mackerel and Pacific anchoveta/bocona sardine are included in the stock assessment process, thus the species passed C.1.1. Its biomass is above the Maximum Sustainable Yield; thus, it passed C.1.2. Pacific jack mackerel was awarded a Productivity score of 1.29 and a Susceptibility score of 2.5, leading to a "Pass" rating against Table D3 of the Productivity-Susceptibility Analysis – PSA. Therefore, Pacific anchoveta/Bocona, Pacific jack mackerel, and Pacific chub mackerel in Mexican territorial waters in the states of Sinaloa and Nayarit. Fishing occurs between 26° N at Punta Ahome near the northern border of the State of Sinaloa with Sonora and 20.5° N near Cabo Corrientes in the State of Jalisco are APPROVED for the production of fishmeal and fish oil under the current MarinTrust v2.3 by-products standard. Reference: MSC. 2022. Southern Gulf of California Thread Herring Fishery, Sinaloa & Nayarit, Mexico. MSC Fishery Assessment Report. Public Certification Report. https://fisheries.msc.org/en/fisheries/southern-gulf-of-california-thread-herring/@@view

Fishery Assessment Peer Review Comments
The assessor correctly classified Pacific chub mackerel, Pacific anchoveta/Bocona sardine, and Pacific jack mackerel all in Gulf of California as the correct categorization. Pacific chub mackerel is subject to an active management regime and was assessed as Category C. Whereas, Pacific anchoveta/Bocona sardine and Pacific jack mackerel are not subject to active management and are managed passively. However, there are reference points defined for the Pacific anchoveta, so it was assessed under Category C. Only the Pacific jack mackerel was assessed under Category D. Catches of Pacific chub mackerel are considered in the stock assessment process and biomass is currently above MSY (target reference point). This stock passes Clauses C.1.1 and C.1.2. Catches of Pacific anchoveta are considered in the stock assessment process and biomass is currently above MSY (target reference point). This stock passes Clauses C.1.1 and C.1.2. The assessor correctly assigned values and scores on table D1 (Pacific jack mackerel). The given average attribute scores result in passing scores on Table D3 for the Pacific jack mackerel. Pacific chub mackerel, Pacific anchoveta/Bocona sardine, and Pacific jack mackerel all in Gulf of California passes their respective categories and should be approved under the MarinTrust Standard v.2.3.
Notes for On-site Auditor
N/A

Note: This assessment is only allowed through the MarinTrust MSC Verification Tool, which accepts assessments of "by-catch" species from MSC-certified fisheries from applicants holding valid MSC Chain of Custody Certificates.

This reduced whole fish assessment recognises the equivalence between the MarinTrust, the Management, Ecosystem and Category A species against the MSC Fisheries Standard through the MarinTrust recognition process.

Species Categorisation

NB: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in CITES Appendix 1, it **cannot** be approved for use as an MarinTrust raw material.

IUCN Red list Category

Raw material from a species listed by IUCN (the International Union for Conservation of Nature) under the Red List for the following categories shall immediately fail the assessment;

- EXTINCT (E) AND EXTINCT IN THE WILD (EW)
- CRITICALLY ENDANGERED (CR) facing an extremely high risk of extinction in the wild.
- ENDANGERED (EN) facing a very high risk of extinction in the wild.

Raw material may be used from the following categories provided that all clauses in the MarinTrust standard are passed.

- VULNERABLE (VU) facing a high risk of extinction in the wild.
- NEAR THREATENED (NT) does not qualify for above now, but is close or is likely to qualify for, a threatened category in the near future.
- LEAST CONCERN (LC) Widespread and abundant.
- DATA DEFICIENT (DD) and NOT EVALUATED (NE)

Table 3 Species Categorisation Table

Note: Category A species are approved through recognition of MSC certified fisheries through the MarinTrust MSC verification tool.

