Pre-assessment report of the marine finfish fishery caught with handlines in Guaymas, Sonora, Mexico

Prepared for:

S.C.P.P. 29 de agosto.
S.C.P.P. El Resbalón.
S.C.P.P. El Mirador de la Manga.
S.C.P.P. Pesquera La Manga Restaurante Doña Rosita.
C.P.P. Pesquera Los Sazanes.
S.C.P.P. Francisco Flores.
S.C.P.P. Alianza de Pescadores de Guaymas.
S.C.P.P. Las Dallanas.
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2 Glossary

Biomass: Individual or group of individuals of a species of a stock, expressed in weight.

Bycatch: Species caught in a fishery whose objective is a different species or a different size interval of the same species.

CAB: Conformity assessment body

CNP: National Fishery Chart

CONAPESCA: National Commission of Aquaculture and Fishing, responsible for managing and organizing the fishing activity.

CPUE: Catch per Unit of Effort

CRIAP: Regional Centre for Aquaculture and Fisheries Research

DOF: Official Federation Journal.

ETP: Endangered, threatened or protected

Ecosystem health: a measure of the adaptability of the ecosystem (it's capacity to maintain its structure and pattern of behavior in the face of tensions), the organization (number and diversity of the interactions between the components of the ecosystem) and the vigor (a measure of the activity, the metabolism or the primary productivity). A healthy ecosystem is capable of maintaining its structure (organization) and function (vigor) in the long-term during situations of tension (adaptability).

Exclusive Economic Zone (EEZ): An area subject to national jurisdiction (up to 200 miles wide) declared in accordance with the provisions of the United Nations Convention regarding the Law of the Sea of 1982, in which the coastal state has the right to explore and exploit living and non-living resources and the obligation to conserve and organize them.

FIP: Fishery Improvement Project

Fishery Management Plan (FMP): Supporting instruments for the national fishing activity and are constituted of a group of actions, oriented to the development of the fishing activity in a balanced way, integral and sustainable, according to the General Law of Sustainable Fishing and Aquaculture. Their development is fundamental in the knowledge of the biological, fishing, environmental, economic, cultural and social aspects that the National Fisheries Institute collects and analyses, with the participation of the producers themselves, federal, state and municipal authorities, and academic institutes of higher education and research centres.

Fishery: The term refers to the sum of all fishing activities of a given resource. For instance, hake or shrimp, or the activities of a unique type or method of fishing for a resource, e.g. fishing with nets near the beach or trawling.

Fishing effort: Represents the number of fishing gears of a specific type used in the fishing grounds per set unit of time, p. E.g. number dragging hours, number hooks cast or number of times a purse seine is charged per day.

Fishing gear: represents the grouping of materials and equipment employed to conduct activities directed toward the extraction of fishing resources.

Fleet: total number of units of any type of fishing activity that use a specific resource.

GoC: Gulf of California

INAPESCA: Public Body that provides the scientific and aquaculture authority with solid scientific bases, with reliable data to preserve order and develop the fishery, and contribute to the care of biodiversity, ecosystems and the aquatic habitat.

La Niña: the atypical cooling of tropical water of the Pacific Ocean.

El Niño: the atypical warming of tropical water of the Pacific Ocean.

LGEEPA: General Law for Ecological Equilibrium and Environmental Protection

LGPAS: General Law of Sustainable Fishing and Aquaculture.

LGVS: General Law of Wildlife.

Handline: Fishing with hook and line.

Maximum Sustainable Yield (MSY): the maximum average that can be extracted from a long-term stock, ensuring that the stock is maintained at levels that allow continued renewal of the fishery.

MBA: Monterey Bay Aquarium

MSC: Marine Stewardship Council

OSC: Civil Society Organizations

Recruitment: are the individuals of a stock, which enter the fishery for the first time every year and are susceptible to being caught.

SADER: Ministry of Agriculture and Rural Development.

SCPBS: Cooperative Society for the Production of Goods and Services

SCPP: Cooperative Society for Fishery Production

SEMARNAT: Ministry of Environment and Natural Resources.

SEMAR: Marine Secretaryship.

SENASICA: National Service of Food Safety and Agro-Food Quality.

Small vessel: also known as “panga”; a fishing unit with an inboard or outboard motor and a maximum length of 10.5 meters, with or without an ice-based catch conservation system with a maximum autotomy of three days.

Stock: group of surviving individuals available from the cohorts of a fishery resource in a given time period, which can be referred to as biomass or number of individuals.

Trophic Level: Position of the organisms in the food chain, determined by energy transfer from one level to another.

UoA: unit of assessment is defined as what is under evaluation.

3 Executive summary

This report sets out the results of a pre-assessment of the small-scale finfish fishery caught using handlines in Guaymas, Sonora, México in relation to the Marine Stewardship Council's (MSC) Principles and Criteria for Sustainable Fishing. This pre-assessment describes the fishery in the Gulf of California, Mexico, focusing on Guaymas, Sonora, where the vessels from nine cooperatives (29 de Agosto, El Resbalón, El Mirador de la Manga, La Manga Restaurante Doña Rosita, Los Sazanes, Alianza de Pescadores de Guaymas, Francisco Flores, Las Dallanas and Pescadores de la Cantera) fish. The cooperative has 30 commercial vessels that are directly engaged in the fishery.

As part of a FIP, COBI conducted site visits from November 2018 to February 2019, prior to initiating this pre-assessment. The COBI team members participated in meetings or conducted interviews with stakeholders. COBI prepared different versions of the pre-assessment for MRAG America´s review, including a previous report (Fernández et al. 2018) that contained the introductory material for this upgraded, comprehensive report.

The pre-assessment was conducted by M.Sc. Francisco Fernández Rivera Melo, M.Sc. Alesa Flores Guzmán, and Dr. José Francisco Chávez (COBI) and reviewed by Dr. Mónica Valle-Esquivel, Jodi Bostrom, and Erin Wilson (MRAG Americas). Qualifications of the team are as follows:

M Sc. Francisco Fernandez Rivera Melo carried out the pre-assessment. He graduated from the Univerisidad Autonoma de Baja California Sur as a Marine Biologist and has a master's degree in Marine and Coastal Management. He has 15 years of experience developing and implementing projects for sustainable fisheries management in collaboration with rural communities, authorities and NGOs. He possesses solid skills in building capacity in fishermen, college students and managers. Mr. Fernandez has knowledge and experience with Mexican fisheries management tools (no-take zones, quotas, fishing gear, etc.). He is also experienced in underwater monitoring. He currently works as a sustainable fisheries coordinator at COBI. He is responsible to supervise the implementation and fundraising for the Sustainable Fisheries Program in COBI. Other activities are designed, assess and implement Fishery Improvement Projects in eight fisheries in Mexico (clams, penshell, squid, octopus, spiny lobster, ocean tilefish, yellowtail and Pacific red snapper). He is an Associate technical consultant for Marine Stewardship Council.

M. Sc. Alesa Flores Guzmán carried out the pre-assessment. She graduated from the Autonomous University of Baja California as a Biologist, focusing on ecology and resource management. Subsequently, she completed her postgraduate degree studies at the Ensenada Center for Scientific Research and Higher Education in the Department of Marine Ecology where she worked in the assessment of data-poor fisheries in Mexico. She has experience developing marine and terrestrial conservation projects with NGOs. She has more than five years of experience working with fishing communities in the Northwestern Mexico, especially with elasmobranch fisheries and currently bony fishes. At present, she works as manager of sustainable fisheries in COBI, where is responsible for developing multi-species fisheries improvement projects in northwest Mexico.

Ph D. José Francisco Chávez Villegas (drafted preliminary updated PA report) he joined COBI, A.C. in 2018 as Sustainable Fisheries Project Manager. Dr. Chávez graduated as Biologist from the Universidad de Occidente, Los Mochis, Sinaloa. He obtained his MSc and PhD degrees in Marine Sciences from the Center for Research and Advanced Studies of the National Polytechnic Institute (Cinvestav-IPN), Merida, Yucatan. He taught courses in mollusk ecology and biology at the National University of Colombia for academics and fishers groups (2010), was an associate professor at Cinvestav-IPN teaching a Mollusk Aquaculture course, and participated in scientific diffusion programs led by the Mexican Academy of Sciences of the Southeast (2009-2017). Dr. Chávez was also a professor at the Institute of Sciences and Superior Studies of Tamaulipas A.C (2015-2018), was a member of the advisory board for the International Journal of Tropical Biology and Conservation from 2013 to 2018, and collaborated in the organization of scientific meetings of the

Gulf and Caribbean Fisheries Institute (GCFI) and the Association of Marine Laboratories of Caribbean (AMLC) in Mexico (2011-2017).

Dr. Mónica Valle-Esquivel (Oversight and Review) joined MRAG Americas in 2010 as Senior Fisheries Biologist. She has over 15 years of experience in sustainable management of marine fisheries. She specialized in fish and shellfish population dynamics, stock assessment, design and evaluation of management strategies, statistical analysis, risk analysis, and fishery simulation modeling. Dr. Valle worked with the University of Miami and NOAA Fisheries as a post-doctoral stock assessment scientist, and has provided scientific advice to FAO, CITES, CARICOM, ACP Fish II, and other international organizations for the management of tropical marine species the US, Latin America, and the Caribbean. In Mexico she coordinated a United Nations (UNIDO) coastal management project within the Gulf of Mexico Large Marine Ecosystem program. At MRAG Americas, Dr. Valle has worked with institutions, scientists, fishers, managers, NGOs, and other stakeholders to promote and achieve sustainability of fishery resources around the world. She is a certified Marine Stewardship Council lead assessor, and for nine years has served as a team leader and member for several fisheries, ranging from invertebrate fisheries to highly migratory fish. Among other professional achievements, Dr. Valle has acquired wide experience in the development and implementation of fishery improvement projects and fishery management plans, in the design and analysis of various monitoring programs, and in essential fish habitat and ecosystem assessments. Dr. Valle received a B.S. degree in Biology from the National Autonomous University of Mexico (UNAM), and a Ph.D. in Marine Biology and Fisheries from the Rosenstiel School of Marine and Atmospheric Science, University of Miami.

The present pre-assessment was carried out during the period from November 2018 to March 2019, using the most adequate information available and information from meetings with nine SCPP from Guaymas, Sonora, which have traditionally harvested multiple marine finfish species using handlines. Five species were identified as targets of this fishery: yellowtail amberjack *(Seriola lalandi)*, Pacific red snapper *(Lutjanus peru)*, goldspotted sand bass *(Paralabrax auroguttatus*),, ocean whitefish *(Caulolatilus princeps),* and rooster hind *(Hyporthodus acanthistius)*,

The main strengths and weaknesses identified in the pre-assessment were:

Principle 1:

Strengths: There is sufficient information on the biology and ecology of the five target species; landing statistics and fishing information have been collected since 2005.

Weaknesses: There are no stock assessments so the current stock status of the target species is not known. There is no structured harvest strategy, there are no harvest control rules, and there is no evidence that the tools available are effective in controlling exploitation. Given that none of these key elements reach SG60, most of the P1 indicators are likely to fail, which would also fail the fishery as a whole. This principle requires the foremost attention.

Principle 2:

Strengths: Due to the selective nature of the fisheries and the type of gear (handlines) used in Guaymas (Gulf of California), the UoA would likely meet some of the criteria related to P2 of the MSC standard that considers its impact on other elements of the ecosystem – specifically bycatch, ETP species, habitat and ecosystem. Available information showed that the UoAs have limited interaction with ETP species, and are in line with Mexican policy, so ecosystem impacts are potentially well regulated.

Weaknesses: The habitat and ecosystem impacts of the UoA are not measured directly. The information used in this document was from nearby areas with similar characteristics. However, it is

necessary to conduct studies in the locality to know the impact of UoA on the habitat and the ecosystem.

Principle 3:

Strengths: The legal system in Mexico includes a structured and generally effective fisheries management system that meets most of the MSC criteria for P3. Fisheries policy is based on the Fishery Law (LGPAS) that delegates management and research responsibilities to CONAPESCA and INAPESCA. These agencies collaborate with other federal, state and municipal authorities in the development, implementation, and enforcement of fisheries laws and regulations. There is a consultation process that is open to stakeholders, and roles and responsibilities are generally clear.

Weaknesses: Most P3 issues occur within the fishery-specific management system, so conditional scores would be likely for a number of indicators. There is no evidence that consultation occurs regularly, or that local knowledge is included in management decisions. The finfish does not have a NOM or a Fishery Management Plan (FMP), and fishery-specific objectives have not been defined. Evidence of compliance by the fishery is required, as well as an assessment of the magnitude and characteristics of illegal fishing in the region. MCS activities may need to be reinforced and better documented.

Conclusion:
Overall, the team concludes that at this time the fishery is does not meet the MSC Fisheries Standard, and several improvements are necessary to meet the minimum requirements to become a candidate for certification. This pre-assessment should help to identify the main issues that the ongoing FIP should address.

4 Introduction

The present report displays the results of the pre-assessment of the marine finfish fishery caught with handlines in Guaymas, Sonora, Mexico in accordance with the principles and criteria for sustainable fishing outlined by the Marine Stewardship Council (MSC).

The pre-assessments are standard instruments that have a limited period of time to investigate, identify the actors involved, verify the available information, and outline the main components of the fishery. These data are useful to guide and inform (but not influence) future assessments, whether they seek certification or not, and to identify problems that could influence such processes.

In accordance with the above, this report represents a provisional review of the fishery against the standard or standards of the MSC, and it is based on the most updated information available and a pair of meetings with some of the interested parties. In contrast, a complete assessment is a transparent, long and rigorous process, open to public scrutiny.

In order to prepare this pre-assessment report, the requirements in the “MSC Pre-Assessment Reporting Template V3.0” provided by the MSC are used as a basis.

5 Report details

5.1 Aims and constraints of the pre-assessment

The MSC is an independent, global, non-profit organization. It works to enhance responsible management of seafood resources and to ensure the sustainability of global fish stocks and the health of the marine ecosystem. The MSC harnesses consumer power by identifying sustainable seafood products through an eco-label. The MSC has identified the following mission statement: “To safeguard the world’s seafood supply by promoting the best environmental choice.”

The objective of pre-assessments is to provide a focus for an eventual Fishery Improvement Project or MSC full assessment. This part of the process provides a basis for understanding the fishery in the context of the MSC Fishery Certification Requirements v2.0 and informs the client of the likelihood of achieving certification of their fishery. The pre-assessment also clarifies with the client the philosophy and expectations of the MSC and identifies the strengths and weaknesses of the fishery with respect to the MSC Standard.

It is important to note that a pre-assessment of a fishery does not attempt to duplicate a full assessment against the MSC Standard, and it can only provide guidance. A full assessment involves expert team members and public consultation stages that are not included in a pre-assessment. A pre-assessment provides a provisional assessment of a fishery based on a limited set of information provided by the client.

This report presents the results of the pre-assessment of the handline finfish fishery (yellowtail amberjack, Pacific red snapper, goldspotted sand bass, ocean whitefish and rooster hind) in Guaymas, Sonora, in the Gulf of California, following the sustainability criteria of the MSC. The status of the fishery is analyzed in this report in order to obtain a comprehensive overview that allows responsible decision making when implementing any fishery improvement scheme. The fishery was evaluated using the most rigorous and demanding standards that currently exist.

It should be noted that the original report was carried out by trained staff from the Civil Society Organization Comunidad y Biodiversidad, A.C. (COBI). It was originally written in Spanish (2017) and later translated into English. The English version was reviewed by MRAG Americas, and further revisions were carried out by COBI and MRAG Americas. The original report used pre-assessment version 2.0 and was updated herein to version 3.0.

There were no limitations to carrying out the pre-assessment. COBI used a wide range of background information and references. During the elaboration process, many meetings were held, and questions related to the applicability of the MSC´s performance indicators for the fishery were reviewed. However, it is important to mention that access to updated information may be limited by the organizations or agencies that are in charge of research and management of the handline finshish fishery of Guaymas. There is a generous collection of information about the species, but most remains unpublished or is not updated regularly to reflect the current situation of the fishery.

5.2 Version details

The pre-assessment was conducted in accordance with the certification requirements of the MSC v2.3. The MSC pre-assessment report template v3.0 was used for the report.

Fisheries program document versions

Document	Version number
MSC Fisheries Certification Process	**Version 2.1**
MSC Fisheries Standard	**Version 2.01**
MSC General Certification Requirements	**Version 2.3**
MSC Pre-Assessment Reporting Template	**Version 3.0**

6 Unit(s) of Assessment

6.1 Unit(s) of Assessment

Based on the information reviewed, we concluded that the fishery evaluated in this pre-assessment is within the scope of the sustainability standards defined by the MSC program since: (i) it does not use introduced species, (ii) the fishery does not make use of destructive practices such as poison or explosives, (iii) the fishery is conducted within the Mexican Exclusive Economic Zone (EEZ), (iv) the fishery is not subject to any international management agreement and (v) the fishery has not been considered within any certification process. Based on these premises, it can be confirmed that the finfish fishery of Guaymas is within the scope of the MSC fishery sustainability criteria and can be evaluated under this standard.

The finfish fishery of Guaymas is a multispecies and multigear fishery. The target species of the fishery are yellowtail amberjack (*Seriola lalandi*), Pacific red snapper (*Lutjanus peru*), goldspotted sand bass (*Paralabrax auroguttatus*), ocean whitefish (*Caulolatilus princeps*) and rooster hind (*Hyporthodus acanthustius*). The handline fishery that targets this species in the Guaymas, Sonora (Gulf of California) are within the scope of the MSC.

The unit of assessment (UoA) includes five finfish species harvested with handlines in Guaymas (Gulf of California). The fleet consists of 90 small vessels operated by nine fishing cooperatives.

This UoA was selected because finfish in the Sonora coast are subpopulations of the Gulf of California populations for two main reasons: 1) connectivity, reproduction takes place between spring-summer which is when there is a greater retention of larvae in the Sonora coast (based on particle dispersion models by CICESE) and, 2) management, CONAPESCA has defined areas of exploitation as part of the spatial management of fisheries in Mexico. Finfish permits include a specific area: marine waters of Federal Jurisdiction in the Sonora state, between Melagos (27.154770 ºN, -110.298564 ºW) and el Colorado (28.293144 ºN, -110.416398 ºW). In addition, nine fishing cooperatives in Guaymas are the largest and most organized in the region and are interested in implementing a FIP. Other eligible fishers would likely include the commercial vessels with similar characteristics that operate in the same fishing grounds but are not members of the cooperatives.

The stock structure of each the five target species is actually unknown, but a metapopulation structure with several subpopulations is hypothesized. For example, Jackson et al. (2015) studied the genetic connectivity of the leopard grouper (species with populational and biological characteristics similar to red snapper, goldspotted sand bass and rooster hind) in the Gulf of California. The study found a genetic differentiation between samples from the Baja California coast and the Sonora coast.

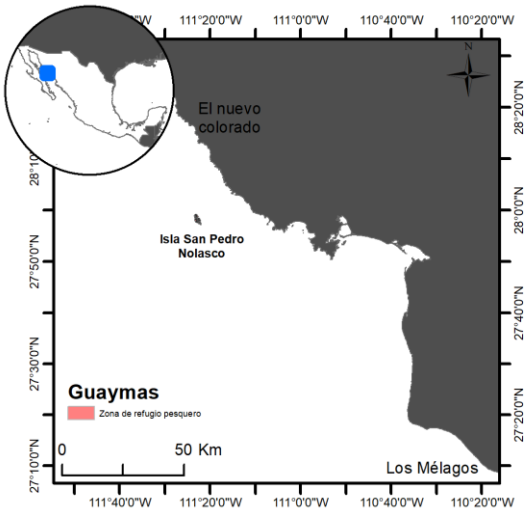
The genetic differentiation is attributed by the authors to the great oceanographic distances and the direction of the flow of the currents, which allow larvae to disperse and to concentrate, particularly around the region of Isla Tiburon and Puerto Libertad (Munguía-Vega et al., 2014). Other factors include the sampling season, habitat distribution, movement patterns of adults, and the type of seafloor concerning species habitat preference.

On the other hand, Bellquist et al. (2008) describe the home range, site fidelity and movement patterns of ocean whitefish (*Caulolatilus princeps*) using acoustic telemetry in a southern California marine reserve. They tracked 16 individuals, fitted with acoustic transmitters and found a site fidelity with periodic shifts, that did not appear to be seasonal in the area studied. Home range distribution averaged 20,439 ± 28,492 m2. This suggests the possible existence of subpopulations for this species within the Gulf of California.

There is a good possibility that other artisanal fleets from the coast of Guaymas will join the ongoing FIP led by COBI in the short term. The cooperatives that will likely be incorporated in the UoA are those from Melagos and el Colorado. Their fleets also operate in the Guaymas coast using similar fishing methods and gears.

The UoA is configured as follows:

Table 1 – Unit(s) of Assessment (UoA)

UoA 1	Description
Species	1) *Seriola lalandi* (Valenciennes, 1833) 2) *Lutjanus peru* (Nichols & Murphy, 1922) 3) *Paralabrax auroguttatus* (Walford, 1936 4) *Caulolatilus princeps* (Jenyns, 1840) 5) *Hyporthodus acanthistius* (Gilbert, 1892)
Common name	1) English: Yellowtail amberjack, California yellowtail Spanish: Jurel aleta amarilla, jurel de castilla 2) English: Pacific red snapper Spanish: Huachinango del Pacífico 3) English: Goldspotted sand bass Spanish: Cabrilla extranjera, extranjero 4) English: Ocean whitefish, Spanish: Blanco, blanquillo fino, pierna 5) English: Rooster hind, Spanish: Baqueta roja, baqueta colorada
Stock	Gulf of California stocks
Geographical area	Marine waters of Federal Jurisdiction in the Sonora state, between Melagos (27.154770 ºN, -110.298564 ºW) and el Colorado (28.293144 ºN, -110.416398 ºW). The fishing area is explicit in finfish fishing permits. 

Harvest method/gear	Handline (Handlines are used consistently across all the Cooperatives included in the UoAs)
Client group	Sociedad Cooperativa de Producción Pesquera 29 de agosto. Sociedad Cooperativa de Producción Pesquera El Resbalón. Sociedad Cooperativa de Producción Pesquera El Mirador de la Manga. Sociedad Cooperativa de Producción Pesquera La Manga Restaurante Doña Rosita. Sociedad Cooperativa de Producción Pesquera Los Sazanes. Sociedad Cooperativa de Producción Pesquera Francisco Flores. Sociedad Cooperativa de Producción Pesquera Alianza de Pescadores de Guaymas. Sociedad Cooperativa de Producción Pesquera Las Dallanas. Sociedad Cooperativa de Producción Pesquera Pescadores de la Cantera.
Other eligible fishers	Yes, some fishers that are fishing in the UoA areas and use the same methods and gear. These fishers could potentially join the Committee and the MSC certification process (or FIP).
Justification for choosing the Unit of Assessment	The stock structure of the five target species is actually unknown, but a metapopulation structure with several subpopulations is hypothesized. Management area: CONAPESCA has defined areas of exploitation as part of the spatial management of fisheries in Mexico. Finfish permits include a specific area: Marine waters of Federal Jurisdiction in the Sonora state, between Melagos (27.154770 ºN, -110.298564 ºW) and el Colorado (28.293144 ºN, -110.416398 ºW). The fishing area is explicit in the finfish fishing permits. Based on this information, the Sonora Coast can be justified as the management area.

7 Traceability

7.1 Traceability within the fishery

The chain of custody for the marine finfish fishery caught that uses handline in Guaymas, Sonora begins at the time of landing and the same cooperatives prepare the product for delivery directly to the buyer or final consumer.

Finfish are sold at the beach generally whole or gutted. The majority of the product is sold to middlemen, who freeze the fish and transport them to nearby cities, such as Hermosillo, Guaymas, Ensenada or Tijuana (depending on where it is fished). In recent years a large part of the product has been exported to the United States, where it acquires a higher price. In general, it is sold in seafood markets as first class fish. A small amount of product stays in the local community for consumption. (Information obtained from surveys conducted by COBI).

Recently, good methods of marketing horse mackerel and other finfish species for gourmet markets have emerged, requiring fish from more sustainable origins and with improved processing practices, to obtain better quality. This type of market is found at large cities such as Mexico City, Los Cabos and Guadalajara, or in the international market in the United States (Information obtained from surveys conducted by COBI).

The prices paid to the fishers vary depending on the supply, the quality of the fish, and the demand of the product, in addition to the locality. On the other hand, it appears that the fishing gear used has repercussions on the buying price, for example, fishing gear such as handlines tend to obtain a higher price, whilst encircling gillnets and gillnets obtain lower prices. This could be due to the bait used during fishing operations resulting in better manipulation of the product and, therefore, higher quality of handline product compared to that from nets.

Table 2 – Traceability within the fishery

Factor	Description
Will the fishery use gears that are not part of the Unit of Certification (UoC)? If Yes, please describe: - If this may occur on the same trip, on the same vessels, or during the same season; - How any risks are mitigated.	Yes. Fishers use other gears to catch different species from those targets in this PA. For example, some cooperatives catch shrimp, so they use nets in specific trips in September. However, when they fish using handline for the target in this PA, it is the only fishing gear employed. The UoC only uses handlines for the five species in this report. However, the target species can also be captured with other fishing gears by other fishers in the same area.
Will vessels in the UoC also fish outside the UoC geographic area? If Yes, please describe: - If this may occur on the same trip; - How any risks are mitigated.	No (All species) Capture areas are specified by the license. In this case, the area is specified as the Marine waters of Federal Jurisdiction in the state of Sonora state, between Melagos (27.154770 ºN, -110.298564 ºW) and el Colorado (28.293144 ºN, -110.416398 ºW). The fishing area is explicit in finfish fishing permits.
Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities. - Transport - Storage - Processing - Landing - Auction If Yes, please describe how any risks are mitigated.	No None of the five species captured by the nine Cooperatives are certified at the moment. The nine cooperatives only use handlines to catch yellowtail amberjack (*S. lalandi*), Pacific red snapper (*L. peru*), goldspotted sand bass (*P. auroguttatus*), ocean whitefish (*C. princeps*), and rooster hind (*H. acanthustius*), Among the activities covered by the client are storage, processing, landing and transportation as well as sale to large retail companies.
Does transhipment occur within the fishery? If Yes, please describe: - If transhipment takes place at-sea, in port, or both; - If the transhipment vessel may handle product from outside the UoC;	No All boats land their catches and the product is delivered to the cooperative

- How any risks are mitigated.	
Are there any other risks of mixing or substitution between certified and non-certified fish? If Yes, please describe how any risks are mitigated.	No

8 Pre-assessment results

8.1 Pre-assessment results overview

8.1.1 Overview

In accordance with the information reviewed, it was determined that the finfish fishery of Guaymas, Sonora is within the scope of the MSC program (see Section 6. UoA). The analysis of the information available also showed that te fishery has several areas where it does not meet the MSC Standard and could prevent it from being certified at this time. These areas would need improvements before moving to a full assessment. Several performance indicators (PIs) in P1, P2, and P3 scored below 60. As noted in Table 3, the indicators marked in red imply that the 60 level is not likely to be met. Indicators marked in yellow imply that the 80 level is not likely to be met; these indicators are liable to raise conditions in a full assessment. Indicators marked in green are at or above the 80 level and are likely to pass without conditions. Summaries are provided below for areas of non-conformance; more details are given in the complete scoring tables for Principles 1, 2 and 3 (Sections 7.4, 7.5, and 7.6).

Table 3 – Key to likely scoring level in Table 4 and P1, P2, and P3 performance indicators.

Definition of scoring ranges for PI outcome estimates	Shading to be used
Information suggests fishery is not likely to meet the SG60 scoring issues.	Fail (<60)
Information suggests fishery will reach SG60 but may not meet all of the scoring issues at SG80. A condition may therefore be needed.	Pass with Condition (60-79)
Information suggests fishery is likely to exceed SG80 resulting in an unconditional pass for this PI. Fishery may meet one or more scoring issues at SG100 level.	Pass (≥80)

Principle 1

Most of the Principle 1 indicators are unlikely to meet the MSC standard, but there are a few positive features in P1. There is sufficient information on the biology and ecology of the five species, and landing statistics and fishing information have been collected since 1980. This principle requires foremost attention, the information gaps are related to the stock assessment and current stock status. Furthermore, there are few harvest control rules, and there is no evidence that the tools available are effective in controlling exploitation. A stock assessments were not conducted in the past; else RBF is recommended.