Common name	Latin name	Stock	Management	Category	IUCN Red List Category[1]	CITES Appendix 1[2]
Pacific chub mackerel ["*macarela*", in Spanish]	*Scomber japonicus*	Pacific chub mackerel in Gulf of California Pacific	Yes	C	LC[3]	No
Pacific anchoveta/Bocona sardine ["*sardina bocona",* in Spanish]	*Cetengraulis mysticetus*	Pacific anchoveta/Bocona sardine in Gulf of California	Yes	C	LC[4]	No
Pacific jack mackerel ["*charrito*" in Spanish]	*Trachurus symmetricus*	Pacific jack mackerel in Gulf of California	Yes	D	LC[5]	No

[1] https://www.iucnredlist.org/
[2] https://cites.org/eng/app/appendices.php
[3] https://www.iucnredlist.org/species/170306/170083106
[4] https://www.iucnredlist.org/species/183878/102902497
[5] https://www.iucnredlist.org/species/183729/8166054

CATEGORY C SPECIES

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 should be marked as 'N/A'. Where a species fails this Clause, it should be assessed as a Category D species instead.

Species Name		**Pacific chub mackerel (*Scomber japonicus*) ["*Macarela*"]**	
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

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.

In the Mexican Pacific, there are two sub-populations, one in the Gulf of California and the other on the northwestern coast of the Baja California peninsula, with an overlapping area in Bahia Magdalena (Gluyas-Millán and Quiñónez-Velázquez 1996). The status of Pacific chub mackerel in Gulf of California was determined by a surplus production dynamic model (Schaefer) with a CMSY++ method using historical catch data in the last stock assessment available (MSC, 2023). The values of the parameters of the Schaefer model and the reference points obtained with the dynamic biomass model for chub mackerel in the northern Gulf of California, are shown in Table 3.

Table 3. Parameters and reference point obtained from the fitted Schaefer model of chub mackerel from the northern Gulf of California [INAPESCA (2022), adapted by MSC (2023)].

Parameter	Chub mackerel
r	0.800
K	336
Q	0.292
MSY	67,200
BMSY	168,00
FMSY	0.400
F last year	0.120
B last year	252,000
B/BMSY	1.500
F/FMSY	0.300

Catches of Pacific chub mackerel are represented in Figure 1.

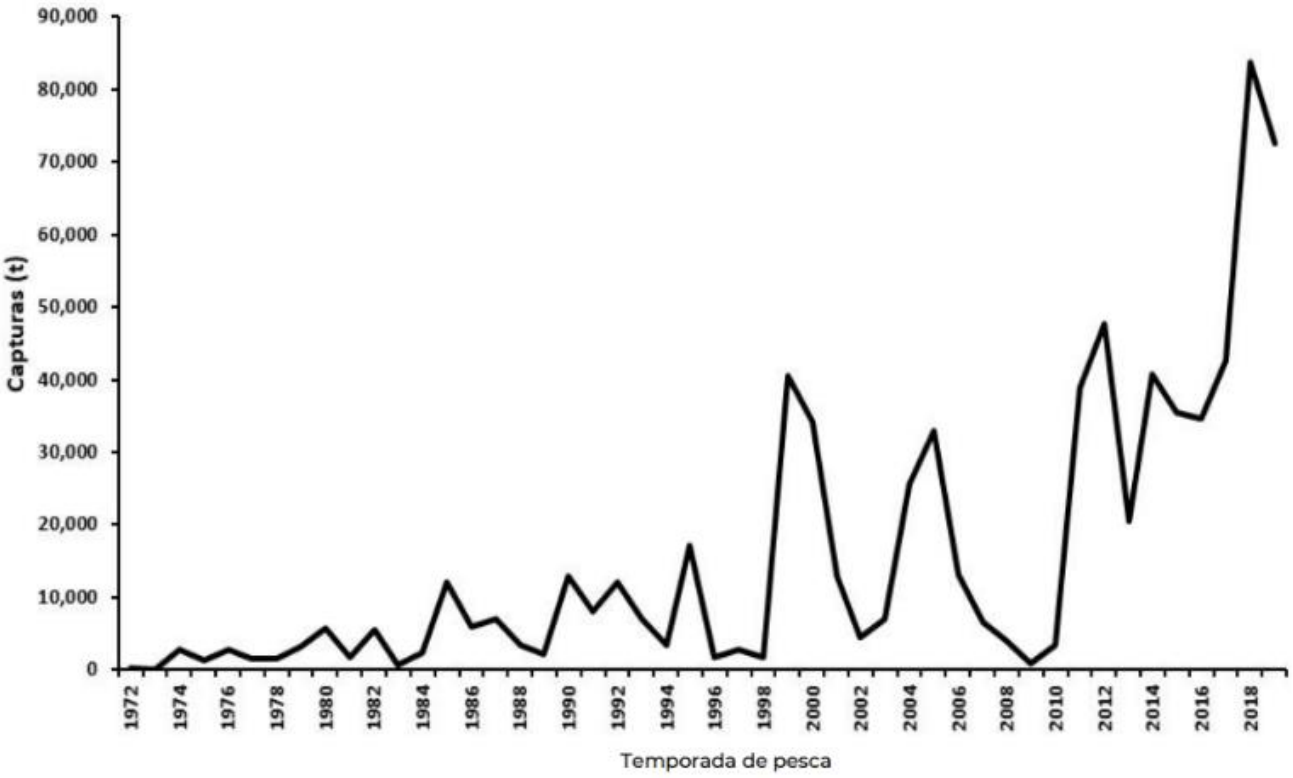

Figure 1. Catches of Pacific chub mackerel in the nothern Gulf of California [Nevárez-Martínez *et al*., 2020, adapted by MSC (2023)].

Fishery removals of the species in the fishery under assessment are included in the stock assessment process. C.1.1 is met.

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.

According to MSC (2023), the relative biomass ratio (Bt/ BMSY) of chub mackerel in the northern Gulf of California is between 1.5 and 2.0, which corresponds to a relative fishing mortality of Ft / FMSY ≤ 0.3. The chub mackerel stock in the Gulf of California is healthy and exploitation rates have been lower than MSY, therefore, there is no overfishing (Figure 2).