Description of PIs< 60 in P1:

PI 1.2.1 Harvest strategy – A robust and precautionary harvest strategy for the finfish stocks is not in place, but monitoring occurs and there are some management measures (fishing licenses/gear restrictions). It is necessary to update status and management information for finfish stocks in the CNP (National Fishing Chart), to develop FMPs (Fishery Management Plan) and to provide evidence/document that the regulations have worked by monitoring the status of the stocks.

PI 1.2.2 Harvest control rules and tools – There are no (formal or implicit) harvest control rules for the handline finfish fishery, and there is no evidence that the HCR responds to changes in indicators of stock status with respect to defined 'trigger' reference points.

PI 1.2.3 – Information and monitoring – - There is no information to support the harvest strategy.

Principle 2

There are no areas of non-conformance in the P2. The fishing operations should allow for maintenance of the structure, productivity, function diversity of the ecosystem. The outcomes, monitoring and information of primary, secondary and ETP species are appropriate, the fishery is not posing a risk of serious or irreversible harm to the component or hindering its recovery. The PI for habitat and ecosystem impact needs more information for the UoA area and assess the information to support the management strategy.

Principle 3

There are no areas of non-conformance in the first PI of the P3. The management system has an appropriate legal and customary framework, based on a Fishery Law (LGPAS) that delegates management and research responsibilities to CONAPESCA and INAPESCA, which collaborate with other federal, state and municipal authorities in the development, implementation, and enforcement of fisheries policies. There is a consultation process that is open to stakeholders, and roles and responsibilities are generally clear. However, there is no evidence that consultation occurs regularly, or that local knowledge is included in management decisions.

Key P3 issues where potential conditions would be issued occur within the fishery-specific management system. The handline fishery (five species) does not have a NOM or FMP, and fishery-specific objectives have not been defined. An FMP must be developed that includes clear objectives, harvest control rules and tools to halt stock decline and begin recovery. Evidence of compliance by the fishery is required, as well as an assessment of the magnitude and characteristics of illegal fishing in the region. MCS activities need to be reinforced and better documented.

Description of PIs< 60 in P3:

PI 3.2.1 Fishery specific objectives – There are no clear and measurable specific objectives in the short or long term. The only official management planning for the fishery is provided in a very general way in the CNP, but should be included in other official management documents (CNP, FMP, and the Law).

PI 3.2.2. Decision-making processes –
The fishery-specific management system does not have clear decision-making processes that result in measures and strategies.

PI 3.2.3 Compliance and enforcement – It is not known if or how the management authority monitors compliance and implements enforcement actions on the fishery under evaluation. No hard evidence was available to know the nature of common violations in this fishery, the frequency of occurrence, what sanctions are applied or whether they provide effective deterrence.

PI 3.2.4 Management performance evaluation – Currently there are no mechanisms to assess of the performance of the fishery-specific management system. There is no legal instrument that defines the specific objectives for the finfish fishery.

8.1.2 Recommendations

Based on the results of this pre-assessment, several areas were identified where the fishery does not meet the MSC standard. The Client is encouraged to continue working on improvements, particularly in the areas identified as critical to the sustainability of the fishery. This analysis should help the FIP focus on key indicators and provide a general basis for actions that need to be undertaken in order to meet the MSC standard.

8.2 Summary of potential conditions by Principle

In a full assessment, indicators that are not likely to meet the 80 level (scoring 60-79) are liable to raise conditions. However, raising conditions is beyond the scope of a pre-assessment, particularly when there are many indicators <60 that would fail the fishery altogether. Otherwise, each of the PIs with a score 60-79 would require a condition. Table 4 shows the number of PIs scoring <60 for each principle.

Table 4 – Summary of Performance Indicator level scores

Principle of the Fisheries Standard	Number of PIs with draft scoring ranges <60
Principle 1 – Stock status	**3**
Principle 2 – Minimising environmental impacts	**0**
Principle 3 – Effective management	**4**

8.3 Summary of Performance Indicator level scores

Table 5 – Summary of Performance Indicator level scores

Performance Indicator	Draft scoring range	Data deficient?
1.1.1 – Stock status	**≥80-RBF (All species)**	**Yes**
Rationale or key points		
At present there is no stock assessment for the yellowtail amberjack (*S. lalandi*), Pacific red snapper (*L. peru*), goldspotted sand bass (*P. auroguttatus*), ocean whitefish (*C. princeps*), rooster hind (*H. acanthustius*), or any other species in the marine finfish complex. However, the RBF approach was used to determine the risk level (RBF) for stock status.		
1.1.2 – Stock rebuilding	**NA**	**NA**
Rationale or key points		

This PI only shall be scored when stock status does not meet the SG80 level in PI 1.1.1		
1.2.1 – Harvest Strategy	**<60 ((Alll Species)**	**Yes**
Rationale or key points		
There are no reference points, stock assessment or harvest strategy defined for any of the stocks in this fishery. All catches of the target stocks are classified in the category of “marine finfish”, where subgroups are composed of different species (DOF, 2010). Catch is monitored through landing tickets and there are a few ad hoc management measures, consisting of fishing licenses, which may not be sufficient to maintain the stocks at sustainable levels.		
1.2.2 – Harvest control rules and tools	**<60 (All species)**	**Yes**
Rationale or key points		
Data must be updated to provide evidence/document that the regulations work by monitoring stock status regularly. The harvest control rules need to be defined in the CNP (National Fishing Chart) and FMP (Fishery Management Plan).		
1.2.3 – Information and monitoring	**<60 (All species)**	**Yes**
Rationale or key points		
There is basic information available related to fishing zones, catch volumes, size structure and biological aspects of the species targeted. However, the catch records are not considered reliable because the collection of data and monitoring of the fishery is not systematic, only relies on the volume of catches and not reported at the species level.		
1.2.4 – Assessment of stock status	**≥80**	**Yes**
Rationale or key points		
Because an RBF approach was applied to PI 1.1.1, according to the MSC methodology, a score of> 80 is assigned to this PI by default.		
2.1.1 – Primary Outcome	**Pacific sardine, Chub mackerel and Pacific thread herring ≥80**	**Yes**
	Market squid 60-79	**Yes**
Rationale or key points		
The handline fishery uses South American pilchard, Pacific thread herring, chub mackerel and market squid as bait. The bait is purchased from the industrial fishery in Guaymas (small pelagic species) and in California (market squid). The three small pelagic and the market squid stocks in the central and northern Gulf of California (GoC) are considered to be above the point where recruitment would be impaired..		
2.1.2 – Primary Management	**60-79 (All primary Species)**	**Yes**
Rationale or key points		

As part of the small pelagics fishery in the Gulf of California, South American pilchard, Pacific thread herring and chub mackerel are managed by NOM-003-PESC-1993 and the Small Pelagics Fisheries Management Plan. There is some evidence that measures in the partial strategy are implemented (landing monitoring, dynamic models, size sampling); however, at present, the harvest control rule for small pelagics is not considered to be 'in place'. The Management Measures for Market squid (MSFMP) (2005) establishe a management program for California's market squid resource and procedures by which the Commission Department of Fish and Wildlife will manage the market squid fishery (CDFW, 2005). The goals of the MSFMP are to manage the market squid resource to ensure long term resource conservation and sustainability, reduce the potential for overfishing, and institute a framework for management that will be responsive to environmental and socioeconomic changes. There is no evidence of monitoring and enforcement to implement the harvest strategy, which precludes the partial strategy from being considered as 'successfully' implemented.		
2.1.3 – Primary Information	**≥80 (All primary Species)**	**Yes**
Rationale or key points		
The information available for South American pilchard, Pacific thread herring and chub mackerel (landings data and catch sampling for the industrial fishery) is sufficient to generate dynamic models that estimate outcome status with respect to biologically based limits. The information for market squid, the Overfishing Limit (OFL) and Allowable Biological Catch (ABC) are both set at the fishing mortality that results in a threshold level of egg escapement of at least 30% (the proxy for MSY) is sufficient to asses outcome status with respect to biological catch limits.		
2.2.1 – Secondary Outcome	**≥80**	**Yes**
Rationale or key points		
The handline finfish fishery has no main secondary species, but there is unwanted catch of a few minor secondary species. There is no formal stock assessment for any of the minor secondary species and there is no evidence that the UoA does not hinder their recovery and rebuilding.		
2.2.2 – Secondary Management	**≥80**	**Yes**
Rationale or key points		
The handline finfish use a highly selective gear with no main secondary species and very low catch rates of the minor secondary species; there is some evidence that the partial strategy is being implemented successfully.		
2.2.3 – Secondary Information	**≥80**	**Yes**
Rationale or key points		
The catch data (quantitative information) show that there are no main secondary species and that the catch of minor secondary species is very low. The selective gear that is used, constitutes a partial strategy to management secondary species.		
2.3.1 – ETP Outcome	**≥80**	**Yes**

Rationale or key points		
While there are ETP species that overlap with the UoA, there is no evidence that the UoA has direct or indirect interactions with them. Therefore, there is a high degree of certainty that the UoA does not cause significant detrimental indirect effects of the fishery on ETP species.		
2.3.2 – ETP Management	**≥80**	**Yes**
Rationale or key points		
There is no evidence of capture of ETP species within the fishery; however, in Mexico there are established measures that are expected to minimize interaction and mortality with ETP species in accordance with international requirements for the protection of these species. Also, the LGPAS, LGEEPA, LGVS, CNP and NOM-059-SEMARNAT-2010 and Management Plans in the Natural Protected Area include management of all ETP species native to Mexico, guarantees that UoA does not hinder the recovery of ETP species		
2.3.3 – ETP Information	**≥80**	**Yes**
Rationale or key points		
While there are ETP species that overlap with the UoA, there is no evidence that the UoA has interactions with them. The fishing logbook program allows monitoring of catch and bycatch and to follow the trend of interaction with ETP species.		
2.4.1 – Habitats Outcome	**≥80**	**Yes**
Rationale or key points		
The handline is a fishing gear with low impact on habitat. The species are caught in midwater and close to the sea bottom. Handlines are considered to have minimal impacts, causing little or no damage to substrate, geomorphology or biota.		
2.4.2 – Habitats Management	**≥80**	**Yes**
Rationale or key points		
The handline fishery operating in Guaymas has not been considered to pose a risk of serious or irreversible harm to habitat types. There are fishery refuges in the area which contribute to minimize the impacts from the fishery. These are considered a partial strategy that helps ensure the UoA does not represent a risk to the habitat.		
2.4.3 – Habitats Information	**60 – 79**	**Yes**
Rationale or key points		
The Gulf of California has been studied in detail, research has focused on general distribution of habitats, areas of productivity and areas of biological importance for invertebrates, fishes, marine mammals and seabirds. Data recorded on logbooks show the fishing areas and the depth where the small-scale handline fleet operates. There is reliable information on the spatial distribution of fishing effort and its distance relative to shore/depth to broadly understand the impacts of gear as a function of contact with the substrate.		

2.5.1 – Ecosystems Outcome	**≥80**	**No**
Rationale or key points		
It is unlikely that the finfish fishery with handlines will modify the structure and function of the ecosystem, causing serious or irreversible damage. The handlines are one of the most selective gears and have low impact on the ecosystem, however, this has not been proven locally. Since the target species are not likely overfished, the unwanted catch is likely minimal, there are no interactions with ETP species and little to no contact of the gear with the seafloor, impacts of the fishery on key ecossystem elements are null.		
2.5.2 – Ecosystems Management	**60-79**	**Yes**
Rationale or key points		
Data obtained from the fishing logbooks show the selectivity of the fishing gear, the low catch of primary, secondary and ETP species. Also, there is a low impact on habitats, reinforced by the of no take zones These elements suggest that there are also potential low impacts of the fishery on the ecosystem. However, the fishery doesn't have an explicit strategy.		
2.5.3 – Ecosystems Information	**60-79**	**Yes**
Rationale or key points		
Trophic structures have not been studied in this area, but studies in nearby areas of the Gulf of California provide an overview of trophic relationships in the area of the fishery. With respect to the general problems of ecosystems, the extraction of target handline finfish and over-exploitation of these could have negative effects on the ecosystem		
3.1.1 – Legal and customary framework	**≥80**	**No**
Rationale or key points		
There is a federal and state-based legal framework for cooperation among management agencies and with stakeholders, capable of delivering sustainable fisheries. This represents an effective, binding national legal system. The rights for indigenous peoples to use fish as food and for cultural rituals are recognized in environmental and fisheries laws.		
3.1.2 – Consultation, roles and responsibilities	**≥80**	**No**
Rationale or key points		
The fisheries law (LGPAS) explicitly describes the roles and responsibilities of most of the agencies (CONAPESCA, INAPESCA, local authorities) and stakeholders involved the in fisheries management system and establishes the form of coordination with other Federal, State, and municipal entities. The development of laws and regulations requires an open consultation process that encourages and facilitates active engagement of stakeholder groups.		
3.1.3 – Long term objectives	**≥80**	**No**
Rationale or key points		
The LGPAS describes clear long-term objectives to guide decision-making, that incorporate precautionary concepts and are consistent with the MSC standard. One of the prime objectives is to establish the basis		

for the conservation, protection, rebuilding, and sustainable utilization of fisheries and aquaculture resources, and the supporting ecosystems.		
3.2.1 – Fishery specific objectives	**<60**	**Yes**
Rationale or key points		
The handline finfish fishery in Mexico does not have an official standard (NOM) or a fisheries management plan (FMP) with explicit specific objectives. The only management information available for the finfish fishery is provided in the National Fishing Chart or the statistical fishing yearbook. These are not updated regularly and do not disaggregate the finfish group into clear management units (e.g., species, stocks, etc).		
3.2.2 – Decision making processes	**<60**	**Yes**
Rationale or key points		
The process to review and evaluate management regulations in Mexico is often based on demand by producers and fishermen. The process starts by scoping issues and potential solutions. The public has an opportunity to provide information and opinions. Subsequently, the authorities propose measures, either in the form of regulations or legislation. Despite the high economic value and ecological importance of the finfish fishery in the Gulf of California, the decision-making process has a number of obstacles, possibly stemming from conflicting interests among stakeholder groups, Thus, the existing management measures and strategies are very weak or non-existent.		
3.2.3 – Compliance and enforcement	**<60**	**Yes**
Rationale or key points		
SADER, via CONAPESCA, and through inter-ministerial agreements with SEMAR, SCT, and SEMARNAT, regulates and carries out monitoring, control, and surveillance of the handline finfish fishery in the Gulf of California. Fishery violations are sanctioned according to the LGPAS and other applicable laws and regulations. However, monitoring mechanisms implemented for the fishery under evaluation have not been implemented.		
3.2.4 – Management performance evaluation	**<60**	**Yes**
Rationale or key points		
The fishery does not have mechanisms (internal or external) to evaluate parts of the management system. Updates to the National Fishing Chart are the only evidence that some parts of the management system for finfish in Mexico are reviewed. However, the most recent update was in 2010.		

8.4 Principle 1

8.4.1 Principle 1 background

a) Biological characteristics of target species

1. Yellowtail amberjack
Taxonomy
Phylum: Chordata
Class: Actinopterygii
Order: Perciformes
Family: Carangidae
Genus: Seriola
Species: *Seriola lalandi* (Valenciennes, 1833)

Common names. English: Yellowtail amberjack, California yellowtail
Spanish: Jurel aleta amarilla, jurel de castilla

Description
S. lalandi has an elongated, fusiform and compressed body (Fig. 1). It exhibits a blue color on the dorsal part of the body, with silver to white belly and sides; a copper to yellowish band is present along the middle region of the body that clearly demarcates the two colors (Paxton et al., 1989). The fins are yellowish in color. The juveniles exhibit dark bands (that do not exist on the dorsal fins).

Figure 1. Yellowtail amberjack, *S. lalandi* (Valenciennes, 1833)

Distribution
It is a circumglobal species that is distributed in subtropical and temperate waters, in the Indo-Pacific, South Africa, and the eastern Atlantic. In the Eastern Pacific, the species is found in the north Pacific from the central Mexican Pacific and Gulf of California to California, United States, (Eschmeyer et al., 1983; Robertson y Gerald, 2015), and in the south, it can be found from southern Peru to Chile (Eschmeyer et al., 1983). The species can also be found outside this range, such as in the Galapagos Islands (Tirado- Sánchez et al., 2014) (Fig. 2). Their distribution can be extended by different oceanographic conditions such as episodes of El Niño, which can increase their distribution further north of the Northwest Pacific (Lluch-Belda et al., 2005). In Australia, it has been documented that the distribution *of S. lalandi* has expanded towards the south, which is certainly due to the increase in the temperature as a result of climate change (Last et al., 2011).

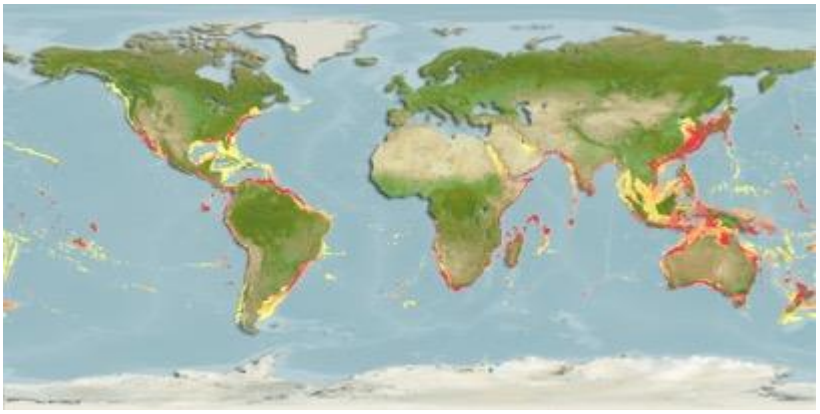


Figure 2. Map of records of the yellowtail amberjack (*Seriola lalandi*) (map obtained from fishbase).

Habitat

The yellowtail amberjack can be found in a variety of environments throughout its life cycle: in coastal zones, including rocky areas, macroalgae forests and in oceanic environments (Eschmeyer et al., 1983), at up to 300 meters of depth (Hureau, 1991). They form shoals in oceanic waters near islands or in submarine mountain regions, and they prefer temperate waters (18-24ºC) (Kailola, 1993; Sala et al., 2003). It is a generalist and carnivorous species that predominantly feeds on octopus, squid, cuttlefish, benthonic crustaceans in addition to other bony fish (Baxter, 1960; Crooke, 1983; Leet et al., 2001).

Reproduction

The reproductive period in the Pacific Northwest mainly occurs during spring-summer (Kolkovski and Sakakura, 2004). Spawning occurs at an optimum temperature of 22 to 25ºC (Kraul, 1985), although mature individuals can be found throughout almost the entire year in the Baja California Peninsula. The Yellowtail amberjack (*S. lalandi*) is an asynchronous species with multiple spawning events producing up to 50000 eggs per day (Kraul, 1985). Larvae and juveniles from 2 to 7 g appear in the months of June to September (which are often concentrated below the sargassum or other algae (Avilés-Quevedo, 2004).

Life cycle

The males mature at smaller sizes (47 cm furcal length for the maturity of 50% of the individuals) than the females (83.4 cm furcal length for the maturity of 50% of the individuals) (Gillanders et al., 1999), requiring a period of more than 3 years. However, in captivity and with constant temperature, the species can reach sexual maturity in 13 months with an average weight of 3.5 kg and 50 cm length (Kolkovski and Sakakura, 2004) (Fig. 3).

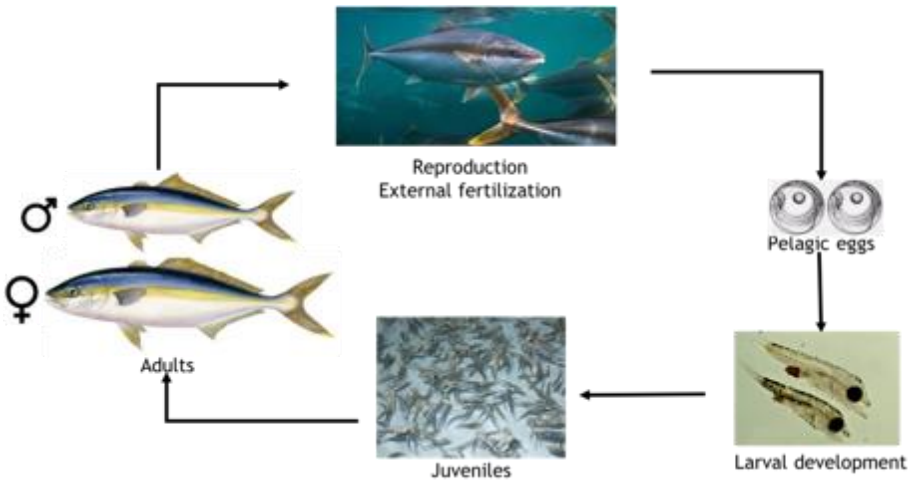


Figure 3. Life cycle of Yellowtail amberjack (*Seriola lalandi*) (modified from Avilés-Quevedo, 2004)

2. Pacific red snapper

Taxonomy

Phylum: Chordata
Class: Actinopterygii
Order: Perciformes
Family: Lutjanidae
Genus: Lutjanus
Species: *Lutjanus peru* (Nichols and Murphy, 1922)

Common names. *English:* Pacific red snapper
Spanish: Huachinango del Pacífico.

Description

L. peru has an oblong, moderately compressed body (Fig. 4). The species has a large head and rounded anterior profile. Its color is predominantly red with silver reflections and reddish fins (Fig. 4). The preorbital bone is very large in adults; specimens have a groove from the anterior border of the eyes up to the nasal orifices. Their posterior profile is pointed, with truncated to slightly emarginated caudal fins. The species exhibits a series of oblique scales just above the lateral line (Fisher et al., 1995).

Figure 4. Pacific red snapper (*Lutjanus peru*) (Poey, 1860) (Image from Tridge ®).

Distribution

This species is distributed widely throughout the Pacific Ocean, from the east, from the United States of America to Peru (Fig. 5), including the central region of the Gulf of California (Rojas et al. 2001).

Figure 5. Map of records of the Pacific red snapper (*Lutjanus peru*) (map obtained from fishbase).

Habitat
The Pacific red snapper mainly inhabits coastal reefs. They can be frequently found in rocky and sandy areas, of at least 80-150 meters of depth (Fisher et al., 1995). This species is a carnivorous predator that mainly feeds on fish, crustaceans, and mollusks (Rojas-Herrera et al., 2014).

Reproduction
L. peru is a species that exhibits between one to three reproductive peaks throughout the year, being partial spawner. In the Mexican states of Baja California Sur, Sinaloa, and Sonora, reproduction is related to the change in water temperature during summer, typically during the months of June-October (Barbosa-Ortega, 2016).

Life cycle
The size at first maturity is estimated *ca.* 32 cm for females and for males *ca.* 29.5 cm (Barbosa-Ortega et al., 2014; Diaz-Uribe et al., 2004). The fertilization occurs when female and male gametes are released into the water column. Larval development occurs in the coastal zone within the water column after settling in muddy areas for the development of juveniles. The sub-adults are located on low rocky or sandy sea floors, later adults inhabit deep submarine mountains (Fig. 6).

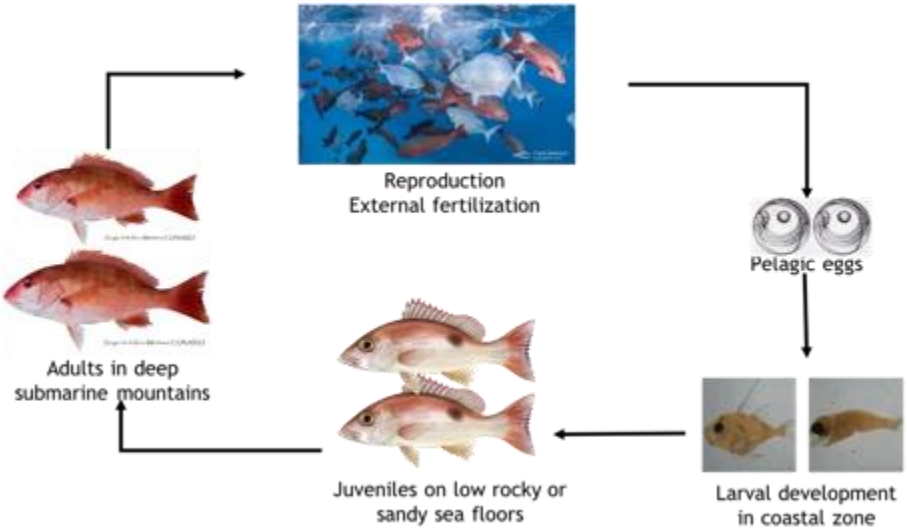


Figure 6. Life cycle of Pacific red snapper (*Lutjanus peru*).

3. Goldspotted sand bass
Taxonomy
Phylum: Chordata
Class: Actinopterygii
Order: Perciformes
Family: Serranidae
Genus: Paralabrax
Species: *Paralabrax auroguttatus* (Walford, 1936)

Common names. *English:* Goldspotted sand bass
Spanish: Cabrilla extranjera, extranjero

Description
The body height is 3.2 to 3.4 times and head length from 2.6 to 2.8 times the standard length (in specimens from 25 to 35 cm standard length). The dorsal fin contains 10 spines (the third is more than 3 times larger than the second and clearly longer than the fourth) and 13 or 14 soft rays; the anal fin has 3-spined and 6 to 8 soft rays; the caudal fin is truncated or slightly concave. The lateral

line has 73 scales and a lateral series of about 90 scales on the body. About 12 scales between the origin of the dorsal fin and the lateral line. Adults exhibit a light grey hue, with 4 brown-orange stripes on the rear of the body, on the superior surface along the base of the dorsal fin, the third and fourth are separated by a pale lateral line. The head, ventral region of the body and caudal peduncle are dotted with orange spots; the dorsal fin is marbled in dark grey, orange-brown and with a light grey line near the base. The species has a dark caudal fin, and dark anal and pelvic fins dotted with orange spots. It has yellow-hyaline pectorals and an orange gill cavity (Fig. 7). Juveniles have longitudinal stripes and rows of dark brown spots (Fischer, et al., 1995).

Figure 7. Goldspotted sand bass (*Paralabrax auroguttatus*) (Walford, 1936).

Distribution

The goldspotted sand bass is found distributed along the Pacific coast of the Baja California Peninsula, from Isla Cedros to Colima (Heemstra, 1995) (Fig. 8).

Figure 8. Map of records of the goldspotted sand bass (*Paralabrax auroguttatus*) (map obtained from fishbase).

Habitat

The goldspotted sand bass is a demersal predator that inhabits rocky bottoms. The juveniles can be present in shallow and deep areas, whilst the adults are predominantly found in deep zones with rocky patches at depths of 25 to 155 m (Aburto-Oropeza et al., 2008).

Reproduction

The goldspotted sand bass reaches sexual maturity at 4 years of age. Not all the Serranidae are hermaphrodites. In species such as the leopard grouper or the goldspotted sand bass, each individual exhibits a single-sex during its lifespan (Aburto-Oropeza et al., 2008).

Life cycle

Many species of Serranids congregate in large groups during particular seasons and in specific habitats as part of their reproduction strategy. In these aggregations, they can meet hundreds of individuals during a few days or several weeks. There are two important elements to identify a reproductive aggregation: 1) the density of individuals of a species can be 10 times greater than the normal density, 2) the individuals can migrate to specific locations for reproduction, which can be found separated by significant distances ("transeunt" species) or reduced distances ("resident" species). Other important evidence could be the behavior and coloration of the individuals, the increase in the size of the abdominal region in females, the gonadal state, or the lunar phase. These characteristics should be identified in each observed aggregation since, together with the date and the location of the observations, they permit the identification of sites that are critical to the species life cycle of these species and, consequentially, relevant to their conservation (Fig. 9).

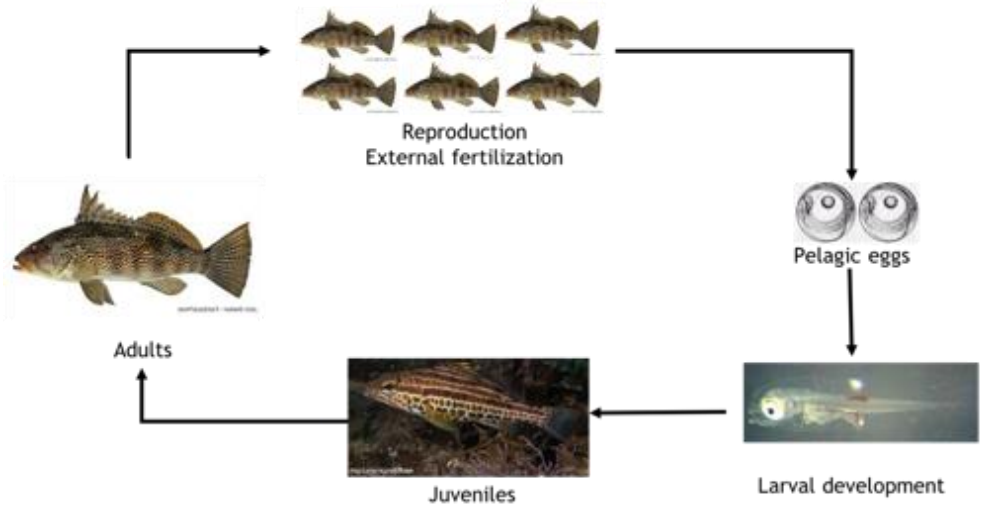


Figure 9. Life cycle of Goldspotted sand bass (*Paralabrax auroguttatus*).