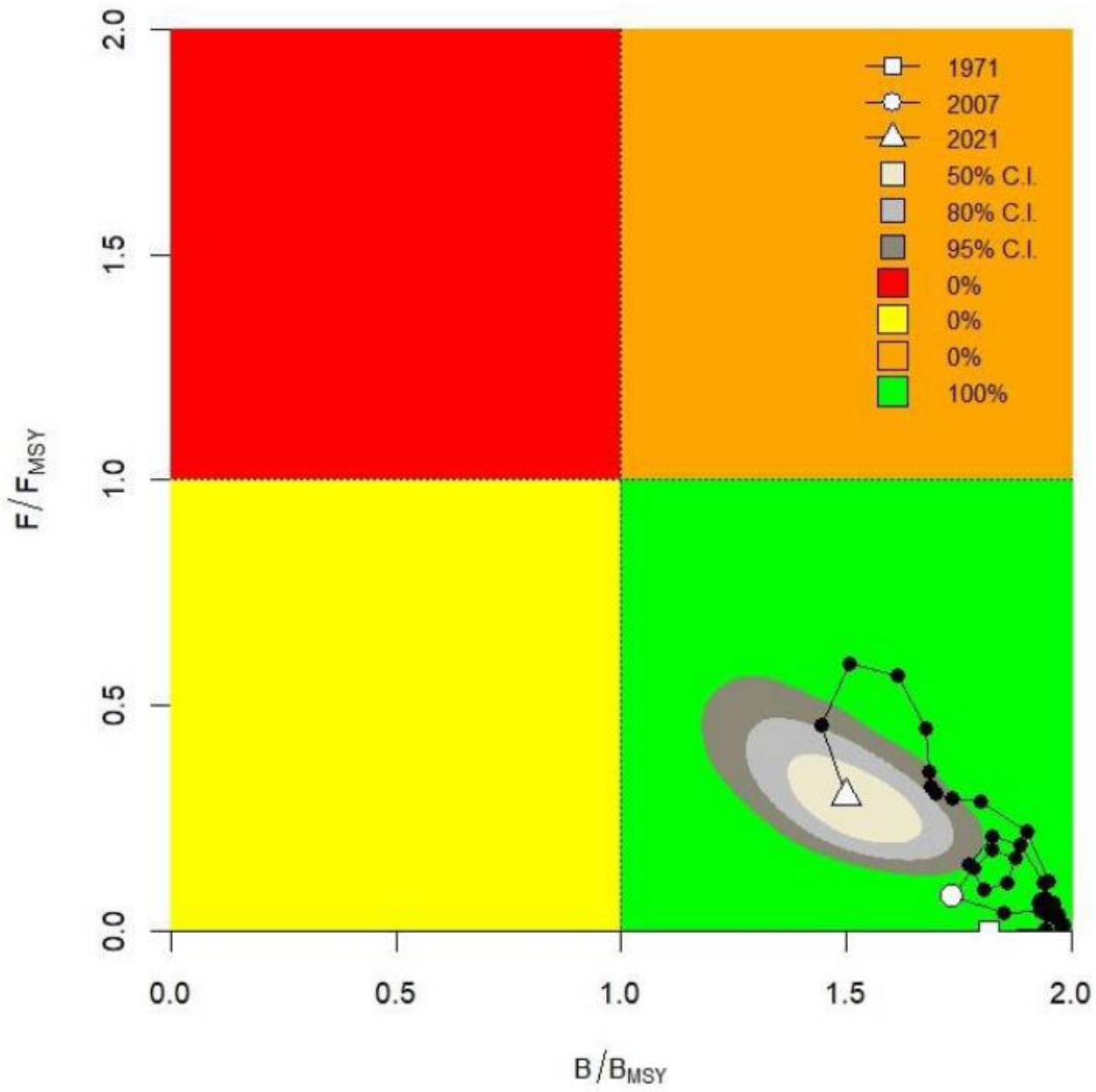

Figure 2. Kobe chart showing Anchovy biomass trajectory and its current status in the Gulf of California [INAPESCA (2022) adapted by MSC (2023).

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy). C.1.2 is met.

References

MSC. 2023. Small Pelagic Fishery in Sonora, Gulf of California. MSC Fishery Assessment Report. Public Certification Report. https://fisheries.msc.org/en/fisheries/small-pelagics-fishery-in-sonora-gulf-of-california/@@assessments

Nevárez-Martínez, M.O., M.A. Martínez-Zavala, J.P. Santos-Molina, V.E. González-Maynez, A.E. López-Lagunas and A. Valdez-Pelayo. 2020a. Evaluación pesquera de sardina bocona (*Cetengraulis mysticetus*) y anchoveta norteña (*Engraulis mordax*) en el Golfo de California, México. Periodo 1985/86 – 2018/19. Informe Técnico. Instituto Nacional de Pesca, Centro Regional de Investigación Pesquera - Guaymas, 18 p.

INAPESCA. 2022. Plan de Manejo pesquero para la pesquería de pelágicos menores (sardinas, anchovetas, macarela y afines) del Noreste de México. 12 de Agosto 2021.

https://www.gob.mx/cms/uploads/attachment/file/848506/DOF_-_Diario_Oficial_de_la_Federaci_n.pdf	
Links	
MarinTrust Standard clause	1.3.2.2
FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

Species Name		**Pacific anchoveta/bocona sardine (*Cetengraulis mysticetus*) [“*Sardina bocona*”]**	
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

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 status of Pacific anchoveta/bocona sardine in Gulf of California was determined by a surplus production dynamic model (Schaefer) with a CMSY++ method using historical catch data (MSC, 2023). The values of the parameters of the Schaefer model and the reference points obtained with the dynamic biomass model for chub mackerel in the northern Gulf of California, are shown in table 4.

Table 4. Parameters and reference point obtained from the fitted Schaefer model of Pacific anchoveta/bocona sardine from the northern Gulf of California [INAPESCA (2022), adapted by MSC (2023)].

Parameter	*Pacific anchoveta*
r	0.951
K	500
Q	0.301
MSY	120,00
BMSY	250,10
FMSY	0.475
F last year	0.132
B last year	432,00
B/BMSY	1.730
F/FMSY	0.277

Catches of Pacific anchoveta/bocona sardine are represented in Figure 3.

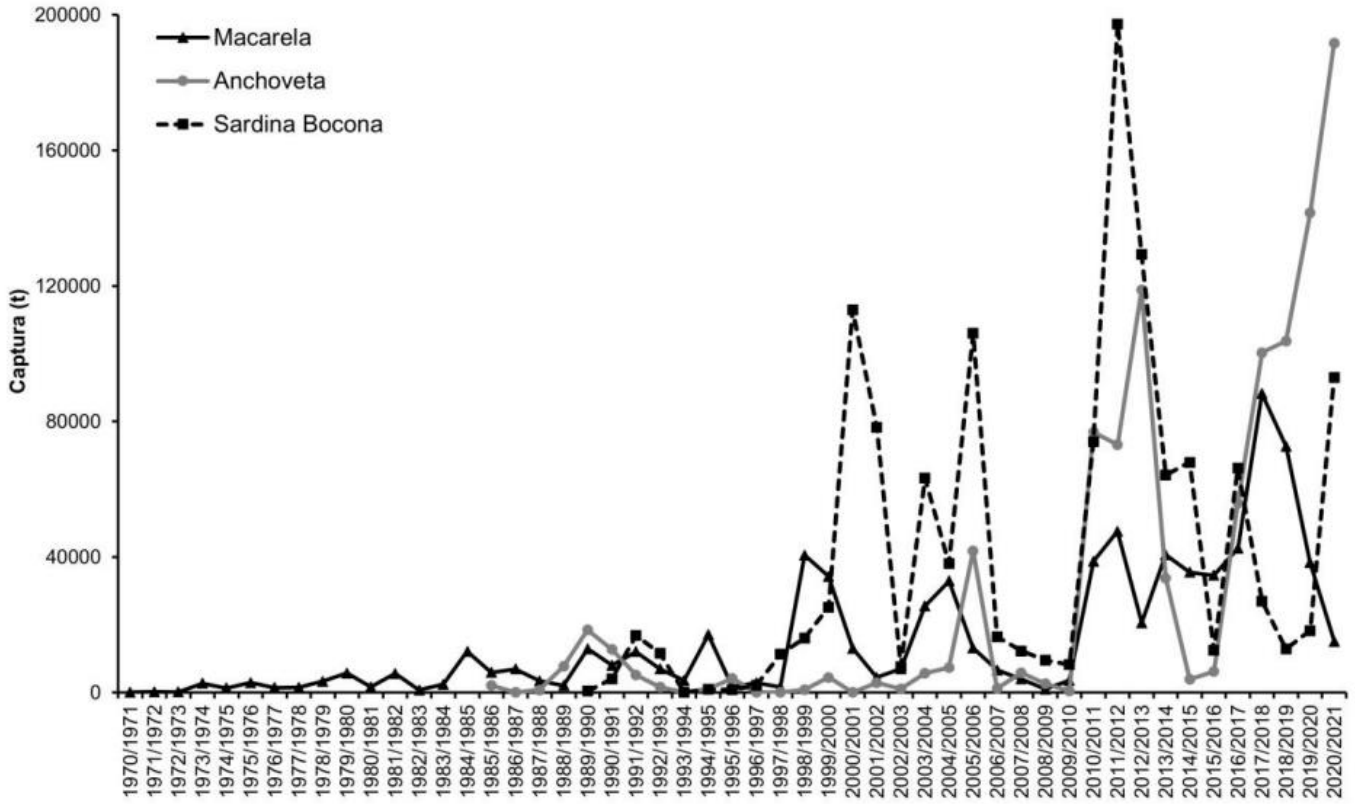

Figure 3. Catches of Pacific anchoveta/bocona sardine in Gulf of California [Nevárez-Martínez *et al*., (2022), adapted by MSC (2023)].

Fishery removals of the species in the fishery under assessment are included in the stock assessment process. C.1.1 is met.

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.

According to MSC (2023), the lowest relative biomass ratio (Bt/ BMSY) of Pacific anchoveta/bocona sardine in the northern Gulf of California over the history was 1.2 in the fishing season 2013/2014, but it is still above the limit reference point Bt / BMSY = 1.0. The stock has been healthy (Figure 4).