4. Ocean Whitefish

Taxonomy

Phylum: Chordata
Class: Actinopterygii
Order: Perciformes
Family: Malacanthidae
Subfamily: Latilinae
Genus: Caulolatilus
Species: *Caulolatilus princeps* (Jenyns, 1840)

Common names. *English:* Ocean Whitefish
Spanish: Blanco, Blanquillo fino, Pierna

Description

C. princeps has an elongated quadrangular slender body; it exhibits a fleshy crest along the midline of the head, before the dorsal fin. It has a small mouth reaching the front edge of the eye. The dorsal and anal fins are long and continuous; the caudal fin is deeply concaved or emarginated, covered almost entirely by small scales. The dorsum is usually clear grey-bluish, with a clearer

belly. A light blue central stripe is present along the dorsal and anal fins; the bluish pectoral fins have a yellow stripe near the center and a yellow tail fin (Fischer et al., 1995) (Fig. 10).

Figure 10. Ocean whitefish (*Caulolatilus princeps)* (Jenyns, 1840).

Distribution

The geographic region where the ocean whitefish (*C. princeps*) can be encountered is mainly subtropical; their wide distribution includes Vancouver Island in British Columbia, Canada to Peru, including, the Gulf of California, Mexico, and the Galapagos Islands, Ecuador (Dooley, 1978; Wertz and Kato, 2003) (Fig. 11).

Figure 11. Map of records of the Ocean whitefish (*Caulolatilus princeps*) (map obtained from fishbase).

Habitat

The ocean whitefish forms part of the demersal fish community which inhabits the continental shelf limit and the upper continental slope; normally being found in both rocky and sandy bottoms at depths of between 40 and 150 meters (Caraveo-Patiño and Elorduy-Garay, 1994; Fischer et al.,1995).

With respect to their feeding habits, the whitefish is characterized as daylight, omnivorous and opportunist general predator which feeds mainly on crustaceans (ostracods) and pelagic or epibenthic fish that inhabit the continental shelf and the upper continental slope (Caraveo-Patiño and Elorduy-Garay, 1994).

Reproduction

The ocean whitefish exhibits an annual reproductive cycle consisting of a massive spawning period of 5 to 7 months, beginning in October and ending in April. The ocean whitefish uses a partial spawning reproductive strategy by which the females spawn two to three times throughout the reproductive seasons, which provides a greater probability of reproductive success (Elorduy-Garay and Ramirez-Luna, 1994).

Life cycle

The ocean whitefish (*C. princeps*) has a life cycle (Fig. 12) similar to the other members of the Malacanthidae family. This species has a high fidelity to the site or, in other words, exhibits a more sedentary strategy (Caraveo-Patiño and Elorduy-Garay, 1994; Bellquist et al., 2008). The ocean whitefish prefers deep, sandy habitats during the day while it feeds, in comparison with the night where it seeks refuge in shallow waters consisting of rocky habitats or kelp forests (Bellquist et al., 2008).

It has been suggested that the production of larvae by this species mainly takes place in Mexican waters up to around 86 nautical miles from the coast, from Ensenada (Baja California) to Bahia Magdalena (Baja California Sur), concentrated around Punta Eugenia to the north of Baja California Sur (Moser et al., 1986).

The eggs of the ocean whitefish are probably taken by the drift of the ocean currents. The details of the migration of these larvae, sized between 2.6 mm to 7.9 mm, are unknown, but it is possible that the currents play an important role in the distribution of this species toward the north and the south of the peninsula (Wertz and Kato, 2003). The pelagic juveniles of the ocean whitefish (16.8 mm) are associated with the coast (Moser et al., 1986).

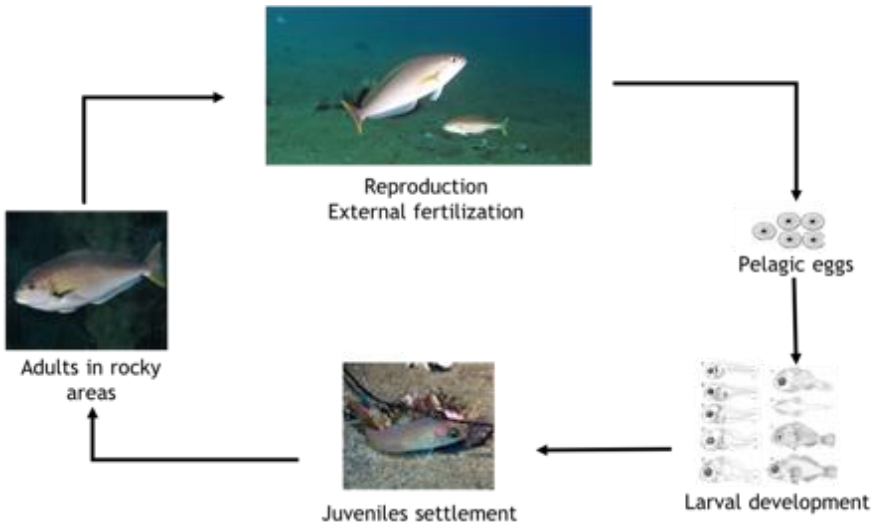


Figure 12. Life cycle of the Ocean whitefish (*Caulolatilus princeps*).

5. Rooster hind

Taxonomy

Phylum: Chordata
Class: Actinopterygii
Order: Perciformes
Family: Serranidae
Genus: Hyporthodus
Species: *Hyporthodus acanthistius* (Gilbert, 1892)

Common names. *English:* Rooster hind
Spanish: Baqueta roja, baqueta colorada

Description

The body height of the species is from 2.4 to 2.6 times and head length from 2.3 to 2.4 times the standard length (specimens of 10 to 50 cm standard length). The dorsal fin consists of 9 spines and 17 soft rays; the second to fourth dorsal spines are very prolongated and the interspinous membranes are low-cut in adults. The anal fin consists of 3 spines (of which the third is long) and 9 soft rays. The pectoral fins consist of 18 to 19 rays, pelvic fins are shorter than the pectorals. Color: dark red or brown head and body; pectoral fins are darker than the body and as well as edges of the interspinous membranes of the darker dorsal fin (Fig. 13). The non-squamous distal area of the soft portion of the dorsal and anal fins and the tail fin is darker than the proximal zone (squamous); a black stripe is obvious on the maxilla (Fischer, et al., 1995).

Figure 13. Rooster hind (*Hyporthodus acanthistius*) (Gilbert, 1892)

Distribution

The rooster hind is distributed from the south of California (United States) to Peru, including the Gulf of California (Aburto et al., 2008) (Fig. 14).

Figure 14. Map of records of the Rooster hind,
(*Hyporthodus acanthistius*) (map obtained from fishbase).

Habitat

Common in the Gulf of California. Occasionally found in the isolated and sandy reef sea floors near the coast, at depths of 46 to 90 m; less common in less deep waters (Craig et al., 2008).

Reproduction

The rooster hind reaches sexual maturity at approximately 7 years of age, at a size of 64 cm. The maximum recorded size of the rooster hind is from 1.1 to 1.3 m. Reproduction involves external fertilization, the larvae are free-living, and their larval time is from 20 to 50 days. Their reproductive period is July (PANGAS, 2012).

Although reproductive aggregations have been observed in other Serranid species, in the case of the baquetas, it has been very difficult since they live at depths greater than 30 meters, complicating their direct observation. During the formation of aggregations, both the females and the males release their gametes into the water, where external fertilization takes place. The serranids have a pelagic larval stage that can extend from a few days to weeks (20 to 50 days). During this stage, the species exhibits increased mortality, mainly related to the environmental conditions and food requirements. In some species, the larvae are transported to shallow waters or rocky reefs and develop in nurseries between sargassum beds, seagrasses, mangroves or estuaries, whilst in others, the larvae are maintained in the same reproduction site. In the case of the baqueta, their growth habitat is unknown although the juveniles have been recorded in the dragging of sandy and muddy sea floors of more than 30 meters deep (PANGAS, 2012).

Life cycle

In general, the Serranids has a more colorful pattern of coloration than usual during the reproductive season. Many Serranids are hermaphrodites that begin their life as females and change to males as they grow. In this species, the males tend to be larger and older than the females and during reproduction, they are found in groups composed of only one male and several females (harem) (Fig. 15).

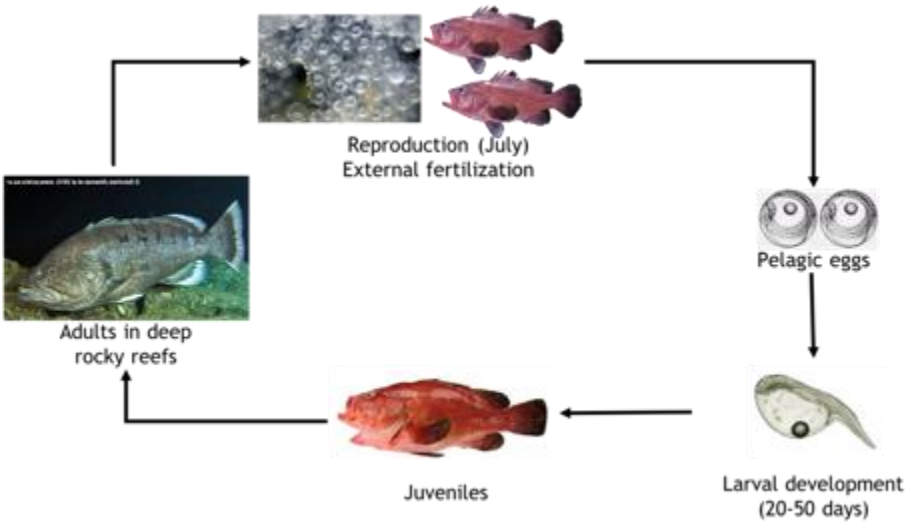


Figure 15. The life cycle Rooster hind (*Hyporthodus acanthistius*) (taken from: H. Green).

b) General description of the finfish fisheries in northwest Mexico.

The small-scale finfish fisheries is composed of wide diversity that ranges from species associated to the coastline and estuarine lagoon environments, including occasional visitors to inland waters (rivers), to marine fish communities associated with shallow or deep seabed, of type rocky or reef, and soft, sandy, clayey or muddy bottoms. This fish's communities inhabit the water column to depths of 200 meters. The pelagic coastal component frequently moves along the coast's profile in direction of the currents, in wide latitudinal movements that maintain a relatively easy pattern to recognize, and variations depending on the critical distance of the bottom fall.

The finfish fisheries are multi-specific, multiple fleets, multiple gears, and uses many fishing methods. The most used are gillnets and handlines. The latter is mentioned as one of the most selective fishing gears and has a minimal impact on the habitats where it is used, however, this fishery can be adapted for a wide variety of fish, with characteristics of life history very different.

The economic value generally defines the target species group, further that, these species can be fished in a defined season or throughout the year; the fisher can go to the known concentration zones of a group of species and decide which fishing system is most effective. On the other hand,

the associated species are those that share the habitat and belong to the same community or assembly forming a functional group and are vulnerable to the same fishing gear and may represent a potential fishing resource.

The finfish fishers use a great diversity of fishing gear and methodologies. In this UoA, only hand-line fishing gear will be described.

The management authority's offices (CONAPESCA), where marine resources catches are reported, in northwestern Mexico are shown in fig. 16.

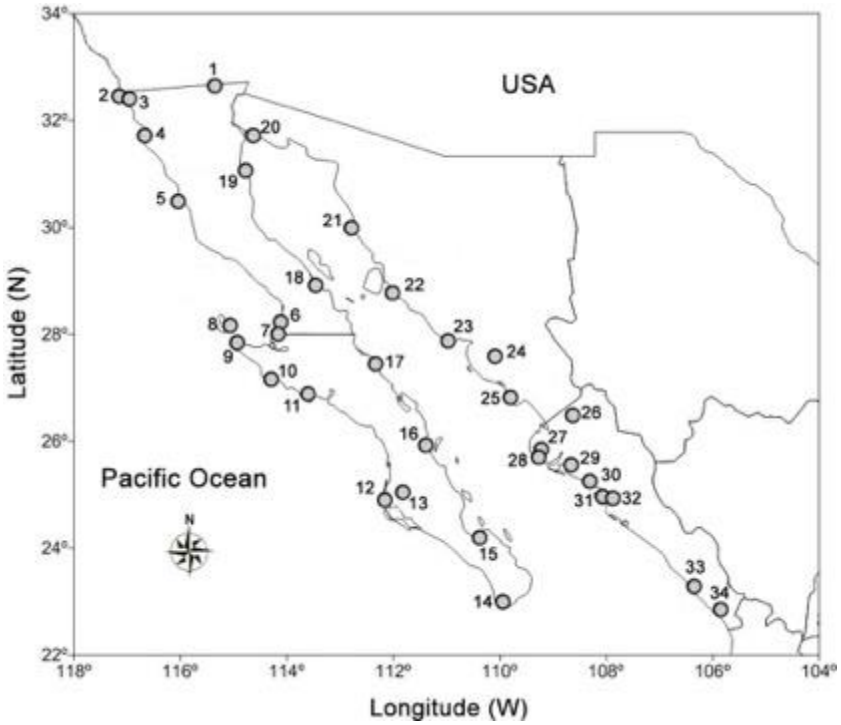


Figure 16. Northwest Mexico CONAPESCA offices (view table below for nomenclature).

Table 6. Northwest Mexico CONAPESCA offices.

No.	Locality	ID
1	Mexicali	MX
2	Tijuana	TJ
3	El Rosario	ER
4	Ensenada	ENS
5	San Quintín	SQ
6	Villa de Jesús María	VJM
7	Guerrero Negro	GN
8	Isla de Cedros	IC
9	Isla Tortugas	IT
10	Bahía de Asunción	BAS
11	Punta abreojos	PA
12	San Carlos	SC
13	Ciudad Constitución	CC
14	Cabo San Lucas	CSL
15	La Paz	LP
16	Loreto	LOR
17	Santa Rosalía	SR

18	Bahía de los Ángeles	BAN
19	San Felipe	SF
20	Golfo de Santa Clara	GSC
21	Puerto Libertad	PL
22	Bahía de Kino	BK
23	Guaymas	GYM
24	Ciudad Obregón	CO
25	Huatabampo	HU
26	El Fuerte	EF
27	Los Mochis	LM
28	Topolobampo	TOP
29	Guasave	GUA
30	La Reforma	LR
31	Navolato	NAV
32	Culiacán	CUL
33	Mazatlán	MZT
34	Escuinapa	ESC

a) Description of the finfish fishery of Guaymas, Sonora

The following information includes a description of the handline fishery targeting five main species in Guaymas, Sonora. The fleet in the assessment unit includes a total of 90 fishing vessels belonging to nine cooperatives. Cooperatives have permits to harvest finfish in general, which includes more than 200 species. The permit includes a detailed description of the area where the extractive activity can be carried out (Marine waters of Federal Jurisdiction in the Sonora state, between Melagos (27.154770 ºN, -110.298564 ºW) and El Colorado (28.293144 ºN, -110.416398 ºW) (fig. 17). Permits to fish finfish do not specify the fishing gear, however, the client for this preassessment (nine cooperatives) only uses handlines to capture the species described in Table I. The handline gear consists of lines with hooks and bait (generally sardine, other small pelagic species or squid), which allows fishing to great depths (>150 meters).

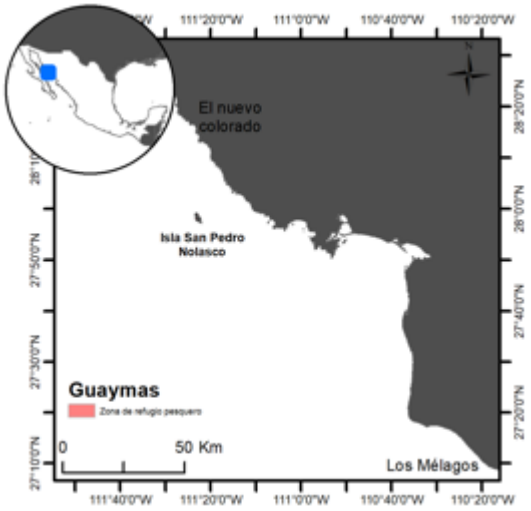


Figure 17. Cooperatives fishing zone.

1. Yellowtail amberjack

Fishery description

In the National Fishery Chart (DOF, 2010) the jacks group is classified as a coastal finfish. This group is composed of a large diversity of species (9 fishes; *Caranx caninus*, *C. sexfasciatus*, *C. caballus*, *Selar crumenophthalmus*, *S. lalandi*, *S. rivoliana*, *Elagatis bipinnulata* and *C. otrynter*) including those that inhabit the coast and lagoons up to the border of the external continental shelf

which can reach near 200 meters of depth. Commercial harvest for these fish is conducted in small vessels using different fishing gears, from handlines with live bait (sardine and mackerel), drift gillnets, trawling and encircling gillnets in open seas and areas near the coast.

Fishing season

According to the majority of fishers interviewed, the yellowtail is a migratory species found in different locations for a few months each year. The fishing seasons vary throughout the northwest of Mexico, especially between the localities within the Gulf of California and on the Pacific coast of the Baja California Peninsula. Fishers in the localities within the Gulf of California usually fish yellowtail during the cold-water months, from December to April-May, although in the south of the Gulf of California fish can also be found in summer. Several interviewees confirmed that within the Gulf of California, during the summer season yellowtail can be caught with handline, but only at the greatest depths (>150 meters), (Fig. 18).

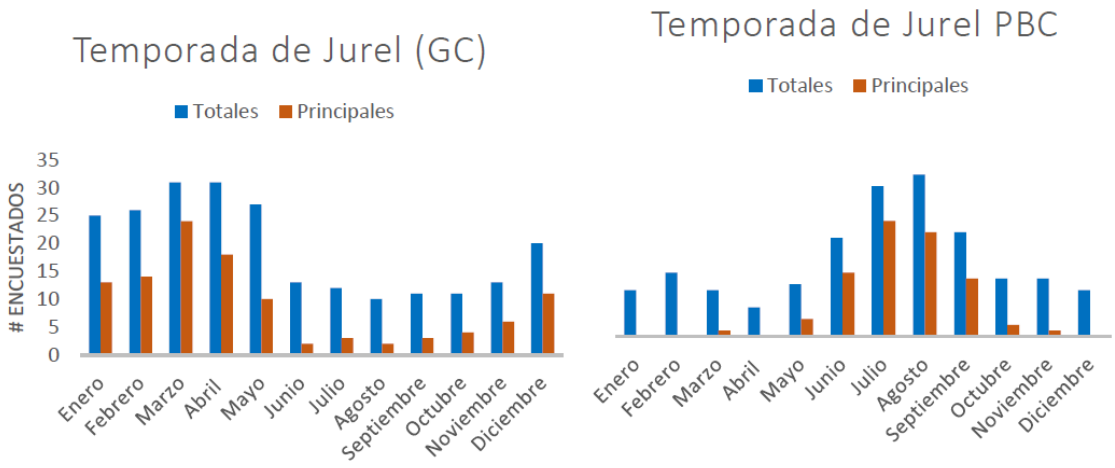


Figure 18. Total months (blue) and main yellowtail fishing months (orange) according to number of fisher's survey: a) In the Gulf of California (GC); b) In the Pacific coast of the Baja California Peninsula (PBC).

Fishing Methods

The handline consists of a string with hooks and bait (generally small pelagic species, like sardines), allowing fishing at great depths. Trolling consists of dragging a rig (normally alive bait that is attractive to fish) that simulates swimming of a small fish, with a hook on its extremity.

2. Pacific red snapper

Fishery

In the National Fishery Chart (DOF, 2010) the snappers group is classified as coastal finfish, with *Lutjanus peru* being the main target. This category is composed of a large diversity of species (10 fishes; *L. peru*, *L. guttatus*, *L. argentrivetris*, *L. jordani*, *L. 37olorado*, *L. novemfasciatus*, *L. inermis*, *L. viridis*, *Hoplopargus guentheri* and *L. aratus*) which includes those that inhabit coasts and lagoons, up to the external continental shelf, near 200 meters of depth. The commercial capture of these species is conducted using fiberglass vessels with an outboard engine of different horsepower and using fishing gears such as handline, longline, and gillnets.

Fishing Season

Fishing for Pacific red snapper is conducted throughout the year, with catch volumes increasing during the summer in the months of June, July, and August. Populations of fish leave the fishing area during the La Niña phenomenon, and, conversely, during El Niño, they approach the coast, becoming more vulnerable to fishing.

Fishing method

For the capture of Pacific red snapper, handlines are used with up to 10 hooks sizes 5, 7 and 9. Each hook is baited with sardine or mackerel, according to the season or what is attracting the fish. Additionally, Pacific red snapper is captured with shore and bottom gill nets which operate on average from 10 to 12 hours in the fishing areas.

3. Goldspotted sand bass

Fishery

In the National Fishery Chart (DOF, 2010) the grouper group is classified as coastal finfish, with *Lutjanus peru* being the main target. This category is composed of a large diversity of species (18 fishes; *Mycteroperca jordani, M. rosacea, M. xenarcha, M. prionura, Dermatolepis dermatolepis, Cephalopholis panamensis, Paralabrax nebulifer, P. auroguttatus, P. clathratus, P. loro, P. maculatofasciatus*, *Sterolepis gigas, Epinephelus acanthistius*, *E. niphobles, E. analogus, E. labriformis, E. panamenisis and E. itajara*) which includes those that inhabit coasts and lagoons, up to the external continental shelf, near 200 meters of depth. The goldspotted sand bass is a commercial fishery in the Gulf of California and its popularity for sport fishing has increased in the north and central regions. The historical analysis of this fishery suggests a cyclic component in the catches that have been maintained throughout the years.

Fishing Season

The greatest catches are registered in the first semester of the year, with the main peak during the months of March to July. The months of highest catch volume correspond to the observation of reproduction aggregations in several areas of the region. This resource additionally forms part of the bycatch from other fisheries, such as the shrimp fishery (Aburto-Oropeza et al. 2008).

Fishing method

The handline consists of a string with hooks and bait (generally small pelagic species, like sardines), allowing fishing at great depths.

4. Ocean whitefish

Fishery

In the National Fishery Chart (DOF, 2010), the ocean whitefish (*Caulolatilus princeps*) is found under the category “Marine Finfish” where the large majority of commercially important bony fish in the Pacific Ocean are grouped within the subcategory “Whitefish and Tilefish”. In this subcategory, three groups of species can be found including *C. princeps* (ocean whitefish or “pierna”), *C. affinis* (bighead tilefish, or, “conejo”) and *C. hubbi* (Hubbs´ tilefish “blanquillo”) the most common in the South Pacific area of the country.

It is common to observe ocean whitefish and bighead tilefish in the landings; however, ocean whitefish represents 70% of the catch with an increase in the prevalence of this species during the months of April to June. The catches of the three species are reported together in the category “Whitefish” (DOF, 2018).

Fishing method

The ocean whitefish (*C. princeps*) is caught principally with handline equipped with Norwegian hooks, numbers 4, 6, and 10. They also use monofilament gill nets (nylon) of 0.35-0.55 lb of caliber. In BC and BCS, other fishing gears are used such as longlines and traps; with BCS being the greatest producer of ocean whitefish both in the Pacific and in the Gulf of California (DOF, 2018).

Fishing season

Fishing for the ocean whitefish (*C. princeps*) in the Baja California Peninsula occurs throughout the year. It catches has two peaks, one during March and April (until May for the West Coast) and the other in the second semester of the year, during September and October for the Gulf of California and for the West Coast; this peak begins in August and continues until December.

5. Rooster hind

Fishery
The rooster hind ("baqueta") has played a very important role in the growth of some fishing villages of the Gulf of California. This species is of great economic importance and has high demand. This species is consumed whole, filleted, in chunks and dry salty. It frequently shows up in trawling nets, although their commercial harvest is conducted predominantly with hooks and lines with live bait (sardines and other small pelagics), in open seas, on muddy seafloors between 50 and 100 meters deep.

Fishing method
The handline consists of a string with hooks and bait (generally small pelagic species, like sardines), allowing fishing at great depths.

b) Stock status and harvest strategy for the UoA species

Management schemes
In the National Fishery Chart (DOF, 2010), the finfish species of the Pacific coast of Mexico are categorized as coastal pelagic fish. This group is composed of a large diversity of species including those that inhabit the coastal areas and lagoons, up to the border of the external continental shelf to almost 200 meters of depth. Their commercial harvest is conducted in small vessels (7-8 m long boats), with different fishing gears, including handline with live bait (sardine), trolling, gillnet and encircling gillnet in open seas and areas near the coast.

Yellowtail amberjack. The National Fishing Chart of 2010 (DOF, 2010) indicates that the yellowtail fishery is being used at its maximum sustainable rate of exploitation, and measures should be taken if catches decrease to 500 tons in Baja California Sur, 200 tons in Baja California and 100 tons in Sonora. However, there is no data that corroborate this since the landing data include various species and are not exclusively of yellowtail (*S. Ialandi*). Other studies emphasize that, based on landing data of the commercial fisheries, the yellowtail fishery (*S. Ialandi*) on the eastern coast of the Gulf of California (in the states of Sonora and Sinaloa) is in a state of development (Arreguín-Sánchez and Arcos-Huitrón, 2011).

Pacific red snapper. The National Fishing Chart of 2010 (DOF, 2010) indicates that the snapper fishery is being used at its maximum sustainable rate of exploitation, and measures should be taken if catches decrease to 800 tons in Baja California Sur and 100 tons in Sonora. However, there is no data that corroborate this since the landing data are configured by various species and are not exclusively Pacific red snapper (*L. peru*).

Goldspotted sand bass. The National Fishing Chart of 2010 (DOF, 2010) indicates that the grouper fishery is being used at its maximum sustainable rate of exploitation, and measures should be taken if catches decrease to 200 tons in Baja California, Sonora and Sinaloa, and 3,000 tons in Baja Claifornia Sur. However, there is no data that corroborate this since the landing data include various species and are not exclusively Pacific goldspotted sand bass (*P. auroguttatus*).

Ocean whitefish. The only existing regulation for the ocean whitefish (*C. princeps*) in Mexico is the commercial fishing permit for finfish in general, which encompasses all species of fish under the category "Marine finfish permit" specifically in the subcategory "Whitefish and Tilefish" (DOF, 2010).

The National Fishery Chart (DOF, 2010), indicates that the Ocean whitefish fishery is exploited to the limits of its Maximum Sustainable Yield (MSY), and must take the necessary measures and actions if annual catches decrease to figures lower than 400 t for BCS, and 40 t in the states of Sonora and BC.

Rooster hind. In the National Fishing Chart (DOF, 2010), the rooster hind is found grouped within the management unit "Hind, sea bass, and sand bass" (Serranidae)." This species is also caught under the "Marine finfish permit". This Fishery is being used at its maximum sustainable yield, and measures should be taken if catches decrease to 200 tons in Baja California, Sonora and Sinaloa,

and 3,000 tons in Baja California Sur. However, there is no data that corroborate this since the landing data are configured by various species and are not exclusively of pacific goldspotted sand bass (*H. acabthistius*).

8.4.2 Catch profiles

Yellowtail amberjack

The capture of yellowtail amberjack in northwest Mexico (Baja California, Baja California Sur, Sonora, and Sinaloa) has fluctuated during recent decades, maintaining a tendency to increase from 2002 to 2015. Baja California Sur is the state that exhibits the highest catches at a regional level, with catches from 979.8 tons (t) during 2005 to more than 2,535 t in 2013. The state of Sonora, which is represented by the locality of Guaymas represents more than 70%, displays catch fluctuations with a peak of 422.11 tons in 2012 (Fig. 19).