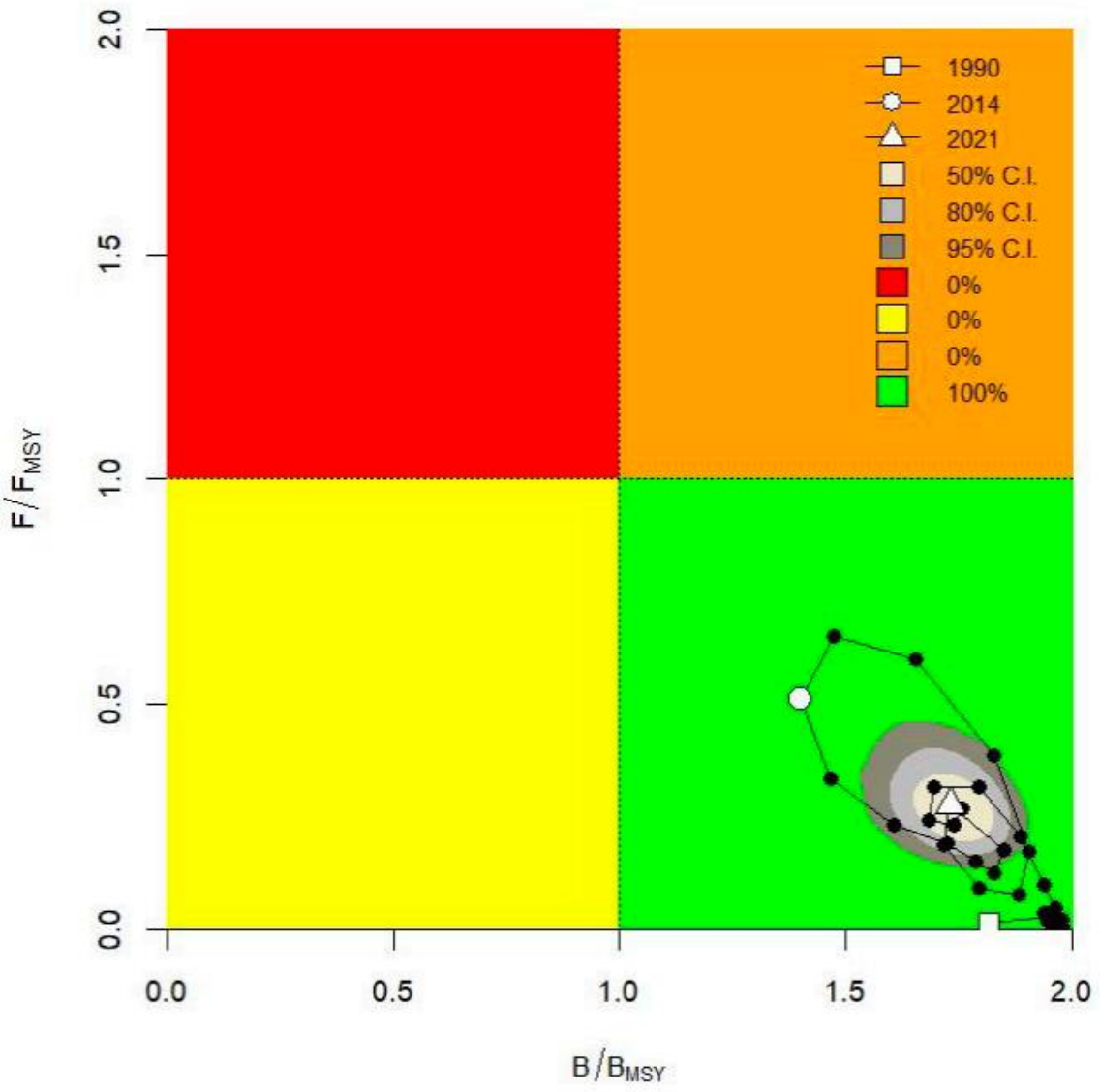

Figure 4. Temporal trend for catch, B/BMSY, F/FMSY, and Kobe plot for Pacific anchoveta/bocona sardine; trajectory (black line), MSY (dashed line) [INAPESCA (2022) adapted by MSC (2023).

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy). C.1.2 is met.

References

MSC. 2023. Small Pelagic Fishery in Sonora, Gulf of California. MSC Fishery Assessment Report. Public Certification Report. https://fisheries.msc.org/en/fisheries/small-pelagics-fishery-in-sonora-gulf-of-california/@@assessments

Nevárez Martínez M.O. et al. 2022. Evaluación pesquera de macarela (*Scomber japonicus*), anchoveta norteña (*Engraulis mordax*) y sardina Pacific anchoveta (*Cetengraulis mysticetus*) del Golfo de California, México. Inf Tec INAPESCA / CRIAP-GUAYMAS ix-2021. 25 p.

INAPESCA. 2022. Plan de Manejo pesquero para la pesquería de pelágicos menores (sardinas, anchovetas, macarela y afines) del Noreste de México. 12 de Agosto 2021.
https://www.gob.mx/cms/uploads/attachment/file/848506/DOF_-_Diario_Oficial_de_la_Federaci_n.pdf

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 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	Pacific jack mackerel (*Trachurus symmetricus*) ["*Charrito*",]	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	1.0[1]	1
	Average maximum age (years)	4.1[1]	1
	Fecundity (eggs/spawning)	>20,000[1,3]	1
	Average maximum size (cm)	55.7[1]	1
	Average size at maturity (cm)	30.9[1]	1
	Reproductive strategy	Broadcast spawner[1]	1
	Mean trophic level	3.6[1]	3
		Average Productivity Score	**1.29**
	Susceptibility Attribute	**Value**	**Score**
	Availability (area overlap)	<10	1
	Encounterability (the position of the stock/species within the water column relative to the fishing gear)	High	3
	Selectivity of gear type	Precautionary	3
	Post-capture mortality	Retained	3
		Average Susceptibility Score	**2.5**
		PSA Risk Rating (From Table D3)	**Pass**
		Compliance rating	**Pass**

Further justification for susceptibility scoring (where relevant)

For susceptibility attributes, please provide a brief rationale for scoring of parameters where there may be uncertainty affecting your decision.

Pacific jack mackerel is found in a depth range of 0 - 400 m and distributed along the eastern Pacific: southeastern Alaska to southern Baja California, Mexico and the Gulf of California; reported from Acapulco in Mexico and the Galapagos Islands[1] (Figure 5). Fishbase provides only an estimate of the maximum fecundity for this species (53,000)[1], while there are reports of 31,572-171,466 of batch fecundity in California[3]. Thus, the fecundity is estimated to be > 20,000 eggs.

Due lack of specific data of the selectivity of gear type, a precautionary score of 3 was given for this attribute.