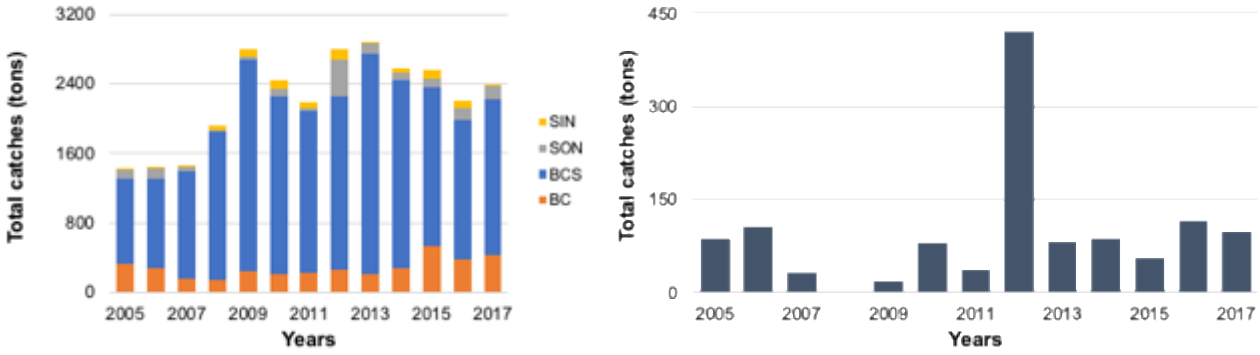


Figure 19. Annual catches of Yellowtail amberjack (*Seriola lalandi*) during 2005-2017. Left: catch per state (SIN: Sinaloa, SON: Sonora, BCS: Baja California Sur, BC: Baja California). Right: catch in Guaymas (from Los Mélagos to El Colorado zone) (data obtained from CONAPESCA).

Pacific red snapper

The Pacific red snapper catches have been increasing since 2010 in the Northwest Mexico. The highest catches are recorded in 2017 with 4071 total tons. Baja California Sur is the state with the highest catches in this region of Mexico, with a maximum catch of 2246 tons in 2017(Fig. 20). Sonora is the third state in catches of this species in this region. In 2016, this state reported its maximum catch of 572 tons, representing a 9.5% of the total catches of this species in Northwest Mexico.

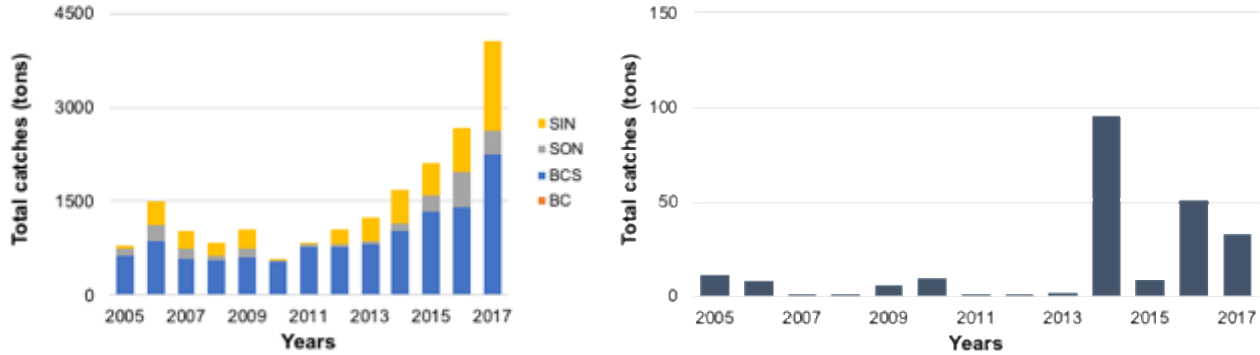


Figure 20. Annual catches of Pacific red snapper (*Lutjanus peru*) during 2005-2017. Left: catch per state (SIN: Sinaloa, SON: Sonora, BCS: Baja California Sur, BC: Baja California). Right: catch in Guaymas (from Los Mélagos to El Colorado zone) (data obtained from CONAPESCA).

Goldspotted sand bass

The Goldspotted sand bass catches have been fluctuating since 2006 in the Northwest Mexico. The highest catches are recorded in 2017 with 926.2 total tons. Baja California Sur is the state with the highest catches in this region, with a maximum catch of 423.6 tons in 2015 (Fig. 21). Sonora is the third state in catches of this species in this region. In 2017, this state reported its maximum catch of 200 tons, representing a 21% of the total catches of Goldspotted sand bass in Northwest Mexico (Fig. 21).

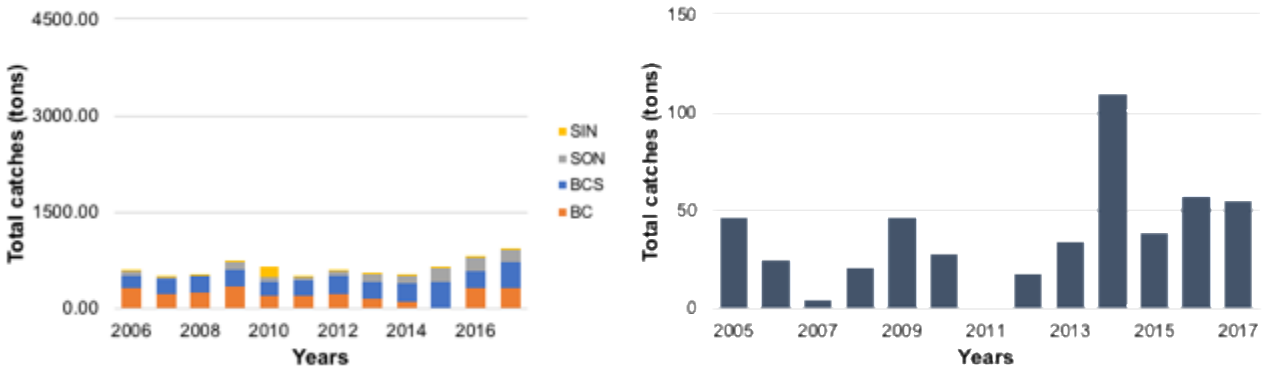


Figure 21. Annual catches of Barred sand bass (*Paralabrax auroguttatus*). Left: catch per state (SIN: Sinaloa, SON: Sonora, BCS: Baja California Sur, BC: Baja California) for the period of 2006-2017. Right: catch in Guaymas (from Los Mélagos to El Colorado zone) (2005-2017 data obtained from CONAPESCA).

Ocean whitefish

During 2005-2017, the annual average catch of *C. princeps* remained below 1650 tons in the Northwest Mexico, reporting it maximum catches in 2017 with a total of 1997 tons. Baja California Sur is the state with the highest catches in this region of Mexico, with a maximum catch of 1917 tons in 2017 (Fig. 21). It is worth noting that more than 90% of the reported catch of Ocean whitefish comes from the state of BCS, both for the Gulf of California and for the West Coast. In Guaymas, this fishery had a peak of 259 tons in 2012, representing a 16% of the catches reported in this region.

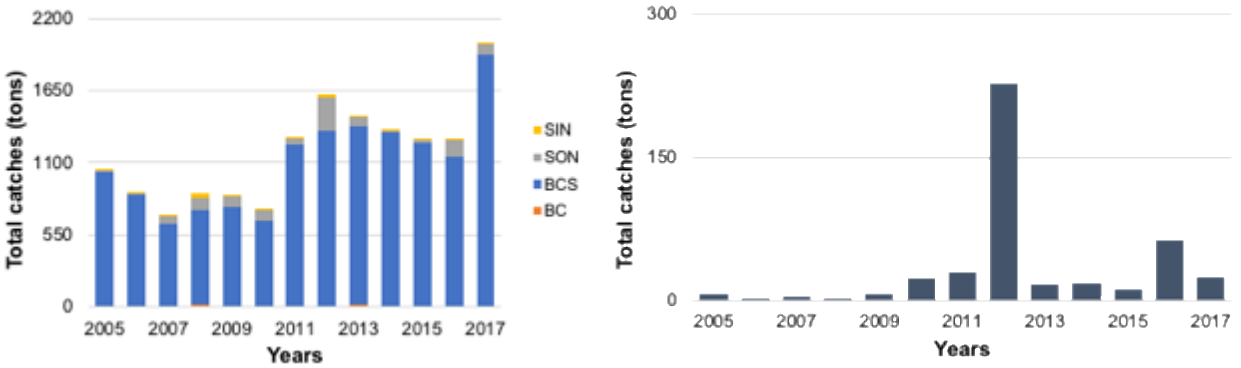


Figure 22. Annual catches of Ocean whitefish (*Caulolatilus princeps*) during 2005-2017. Left: catch per state (SIN: Sinaloa, SON: Sonora, BCS: Baja California Sur, BC: Baja California). Right: catch in Guaymas (from Los Mélagos to El Colorado zone) (data obtained from CONAPESCA).

Rooster hind

The Rooster hind fishery begins at the end of the year (December) up to the change in seasons between spring and summer (May-June). Most of the catches are recorded during the first semester of the year, with a peak between February and April (Aburto, et al., 2008).

In Northwest Mexico, the catches of this species show a tendency to increase. The maximum catch reported for this region is a total of 1359 tons in 2017 (Fig. 23). Sinaloa is the state that contributes with the highest catches, report in a total of 664.7 tones for 2017. For this fishery, Sonora represent the second state, reporting a total of 514 tones for the same year. This corresponds to a 37% of the total catches in Northwest Mexico. In Guaymas, Sonora, from 2005-2017 the catches have fluctuated from 5.5 tones in 2008 to 113 tons in 2016.

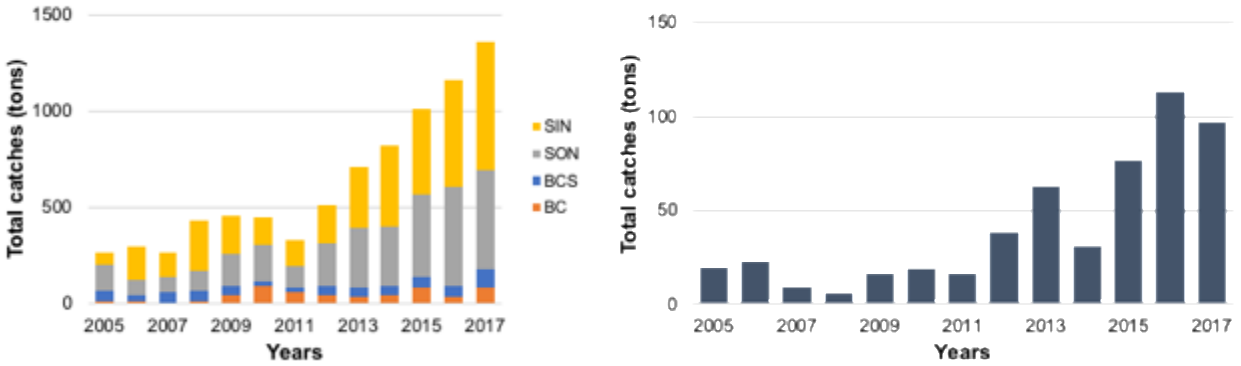


Figure 23. Annual catches of Rooster hind (*Hyporthodus acanthistius*) during 2005-2017. Left: catch per state (SIN: Sinaloa, SON: Sonora, BCS: Baja California Sur, BC: Baja California). Right: catch in Guaymas (from Los Mélagos to El Colorado zone) (data obtained from CONAPESCA).

8.4.3 Total Allowable Catch (TAC) and catch data

Catch data by year were obtained from the CONAPESCA landing reports, where landings are reported by fishery and location. However, the fishing gear is not defined. The following tables summarize the catch by species in Guaymas, Sonora for years 2016 and 2017.

Table 7 – Total Allowable Catch (TAC) and catch data – yellowtail amberjack, *Seriola lalandi* (Valenciennes, 1833)

TAC	Year	**N/A**	Amount	**N/A**
UoA share of TAC	Year	**N/A**	Amount	**N/A**
UoA share of total TAC	Year	**N/A**	Amount	**N/A**
Total green weight catch by UoC	Year (most recent)	**2017**	Amount	**99,717kg**
Total green weight catch by UoC	Year (second most recent)	**2016**	Amount	**114,901 kg**

Table 8 – Total Allowable Catch (TAC) and catch data – Pacific red snapper, *Lutjanus peru* (Nichols & Murphy, 1922)

TAC	Year	**N/A**	Amount	**N/A**
UoA share of TAC	Year	**N/A**	Amount	**N/A**
UoA share of total TAC	Year	**N/A**	Amount	**N/A**

Total green weight catch by UoC	Year (most recent)	**2017**	Amount	**32,810 kg**
Total green weight catch by UoC	Year (second most recent)	**2016**	Amount	**50,744 kg**

Table 9 – Total Allowable Catch (TAC) and catch data – goldspotted sand bass, *Paralabrax auroguttatus* (Walford, 1936)

TAC	Year	**N/A**	Amount	**N/A**
UoA share of TAC	Year	**N/A**	Amount	**N/A**
UoA share of total TAC	Year	**N/A**	Amount	**N/A**
Total green weight catch by UoC	Year (most recent)	**2017**	Amount	**55,108 kg**
Total green weight catch by UoC	Year (second most recent)	**2016**	Amount	**57,201 kg**

Table 10 – Total Allowable Catch (TAC) and catch data – ocean whitefish, *Caulolatilus princeps* (Jenyns, 1840)

TAC	Year	**N/A**	Amount	**N/A**
UoA share of TAC	Year	**N/A**	Amount	**N/A**
UoA share of total TAC	Year	**N/A**	Amount	**N/A**
Total green weight catch by UoC	Year (most recent)	**2017**	Amount	**24,920 kg**
Total green weight catch by UoC	Year (second most recent)	**2016**	Amount	**63,258 kg**

Table 11 – Total Allowable Catch (TAC) and catch data – rooster hind, *Hyporthodus acanthistius* (Gilbert, 1892)

TAC	Year	**N/A**	Amount	**N/A**
UoA share of TAC	Year	**N/A**	Amount	**N/A**
UoA share of total TAC	Year	**N/A**	Amount	**N/A**
Total green weight catch by UoC	Year (most recent)	**2017**	Amount	**96,775 kg**
Total green weight catch by UoC	Year (second most recent)	**2016**	Amount	**113,012 kg**

8.4.4 Principle 1 Performance Indicator scores and rationales

PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
a Stock status relative to recruitment impairment			
Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
Met?	**NA**	**NA**	**NA**
Rationale			
There is no stock assessment for Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack and ocean withfish in the fishery that supports the Guaymas fleet. Therefore, the status of the stocks is not known with respect to the BMSY, PRI or any other proxy. A RBF was applied to score the five target species (See Section 7.10: RBF Scoring Table). Productivity-susceptibility analysis scores entered into the MSC RBF worksheet resulted in an unconditional pass for the five species.			
b Stock status in relation to achievement of Maximum Sustainable Yield (MSY)			
Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is **a high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
Met?	**NA**	**NA**	**NA**
Rationale			
There are no reference points to know the state of the population, either derived from an analytical evaluation of the population or using empirical approaches. A RBF was applied to score the five species (See Section 7.10: RBF Scoring Table). Productivity-susceptibility analysis scores entered into the MSC RBF worksheet resulted in an unconditional pass for the five species. The SG80 is met.			
References			
DOF. 2010. Carta Nacional Pesquera. Diario Oficial. Mexico.			

Stock status relative to reference points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	NA	NA	NA

Reference point used in scoring stock relative to MSY (SIb)	NA	NA	NA

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	Pacific red snapper	**≥80-RBF**
	Rooster hind	**≥80-RBF**
	Goldspotted sand bass	**≥80-RBF**
	Yellowtail amberjack	**≥80-RBF**
	Ocean whitefish	**≥80-RBF**
Information gap indicator	**More information sought**	
Data-deficient? (Risk-Based Framework needed)	**Yes (**See Section 7.10: RBF Scoring Table)	

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.1.2 – Stock rebuilding

PI 1.1.2		**Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe**		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guide post	A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock.
	Met?	**NA**	**NA**	**NA**
Rationale				
This PI only shall only be scored when stock status does not meet the SG80 level in PI 1.1.1				
b	Rebuilding evaluation			

	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.	There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**.
	Met?	**NA**	**NA**	**NA**
Rationale				
References				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**N/A**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.1 – Harvest strategy

PI 1.2.1	**There is a robust and precautionary harvest strategy in place**		
Scoring Issue	SG 60	SG 80	SG 100
a Harvest strategy design			
Guide post	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
Met?	**No**	**No**	**No**
Rationale			
SADER currently manages the finfish stocks as part of the multi-specific fishery in the Pacific and Gulf of California. The finfish permits include around 200 species and use a diversity fishing gear. The National Fishing Chart (DOF 2010) divides the finfish fishery into 10 groups, including snappers (Pacific red snapper and rooster hind), groupers (goldspotted sand bass), jacks (amberjack yellowtail) and ocean withefish.			

The five target species (Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack and ocean withefish) don't have a harvest strategy (only permits), with regular monitoring (landing reports), but no reference points or harvest controls. The finfish permits are not specific and do not specify the fishing gears that can be used. Considering that the harvest strategy is limited and that there are not stock assessments or specific stock objectives, SG 60 is not met.

b	Harvest strategy evaluation			
	Guide post	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	**No**	**No**	**No**

Rationale

The finfish fishery does not currently have a harvest strategy in place. The only official regulation is that a general fishing permit for marine finfish species is issued. Catches are not separated by fishing gear, so currently, the effectiveness of the only management tool (the fishing permits) cannot be evaluated. Also, since the status of the target stocks is not known, and target or limit reference levels do not exist, it is not possible to know if the (limited) strategy, namely the fishing permits, is likely to work. This issue does not reach the SG60.

c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	**No**	**No**	**No**

Rationale

CONAPESCA has been monitoring the landings for Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack and ocean withefish in the Gulf of California since the 2005, through a landing-report system ("Avisos de arribo"), which includes landings and fishing effort information. However, the landing reports are not seggregated by species and fishing gear, so currently, the effectiveness of the harvest strategy cannot be assessed (DOF 2010).

Considering that limited monitoring of the stock and the fishery take place, the (also) limited information produced would be insufficient to determine stock status or trends or to determine if the management measures in place are working. Thus, data are insufficient to assess if the harvest strategy is working, and SG60 is not likely to be met. Stock assessments will be critical in the development and evaluation of a harvest strategy.

d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			**No**

Rationale

The National Institute of Fisheries and Aquaculture (INAPESCA) is responsible for periodically reviewing

all the resources presented in the CNP and for improving the harvest strategies, as necessary. This is analyzed at the level of the category of "marine finfish" and subgroups mentioned in PI1.2.1 (snappers, groupers, jacks, ocean withefish, etc). However, there is no harvest strategy in place, so SG100 is not met.

e	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**NA**	**NA**	**NA**

Rationale

Sharks are not target species in this UoA. The NOM-029-PESC-2006 prohibits the finning of sharks in Mexico.

f	Review of alternative measures			
	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	**No**	**No**	**No**

Rationale

The handline finfish fishery doesn't have harvest strategy. The fishery is only managed through fishing permits. However, the review of potentiality alternative measures to minimize the mortality on unwanted catch of the target stocks doesn't occur. The SG60 is not met.

References

DOF. 2010. Actualización de la Carta Nacional Pesquera y su anexo. Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación. Diario Oficial. México.
DOF. 2007. NORMA Oficial Mexicana NOM-029-PESC-2006, Pesca responsable de tiburones y rayas. Especificaciones para su aprovechamiento. Diario Oficial. Mexico.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	Pacific red snapper	**<60**
	Rooster hind	**<60**
	Golspotted san bass	**<60**
	Yellowtail amberjack	**<60**
	Ocean whitefish	**<60**
Information gap indicator	**More information sought**	

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	**No**	**No**	**No**
Rationale				
Neither stock status indicators nor reference points are available for the five target species (Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack, ocean withefish) in the Gulf of California. Thus, there are no limit or target biomass, catch or fishing mortality (effort) values that would trigger management action if they were approached or exceeded. The only reference values described in the 2010 CNP are for finfish groups, not stocks. They were related to maintaining total annual catch below 200 t in Baja California, Sonora and Sinaloa for groupers (18 species), 100 t for snappers in Sonora (10 species), 100 t for jacks (nine species) in Sonora and 40 t ocean whitefish (three species) in Sonora and Baja California. Since the fishery doesn't have HCRs, SG60 is not met for any of the five target species.				
b	HCRs robustness to uncertainty			
	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		**No**	**No**
Rationale				
There are no available harvest control rules for the five target species (Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack and ocean whitefish). The uncertainty in the fishery is high. In particular the true scale and intensity of both artisanal and sport fisheries are unknown, as well as the interactions between species and the impact of removal of target species over one another. These and other factors need to be considered in the design of HCRs. SG80 in not met.				
c	HCRs evaluation			
	Guide post	There is **some evidence** that tools used **or available** to implement HCRs are	**Available evidence indicates** that the tools in use are appropriate and effective	**Evidence clearly shows** that the tools in use are effective in achieving the

		appropriate and effective in controlling exploitation.	in achieving the exploitation levels required under the HCRs.	exploitation levels required under the HCRs.
	Met?	**No**	**No**	**No**

Rationale
At present, there is no evidence that the tool used (finfish permits) are appropriate or effective in controlling exploitation for the five target species (Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack and ocean whitefish). The fact that the stocks are not monitored regularly, and that scientific reports from INAPESCA are not available to the public, provides very limited information to determine if the effectiveness of management tools is measured somehow or not. Thus, SG60 is not met.
References
DOF. 2010. Actualización de la Carta Nacional Pesquera y su anexo. Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación. Diario Oficial. México.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	Pacific red snapper	**<60**
	Rooster hind	**<60**
	Golspotted san bass	**<60**
	Yellowtail amberjack	**<60**
	Ocean whitefish	**<60**
Information gap indicator	**More information sought**	

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.3 – Information and monitoring

PI 1.2.3	**Relevant information is collected to support the harvest strategy**		
Scoring Issue	SG 60	SG 80	SG 100
a	Range of information		
	Guide post	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be

				directly related to the current harvest strategy, is available.
	Met?	**Yes**	**No**	**No**

Rationale

CONAPESCA has been monitoring catches of the five species (Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack and ocean whitefish) in the Gulf of California since 2005, through a landing-report system ("Avisos de arribo"), which includes the fishing license and vessel registration number, landings by finfish group (in a few cases by species) in kilograms, type of product, price of sale, fishing and landing location, CONAPESCA compiles this data by state, port of landing, month, and year.

Stock structure (age, size and sex) or stock productivity (maturity, growth, natural mortality and fecundity) data are not collected, and fishery independent surveys are not carried out.

Some finfish research in the Gulf of California conducted by INAPESCA and regional Universities includes studies on reproduction, age and growth, population dynamics, feeding habits, general life-history traits, fishing and description of the fisheries in the Gulf of California over the last 20 years.

The harvest strategy is only limited to fishing licenses and considering the information of the previous paragraphs in this PI, there is some information to support the harvest strategy, this issue might meet SG60. However, information may not be sufficient and SG80 is not met.

b	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	**No**	**No**	**No**

Rationale

Fishery removals of the five target species (Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack and ocean withefish) in Guaymas (Gulf of California) have been collected by CONAPESCA since 2005. Landing statistics by finfish group (in a few species by species), state, CONAPESCA office, year and month through 2014 are publicly available through the CONAPESCA portal. Nevertheless, data are not segregated by gear and the landing information is by finfish group.

The catch records are not considered reliable because the collection of data and monitoring of the fishery is not systematic, only relies on the volume of catches and most frequently, catches are not reported at the species level. Removals are monitored but stock abundance is not, and there are no indicators of stock status.. The information does not meet SG60.

c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	

	Met?		**No**	

Rationale
Commercial catches are monitored by CONAPESCA. Nevertheless, catches from subsistence or (legal) recreational fleets are unknown. The existing monitoring program does not collect information on Pacific red snapper, rooster hind, goldspotted sand bass, yellowtail amberjack and ocean whitefish discards or bycatch in other (industrial) fisheries or with other fishing gears in the Gulf of California. Finally, quantities of Illegal, Unreported and Unregulated fishing (IUU) are unknown. This issue does not reach the SG80.

References
https://www.conapesca.gob.mx/wb/cona/informacion_estadistica_por_especie_y_entidad DOF. 2010. Actualización de la Carta Nacional Pesquera y su anexo. Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación. Diario Oficial. México. Cisneros-Montemayor et al. 2013. Extent and implications of IUU catch in Mexico´s marine fisheries. Marine Policy. DOI:10.1016/j.marpol.2012.12.003

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	Pacific red snapper	**<60**
	Rooster hind	**<60**
	Golspotted san bass	**<60**
	Yellowtail amberjack	**<60**
	Ocean whitefish	**<60**
Information gap indicator	**More information sought**	
Data-deficient? (Risk-Based Framework needed)	**Possibly**	

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		**NA**	**NA**

Rationale				
When the MSC Risk Based Framework is used to assess stock status for PI 1.1.1, a default score of 80 is given to this PI.				
b	Assessment approach			
	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	**NA**	**NA**	
Rationale				
NA				
c	Uncertainty in the assessment			
	Guide post	The assessment **identifies major sources** of uncertainty.	The assessment **takes uncertainty into account**.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	**NA**	**NA**	**NA**
Rationale				
NA				
d	Evaluation of assessment			
	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			**NA**
Rationale				
NA				
e	Peer review of assessment			
	Guide post		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		**NA**	**NA**
Rationale				
NA				
References				

Working towards MSC certification: A practical guide for fisheries improving to sustainability (https://www.msc.org/docs/default-source/default-document-library/for-business/msc_capacity_building_toolkit.pdf?sfvrsn=3c080f7a_4)

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

8.5 Principle 2

8.5.1 Principle 2 background

a. Primary, Secondary and Endangered, Threatened or Protected (ETP) species including their status and relevant management history.

Primary species

None of the non-target species caught by the handline finfish fishery of Guaymas, Sonora, meets the requirements to be considered as primary species, except those used as bait. Species used as bait in UoAs are the South American pilchard or Monterey sardine (*Sardinops sagax*) and/or Pacific thread herring (*Ophistonema libertate*) and Chub mackerel (*Scomberomorus japonicas*). These species are used during the finfish season (5 months) with an average volume of 12 tons, which represents a 19.2% of the total finfish caught during the season (Table 12). Monterey sardine, Pacific thread herring, and chub mackerel are purchased from a small pelagic industrial fleet in Guaymas.

Chub mackerel (*Scomberomorus japonicas*) is captured with thrownets and used as live bait in the yellowtail amberjack fishery. During the yellowtail season (3 months), they catch an average of 18 tons which represents 18% of the total catches of yellowtail amberjack (Table 12).

The three species mentioned above are managed thought the small pelagic Fishery Management Plan (DOF, 2012).

The California market squid (*L. opalenscens*) is also used as bait during the fishing season (3 months). An average of 18 tons are used per season, which represents a 3.8% of the total finfish catches (Table 12).

Table 12. Species used as bait by the fishing cooperatives in Guaymas.

Species	Volume (tons)	Fishing season (months)	% with respect to the annual catch
Sardinops sagax, Ophistonema libertate and Scomber japonicas	12	5	19.2
Scomber japonicas	60	5	18
Loligo opalescens	18	3	3.8

South American pilchard or Monterey sardine (Sardinops sagax)

The method of capture is purse seine nets, targeted by 46 vessels, members of the National Chamber of Fisheries and Aquaculture Industries (CANAINPES) and licensed by the Mexican government. The catches are landed in Sonora, Mexico. The fleet's capacity and fishing gear characteristics are regulated by the Mexican federal government via the applicable Official Mexican Standard 003-PESC-1993.

The NOM specifies the minimum length for small pelagics. For Pacific sardine, the minimum size is 150 mm of standard length (SL). However, 30% of the total catch of this species is allowed to be smaller than the minimum size. Also, the Fisheries National Charter (Carta Nacional Pesquera) periodically reviews the fishery and establishes regulations.

In November of 2012, The Small Pelagics Fisheries Management Plan was declared a law. This management plan includes definitions and estimations for reference points. It establishes that the

limit reference point, used as the biological acceptable catch computed as a fraction of the estimated MSY, has to be estimated annually. The Pacific sardine is categorized as Actively Managed in the 2012 law.

Different methodologies have been applied to assess the Pacific sardine stock. Stock assessment using regular Virtual Population Analysis (VPA; Cisneros-Mata et al., 1995), length based (Jones') VPA (Nevárez-Martinez, 2014) and statistical catch at age using ASAP (Nevárez-Martinez et al., 2015) it has been concluded that recruitment is highly variable and suggest that environmental conditions may play an important role in such variability. These assessments also suggest that the total abundance closely follows the trend in recruitment. On the other hand, the VPA suggests that overfishing may have played a role in the fall on the stock in the 90s.

Abundance's estimates independent of the fishery have been obtained from hydroacoustic surveys carried out in the Gulf of California from 2008-2016 (Nevárez-Martinez et al., 2015). The abundance trends showed a decrease of biomass from 2008-2010 and in 2013-2016 it has stabilized at an average range of 469,000 to 647,000 mt. Also, it has been observed that the availability of sardines depends on wind patterns and inter-annual fluctuations directed related to the El Niño Southern California Oscillation (ENSO).

Based on the results of these assessments, the reference points for this fishery have been stablished (table 13).

Table 13 – Reference points (RF) for the Pacific sardine in the Gulf of California. Table reproduced from the document sent by M. A. Martinez-Zavala, complemented with data from CRIP (2015) by Andraka et al. 2018.

Reference Points (RF)	Reference Points (RF) Source	P. sardine (2014) RP for 2013	P. sardine (2015) RP for 2014	P. sardine (2016) RP for 2015
Minimum advisable stock abundance (individuals)	INAPESCA 2015	269 X 106 - 1,569 X 106	-	-
Minimum advisable stock abundance (biomass, mt)	?	22,000 – 126,000 t	9,500 – 52,000	185,000 (65,000 "for ecosystem ")
Advisable exploitation rate	Fisheries National Charter	0.25/year	0.25/year	
Fishing mortality rate (F)	Cohort Analysis 2011/12 (CRIP)	0.189/year	-	
Fishing mortality rate (F)	Cohort Analysis 2012/13 (CRIP)	0.218/year	-	
Fishing mortality rate producing MSY (Fmsy)	ASAP (Nevárez-Martinez 2015) ASAP (Nevárez-Martinez 2016)	-	0.28	0.290
Exploitation rate (E)	Cohort analysis (2011/12) (CRIP)	0.161/year	NA for 2013/14	
Exploitation rate (E)	Cohort analysis	0.183/year	-	
Actual biomass (B)	(estimated by hydroacoustics)	515,000 – 711,000 t	-	

Actual biomass (B)	Probably estimated by hydroacoustics, estimated for ASAP	-	572,000 t ~750,000 t	420,000

Pacific thread herring (Opisthonema libertate)

This species has been the second main small pelagic species in landing volumes, unlike Pacific sardine. The method of capture is purse seine nets, targeted by 46 vessels, members of the National Chamber of Fisheries and Aquaculture Industries (CANAIPES) and licensed by the Mexican government. The catches are landed in Sonora, Mexico. The fleet's capacity and fishing gear characteristics are regulated by the Mexican federal government via the applicable Official Mexican Standard 003-PESC-1993.

The NOM specifies the minimum length size for small pelagics. For thread herring, the minimum size is 160 mm of standard length (SL). Pacific thread herring is also categorized as actively managed in the Small Pelagics Fisheries Management Plan, which was declared a law.

Fisheries independent data are being collected via hydroacoustic surveys since 2008. However, the only available abundance estimates for thread herring are from 2016 which were not used in the stock assessment (table 14).

Table 14 – Estimations of thread herring using hydroacoustic surveys (Alvarez et al. 2018).

Year	Average size (mm)	Weight (gr)	Organisms per area	Average biomass	Biomass
2016	148	74.5	492,248.8	36.69	355,924
			679,492	50.65	491,312

The stock status and productivity have been evaluated using three different methodologies. The first is a Virtual Population Analysis (VPA) which allows calculating abundance and recruitment, and the annual fishing mortality rates (F) (Villalobos et al., 2013). This analysis reflected an increasing biomass abundance starting in 1932. In 2003-2004, this abundance stabilized around 1,750,000 tons. In 2007, recruitment reached a maximum high near 1,000,000 tons. Concerning F, the highest peak has its maximum in 1992 and 1992, close to 0.2. From 1994-2002 F remained around 0.025. From 2003-2007 F average around 0.05. From 2008-2010 F had its lowest value close to 0.01 and increase in 2010 to 0.1.

The second type of evaluation by Nevárez-Martínez et al. (2014) used the statistical catch at age software ASAP (Legault and Restrepo, 1999). The results showed an increasing trend in the thread herring biomass. The values obtained for F in this evaluation were higher than using the VPA. The MSY obtained with the ASAP was of 101,484 tons and Fmsy of 0.879.

The third analysis uses a biomass dynamics model by Névarez-Martínez et al. (2016). The results showed several problems, particularly in fitting the predicted model. However, the results show a fishing mortality rate at MSY of 0.575 and MSY around 354,000 tons.

Based on the results of these assessments, the reference points for this fishery has been stablished (table 15).

Table 15 – Reference points for thread herring in the Gulf of California. Table produced from documents sent by M.A. Martinez-Zavala in 2014-2015 and data from Nevárez-Martinez et al. 2016 (Alvarez et al. 2018).

Reference Points (RP)	Source RP	Thread Herring Values using ASAP (1972-2012)	Thread herring Values using ASAP (1972-2014)	Thread herring Values using Bdm
FMSY Fishing mortality rate producing maximum sustainable yield	INAPESCA 2014 Nevárez-Martinez et al. 2016	0.879/year	0.312	0.5195
FOY Fishing mortality rate at optimal yield	INAPESCA 2014	0.621/ year	NA	NA
Fcurrent Actual fishing mortality rate	INAPESCA 2014	0.110/ year	0.04	NA
MSY Maximum Sustainable Yield	INAPESCA 2014 Nevárez-Martinez et al. 2016	101,484 t	170,949 t	290,257 t
OY Optimum Yield (tonnes)	INAPESCA 2014	97,945 t	NA	NA
Exploitation rate (E)	INAPESCA 2014 Nevárez-Martinez et al. 2016	0.185/ year	0.072-0.109	NA
Biologically Acceptable Catch (BAC)	Nevárez-Martinez et al. 2016	NA	258,000 – 213,000	NA
Exploitation rate (E)	Carta Nacional Pesquera (2012), 68-69 p.	0.25/ year	NA	NA
Fishing mortality rate (F)	Cohort analysis (2011/12) (CRIP)	0.163/ year	NA	NA
Fishing mortality rate (F)	Cohort analysis (2012/13) (CRIP)	-	NA	NA
Exploitation rate (E)	Cohort analysis (2011/12) (CRIP)	0.143/ year	NA	NA
Exploitation rate (E)	Cohort analysis (2012/13) (CRIP)	0.183/ year	NA	NA
Minimum biomass (Bmin)	INAPESCA 2015 - 2016 Based on Method by Morales-Bojorquez and Nevárez-Martinez (2005)	3,000 t (preliminary)	52,700 t	NA

Chub mackerel *(Scomber japonicas)*

Chub mackerel is categorized as actively managed in the Small Pelagics Fisheries Management Plan, which was declared a law.

This species is retained in the catches of the small pelagic fisheries. Chub mackerel have shown variable peaks in abundance. The highest peak show in 1998-1999 with 40,535 mt landed, accounting for 25% of the catch composition of the fishery. The size composition shows an average

length of 199.9 mm, and the mean maturity length (L50) for the Gulf of California is estimated to be 228.9 mm (DOF, 8th November 2012).

Using the predictive model of Thompson Bell, the MSY and associated biomass of the Gulf of California chub mackerel has been obtained as shown in table 16.

Table 16 – Maximum Sustainable Yield (MSY) and associated mean biomass of Gulf of California chub mackerel. Reproduced from Nevárez-Martínez et al. 2016 (Alvarez et al., 2018)

Period	MSY (t)	Associated mean biomass (t)	Authors
1991/92-1992/93	10,039	8,742	Cisneros-Mata et al., 1997.
1993/94-1995/96	11,243	10,228	Cisneros-Mata et al., 1997.
1996/97-1997/98	2,494	1,680	Martínez-Zavala et al., 2000.
1998/99-1999/00	43,383	38,629	Martínez-Zavala et al., 2006.
2000/01-2002/03	8,168	7,820	Martínez-Zavala et al., 2006.

Results from a biomass dynamic model from Nevárez-Martínez et al. (2016) show that the catches are far below the estimated BMSY for all of its trajectory of catches from 1971-2015. On the other hand, Kobe plots show positive results for the population status, indicating that estimated biomass is above the BMSY and the average fishing mortality rate remains below FMSY, concluding there is no risk of overfishing.

Based these assessments, The Small Pelagics Fisheries Management Plan has established an MSY-based control rule indicating that the catch needs to be reduced if the biomass declines. Also, a minimum size is listed, as previously mentioned.

The chub fishery has to be analyzed every 3-4 years. When reaching or exceeding one or more reference points, temporary closures or closed areas, minimum sizes, allowable catch levels and effort restrictions can be adjusted.

California market squid (*Loligo opalescens*)

Market squid belongs to the family Loliginidae. Market squid are less than 3 mm at hatching and grow to an average mantle length of 152 mm at the time of spawning. Males are larger and more robust than females. Market squid are terminal spawners, spawning occurs at the end of their lifespan. In California, commercial fisheries target adults during spawning events. Recent age studies indicate that squids are a semi-annual species; the average age of squid taken in the fishery is six months (range 4-10 months) (Butler et al. 2001).

The range distribution of market squid is from the southern tip of Baja California, Mexico (23° N latitude) to southeastern Alaska (55° N latitude). Juveniles and adults' range throughout the California and Alaska Current systems (Roper and Sweeney, 1984). Paralarvae, the life stage of market squid at the time of hatching, are often collected in the waters closer to the shoreline (Zeidberg and Hamner 2002).

There are two major fishery areas in California. The northern fishery is centered in Monterey Bay, and squid are landed primarily at Monterey and Moss Landing. The northern fishery operates predominately within a half-mile of the Monterey Bay shoreline. The southern fishery targets a multitude of fishing spots including the Channel Islands and coastal areas from Point Conception

south to La Jolla. Squid are landed chiefly at the ports of Ventura, Port Hueneme, San Pedro, and Terminal Island (CDFW, 2005).

Market squid population dynamics are poorly understood. Although some information exists on the coastwide distribution and abundance of market squid from fishery-independent midwater and bottom trawl surveys aimed at assessing other species. There is no good measure of annual recruitment success beyond information obtained from the fishery. Because fishing activity occurs only on shallow water spawning aggregations, it is not apparent if landings reflect availability to the fishery or overall stock size since squid have been documented at greater depths using other gear. Historically, the squid resource was considered by some to be underutilized (CDFW, 2005).

Management reference points are based on an "egg escapement model," which allows for the estimation of reproductive output and fishing mortality rates. However, this approach is not designed to assess species abundance and is not intended for that purpose in this fishery (Dorval et al. 2013).

For market squid, the Overfishing Limit (OFL) and Allowable Biological Catch (ABC) are both set at the fishing mortality that results in a threshold level of egg escapement of at least 30% (the proxy for MSY). At the time these thresholds were set, managers considered the state measures in place (weekend closures, area closures, harvest cap) enough of a buffer to not worry about setting the ABC lower than the OFL (MSFMP 2005).

The Management Measures for Market squid (MSFMP) (2005) establishes a management program for California's market squid resource and procedures by which the Commission Deparment of Fish and Wildlife will manage the market squid fishery (CDFW, 2005). The goals of the MSFMP are to manage the market squid resource to ensure long term resource conservation and sustainability, reduce the potential for overfishing, and institute a framework for management that will be responsive to environmental and socioeconomic changes. The tools implemented to accomplish these goals include:

- Establishment of fishery control rules, including a seasonal catch limitation to prevent the fishery from over-expanding; continuing weekend closures, which provide for periods of uninterrupted spawning; continuing gear regulations regarding light shields and wattage used to attract squid, and maintaining monitoring programs designed to evaluate the impact of the fishery on the resource.
- Creation of a restricted access program, including provisions for initial entry into the fleet, types of permits, permit fees and permit transferability that produces a moderately productive and specialized fleet.
- Establishment of a seabird closure restricting the use of attracting lights for commercial purposes in any waters of the Gulf of the Farallon's National Marine Sanctuary.

Secondary species

Since 2015, the cooperatives 29 de Agosto, La Manga Restaurante and Los Sazanes have implemented fishing logbooks for the handline fishery. From this monitoring effort, nine species have been recorded as bycatch. The nine species represent a percentage below 5% and are classified as resilient using a productivity analysis (Table 17).

Table 17 – Percentage of target and unwanted species for the handline fishery in Guaymas (data from the fishery logbook program).

Category species	Species	%
Target species	*Paralabrax auroguttatus*	26.1
Target species	*Hyporthodus acanthistius*	23.4
Target species	*Caulolatilus princeps*	18.9
Target species	*Seriola lalandi*	10.6
Secondary minor species	*Lutjanus argentiventris*	4.9
Secondary minor species	*Caulolatilus affinis*	3.9
Secondary minor species	*Mycteroperca rosacea*	2.9
Secondary minor species	*Lutjanus spp.*	2.5
Target species	*Lutjanus peru*	2.3
Secondary minor species	*Balystes polylepis*	1.4
Secondary minor species	*Atractoscion nobilis*	0.7
Secondary minor species	*Hoplopargus guenterii*	0.3
Secondary minor species	Caranx spp.	0.2
Secondary minor species	*Ephinephelus spp.*	0.1

b. Endangered, threatened, or protected species (ETP species) in the finfish fishery handline UoAs.

There is no evidence of interactions of any of ETP species with the handline finfish fishery in Guaymas, Sonora.

Within the area where the UoA operates, there are several species that are on the IUCN red list as endangered or critically endangered or part of NOM-059. There is no evidence of interaction between any ETP species and the handline finfish fishery in Guaymas, Sonora (Table 18).

Table 18 – ETP species in Gulf of California.

No.	Common name	Scientific Name	IUCN Red List Category	CITES (Appendix)	NOM-059
1	Whale Shark	*Rhincodon typus*	Endangered	II	X
2	Dusky Shark	*Carcharhinus obscurus*	Endangered		
3	White Shark	*Carcharodon carcharias*	Vulnerable	II	X
4	Shortfin Mako	*Isurus oxyrinchus*	Endangered		
5	Oceanic Whitetip Shark	*Carcharhinus longimanus*	Critically Endangered	II	
6	Hammerhead Shark	*Sphyrna lewini*	Critically Endangered	II	
7	Basking Shark	*Cetorhinus maximus*	Endangered	II	X
8	Pelagic Thresher	*Alopias pelagicus*	Endangered	I	
9	Giant Devilray	*Mobula mobular*	Endangered	I	
10	Sicklefin Devilray	*Mobula tarapacana*	Endangered	I	

11	Bentfin Devilray	*Mobula thurstoni*	Endangered	I	
12	Giant Manta Ray	*Mobula birostris*	Vulnerable	I	
13	Sei Whale	*Balaenoptera borealis*	Endangered	I	X
14	Blue Whale	*Balaenoptera musculus*	Endangered	I	X
15	Harbor Seal	*Phoca vitulina*	Least concern		X
16	Northern Elephant Seal	*Mirounga angustirostris*	Least concern		X
17	California Sea Lion	*Zalophus californianus*	Least concern		X
18	Green Turtle	*Chelonia agassizi*	Endangered	I	X
19	Hawksbill Turtle	*Eretmochelys imbricata*	Critically Endangered	I	X
20	Loggerhead turtle	*Caretta c. gigas*	Vulnerable		X
21	California sheephead	*Semicossyphus pulcher*	Vulnerable		
22	Totoaba	*Totoaba macdonaldi*	Critically Endangered		X
23	King Angelfish	*Holacanthus passer*			X
24	Cortes Angelfish	*Pomacanthus zonipectus*			X
25	Blue and yellow chormis	*Chromis limbaughi*			X
26	Blue spotte jawfish	*Oistognathus rosenblatti*			X
27	Gulf Grouper	*Mycteroperca jordani*	Endangered		

c. The aquatic ecosystem, its status and any particularly sensitive areas, habitats or ecosystem features influencing or affected by the UoAs.

The Gulf of California (also known as the Sea of Cortés) is a partially closed, long, wide sea (1,000 km length and 150 km width) known for an exceptionally high level of biodiversity and high primary productivity resulting from the combination of its topography, southern latitude, and upwelling systems. This region is characterized by deep basins (from more than 3,000 m at the entrance to the gulf), slopes, narrow continental shelves and numerous islands, bays, sandy beaches, and coastal lagoons, which are generally hypersaline (Wilkinson et al., 2009).

The Gulf of California is an evaporation basin and it has a reduced exchange with the Pacific Ocean. The gulf has three natural mechanisms that feed the region: upwellings induced by the wind, tidal mixing, and thermohaline circulation (Álvarez Borrego, 2002). In response to this complex pattern, upwellings generally occur near the east coast with northwest winds (“winter” conditions) from December to May and near the coast of the Baja California peninsula with south-easterly winds (“summer” conditions) from July to October with June and November as transition periods. Following the upwelling events that occur for only a few days, the water column is stabilized, and the phytoplankton communities decrease (Wilkinson et al., 2009).

The GOC comprises a variety of habitats that vary along broad latitudinal and bathymetric gradients covering over 12 degrees in latitude. Based on community structure and the distribution of marine biota, three distinct biogeographic subregions (Northern, Central, Southern, Fig. 26) have been described where the same habitat supports distinct suites of species (Brusca et al. 2005; Brusca and Hendrickx, 2010). Major habitat types in decreasing order of their coverage in the GOC include rocky reefs, wetlands, mangrove forests, Sargassum spp. forests, seagrass beds, rhodolith beds and seamounts, and their geographic distribution varies considerably among subregions (Fig. 27, see Online Resource 3 for detailed descriptions of each habitat). Sandy bottoms are also a major habitat type in the GOC, but their distribution and coverage remain unclear (Munguia et al 2018).

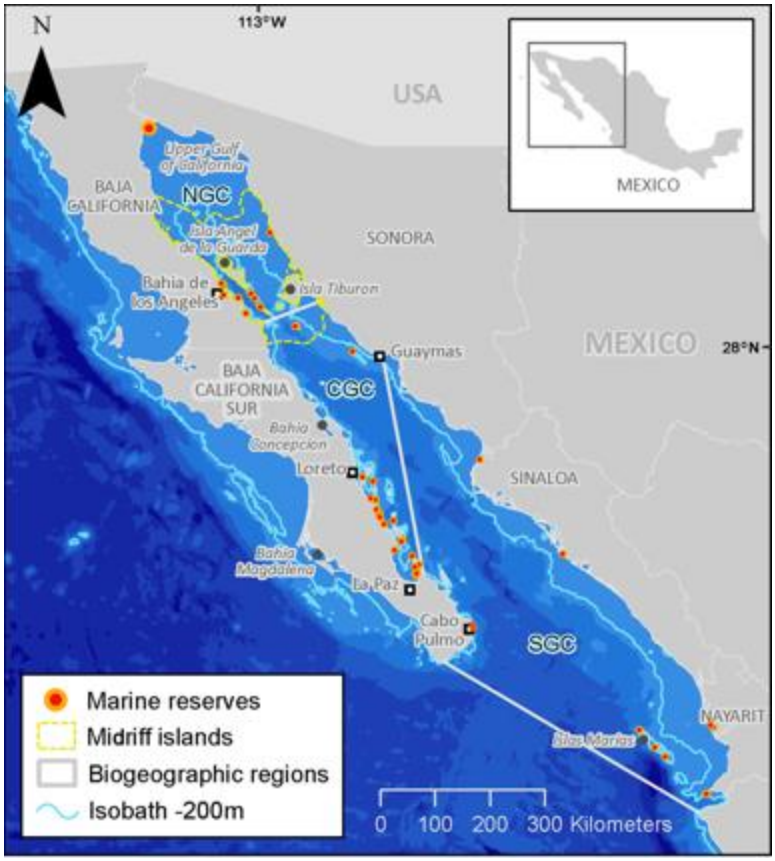


Figure 26. Gulf of California showing the location of 47 existing marine reserves, and the location of the three biogeographic subregions (Brusca et al. 2005): Northern (NGC), Central (CGC) and Southern (SGC) (Munguia et al. 2018).

The Gulf of California has been widely recognized as a marine biodiversity hotspot. Nearly 6000 macroscopic marine animal species have been described (4854 invertebrates and 1115 vertebrates including 801 teleosts and 87 elasmobranchs), of which about 16% are endemic to the GOC (Brusca et al. 2005), making it one of the world's top 10 ecosystems for endemic species. The Gulf of California is fundamentally a subtropical system with high primary productivity; this high productivity sustains large populations of Pacific sardine (*Sadinops sagax*) and Pacific thread herring (*Opisthonema libertate*), in addition to many species of anchovies that are, in turn, the main source of food for various species of fish predators (Piscivorous), including squid, finfish, seabirds, and marine mammals.

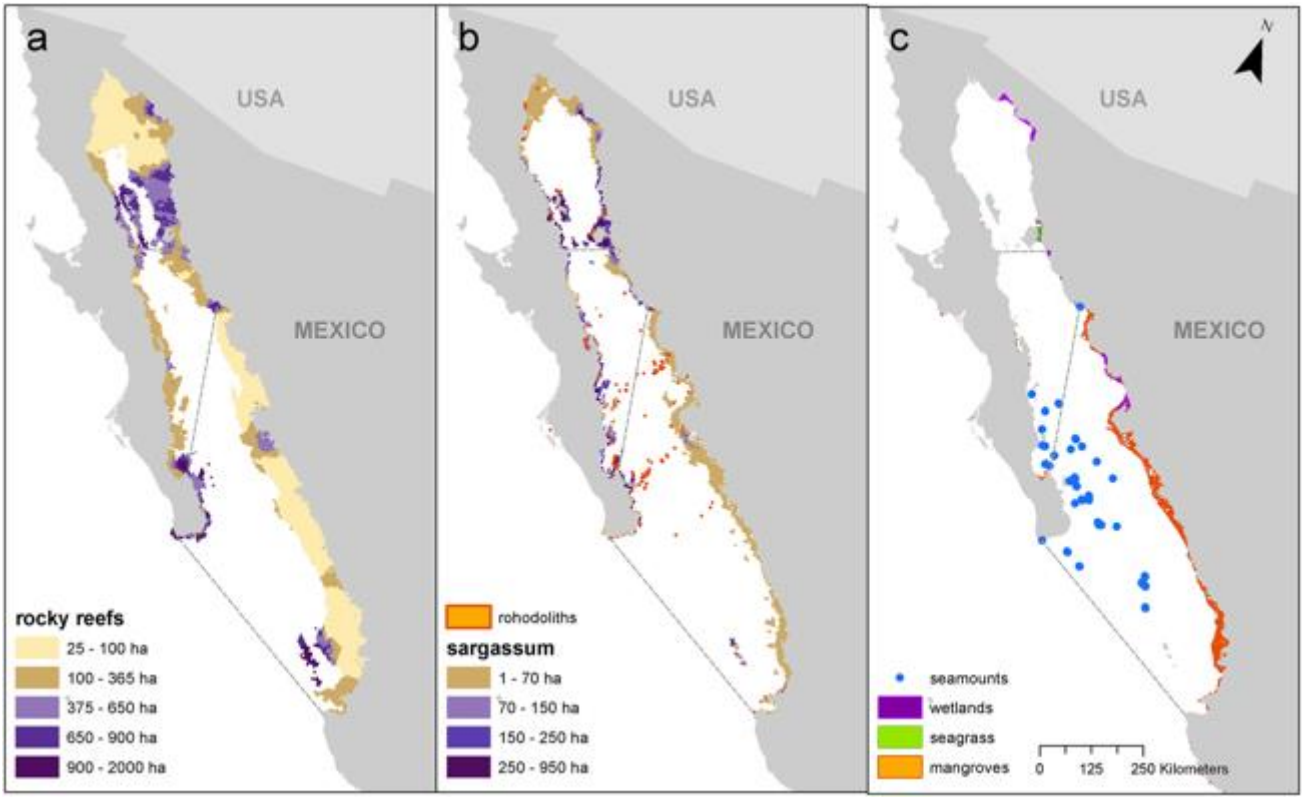


Figure 27. Major habitats in the Gulf of California. a) rocky reef (including pebbles, shallow and deep reefs; b) seaweed forests including Sargassum spp. and rhodoliths; c) seamounts, wetlands, seagrass beds and mangrove forest (Munguia et al. 2018)

In 2017, CONAPESCA established three no-take zones (Punta Chivato, 0.30 km^2; El Resumidero, 0.43 km^2; and Roca Partida, 0.65 km^2) in the marine waters of San Pedro Nolasco Island; therefore, extraction activities of any type are not to be conducted in these areas for a period of 5 years. The fishing cooperatives of Guaymas are respecting this closure (DOF, 2017) (Fig. 28).

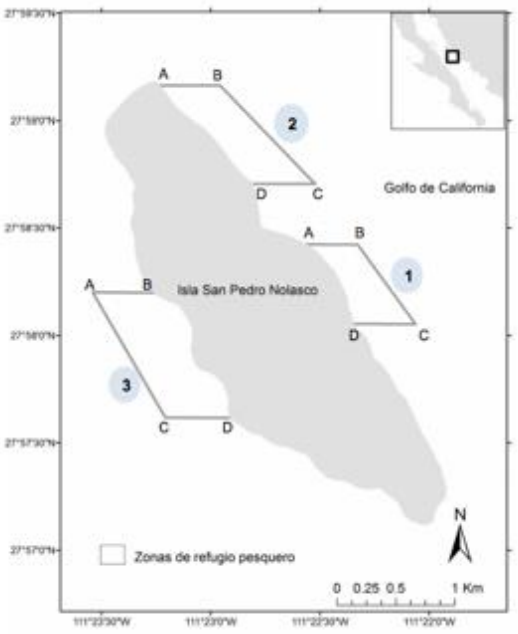


Figure 28. Fishing refuges located in San Pedro Nolasco Island. 1: Punta Chivato, 2: El Resumidero, 3: Roca Partida.

Based on ecosystem modeling of the South region of the Gulf of California, Díaz-Uribe et al. (2012) and Tovar-Cortes (2013) point out that the populations of yellowtail amberjack, snappers, and serranids show intermediate vulnerability and a high index of inter-specific interactions. Also, they present low energy flow, so these organisms are affected due to the increase in fishing effort, which influences the decrease in ecotrophic efficiency (Sala et al. 2003). Díaz-Uribe (2005) indicates that the handline fishery produces less effect on the ecosystem than the use of longlines and networks. Although the aforementioned organisms have lower ecotropic efficiency, the effect is generated due to an increase in fishing pressure on juveniles, mainly on populations of *Lutjanus peru* and *Caulolatilus princeps* (organisms with higher fishing mortality). On the other hand, the risk is reduced for yellowtail amberjack and sand bass. Therefore, it is suggested to reduce or eliminate the capture of this cohort through regulations or modification of the fishing methods.