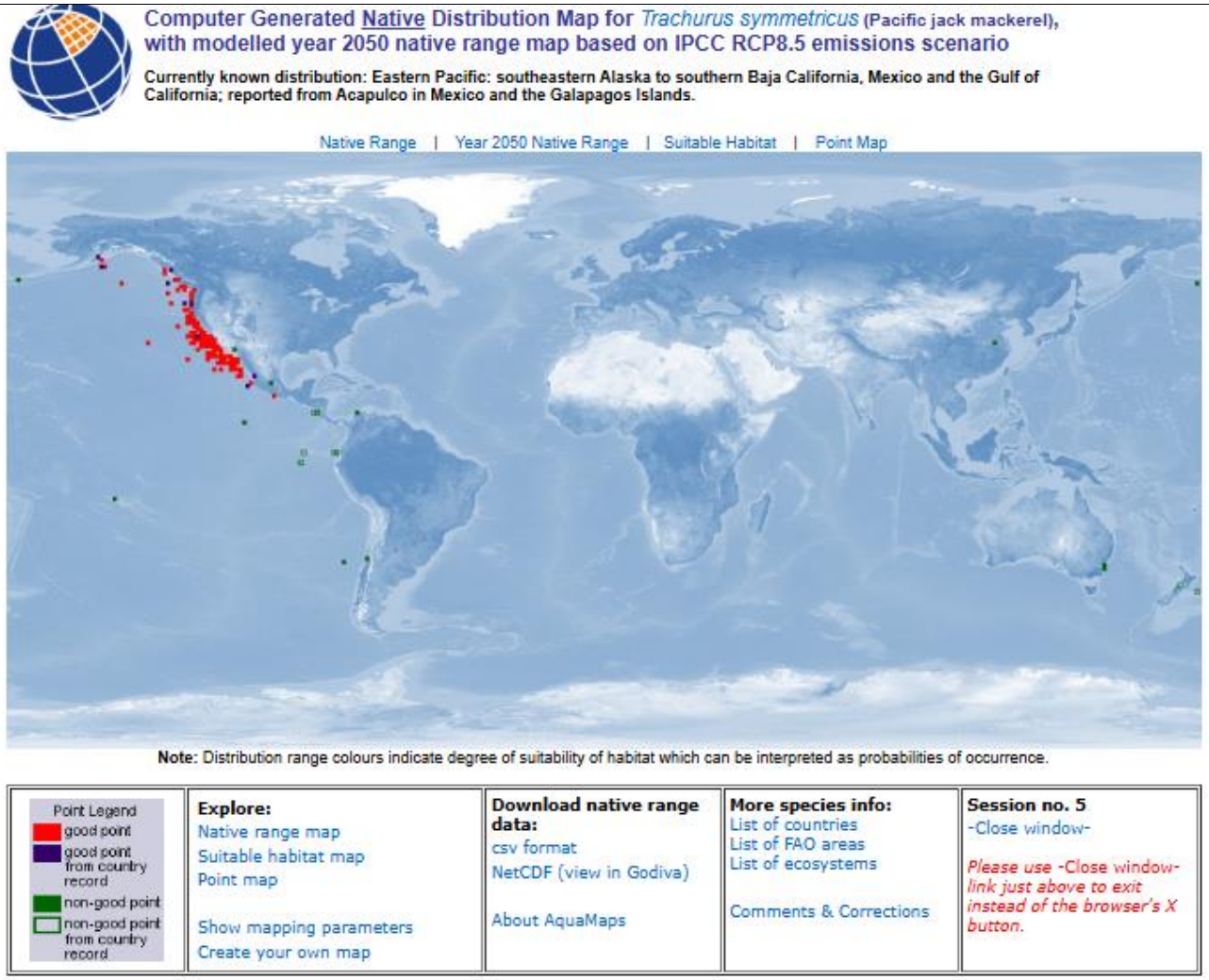

Figure 5. Distribution of Pacific jack mackerel.[2]

References

[1]Froese, R. and D. Pauly. Editors. 2024.FishBase. World Wide Web electronic publication. https://fishbase.mnhn.fr/summary/trachurus-symmetricus.html

[2]AquaMaps. 2019. Computer generated distribution maps for *Trachurus symmetricus* (Pacific jack mackerel), with modelled year 2050 native range map based on IPCC RCP8.5 emissions scenario. https://www.aquamaps.org/receive.php?type_of_map=regular&map=cached

[3]Macewicz, B.J. and Hunter, J.R. 1993. Spawning frequency and batch fecundity of jack mackerel, *Trachurus symmetricus*, off California During 1991. California Cooperative Oceanic Fisheries Investigations Reports 34: 112-121. https://www.semanticscholar.org/paper/SPAWNING-FREQUENCY-AND-BATCH-FECUNDITY-OF-JACK-Mackerel/66dc90feddd6d57a4a12e31e814790df04087a95

Standard clauses 1.3.2.2

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	High productivity (Low risk, score = 1)	Medium productivity (medium risk, score = 2)	Low productivity (high risk, score = 3)
Average age at maturity	<5 years	5-15 years	>15 years
Average maximum age	<10 years	10-25 years	>25 years
Fecundity	>20,000 eggs per year	100-20,000 eggs per year	<100 eggs per year
Average maximum size	<100 cm	100-300 cm	>300 cm
Average size at maturity	<40 cm	40-200 cm	>200 cm
Reproductive strategy	Broadcast spawner	Demersal egg layer	Live bearer
Mean Trophic Level	<2.75	2.75-3.25	>3.25

Susceptibility attributes	Low susceptibility (Low risk, score = 1)	Medium susceptibility (medium risk, score = 2)	High susceptibility (high risk, score = 3)
Areal overlap (availability) Overlap of the fishing effort with the species range	<10% overlap	10-30% overlap	>30% overlap
Encounterability The position of the stock/species within the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounterability).	Medium overlap with fishing gear.	High overlap with fishing gear (high encounterability). Default score for target species
Selectivity of gear type Potential of the gear to retain species	a Individuals < size at maturity are rarely caught	a Individuals < size at maturity are regularly caught.	a Individuals < size at maturity are frequently caught
	b Individuals < size at maturity can escape or avoid gear.	b Individuals < half the size at maturity can escape or avoid gear.	b Individuals < half the size at maturity are retained by gear.
Post-capture mortality (PCM) The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Evidence of majority released post-capture and survival.	Evidence of some released post-capture and survival.	Retained species or majority dead when released.

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