Table 19 – Scoring elements

Component	Scoring elements	Designation	Data-deficient
Primary	Bait species: Pacific sardine (*Sardinops sagax*) Pacific thread herring (*Ophistonema libertate*) Chub mackerel (*Scomberomorus japonicus)* *Market squid: Loligo opalescens*	Main.	No
Secondary	Non target species: Yellow snapper (*Lutjanus argentiventris)* Bighead tilefish (*Caulolatilus affinis*) Mexican barred snapper *(Hoplopagrus guentherii*) Yellow snapper (*Lutjanus argentiventris*) Trigger fish (*Balystes polylepis*) Leopard grouper (*Mycteroperca rosacea*)	Minor	Yes (All)
ETP	No ETP Species	NA	NA
Habitat	Unknown	NA	No
Ecosystem	Foodweb dynamics	NA	No

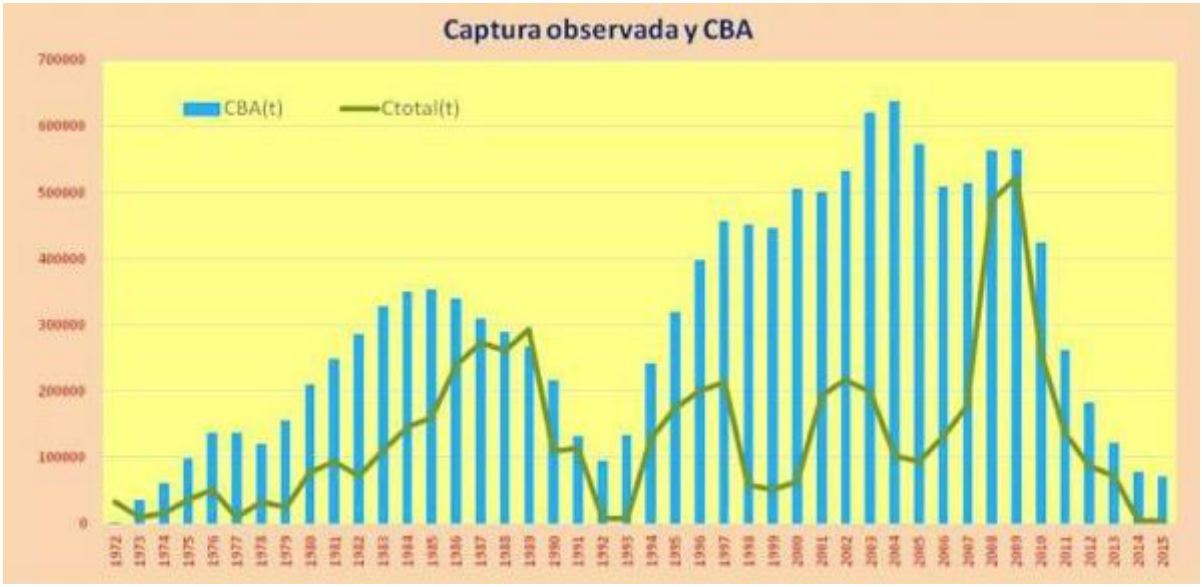
8.5.2 Principle 2 Performance Indicator scores and rationales – delete if not applicable

PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are **likely** to be above the PRI. OR If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are **highly likely** to be above the PRI. OR If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY.
	Met?	**Pacific sardine – Yes** **Chub mackerel – Yes** **Pacific thread herring - Yes** **Market squid- Yes**	**Pacific sardine – Yes** **Chub mackerel – Yes** **Pacific thread herring - Yes** **Market squid- No**	**Pacific sardine – Yes** **Chub mackerel – Yes** **Pacific thread herring - Yes** **Market squid- No**
Rationale				

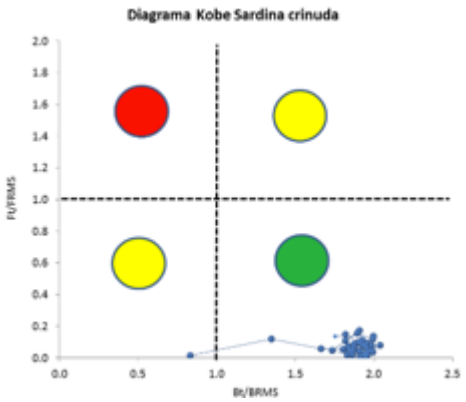
Analysis carried out by the research group of small pelagic fisheries (CRIP-Guaymas) indicates that there is a high degree of certainty that the stocks are above the point where recruitment would be impaired. The historic trend in biomass and the stock status in terms of biomass and fishing mortality rate is relative to the levels producing MSY.

Comparison of catch records (green line) of Pacific sardine in the Gulf of California with the estimated Biologically Acceptable Catch (bars) obtained with the control rule in the Management Plan. Reproduced from Nevarez-Martinez et al. 2016.

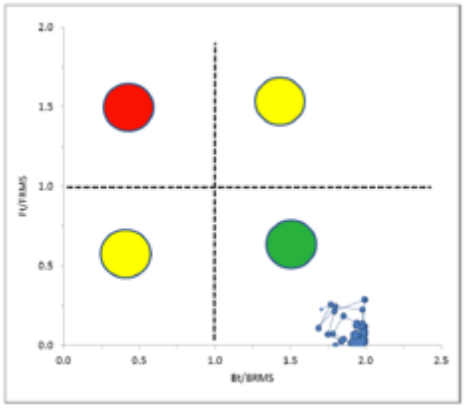


The results of a biomass dynamics model approach to estimate stock status and fishing mortality produced a Kobe plot where the estimated relative fishing mortality rate was far below the level producing MSY which is consistent with previous results. The Kobe plot also shows biomass far above the level producing MSY for Pacific thread herring and Chub mackerel.

Pacific thread herring



Chub mackerel



The fishing mortality rate in South American pilchard and Pacific thread herring has been historically well under the LRP.

Market Squid can be considered to be below the PRI. Management reference points are based on an "egg escapement model," which allows for the estimation of reproductive output and fishing mortality rates. However, this approach is not designed to assess species abundance and is not intended for that purpose in this fishery (Dorval et al. 2013). For market squid, the Overfishing Limit (OFL) and Allowable Biological Catch (ABC) are both set at the fishing mortality that results in a threshold level of egg escapement of at least 30% (the proxy for MSY).

The small pelagic species used as bait meet SG80, market squids only meet SG60.

b	Minor primary species stock status			
	Guide post			Minor primary species are highly likely to be above the PRI.

				OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.
	Met?			**Yes**

Rationale

There are no minor primary species in the UoA so SG100 is met.

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Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	***Pacific sardine ≥80***
	Chub mackerel ≥80
	Pacific thread herring ≥80
	***Market squid* 60-79**
Information gap indicator	**Information sufficient to score PI**
Data-deficient? (Risk-Based Framework needed)	**No**

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.2 – Primary species management strategy

PI 2.1.2		**There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a **partial strategy** in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a **strategy** in place for the UoA for managing main and minor primary species.
	Met?	**Pacific sardine – Yes** **Chub mackerel – Yes** **Pacific thread herring - Yes** ***Market squid- Yes***	**Pacific sardine – Yes** **Chub mackerel – Yes** **Pacific thread herring - Yes** ***Market squid- Yes***	**Pacific sardine – No** **Chub mackerel – No** **Pacific thread herring - No** ***Market squid- No***

Rationale

The bait is purchased from the industrial small pelagic fleet. South American pilchard, Pacific thread herring, and chub mackerel are part of the fishery for small pelagics, and as such are managed under the provisions outlined in the Norma Oficial Mexicana (NOM) 003-PESC-2018—including regulations for fishing gear, minimum size, and fleet capacity. The implementation of management provisions is guided and informed by the Small Pelagics Fishery Management Plan (2012) and the National Fisheries Chart (DOF 2018). The basic management strategy for the small pelagic fishery in the Gulf of California, as advised in the National Fisheries Charter, is to stay at or below the exploitation rate of 0.25 F, which is equal to 0.9 FMSY (Nevárez-Martínez et al. 1999).

Under this management framework, there is a sampling program to collect landing data, surveys to

gather size data, and stock assessments have been conducted for three species. Also, the three species are monitored by acoustic surveys in the Gulf of California. The management measures, stock assessment and the fishery management plan are a partial strategy to maintain the South American pilchard, Pacific thread herring, and chub mackerel at levels which are highly like to be above the PRI.

For the market squid, the Management Measures (MSFMP) (2005) establishes a management program for California's market squid resource and procedures by which the Commission will manage the market squid fishery (CDFW, 2005). There are stablished control rules, seasonal catch limitation, weekend closures, gear regulations, and monitoring program to evaluate the impact of the fishery. Also, a seabird closure restricting the use of attracting lights for commercial purposes in any waters of the Gulf of the Farallon's National Marine Sanctuary is stablished. To control the fishing effort, a restricted access program is implemented. This program includes provisions for initial entry into the fleet, types of permits, permit fees and permit transferability that produces a moderately productive and specialized fleet.

The management, data collection and analyses described above constitute a partial strategy, and based on the species' stock status, it is expected to maintain the main primary species at levels that are highly likely to be above PRI so SG80 is met. SG100 is not met since there is not a strategy in place for any of the primary stocks.

b	Management strategy evaluation			
	Guide post	The measures are considered **likely** to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	**Pacific sardine – Yes** **Chub mackerel – Yes** **Pacific thread herring - Yes** ***Market squid- Yes***	**Pacific sardine – Yes** **Chub mackerel – Yes** **Pacific thread herring - Yes** ***Market squid- No***	**Pacific sardine – No** **Chub mackerel – No** **Pacific thread herring - No** ***Market squid- No***

Rationale

Several management measures for the small pelagic fishery are already in place. Systematic monitoring of landing has been conducted since the 1970s, and several evaluations of biological reference points for South American pilchard, Pacific thread herring and chub mackerel have been conducted. Information collected from the observer program provides some objective basis for confidence of the likelihood that the current operations of the fleet will work to manage impacts of the small pelagic fishery.
SG80 is met for all small pelagic species. SG100 is not met since testing to support higher confidence has not occurred.

For the market squid, the Management Measures (MSFMP) (2005) establishes a management program for California's market squid resource and procedures by which the Commission will manage the market squid fishery (CDFW, 2005). There are stablished control rules, seasonal catch limitation, weekend closures, gear regulations, and monitoring program to evaluate the impact of the fishery. To control the fishing effort, a restricted access program is implemented. This program includes provisions for initial entry into the fleet, types of permits, permit fees and permit transferability that produce a moderately productive and specialized fleet. The squid stock is currently below the PRI, so the measures are only considered likely to work, but there is no objective basis for confidence that they are working. Thus, SG60 is met but SG80 is not.

c	Management strategy implementation			
	Guide post		There is **some evidence** that the measures/partial strategy	There is **clear evidence** that the partial strategy/strategy is

			is being **implemented successfully**.	being **implemented successfully and is achieving its overall objective as set out in scoring issue (a).**
	Met?		**Pacific sardine – No Chub mackerel – No Pacific thread herring - No *Market squid- No***	**Pacific sardine – No Chub mackerel – No Pacific thread herring - No *Market squid- No***

Rationale

There is some evidence that measures in the partial strategy are implemented (landing monitoring, dynamic models, size sampling), however, at present, the harvest control rule for small pelagics and market squid is not considered to be 'in place'. The absence of evidence of monitoring and enforcement to implement the harvest strategy preclude the partial strategy from being considered as 'successfully' implemented, thus SG80 is not met.

d	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**NA**	**NA**	**NA**

Rationale

Sharks are not primary species in this UoA. The NOM-029-PESC-2006 prohibits the finning of sharks in Mexico.

e	Review of alternative measures			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	**NA**	**NA**	**NA**

Rationale

Since the only primary species in the UoA are used for bait, there is no unwanted catch. This scoring issue is not relevant. Therefore this scoring issue is not applicable.

References

CDFW (2005). Market Squid Fishery Management Plan. California Department of Fish and Game.

DOF 2012. ACUERDO por el que se da a conocer el Plan de Manejo Pesquero para la Pesquería de Pelágicos Menores (sardinas, anchovetas, macarela y afines) del Noroeste de México. Diario Oficial. Mexico.

DOF. 2019. NORMA Oficial Mexicana NOM-003-SAG/PESC-2018, Para regular el aprovechamiento de las especies de peces pelágicos menores con embarcaciones de cerco, en aguas de jurisdicción federal del Océano Pacífico, incluyendo el Golfo de California. Diario Oficial. Mexico.

DOF. 2018. Actualización de la Carta Nacional Pesquera y su anexo. Secretaría de Agricultura,

Ganadería, Desarrollo Rural, Pesca y Alimentación. Diario Oficial. México.

Nevárez-Martínez M.O., M. A. Martinez-Zavala, J.P. Santos-Molina, V.E. Gonzalez-Maynez, M.E.Gonzalez-Corona, A.E. Lopez-Laguna, A. Valdez-Pelayo, D.I. Arizmendi-Rodríguez, E. Velarde-Romero. 2016a. Evaluación poblacional de la sardina monterrey (*Sardinops sagax*) en el Golfo de California, Mexico, 1971/72 – 2014/15. Informe Técnico del Programa de Pelágicos Menores. Instituto Nacional de Pesca. CRIP Guaymas, Sonora. 23 pp.

Nevárez-Martínez M.O., M. A. Martinez-Zavala, J.P. Santos-Molina, M.E. Gonzalez-Corona, D.I. Arizmendi-Rodríguez V.E. Gonzalez-Maynez, A.E. Lopez-Laguna, A. Valdez-Pelayo, E. Velarde-Romero. 2016b. Evaluación poblacional de la sardina crinuda (*Opisthonema libertate*) en el Golfo de California, México, 1971/72-2013/14. Informe Técnico del Programa de Pelágicos Menores. Instituto Nacional de Pesca. CRIP Guaymas, Sonora.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	***Pacific sardine* 60-79**
	***Chub mackerel* 60-79**
	***Pacific thread herring* 60-79**
	***Market squid* 60-79**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is **adequate to estimate** the impact of the UoA on the main primary species with respect to status. **OR** **If RBF is used to score PI 2.1.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is **adequate to assess** the impact of the UoA on the main primary species with respect to status. **OR** **If RBF is used to score PI 2.1.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is **adequate to assess with a high degree of certainty** the impact of the UoA on main primary species with respect to status.

	Met?	**Pacific sardine – Yes Chub mackerel – Yes Pacific thread herring - Yes *Market squid- Yes***	**Pacific sardine – Yes Chub mackerel – Yes Pacific thread herring - Yes *Market squid- Yes***	**Pacific sardine – No Chub mackerel – No Pacific thread herring - No *Market squid- No***
Rationale				
The small pelagic fishery in the Gulf of California and market squid in California landings and effort are monitored, providing some quantitative information on the amount taken of South American pilchard, Pacific Thread herring, and Chub mackerel by the fishery. The information obtained from monitoring includes the catch volumes and sizes for each of the captured species. The data is collected through a logbook and notice landing reports by fishermen and biological sampling carried out by CRIP staff (small pelagics). The market squid data is collected through landing reports. Thus, some qualitative information is available and adequate to assess the impact of the UoA on the main primary species with respect to status, and the SG80 is met. The information does not provide a high degree of certainty, so SG100 is not met.				
b	Information adequacy for assessment of impact on minor primary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			**Yes**
Rationale				
There are no minor primary species in the UoA, so SG100 is met.				
c	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage **main** primary species.	Information is adequate to support a **partial strategy** to manage **main** primary species.	Information is adequate to support a **strategy** to manage **all** primary species, and evaluate with a **high degree of certainty** whether the strategy is achieving its objective.
	Met?	**Pacific sardine – Yes Chub mackerel – Yes Pacific thread herring - Yes *Market squid- Yes***	**Pacific sardine – Yes Chub mackerel – Yes Pacific thread herring - Yes *Market squid- Yes***	**Pacific sardine – No Chub mackerel – No Pacific thread herring - No *Market squid- No***
Rationale				
The information available (catch and effort data and biological reference points from fishery models) for South American pilchard, Pacific Thread herring, and Chub mackerel are considered adequate to support the partial strategy to manage these species. The data include dependent and independent fishery information (See primary species information in pag 65). The information available (catch and effort data and assessment) for market squid are considered adequate to support the partial strategy to manage this species. (See primary species information in pag 65) The SG80 is met, but SG100 is not met since there is not a strategy.				
References				
Nevárez-Martínez M.O., M. A. Martinez-Zavala, J.P. Santos-Molina, V.E. Gonzalez-Maynez, M.E.Gonzalez-Corona, A.E. Lopez-Laguna, A. Valdez-Pelayo, D.I. Arizmendi-Rodríguez, E. Velarde-				

Romero. 2016a. Evaluación poblacional de la sardina monterrey (Sardinops sagax) en el Golfo de California, Mexico, 1971/72 – 2014/15. Informe Técnico del Programa de Pelágicos Menores. Instituto Nacional de Pesca. CRIP Guaymas, Sonora. 23 pp.

Nevárez-Martínez M.O., M. A. Martinez-Zavala, J.P. Santos-Molina, M.E. Gonzalez-Corona, D.I. Arizmendi-Rodríguez V.E. Gonzalez-Maynez, A.E. Lopez-Laguna, A. Valdez-Pelayo, E. Velarde-Romero. 2016b. Evaluación poblacional de la sardina crinuda (Opisthonema libertate) en el Golfo de California, México, 1971/72-2013/14. Informe Técnico del Programa de Pelágicos Menores. Instituto Nacional de Pesca. CRIP Guaymas, Sonora.

DOF. 2019. NORMA Oficial Mexicana NOM-003-SAG/PESC-2018, Para regular el aprovechamiento de las especies de peces pelágicos menores con embarcaciones de cerco, en aguas de jurisdicción federal del Océano Pacífico, incluyendo el Golfo de California. Diario Oficial. Mexico.

DOF. 2018. Actualización de la Carta Nacional Pesquera y su anexo. Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación. Diario Oficial. México.

Alvarez, C., S. Anraka, Anhalzer, G. & S. Morgan. 2018. Smmal Pelagic Fishery in Sonora, Gulf of California. MSC Fishery Assessment Report. SCS gobal services report. 270 pp.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	***Pacific sardine ≥80***
	Chub mackerel ≥80
	Pacific thread herring ≥80
	Market squid ≥80
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	Main secondary species are **likely** to be above biologically based limits. OR If below biologically based limits, there are **measures** in	Main secondary species are **highly likely** to be above biologically based limits. OR If below biologically based limits, there is either	There is a **high degree of certainty** that main secondary species are above biologically based limits.

		place expected to ensure that the UoA does not hinder recovery and rebuilding.	**evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are **considerable**, there is either **evidence of recovery** or a, **demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species**, to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	**Yes**	**Yes**	**Yes**

Rationale

There are no main secondary species in the handline finfish fishery. Although there are no official data on the composition of the catch, the data used in this preassessment was taken form fisheries logbooks implemented in Guaymas. Since there are no main secondary species, SG100 is met.

b	Minor secondary species stock status			
	Guide post			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			**No**

Rationale

For the handline UoA, the 2017-2019 fishing logbook recorded nine species as secondary minor: *Lutjanus argentiventris*, *Caulolatilus affinis*, *Mycteroperca rosacea*, *Lutjanus spp.*, *Balystes polylepis*, *Atractoscion nobilis,* and Caranx. The nine species have a percentage below 5% and are classified as resilient using the productivity analysis of a PSA. There is no formal stock assessment for any of the minor secondary species, and there are no biologically based limits for these minor species. Therefore, SG100 is not met.

References

DOF. 2010. Actualización de la Carta Nacional Pesquera y su anexo. Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación. Diario Oficial. México.

Fishery Monitoring Program in Guaymas

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**

Information gap indicator	**Information sufficient to score PI**
Data-deficient? (Risk-Based Framework needed)	**No**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.2 – Secondary species management strategy

PI 2.2.2		**There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **strategy** in place for the UoA for managing main and minor secondary species.
	Met?	**Yes**	**Yes**	**No**
Rationale				
There are measures in place that could limit the impact of the UoAs on secondary species (hook size, licensing, fishing area, and closed areas). Also, the use of highly selective gear acts as a partial strategy and there are no main secondary species, so altogether these measures are considered as a partial strategy, so SG80 is met. Since there is no strategy, SG100 is not met.				
b	Management strategy evaluation			
	Guide post	The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	**Yes**	**Yes**	**No**
Rationale				
Given that the fishery uses highly selective gear with no main secondary species and very low catch rates of the minor secondary species (data form fishing logbooks), there is some objective basis for confidence that the partial strategy will work. SG80 is met. SG100 is not met since there is no testing to support a partial strategy.				
c	Management strategy implementation			

	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective as set out in scoring issue (a).**
	Met?		**Yes**	**No**

Rationale

Given that the fishery uses highly selective gear with no main secondary species and very low catch rates of the minor secondary species (data form fishing logbooks), there is some evidence that the partial strategy is being implemented successfully. SG80 is met. SG100 is not met since there is not clear evidence.

d	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**NA**	**NA**	**NA**

Rationale

The secondary species are not sharks, and the NOM-029-PESC-2006 prohibits shark finning in Mexico.

e	Review of alternative measures to minimise mortality of unwanted catch			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate.
	Met?	**NA**	**NA**	**NA**

Rationale

There are no main secondary species so SG80 is met. Since there is no biennial review of unwanted catch of all secondary species, SG100 is not met.

References

DOF. 2007. NORMA Oficial Mexicana NOM-029-PESC-2006, Pesca responsable de tiburones y rayas. Especificaciones para su aprovechamiento. Diario Oficial. Mexico.

FAO 2005. Guia del administrador pesqeuro. FAO Italia. http://www.fao.org/3/y3427s/y3427s00.htm#Contents

Ross-Salazar, E. 2014. Artes, metodos e implementos de pesca. Fundacion MarViva. San Jose, Costa Rica. 86p.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is **adequate to estimate** the impact of the UoA on the main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				
The catch data show that there are no main secondary species and that the catch of minor secondary species is very low. Therefore, there is quantitative information available (fishing logbooks) to adequately assess with a high degree of certainty the UoA's impact on main secondary species. SG100 is met.				
b	Information adequacy for assessment of impacts on minor secondary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			**No**
Rationale				
There is some quantitative information (fishing logbooks) which is expected to be adequate to estimate the impact of UoA on the status of minor secondary species. However, the degree of uncertainty does not allow to reach the SG100.				
c	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage	Information is adequate to support a **partial strategy** to	Information is adequate to support a **strategy** to manage

		main secondary species.	manage **main** secondary species.	**all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**.
	Met?	**Yes**	**Yes**	**No**

Rationale

The catch data show that there are no main secondary species. This is due to the highly selective gear that is used, which constitutes a partial strategy. Therefore, SG80 is met. SG100 is not since there is no strategy.

References

DOF. 2010. Actualización de la Carta Nacional Pesquera y su anexo. Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación. Diario Oficial. México.

Fishery Monitoring Program in Guaymas

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the **effects of the UoA** on the population/ stock are known and **likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population /stock are known and **highly likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

According to MSC Fisheries Standard v2.01; SA3.2.1, if an assessment team determines that a UoA has no impact on a particular component, it shall receive a score of 100 under the Outcome PI. Therefore, as it has been determined that the handline finfish fishery UoAs have no impact on the ETP species component, (mammals, birds, fishes and invertebrates include in NOM-059, CITES and UICN red list) automatically receive a score of 100 for this particular Outcome PI.

b	Direct effects			
	Guide Post	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	There is a **high degree of confidence** that there are no **significant detrimental direct effects** of the UoA on ETP species.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

While there are ETP species that overlap with the UoA, there is no evidence (from landing tickets, fishing logbooks or literature) to indicate that the UoA has interacted with them. This is supported by a robust explanation in the book "Sustainability and Responsible Fishing in Mexico", an analysis of the fishing logbook program and the assessment of gears impacts on in ETP species (DOF, 2010; Aurioles-Gamboa et al 2003; FAO 2005; Gomez-Gomez et al. 2016; Chupenague et al. 2003). Therefore, with this information, it is possible to determine with a high degree of confidence that there is no negative effect on ETP species, so this scoring issue meets SG100.

c	Indirect effects			
	Guide Post		Indirect effects have been considered for the UoA and are thought to be **highly likely** to not create unacceptable impacts.	There is a **high degree of confidence** that there are no **significant detrimental indirect effects** of the UoA on ETP species.
	Met?		**Yes**	**Yes**

Rationale

According to logbook data (2015-2019) there is not interaction of the UoA with ETP species; the fishing method (handline) is highly selective. Also, there is no loss of fishing gear (ghost fishing) so there is no evidence that the UoA has indirectly interacted with ETP species. Therefore, there is a high degree of certainty that the UoA does not cause significant detrimental indirect effects on ETP species. The fishery meets the SG100.

References

DOF. 2010. NOM-059-SEMARNAT. Diario Oficial. Mexico

Gomez-Gomez, A., Fernandez-Rivera Melo F.J., y Lejbowicz A. 2016. Reporte de la pesqueria de jurel (Seriola lalandi) en Isla Natividad, Baja California Sur del 2014 al 2016. Comunidad y Biodiversidad A.C. Guaymas, Sonora, Mexico.

Chuenpagdee, R., Morgan, L. E., Maxwell, S. M., Norse, E. A., & Pauly, D. (2003). Shifting gears: assessing collateral impacts of fishing methods in US waters. Frontiers in Ecology and the Environment, 1(10), 517–524. doi:10.1890/1540-9295(2003)001[0517:sgacio]2.0.co;2

FAO 2005. Guia del administrador pesqeuro. FAO Italia. http://www.fao.org/3/y3427s/y3427s00.htm#Contents

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**
Data-deficient? (Risk-Based Framework needed)	**No**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.2 – ETP species management strategy

PI 2.3.2		The UoA has in place precautionary management strategies designed to: - meet national and international requirements; - ensurethe UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species.
	Met?	**NA**	**NA**	**NA**
Rationale				
The UoA does not interact with any ETP species that is under any regime of any of the national and international institutions / organizations and national and foreign laws, such as NOM-059, CITES, and IUCN, or any other of this nature. Since there are no national and/or international limitations or requirements, this scoring issue is not scored.				
b	Management strategy in place (alternative)			
	Guide post	There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	**Yes**	**Yes**	**No**
Rationale				
There is no evidence of capture of ETP species within the fishery. Also, in Mexico there are established measures that are expected to minimize interaction and mortality with ETP species in accordance with international requirements for the protection of these species. For example, the LGPA, LGEEPA, LGVS, CNP and NOM-059-SEMARNAT-2010, NOM-064-SAG/PESC/SEMARNAT-2013, Natural Protected Area Pacific Islands (DOF 2016). The selectivity of gear, location of fishing, permanent area closure for mammals constitute a partial strategy in place, wich ensure the UoA does not hinder the recovery of ETP species. The SG 80 is met, SG 100 is not met since there is not a comprehensive strategy.				

c	Management strategy evaluation			
	Guide post	The measures are **considered likely** to work, based on **plausible argument** (e.g., general experience, theory or comparison with similar fisheries/species).	There is an **objective basis for confidence** that the measures/strategy will work, based on **information** directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis** supports **high confidence** that the strategy will work.
	Met?	**Yes**	**Yes**	**No**

Rationale

There is no interaction with ETP species. Due to the selectivity of the gear and the strategy followed by fishery, there is an objective basis for the confidence that the strategy will work based on information directly from the fishery. SG80 is met, but SG100 is not met since there has been no quantitative analysis to support high confidence.

d	Management strategy implementation			
	Guide post		There is some **evidence** that the measures/strategy is being implemented successfully.	There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and **is achieving its objective as set out in scoring issue (a) or (b).**
	Met?		**Yes**	**No**

Rationale

It has been determined with a high degree of confidence that there is no interaction of the handline finfish fishery with ETP species. There is some evidence that the strategy is being implemented successfully; therefore SG80 is met.

e	Review of alternative measures to minimize mortality of ETP species			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	**Yes**	**Yes**	**No**

Rationale

The fishing logbooks implemented since 2015 include reports of the catch and bycatch of the handline fishery. The NOMs (in this case NOM-059) are reviewed every 10 years, so there is a regular review of the effectiveness and potential feasibility of alternative measures to minimize the mortality of ETP species. SG80 is met but not SG100 because the review is not biennial.

References

DOF. 2010. NOM-059-SEMARNAT. Diario Oficial. Mexico

DOF. 2018. Ley General de Vida Silvestre. Diario Oficial. Mexico.

DOF. 2015. Ley General del Equilibrio Ecologico y la Proteccion al Ambiente. Diario Oficial. Mexico.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.3 – ETP species information

PI 2.3.3		**Relevant information is collected to support the management of UoA impacts on ETP species, including:** - **Information for the development of the management strategy;** - **Information to assess the effectiveness of the management strategy; and** - **Information to determine the outcome status of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is **adequate to estimate** the UoA related mortality on ETP species. **OR** **If RBF is used to score PI 2.3.1 for the UoA:** Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species.	Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. **OR** **If RBF is used to score PI 2.3.1 for the UoA:** Some quantitative information is **adequate to assess productivity and susceptibility attributes** for ETP species.	Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species.
	Met?	**Yes**	**Yes**	**No**
Rationale				
According to the justification presented in PI 2.3.1 and the information shown in the catch composition, there is no interaction with ETP species. Thus, there is some information to determine with a high degree of certainty that there are no impacts on ETP species related to the UoA, and SG80 is met. SG100 is not met because the information does not provide a high degree of certainty.				
b	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage the impacts on ETP species.	Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species.	Information is adequate to support a **comprehensive strategy** to manage impacts, minimize mortality and injury of ETP species, and evaluate with a **high degree of**

				certainty whether a strategy is achieving its objectives.
	Met?	**Yes**	**Yes**	**No**

Rationale

According to the justification presented in PI 2.3.1 and the information shown in the capture data, there is no interaction with ETP species. The fishing logbook program allows monitoring of catch and bycatch and to measure the trend of interaction with ETP species, thus SG80 is not met, but SG100 is not because the information cannot support the strategy with a high degree of certainty.

References

DOF. 2010. NOM-059-SEMARNAT-2010. Diario Oficial. Mexico.

FAO. 2005. Guia del administrador pesquero. FAO Documento técnico de pesca 424.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is **unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	**Yes**	**Yes**	**No**

Rationale

The handline is a fishing gear with low impact habitat (Chuenpagdee, 2003; FAO 2005). The species are fished in midwater and close to the sea bottom, so this gear is considered to have minimal impacts, causing little or no damage to substrate, geomorphology or biota (Bjarnason 1995; INAPESCA 2000). It can be inferred that it is highly unlikely that the gear type used in this fishery can reduce habitat structure and function to a point where there would be serious or irreversible harm. SG80 met.

b	VME habitat status

	Guide post	The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	**NA**	**NA**	**NA**
Rationale				
The UoA does not interact with Vulnerable Marine Ecosystem (VME) habitats; therefore, this scoring issue does not need to be scored.				
c	Minor habitat status			
	Guide post			There is **evidence** that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?			**No**
Rationale				
According to the information presented in PI 2.4.1 (a and b) the gear has limited contact with the bottom and no benthic species interaction occurs, thus there is low habitat impact. Thus, negative impacts that reduce the structure and function of minor habitats is very unlikely. However there is no robust evidence where the UoA operates (the information was taken from literature review and for other fisheries), so SG 100 is not met.				
References				

Chuenpagdee, R., Morgan, L. E., Maxwell, S. M., Norse, E. A., & Pauly, D. (2003). Shifting gears: assessing collateral impacts of fishing methods in US waters. Frontiers in Ecology and the Environment, 1(10), 517–524. doi:10.1890/1540-9295(2003)001[0517:sgacio]2.0.co;2

FAO 2005. Guia del administrador pesqeuro. FAO Italia. http://www.fao.org/3/y3427s/y3427s00.htm#Contents

INAPESCA 2000. Catálogo de los Sistemas de Captura de las Principales Pesquerias Comerciales. Mexico. 139 p.

Bjarmason B.A. 1995. Pesca con linea de mano y con calamarera. Colección FAO Capacitacion. FAO Italia. http://www.fao.org/3/t0511s/T0511S03.htm#ch3.2

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**More information sought**
Data-deficient? (Risk-Based Framework needed)	**No**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	**Yes**	**Yes**	**No**
Rationale				
The handline fishery operating in the Guaymas has not been considered to pose a risk of serious or irreversible harm to habitat types (see PI 2.4.1). Additionally, there are fishing refuges in the area which contribute to minimize the fishery impact. These and the gear itself are considered a partial strategy that helps ensure UoA does not represent a risk to the habitat. SG80 is reached, but SG100 is not since there is not a strategy.				
b	Management strategy evaluation			
	Guide post	The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved.
	Met?	**Yes**	**Yes**	**No**
Rationale				
FAO (2005) and Chuenpagdee et al. (2003) assessed the collateral impact (bycatch and impact on habitat) of a variety of fishing gear by integrating the knowledge of a wide range of fisheries stakeholders. They concluded that handlines showed relatively low impact compared to other gear types like bottom trawl and bottom gillnet. There is some objective basis that the partial strategy will work based on the normal fishing operation method of the handline fishery, but also on the effectiveness of closed areas and of restoring benthic habitats. SG80 is met. Since there is no testing to support high confidence, SG100 is not met.				
c	Management strategy implementation			
	Guide post		There is **some quantitative evidence** that the measures/partial strategy is being implemented successfully.	There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		**Yes**	**No**
Rationale				
There is some quantitative evidence (fishing logbooks and underwater monitoring surveys) to ensure that the partial strategy is being carried out successfully. The SG80 is met, but since there is no clear quantitative evidence, SG100 is not.				

d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			
	Guide post	There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs.	There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	**NA**	**NA**	**NA**

Rationale

The UoA does not interact with Vulnerable Marine Ecosystem (VME) habitats; therefore, this scoring issue does not need to be scored.

References

FAO 2005. Guia del administrador pesqeuro. FAO Italia. http://www.fao.org/3/y3427s/y3427s00.htm#Contents

Chuenpagdee, R., Morgan, L. E., Maxwell, S. M., Norse, E. A., & Pauly, D. (2003). Shifting gears: assessing collateral impacts of fishing methods in US waters. Frontiers in Ecology and the Environment, 1(10), 517–524. doi:10.1890/1540-9295(2003)001[0517:sgacio]2.0.co;2

DOF. 2017. ACUERDO por el que se establece una red de tres Zonas de Refugio Pesquero Totales Temporales en aguas marinas de jurisdicción federal de la Isla San Pedro Nolasco, frente a las costas del Municipio de Guaymas en el Estado de Sonora. Diario Oficial. Mexico.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.3 – Habitats information

PI 2.4.3		**Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	The types and distribution of the main habitats are **broadly understood**. **OR**	The nature, distribution and **vulnerability** of the main habitats in the UoA area are known at a level of detail relevant to the scale and	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.

		If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	intensity of the UoA. **OR** **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	
	Met?	**Yes**	**Yes**	**No**

Rationale

There is adequate information of the general distribution of habitats, areas of productivity and areas of biological importance for invertebrates, fishes, marine mammals, seabirds in the Gulf of California (Ulloa eta al 2015; Munguia et al 2018. In the Central Gulf the major habitat types in decreasing order of coverage include rocky reefs, wetlands, mangrove forests, Sargassum spp. forests, seagrass beds, rhodolith beds and seamounts. Sandy bottoms are also a major habitat type in the GOC, but their distribution and coverage remains unclear (Munguia et al 2018). The SG80 is met.

b	Information adequacy for assessment of impacts			
	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	**Yes**	**No**	**No**

Rationale

Data from logbooks show the fishing areas and the depth for the small-scale handline fleet. There is reliable information on the spatial distribution of fishing effort and its distance relative to shore/depth to broadly understand the impacts of gear as a function of contact with the substrate. Due to the level of information, the SG60 is met, but not the SG80.

c	Monitoring			
	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		**Yes**	**No**

Rationale
The cooperatives and COBI signed an agreement to continue with the implementation of a fishing logbook program, as well as the assessment and monitoring of fishing refuge areas in San Pedro Nolasco Island. The SG80 is met.

References
Ulloa R., Torre, J., Bourillon L., Alcantar N. 2015. Planeacion ecorregional para la conservacion marina: Golfo de California y costa occidental de Baja California Sur. Informe final a The Nature Conservancy.Guaymas (México): Comunidad y Biodiversidad, A.C., 153 Munguia-Vega A., A. L. Green, A. N. Suarez-Castillo, M. J. Espinosa-Romero, O. AburtoOropeza, A. M. Cisneros-Montemayor, G. Cruz-Piñón, G. Danemann, A. Giron-Nava, O. Gonzalez-Cuellar, C. Lasch, M. del M. Mancha-Cisneros, S. G. Marinone, M. MorenoBáez, H. N. Morzaria-Luna, H. Reyes-Bonilla, J. Torre, P. Turk-Boyer, M. Walther y A. H. Weaver. 2018. Ecological guidelines for designing networks of marine reserves in the unique biophysical environment of the Gulf of California. Rev. Fish. Biol. Fisheries, 28: 749-776. Lluch-Cota SE, Aragon-Noriega EA, Arreguin-Sanchez F, Aurioles-Gamboa D, Bautista-Romero JJ, Brusca RC, Cervantes-Duarte R, Cortes-Altamirano R, Del-Monte-Luna P, Esquivel-Herrera A, et al. 2007. The Gulf of California: review of ecosystem status and sustainability challenges. Progress in Oceanography 73: 1–26

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is **unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is **highly unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	**Yes**	**Yes**	**No**
Rationale				

It is unlikely that the finfish fishery with handlines will modify the structure and function of the ecosystem, causing serious or irreversible damage. The handlines are one of the most selective and low impact fishing gear; however, this has not been proven locally. Since the target species are not likely overfished, unwanted catch is likely minimal, there are no interactions with ETP species, and there is little to no contact of the gear with the seafloor, the UoA is highly unlikely to disrupt the key elements of the ecosystem.

Also, regional studies using Ecopath (South region of the Gulf of California) Díaz-Uribe (2005) indicates that the hook and line fishery produces less impact on the ecosystem than the use of longlines and nets. Díaz-Uribe et al. (2012) and Tovar-Cortes (2013) point out that the populations of yellowtail amberjack, snappers and serranids in this region present intermediate vulnerability and high index of inter-specific interactions, but low energy flow. These organisms are affected by the increase in fishing effort, which influences the decrease in ecotrophic efficiency. While the UoA (fishing effort) has an effect on trophic dynamics, it is is highly unlikely to disrupt the key elements of the ecosystem. SG80 is reached.

References

Díaz-Uribe, J.G. 2005.Estrategias de evaluación para el manejo de la pesquería de huachinango (Lutjanus peru) en el sur del Golfo de California. Doctoral thesis. Centro de Investigaciones Biológicas del Noroeste, S.C. La Paz, B.C.S. 98 pp.

Díaz-Uribe, J.G., F. Arreguín-Sánchez, D. Lercari-Bernier, V.H. Cruz-Escalona, M.J. Zetina-Rejón, P. del-Monte-Luna, S. Martínez-Aguila. 2012. An integrated ecosystem trophic model for the North and Central Gulf of California: An alternative view for endemic species conservation. Ecollogical modelling. 230: 73-91.

Tovar-Cortes, R.I. 2013. Efecto de la pesca de arrastre del camarón sobre el ecosistema del Alto Golfo de California. Master in Sciences thesis. Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California. 62pp.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**More information sought**
Data-deficient? (Risk-Based Framework needed)	**No**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary which take into account the **potential impacts** of the UoA on key elements of the ecosystem.	There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place.
	Met?	**Yes**	**No**	**No**
Rationale				
The finfish fishery does not have any unwanted species, interactions with ETP species, or poses risks to habitats or to the main ecosystem. In addition, the establishment of fishing refuges as tools to reduce the impact of fishing on the ecosystem.are considered as measures that take into account potential impacts on the ecosystem. However, there are clear and specific measures or a strategic management proposal within the legal framework, which allow determining the impact of extracting certain finfish biomass on other elements of the trophic chain. The SG 60 is met.				
b	Management strategy evaluation			
	Guide post	The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is **some objective basis for confidence** that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	**Testing** supports **high confidence** that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	**Yes**	**No**	**No**
Rationale				
The high selectivity of the handline gear, the low impact on the habitat and the implementation of fishing refuges can be considered as measures that are working. However, little knowledge of the target species stock status does not form a coherent strategy that considers the relative equilibrium of the species. Diaz et al (2012) report these organisms are affected due to the increase in fishing effort, which influences the decrease in ecotrophic efficiency The SG60 is met.				
c	Management strategy implementation			
	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective as set out in scoring issue (a).**

	Met?		**No**	**No**
Rationale				
There is not clear evidence that the measures are being implemented successfully given that the effect of increased fishing effort on target species could potentially influence the decrease in ecotrophic efficiency in the ecosystem. The SG80 is not reached.				
References				
Fishery statistics (CONAPESCA, 2017): https://www.conapesca.gob.mx/wb/cona/informacion_estadistica_por_especie_y_entidad				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to **identify** the key elements of the ecosystem.	Information is adequate to **broadly understand** the key elements of the ecosystem.	
	Met?	**Yes**	**No**	
Rationale				
Trophic structures have not been studied in this area, but studies in nearby areas of the Gulf of California provide an overview of trophic relationships in the area of the fishery. With respect to the general problems of ecosystems, the extraction of target handline finfish and over-exploitation of these could have negative effects on the ecosystem (Díaz-Uribe 2005). The SG60 is met because information is adequate to identify key elements of the ecosystem.				
b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but **have not been investigated** in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and **some have been investigated in detail**.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and **have been investigated in detail**.
	Met?	**Yes**	**No**	**No**

Rationale
The main impacts of the UoA on the key elements of the ecosystem in the Gulf of California can be inferred from existing information that has been generated and published in nearby areas of the Gulf of California. This information provides an overview of trophic relationships. However, these have not been investigated in detail so this scoring issue only meets SG60.

c	Understanding of component functions			
	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are **known**.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are **understood**.
	Met?		**No**	**No**

Rationale
The handline fishery is highly selective and presents low or no interaction with primary, secondary species, ETP species, or with the habitat. However, there is little information on their interactions with other species and the habitat, so it is considered that the information is not sufficient to reach SG80.

d	Information relevance			
	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components **and elements** to allow the main consequences for the ecosystem to be inferred.
	Met?		**No**	**No**

Rationale
The main impacts of the UoA on the key elements of the ecosystem in the Baja California Coast can be inferred from existing information that has been generated and published in nearby areas, which provides an overview of trophic relationships. However, an Ecopath analysis is being conducted to assess what the impacts of the UoA may be on key ecosystem components. Therefore, this scoring issue does not reach the SG80 score.

e	Monitoring			
	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		**No**	**No**

Rationale
The cooperatives and COBI signed an agreement to continue with the implementation of a fishing logbook program. The program includes data collection of fishing trips (capture) and morphometric information. There are other investigations on different aspects of the ecosystems by various research centers in the area, however, the SG80 is not reached.

References
Díaz-Uribe, J.G., F. Arreguín-Sánchez, D. Lercari-Bernier, V.H. Cruz-Escalona, M.J. Zetina-Rejón, P. del-Monte-Luna, S. Martínez-Aguila. 2012. An integrated ecosystem trophic model for the North and

Central Gulf of California: An alternative view for endemic species conservation. Ecollogical modelling. 230: 73-91.

DOF 2010. Carta Nacional Pesquera. Diario Oficial. Mexico.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

8.6 Principle 3

8.6.1 Principle 3 background

Legal Framework

In Mexico, federal, state and municipal government agencies develop and apply fisheries policies. State and regional committees and councils, academic institutions, and Civil Society Organizations (NGOs) are also involvedin the Mexican fishery policy. Currently, coastal and oceanic management in Mexico is governed by a collection of federal laws, regulations, decrees and secretarial agreements. There are two main laws that define the fishing management system in Mexico: 1) the Ley General de Pesca y Acuacultura Sustentable (LGPAS), and 2) The Ley General para el Equilibrio Ecologico y la Proteccion del Ambiente (LGEEPA).

In Mexico, there are 18 ministries at the federal level, two of which are closely linked to fishery management (SEMARNAT and SADER) and two more have a secondary role (SEMAR and SCT). SEMARNAT (Secretaría de Medio Ambiente y Recursos Naturales) incorporates criteria and instruments that assure the optimum protection, conservation and exploitation of the country's natural resources and allow the sustainable development of ecosystems and biodiversity conservation. SADER (Secretaría de Agricultura y Desarrollo Rural) is a dependency of the federal executive whose main objective is to manage, regulate and promote the integral and sustainable development of primary activities (fishing, agriculture, livestock, and aquaculture). Fishing and aquaculture activities are managed through two decentralized agencies, Instututo Nacional de Pesca y Acuacultura (INAPESCA) and Comisión Nacional de Pesca y Acuacultura (CONAPESCA) that are also under the scope of the Federal executive. Fisheries management is carried out through operative plans, management plans, official regulations and fishery refuge zones, in accordance with the Federal Fishery Law, LGPAS (DOF 2018).

The INAPESCA conducts, directs, and coordinates the scientific research and the development of proposals for fisheries management and, in conjunction with SEMARNAT, is responsible for producing the National Fisheries Chart, a document that outlines the strategies and actions that, in accordance with the fishery law, must be met to regulate each fishery without altering the ecological equilibrium. In practice, surveys and stock assessments are completed by Regional Fishery Centers known as "CRIPs" (Centro Regional de Investigación Pesquera), which are subdivisions of INAPESCA. INAPESCA serves a technical advisory role to CONAPESCA. The information and guidelines generated by INAPESCA are submitted to CONAPESCA, an agency that is responsible for the formal and legal development and implementation of fishery and aquaculture policies and programs.

The management measures for the finfish fishery are established in the National Fishery Chart, shown in Table 20.

Table 20 - Management measures described in the CNP for finfish fishery in the Gulf of California (Taken from DOF, 2010).

Management Control	Yes / No	Measures	Reference
Official Mexican Standard	No	NA	
Fishery Management Plan	No	NA	
Type of access	Yes	Commercial fishing permit for marine finfish	DOF 2010: Technical opinion from INAPESCA
Minimum size	No	NA	

Fishing gears and methods	Yes	Handline, longlines, and nets	DOF 2010
Closed season	No	NA	
Quota	No	NA	
Fishing unit	Yes	Smaller vessels	DOF 2010
Effort	No	56,412 small vessels in Mexico 1,250 Small vessels in Guaymas 113 finfish permits in 2012	DOF 2010 Espinosa-Romero et al. (2013)
Fishing zone	Yes	Marine waters of Federal Jurisdiction in the Sonora state, between Melagos (27.154770 ºN, -110.298564 ºW) and el Colorado (28.293144 ºN, -110.416398 ºW).	Permission specifications

Fisheries laws

Fisheries legislation in Mexico includes a series of national laws, regulations, decrees and secretarial agreements. The foundation for the use of natural resources in Mexico is provided in Article 27 of the Mexican Constitution, from which the Fishery Law is derived (issued on 25th June 1992), whose objective is to regulate, promote and manage the exploitation of the fishing and aquaculture resources in the territorial waters of Mexico (LGPAS 2018). There are two main laws linked to fisheries management:

1) LGPAS came into force in 2007 and supports the comprehensive and sustainable development of these activities. The LGPAS, through article 94, confers authority to the LGPAS for the exploration, exploitation, use, and management of Aquatic resources. Fishing activities are also linked to the Federal Law of the Sea, which establishes fishing limits within the Economic Exclusive Zone (excluding areas of Natural Protection) and promotes the optimal utilization of the resources.

2) General Law of Ecological Balance and Environmental Protection (LGEEPA) was implemented in January 1988 and has promoted sustainable development based on the creation of environmental policies and instruments for the protection and preservation of biodiversity, and for the restoration and improvement of the environment.

Official Standards and Regulations

At the national level, the specific instrument for Mexican fisheries legislation is the LGPAS, which provides guidelines for the regulation of fisheries. Linked to this law are fisheries regulations and Official Mexican Norms (NOMs) that define management measures, such as temporal/ seasonal/ spatial closures, size limits, vessel/gear specifications, fishing licenses, limited entry, catch quotas, etc. NOMs are mandatory (legally binding) and consist of technical regulations that control specific fisheries. However, NOMs have not been developed for the target species of the handline fishery that operates in Guaymas, Sonora.

The National Fishing Chart (INAPESCA, 2000 and periodic updates: 2010, 2012, 2018, etc.) is the most influential document on the Mexican fisheries, the chart represents the primary assessment of fish and shellfish stocks and includes an inventory for each known fishing resource in the nation. It also provides a short description of each fishery, defines levels of effort applied to each species or group of species in a given area, in addition to the permitted fishing gear. The National Fishery Chart (CNP) groups the majority of the commercially important fish within the category of “Marine Finfish” (DOF, 2010). Within this large category, there are subgroups of species that are grouped according to their classification or biological relationship.

Fishery management plans (FMP) are also used by INAPESCA as a tool to establish the management goals and the harvest strategy for each fishery. However, the finfish fishery does not have an FMP.

Fishery-specific management system
The finfish fishery is currently managed through regulations outlined in the 2010 CNP. General measures include fishing permits and authorized gears. These fishing permits are granted to cooperative fishery production societies or to individuals who meet the requirements set by CONAPESCA. Some of these fishing permits are issued for a particular species or for groups of species. An example is the “marine finfish” permit, which covers a large majority of marine finfish species.

Monitoring, Control and Surveillance
The finfish fishery in Mexico is regulated by SADER, via INAPESCA and CONAPESCA, and through interministerial agreements with SEMAR (Secretaría de Marina), SCT (Secretaría de Comunicaciones y Transportes), SEMARNAT (Secretaría de Medio Ambiente y Recursos Naturales), PROFEPA (Procuraduría Federal de Protección al Ambiente), the Army (SEDENA, Secretaría de la Defensa Nacional), and the Police force.

According to the LGPAS (2018), CONAPESCA is the regulatory agency in charge of the management, coordination, and development of marine resource policies (LGPAS 2018). Also, CONAPESCA conducts monitoring, control, and surveillance activities in coordination with federal, state, and municipal entities, according to the scope of their authority. Fishery violations are sanctioned according to the LGPAS (Art. 132. Fraction I to XXXI and Art. 133. Fraction I to VII), and the fines are described in the Art. 138. Fraction I to IV.

Some examples of sanctions in LGPAS (Art. 133) are:
I. Warning;
II. The imposition of a fine;
III. The imposition of an additional fine for each day the violation persists;
IV. Administrative arrest for up to thirty-six hours;
V. The confiscation of vessels, vehicles, fishing gear and/or products obtained from the aquaculture and fisheries directly related to the offenses committed, and
VI. Suspension or revocation of the corresponding permits, concessions, and authorizations

SEMAR is the federal agency in charge of monitoring, control, and surveillance (MCS) activities at sea, within the Mexican EEZ. On land, CONAPESCA carries out MCS activities at landing sites, collection sites, or processing facilities. During transportation of fishery products, the state and road police, the army, and the SCT (Fitosanitary Division) conduct surveillance activities. However, the procedure of a surveillance strategy is not known and the inspection reports are not available.

CONANP (Comisión Nacional de Áreas Naturales Protegidas) is the agency in charge of Natural Protected Areas (NPAs), including marine areas. In case of violations within NPAs, PROFEPA (Procuraduria Federal de Proteccion al Ambiente), the federal agency responsible for environmental protection, is the enforcement agency. In Sonora NPAs, the state environmental agency (SEMARNAT) is also involved in the enforcement of environmental laws. The NPAs have management plans that include zoning of use (areas of use and core areas). The park rangers carry out inspection and surveillance activities (at sea) to comply with the NPA management plan, however, surveillance strategies and inspection reports are not available.

All MCS activities carried out by local agencies (state government) are listed in the Organic Law of the State and are aligned with the State Development Program.

8.6.2 Principle 3 Performance Indicator scores and rationales – delete if not applicable

PI 3.1.1 – Legal and/or customary framework

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: - Is capable of delivering sustainability in the UoA(s); - Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and - Incorporates an appropriate dispute resolution framework		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system **and a framework for cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and **organised and effective cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and **binding procedures governing cooperation with other parties** which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				
Mexico has a constitutional government with a legislature that sets overall governance and policy through a national fishery law (LGPAS). The law delegates management and research responsibility to CONAPESCA and INAPESCA. State Fisheries Committees can participate in the development of fisheries policies, but normally have only a consultative role. NOMs (Official Mexican Standard, Norma Oficial Mexicana), CNP (National Fishing Chart, Carta Nacional Pesquera), and Fishery Management Plans set specific requirements for individual fisheries. There is a federal and state-based legal framework for cooperation among management agencies and with stakeholders, capable of delivering sustainable fisheries. This represents an effective, binding national legal system, likely to meet SG100.				
b	Resolution of disputes			
	Guide post	The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes which is **considered to be effective** in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes that is appropriate to the context of the fishery and has been **tested and proven to be effective**.
	Met?	**Yes**	**Yes**	**No**
Rationale				
There is a conflict resolution mechanism through the judicial system. The sanctions imposed by the authorities for infractions of the law and its regulations must comply with the requirements of the Federal Administrative Procedures Law. To the team's knowledge, there have been no cases in which they have had to resort to the conflict resolution process. In addition, the mechanism was revised and is suitable				

for the fishery.

On the other hand, no evidence was found for any legal event/conflict in which the fishery has implemented such a mechanism, so there is no way to prove that it was tested and that it works. This scoring issue thus meets SG80, but not SG100.

C	Respect for rights			
	Guide post	The management system has a mechanism to **generally respect** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **observe** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **formally commit** to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

Environmental and fisheries laws and regulations recognize the dependence on fishing for food and livelihood and include clauses to generally respect customary or traditional legal rights of local fishermen and coastal communities. The LGPAS sets the baseline for the development of fisheries in Mexico under the principle of sustainability and accounting for other biological, environmental and socio-economic factors. For example, article 72 of the LGPAS allows fishing without permits when fishing for food and livelihood by coastal communities. This article prohibits the sale of the product that was fished for subsistence and without a permit. The rights for indigenous people to use fish as food and for cultural rituals are given priority and special considerations, and are recognized and allowed (OECD 2013). SG100 is likely to be met.

References

DOF. 2007. Ley General de Pesca y Acuacultura Sustentables. Diario Oficial. Mexico.

DOF. 2018. Ley General de Pesca y Acuacultura Sustentables. Diario Oficial. Mexico.

DOF. 2015. Ley General del Equilibrio Ecológico y la Protección al Ambiente. Diario Oficial. Mexico.

OECD. 2013. Review of Fisheries: Policies and Summary Statistics 2013. (DOI:10.1787/rev_fish2013-en)

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				
There is good knowledge of the roles, authority, and key areas of responsibility (data collection, management decision-making, technical innovation for capture, etc.) of the legislature. According to the LGPAS, different institutions interact with the fisheries authority: SADER, SEMARNAT, SEMAR, INAPESCA, CONAPESCA, SENASICA, local authorities, and stakeholders that are involved in the fishery. The roles and responsibilities of the main government agencies involved in the fisheries management system are provided in the Principle 3 background section of this report. Therefore, this scoring issue meets SG100.				
b	Consultation processes			
	Guide post	The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information and **explains how it is used or not used**.
	Met?	**Yes**	**Yes**	**No**
Rationale				
The management system incorporates consultation processes that regularly seek and accept local and empirical knowledge and information. In the LGPAS, article 2, objective VII aims to establish the basis for the creation, operation mechanisms for the producers' participation and their engagement with fishing and aquaculture activities (DOF, 2012). CONAPESCA/ SADER holds multiple workshops involving fishermen and other stakeholders, and the process includes national and state councils and advisory committees that promote an inter-sectorial forum for the support, coordination, consultation and assistance in fisheries management activities. However, neither INAPESCA nor CONAPESCA explain how the information is used or not used, therefore, this scoring issue meets SG80 but does not meet SG100.				

c	Participation			
	Guide post		The consultation process **provides opportunity** for all interested and affected parties to be involved.	The consultation process provides **opportunity and encouragement** for all interested and affected parties to be involved, and **facilitates** their effective engagement.
	Met?		**Yes**	**Yes**

Rationale
The National and State councils provide the opportunity for all stakeholders to be involved in the consultation process, including federal, state, and local authorities (fishery, environmental, enforcement), scientists, fishermen, industry groups, and NGOs. All interested parties are called to take part in workshops and meetings and are given opportunities to participate. The consultation process encourages and facilitates active engagement of stakeholder groups involved in drafting, reviewing, and approving norms, the CNP, and FMPs before they are published in the final version. SG100 is likely met.

References
DOF. 2007. Ley General de Pesca y Acuacultura Sustentables. Diario Oficial. Mexico. DOF. 2018. Ley General de Pesca y Acuacultura Sustentables. Diario Oficial. Mexico. DOF. 2018. Ley General de Mejora Regulatoria. Diario Oficial. Mexico.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are **implicit** within management policy.	**Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are **explicit** within management policy.	**Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are **explicit** within **and required by** management policy.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

The fisheries law (LGPAS) incorporates these main objectives:

- Promote and regulate the integrated management and sustainable utilization of fisheries and aquaculture, considering the social, technological, productive, biological and environmental aspects;
- Promote enhanced quality of life of the country's fishing and aquaculture livelihoods through programs implemented for fisheries and aquaculture sectors;
- Establish the basis for the management, conservation, protection, rebuilding and sustainable utilization of fisheries and aquaculture resources and the protection and rehabilitation of ecosystems in which these resources are found;
- Set ground rules for planning and regulating the exploitation of fishery resources and aquaculture media or selected environments;
- To procure the preferential access, use and enjoyment rights for indigenous communities in the regions where they live.
- Establish the basis for coordination among federal, state, and local authorities to implement the fisheries laws.
- Set out the basis to provide fishing concessions and permits for fishing activities and aquaculture.
- Establish the baseline for monitoring, control, and surveillance activities.
- Provide support and promote scientific and technological research.

The LGPAS incorporates clear long-term objectives that guide decision-making, consistent with the MSC standard. As outlined above, the LGPAS defines one of its prime objectives as establishing the basis for the conservation, protection, rebuilding, and sustainable utilization of fisheries and aquaculture resources, and of the supporting ecosystems. The LGPAS also establishes that the Authority (CONAPESCA) must adopt the precautionary approach for the conservation and protection of fishery resources and ecosystems. The objectives include sustainable use, preservation, and conservation in the management policy, which implicitly and explicitly incorporates the precautionary concepts. This indicator is likely to meet SG100.

References

DOF. 2018. Ley General de Pesca y Acuacultura Sustentables. Diario Oficial. Mexico.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**

Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	**Objectives**, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific management system.	**Short and long-term objectives**, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.	**Well defined and measurable short and long-term objectives**, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.
	Met?	**No**	**No**	**No**

Rationale

The finfish fishery in Mexico does not have a NOM or an FMP, where fishery-specific objectives would be described. The fishery is managed through the National Fishing Chart 2010, where management measures and recommendations for the fishery are outlined by subgroups of finfish species. The only information in LGPAS Article II focuses on economic, social and environmental aspects applicable to all fisheries in the country. This indicator does not meet SG 60.

References

DOF. 2018. Ley General de Pesca y Acuacultura Sustentables. Diario Oficial. Mexico.

DOF 2010. Carta Nacional Pesquera. Diario Oficial. Mexico.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**<60**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.2 – Decision-making processes

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are **some** decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are **established** decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	**Yes**	**No**	
Rationale				
The process to review, evaluate, and revise management regulations in Mexico is often based on demand by producers and fishermen. The process starts with a scope to address issues and potential solutions. The public has an opportunity to provide information and opinions. Subsequently, the authorities propose measures, either in the form of regulations or legislation. Workshops with stakeholders are held to receive comments. Draft laws or regulations are published in the Official Gazette (Diario Oficial) and undergo another opportunity for public comment before implementation. Public comments affect the final product; and in some cases, weaken the original proposed measures. However, scientific advice is not always incorporated into the decisions, or it can take several years before recommendations are considered in the regulation. Despite the high economic value and ecological importance of the finfish fishery in the Gulf of California, the decision-making process has several obstacles, possibly stemming from conflicting interests among stakeholder groups, and because the existing measures and strategies are very weak or non-existent. However, some measures are in place (e.g., permitting and vessel/ gear), which means that some general decisions were made for the fishery. The fishery meets SG60 but not SG80 because the processes to implement measures are not clearly established or have suffered interruptions.				
b	Responsiveness of decision-making processes			
	Guide post	Decision-making processes respond to **serious issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to **serious and other important issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	**No**	**No**	**No**
Rationale				
Two types of decisions are made by the management system in Mexico: 1) changes to laws and regulations, and 2) emergency regulations that respond to critical issues. The regular process is described in the scoring issue a. above. Once draft laws or regulations are published in the Official Gazette (Diario Oficial), there is an opportunity for public comment before implementation. Public				

comments affect the final product, but scientific advice is not always incorporated into the decisions or can take several years before recommendations are considered in the regulation. The process may be slow, but in general, it is considered transparent and inclusive.

No evidence was available for this analysis to know whether the public has supported previous management recommendations provided by INAPESCA/ CONAPESCA for the finfish fishery in the Gulf of California (e.g., 2010 CNP), nor to know what the management priorities are for the current administration. The updated 2018 CNP did not include finfish for the Gulf of California management recommendations. The CNP also did not provide a clear recommendation on whether a finfish NOM or FMP was under consideration, or when the HCR minimum size or closed season regulations would be produced. SG60 is not met.

c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		**No**	
Rationale				
There is no evidence suggesting that the precautionary approach or the best available information is used in the decision-making processes for the finfish fishery in the Gulf of California. To date, the fishery has not implemented tools to protect recruitment and avoid overfishing. There is not a seasonal closure, minimum length, or other more precautionary measures (aside from licensing or gear restriction) to protect the spawning stock or to prevent overfishing. Thus, SG80 is not met.				
d	Accountability and transparency of management system and decision-making process			
	Guide post	Some information on the fishery's performance and management action are generally available on request to stakeholders.	**Information on the fishery's performance and management action are available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	**Yes**	**No**	**No**
Rationale				
Information on the performance of the fishery is generally available and explanations are provided when deemed relevant. In Mexico, the National Fishing Chart is the official document for fishery information, which describes the health of resources and the strategic direction of management. However, it is not documented how the management system responds to the relevant conclusions and recommendations that result from research, monitoring, and evaluation of the activity (Stiles et al. 2014). SG60 is met but not SG80.				
e	Approach to disputes			
	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not	The management system or fishery is attempting to comply in a timely fashion with judicial decisions	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial

		indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	arising from any legal challenges.	decisions arising from legal challenges.
	Met?	**Yes**	**Yes**	**No**

Rationale

The management system is inclusive and there is no evidence that obstacles will prevent the timely resolution of conflicts. To the team's knowledge, there are no pending legal disputes. However, there is little evidence that the management system or the fishery act proactively in order to avoid conflicts (Stiles et al. 2014). To resolve illegal fishing conflicts in the region, the Cooperatives of Guaymas rely mainly on communication and present their problems to the competent authorities, such as CONAPESCA. The SG60 is met, however the SG80 is not met due to the lack of evidence from within the management system.

References

DOF. 2018. Ley General de Pesca y Acuacultura Sustentables. Diario Oficial. Mexico.

DOF 2010. Carta Nacional Pesquera. Diario Oficial. Mexico.

DOF. 2018. Carta Nacional Pesquera. Diario Oficial. Mexico.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guide post	Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A **comprehensive** monitoring, control, and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.

	Met?	**No**	**No**	**No**
Rationale				
SADER, via CONAPESCA, and through inter-ministerial agreements with SEMAR, SCT, and SEMARNAT, regulates and carries out monitoring, control, and surveillance of the handline finfish fishery in the Gulf of California. At the cooperative level, there is a culture of compliance with fishing regulations. Fishery violations are sanctioned according to the LGPAS and other applicable laws and regulations. However, there are no monitoring mechanisms implemented in the fishery under evaluation. Therefore, the SG60 is not met.				
b	Sanctions			
	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and **demonstrably** provide effective deterrence.
	Met?	**Yes**	**No**	**No**
Rationale				
The LGPAS specifies how field fisheries officers should conduct surveillance activities, report fishery violations and apply sanctions. They must submit the case to the Public Ministry, which is an independent body of the judiciary and the executive that isresponsible for investigating the offenses based on all available evidence. Fishery violations are sanctioned according to the LGPAS and other applicable laws and regulations. No substantial evidence was available from the Guaymas handline finfish fishery to know the nature of common violations, the frequency of occurrence, what sanctions are applied (e.g., seizure of the catch, vessels, or gear, arrests, fines, prison time, etc.), or whether they provide effective deterrence. The SG60 is met, but the SG80 is not met.				
c	Compliance			
	Guide post	Fishers are **generally thought** to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	**Some evidence exists** to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a **high degree of confidence** that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	**Yes**	**No**	**No**
Rationale				
Registered fishers are expected to comply with the regulations in general terms, however this has not been evaluated. On the other hand, there is the problem of illegal fishing, unregulated fishing, and unreported fishing, which is a problem in most Mexican fisheries. The SG60 is met.				
d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		**No**	
Rationale				
To the team's knowledge, systematic non-compliance within the handline finfish fishery in Guaymas is not known to occur. However, interviewees (Munguia et al. 2015) noted that there are illegal fishers in				

the area that are unaccounted for, and these consistent IUU activities represent a systematic non-compliance with fisheries rules and regulations, so SG80 is not met.
References
DOF. 2018. Ley General de Pesca y Acuacultura Sustentables. Diario Oficial. Mexico. DOF 2010. Carta Nacional Pesquera. Diario Oficial. Mexico. Cisneros-Montemayor et al. 2013. Extent and implications of IUU catch in Mexico´s marine fisheries. Marine Policy. DOI:10.1016/j.marpol.2012.12.003 Munguia et al. 2015. PANGAS: An Interdisciplinary EcosystemBased Research Framework for Small-Scale Fisheries in the Northern Gulf of California. Journal of the Soutwest. 57 337-390 p.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		**There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system**		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate **some** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **key** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **all** parts of the fishery-specific management system.
	Met?	**No**	**No**	**No**
Rationale				
The fishery does not have mechanisms to evaluate parts of the management system, where the only information available is the National Fishing Chart or the statistical fishing yearbook. Other systems also lack the mechanisms to evaluate the fishery-specific management system, therefore the SG60 is not met.				
b	Internal and/or external review			
	Guide post	The fishery-specific management system is subject to **occasional internal** review.	The fishery-specific management system is subject to **regular internal** and **occasional external**	The fishery-specific management system is subject to **regular internal and external** review.

			review.	
	Met?	**No**	**No**	**No**

Rationale
The National Fishing Chart and the fishing yearbook for CONAPESCA are the only legal documents that include a few specific management systems and these documents are not subject to regular internal and external review. SG60 is not met.
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Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**<60**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	
Condition number (if relevant)	

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(1) www.fishbase.org

(2) www.iucnredlist.org

Appendices

8.8 Assessment information

8.8.1 Small-scale fisheries

To help identify small-scale fisheries in the MSC program, the CAB should complete the table below for each potential Unit of Assessment (UoA). For situations where it is difficult to determine exact percentages, the CAB may use approximations e.g. to the nearest 10%.

Table 21 – Small-scale fisheries

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
Handline	100%	95%

8.9 Evaluation processes and techniques

8.9.1 Site visits

Starting in November 2016, meetings were held with nine Cooperative Fishing Production Societies of Guaymas, Sonora, and users of San Pedro Nolasco Island. During the meetings, different fishing sustainability criteria (the MSC standards and others) and Fishery Improvement Projects (FIP) were presented. Subsequently, in December of the same year, the general objectives and project particulars were defined.

In January 2017, a 3rd meeting was carried out in which both the needs of the project and the generation of fisheries information through monitoring were identified, including the market component. As well as the need to create and define roles and procedures important to the decision-making process for the amberjack fishery in Guaymas was also discussed. Subsequently, in February, a workshop was conducted to train the fishermen to complete fishing logbooks.
In April 2017, the first meeting was held after the implementation of a fishery improvement project for yellowtail amberjack in Guaymas. Monitoring programs, information analysis and the inclusion of new stakeholders were discussed.

In September 2018 the participants of the FIP (table 22) decided to include 4 additional species within the FIP which encompasses the main target species of the handline fishery throughout the year in Guaymas, Sonora.

As a result of the meetings, the stakeholders pointed out the need to create a fishery monitoring project, and also suggested including market issues in the project, to promote the fishery as a sustainable model in the region, create and define roles and procedures for taking of decisions for the fishery.

Another relevant aspect was the need to certify technicians from the SCPP of Guaymas, Sonora, in the standard in order to apply the monitoring of the small-scale fishing activity.

Table 22. Relation of participants at the Finfish Guaymas FIP meetings.

Participants	**Representative**
29 de Agosto cooperative	Andrés Grajeda Coronado
El Resbalón cooperative	Carlos Ernesto Barragan
El Mirador de la Manga cooperative	José Luis Ramirez
La Manga Restaurante Doña Rosita cooperative	Fernando Flores García
Los Sazanes cooperative	Bernardo Duarte
Alianza de Pescadores de Guaymas cooperative	Manuela Ojeda Amador
Francisco Flores cooperative	Maria Beatriz Collins
Las Dallanas cooperative	Suzeth Arlene Collins
Pescadores de la Cantera cooperative	Mirella Emilia Rodriguez
Comunidad y Biodiversidad A.C.	Jesús Bernardo Sánchez Cota
Instituto Nacional de Pesca y Acuacultura	Alejandro Balmori
Comisión Nacional de Acuacultura y Pesca	Juan Pablo Miranda
Secretaria de Pesca del Estado de Sonora	Juan Pablo Miranda

8.9.2 Recommendations for stakeholder participation in full assessment

Stakeholders	Roles/description
Sociedad Cooperativa de Producción Pesquera 29 de agosto. Sociedad Cooperativa de Producción Pesquera El Resbalón. Sociedad Cooperativa de Producción Pesquera El Mirador de la Manga. Sociedad Cooperativa de Producción Pesquera La Manga Restaurante Doña Rosita. Sociedad Cooperativa de Producción Pesquera Los Sazanes. Sociedad Cooperativa de Producción Pesquera Francisco Flores. Sociedad Cooperativa de Producción Pesquera Alianza de Pescadores de Guaymas. Sociedad Cooperativa de Producción Pesquera Las Dallanas. Sociedad Cooperativa de Producción Pesquera Pescadores de la Cantera.	Cooperative Societies of Fishing Production that make use of the finfish resource in Guaymas, Sonora, and participate in the Fishery Improvement Project.
Comunidad y Biodiversidad, A. C. (COBI)	Mexican NGO that works with fishing communities, promoting marine conservation and sustainable fisheries through community participation.
INAPESCA	Mexican institution responsible for scientific research in fisheries and aquaculture.
CONAPESCA	The institution responsible for managing, ordering and promoting fishing and aquaculture activity.
SADER	Dependence of the Federal Executive Power, which has among its objectives to promote the exercise of a support policy that allows to produce better, to take better advantage of the comparative advantages of the agricultural sector, to integrate the activities of the rural environment to the productive chains of the rest of the economy, and stimulate the collaboration of producer organizations with their own programs and projects, as well as with the proposed goals and objectives, for the agricultural sector, in the National Development Plan.
UABC	Socially responsible institution that contributes to the best quality standards, to increase the level of human development of Baja California society and the country.

CIBNOR	Public research center of contribution to the sustainable economic and social progress of the country, especially in the Northwest, through the generation of scientific knowledge, and innovation in the field of biological sciences and in the use, management and preservation of natural resources.
CETMAR - Guaymas	Center for Technological Studies of the Sea; belonging to the General Directorate of Education in Science and Technology of the Sea, of the Subsecretariat of Higher Secondary Education.
Sub-Secretaria de Pesca y Acuacultura del Gobierno del Estado	Institution is responsible for matters expressly conferred by the Fisheries and Aquaculture Law for the State of Sonora and its Fisheries and Aquaculture Management Plans for the State Dams, as well as the regulations, decrees, agreements, circulars and orders of the Governor of the State.

8.10 Risk-Based Framework outputs

The revision and analysis of the information presented in this pre-assessment indicate that the default assessment tree is adequate and appropriate for the marine finfish fishery that uses handlines in Guaymas, Sonora. However, for some performance indicators, it was necessary to utilize the risk-based framework.

The pre-assessment requires the application of a risk-based framework (RBF), which is a set of precautionary assessment methods for fisheries that exhibit limited quantitative data and unavailable stock assessments and a certain deficiency or lack of information.

For the target species of the marine scale fishery caught with handline, the risk-based framework is used as a precautionary approach due to certain indicators suggesting that there is insufficient information to allow an adequate and complete assessment of the fishery.

The RBF only applies to a small number of performance indicators (PI): PI 1.1.1 State of the population, PI 2.1.1 Status of primary species and PI 2.4.1 Habitat status.
For each PI there is an analysis method: Consequence analysis (CA), which is evaluated on the PI 1.1.1. Productivity and susceptibility analysis (PSA), that covers PI 1.1.1, 2.1.1 and Analysis of Spatial Consequences (CSA), where PI 2.4.1 is found.

It is important to note that in the PSA, secondary species are not assessed, nor are ETP species because the handline gear used in the fishery is highly selective and there are almost no other unwanted species, nor bycatch or discarded species, or those discarded are returned to the sea alive. In addition, no fish, mammals, turtles, or birds under any type of special protection or in danger of extinction are captured; therefore, the evaluation of the attributes of RBF of these indicators does not apply to the marine scale fishery with handline.

8.10.1 Consequence Analysis (CA)

Table 23 – CA scoring template – *Seriola lalandi*

	Scoring element	Consequence subcomponents	Consequence score
Principle 1: Stock status outcome	*Seriola lalandi*	Population size	≥80
		Reproductive capacity	
		Age/size/sex structure	
		Geographic range	
Rationale for most vulnerable subcomponent	There is no official stock assessment for any of the species in the finfish fishery of Guaymas, Sonora. It was necessary to use the RBF to assess the status of the target stocks. Results showed that it is highly likely that the population is above the point where recruitment be impaired (PRI).		
Rationale for consequence score	The catches of Yellowtail amberjack (*S. lalandi*) group "jureles y medregales" have oscillated between on average of 500-1500 tons per year for the state of Sonora. The National Fishing Chart (2010) mentions as a point of reference that if "jureles y medregales" group catches in Sonora fall below the average 250 tons per year, necessary management measures will have to be taken. Similarly, from 2016 to 2017, lower catches were observed for the five species assessed in this pre-assessment. Taking into account the RBF approach, results showed that		

	the stock is, or oscillates, around a level consistent with MSY.

Table 24 – CA scoring template – *Lutjanus peru*			
Principle 1: Stock status outcome	Scoring element	Consequence subcomponents	Consequence score
	Lutjanus peru	Population size	≥80
		Reproductive capacity	
		Age/size/sex structure	
		Geographic range	
Rationale for most vulnerable subcomponent	There is no official stock assessment for any of the species in the finfish fishery of Guaymas, Sonora. It was necessary to use the RBF to assess the status of the target stocks. Results showed that it is highly likely that the population is above the point where recruitment be impaired (PRI).		
Rationale for consequence score	The catches of Pacific red snapper (*L. peru*) group "huachinango y pargos" have oscillated between on average of 200-400 tons per year for the state of Sonora. The National Fishing Chart (2010) mentions as a point of reference that if "huachinango y pargos" group catches in Sonora fall below the average 100 tons per year, necessary management measures will have to be taken. Similarly, from 2016 to 2017, lower catches were observed for the five species assessed in this pre-assessment. Taking into account the RBF approach, results showed that the stock is, or oscillates, around a level consistent with MSY.		

Table 25 – CA scoring template – *Paralabrax auroguttatus*			
Principle 1: Stock status outcome	Scoring element	Consequence subcomponents	Consequence score
	Paralabrax auroguttatus	Population size	≥80
		Reproductive capacity	
		Age/size/sex structure	
		Geographic range	
Rationale for most vulnerable subcomponent	There is no official stock assessment for any of the species in the finfish fishery of Guaymas, Sonora. It was necessary to use the RBF to assess the status of the target stocks. Results showed that it is highly likely that the population is above the point where recruitment be impaired (PRI).		
Rationale for consequence score	The catches of goldspotted sand bass (*P. auroguttatus*) group "baquetas, cabrillas y verdillo" have oscillated between on average of 250-900 tons per year for the state of Sonora. The National Fishing Chart (2010) mentions as a point of reference that if "baquetas, cabrillas y verdillo" group catches in Sonora fall below the average 200 tons per year, necessary management measures will have to be taken. Similarly, from 2016 to 2017, lower catches were observed for the five species assessed in this pre-assessment. Taking into account the RBF approach, results showed that		

	the stock is, or oscillates, around a level consistent with MSY.

Table 26 – CA scoring template – *Caulolatilus princeps*			
Principle 1: Stock status outcome	Scoring element	Consequence subcomponents	Consequence score
	Cauolatilus princeps	Population size	≥80
		Reproductive capacity	
		Age/size/sex structure	
		Geographic range	
Rationale for most vulnerable subcomponent	There is no official stock assessment for any of the species in the finfish fishery of Guaymas, Sonora. It was necessary to use the RBF to assess the status of the target stocks. Results showed that it is highly likely that the population is above the point where recruitment be impaired (PRI).		
Rationale for consequence score	The catches of ocean whitefish (*C. princeps*) group “pierna y conejo” have oscillated between on average of 20-80 tons per year for the state of Sonora. The National Fishing Chart (2010) mentions as a point of reference that if “pierna y conejo” group catches in Sonora fall below the average 40 tons per year, necessary management measures will have to be taken. Similarly, from 2016 to 2017, lower catches were observed for the five species assessed in this pre-assessment. Taking into account the RBF approach, results showed that the stock is, or oscillates, around a level consistent with MSY.		

Table 27 – CA scoring template – *Hyporthodus acanthistius*			
Principle 1: Stock status outcome	Scoring element	Consequence subcomponents	Consequence score
	Hyporthodus acanthistius	Population size	≥80
		Reproductive capacity	
		Age/size/sex structure	
		Geographic range	
Rationale for most vulnerable subcomponent	There is no official stock assessment for any of the species in the finfish fishery of Guaymas, Sonora. It was necessary to use the RBF to assess the status of the target stocks. Results showed that it is highly likely that the population is above the point where recruitment be impaired (PRI).		
Rationale for consequence score	The catches o rooster hind (*H. acanthistius*) group “baquetas, cabrillas y verdillo” have oscillated between on average of 250-900 tons per year for the state of Sonora. The National Fishing Chart (2010) mentions as a point of reference that if “baquetas, cabrillas y verdillo” group catches in Sonora fall below the average 200 tons per year, necessary management measures will have to be taken. Similarly, from 2016 to 2017, lower catches were observed for the five species assessed in this pre-assessment. Taking into account the RBF approach, results showed that the stock is, or oscillates, around a level consistent with MSY.		

8.10.2 Productivity Susceptibility Analysis (PSA)

Table 28 – PSA productivity attributes and scores of Yellowtail amberjack		
Performance Indicator	1.1.1	
Productivity		
Scoring element (species)	Yellowtail amberjack, *Seriola lalandi* (Valenciennes, 1833)	
Attribute	Rationale	Score
Average age at maturity	This species reaches maturity in a period of more than 2 years (Shiraishi *et al*., 2010). However, in captivity and with constant temperature, the species can reach sexual maturity in 13 months with an average weight of 3.5 kg and 50 cm of length (Gillanders et al., 1999; Kolkovski and Sakakura, 2004).	**1**
Average maximum age	Is reported a maximum age of 12 years (Baxter, 1960).	**2**
Fecundity	This species produces an average of 940,000 eggs per year (Crooke, 2001).	**1**
Average maximum size Not scored for invertebrates	A total length of 250 cm is reported (1).	**2**
Average size at maturity Not scored for invertebrates	The males mature at smaller sizes (47 cm in males, and 83.4 cm in females of furcal length for the maturity of 50% of the individuals) than the females (83.4 cm furcal length for the maturity of 50% of the individuals) (Gillanders et al., 1999).	**2**
Reproductive strategy	External fertilization and free-living larvae; they are broadcast spawners (Walford, 1937).	**1**
Trophic level	4.2 +/- 0.1, daytime opportunistic predator. Feeds primarily on sardines, anchovies, mackerels, and squid (Crooke, 2001).	**3**
Density dependence Invertebrates only		**NA**
Susceptibility		
Fishery Only where the scoring element is scored cumulatively	*Insert list of fisheries impacting the given scoring element (FCP v2.1 Annex PF 7.4.10)*	
Attribute	Rationale	Score
Areal Overlap	Circumglobal species that is located in subtropical and temperate waters, in the Indo-Pacific, South Africa, and the East Atlantic. In the Eastern Pacific, in the north it is found from the central Mexican Pacific and the Gulf of California to California, United States, (Eschmeyer et al., 1983; Robertson and Gerald, 2015), and in the south it is found from the south of Peru to Chile (Eschmeyer et al., 1983), being found outside this range,	**3**

	as in the Galapagos Islands (Tirado-Sánchez et al., 2014). In the National Fisheries Chart (DOF, 2012) the horse mackerel species (*S. lalandi*) is classified as riparian scale fishing. This is made up of a great specific diversity of species, which includes those that live from the coast and lagoons, to the edge of the outer continental shelf, about 200 meters deep. Its commercial capture is carried out in smaller vessels, with different fishing gear, from lines with live bait (sardine), gill net, trolling and purse seine, in the open sea and areas near the coast. Its capture, in national waters, takes place in 10% of the distribution area.	
Encounterability	The position of the yellowtail amberjack in relation to the water column and the fishing gear are coincidental. Usually the hook and lines are placed in half water or relatively close to the bottom (Grajeda-Coronado, pers. Comm.).	**2**
Selectivity of gear type	Globally, incidental fishing with handline is around 2% (Kelleher, 2005).	**1**
Post capture mortality	The juveniles are returned to the sea with a high survival rate (CDFG, 2002; Chuenpagdee *et al*., 2003).	**1**
Catch (weight) Only where the scoring element is scored cumulatively	In Guaymas, Sonora, 57.43 tons was reported in 2015 Increasing to 99.17 tons in 2017.	**1**

Table 29– PSA productivity attributes and scores of the Pacific red snapper		
Performance Indicator	1.1.1	
Productivity		
Scoring element (species)	Pacific red snapper, *Lutjanus peru* (Nichols & Murphy, 1922).	
Attribute	Rationale	Score
Average age at maturity	*L. peru* reach it first maturity at 3 years (Diaz-Uribe, 2001; Chavez and Elorduy-Garay; 2004).	**1**
Average maximum age	Maximum age register to Pacific snapper was 31 years (Diaz-Uribe et al.; 2004; Rocha-Olivares, 1998).	**1**
Fecundity	Each female had on average 1.838 million (M) of viable eggs, and a relative fecundity of 0.555 M eggs/kg yielding 0.010 M eggs/kg per spawn (Guerrero-Tortolero et al., 2016).	**1**
Average maximum size Not scored for invertebrates	The maximum size reported was 95 cm (Allen, 1995).	**1**
Average size at maturity Not scored for invertebrates	The size of first maturity is estimated to be around 32 cm for females, whilst for males it is approximately 29.5 cm (Barbosa-Ortega et al., 2014; Diaz-Uribe et al., 2004; Rocha-Olivares, 1998).	**1**

Reproductive strategy	External fertilization and free-living larvae; they are broadcast spawners (Allen, 1995)	**1**
Trophic level	This species is a carnivorous predator that mainly feeds on fish, crustaceans and molluscs (Rojas-Herrera et al., 2014). Is reported and trophic level of 4.0+/- 0.62 (1)	**3**
Density dependence Invertebrates only		**NA**
Susceptibility		
Fishery Only where the scoring element is scored cumulatively	*Insert list of fisheries impacting the given scoring element (FCP v2.1 Annex PF 7.4.10)*	
Attribute	Rationale	Score
Areal Overlap	The area where the UoA captures Pacific red snapper corresponds to 10% of its distribution.	**2**
Encounterability	The interaction of fishing gear with the species is 20%. His capture is performed in the bottom.	**2**
Selectivity of gear type	Globally, bycatch with handline is around 2% (Kelleher, 2005). Only mature specimens are caught.	**2**
Post capture mortality	100% decompression mortality is reported in the Pacific red snappers.	**2**
Catch (weight) Only where the scoring element is scored cumulatively	The highest catches recorded was in 2010 (135 tons), in 2017 was reported 32.81 tons caught in Guaymas area.	**1**

Table 30 – PSA productivity attributes and scores Goldspotted sand bass		
Performance Indicator	1.1.1	
Productivity		
Scoring element (species)	Goldspotted sand bass, *Paralabrax auroguttatus* (Walford, 1936)	
Attribute	Rationale	Score
Average age at maturity	The goldspotted sea bass reaches sexual maturity at 4 years of age (Aburto-Oropeza et al., 2008).	**1**
Average maximum age	Maximum age collected was 24 years (Pondella et al., 2001).	**2**
Fecundity	Production of 4,000,000 eggs per years is reported to Paralabrax sp. (Shanks and Eckert, 2005).	**1**
Average maximum size Not scored for invertebrates	Was reported 71 cm as maximum size (Heemstra, 1995).	**1**

Average size at maturity Not scored for invertebrates	Reproduction is reported in females of 17 cm TL (Pondella et al., 2001).	**1**
Reproductive strategy	External fertilization and free-living larvae; they are broadcast spawner.	**1**
Trophic level	Carnivorous organism. According to Fishbase items, the trophic level for this species is 4.2 +/-0.5 (1).	**3**
Density dependence Invertebrates only		**NA**
Susceptibility		
Fishery Only where the scoring element is scored cumulatively	*Insert list of fisheries impacting the given scoring element (FCP v2.1 Annex PF 7.4.10)*	
Attribute	Rationale	Score
Areal Overlap	*P. auroguttatus* is distributed from California, USA to Baja California Sur (2). Its capture is developed in 10% of the total distribution area.	**3**
Encounterability	Mature organism performs migrations from rocky to shallow sandy bottoms in the reproductive period (Turner et al., 1969), and they return to their previous distribution site in non-reproductive season (Jarvis et al., 2010). McKinzie (2012) records that the greengrocer performs migrations during the reproductive season by diving to the bottom and in the non-breeding season he usually inhabits reefs and the bottom.	**3**
Selectivity of gear type	Globally, bycatch with handline is around 2% (Kelleher, 2005).	**1**
Post capture mortality	100% decompression mortality is reported in the *P. auroguttatus*.	**1**
Catch (weight) Only where the scoring element is scored cumulatively	From 2000 the annual production has occasionally been greater than 12 tons. In 2017 was reported 55 tons of this species in Guaymas.	**2**

Table 31 – PSA productivity attributes and scores of the Ocean Whitefish		
Performance Indicator	1.1.1	
Productivity		
Scoring element (species)	Ocean Whitefish, *Caulolatilus princeps* (Jenyns, 1840).	
Attribute	Rationale	Score
Average age at maturity	It is reported 4-5 years in males and 3-4 years to females (Wertz y Kato, 2003).	**1**

Average maximum age	The maximum age reported to whitefish is 21 years (Elorduy-Garay, 2005).	**2**
Fecundity	In *Caulolatilus sp*. Was reported fecundity from 0.2 to 4.1 millions of eggs (Roos and Merriner, 1983).	**1**
Average maximum size Not scored for invertebrates	Was reported a máximum age of 102 cm in total length.	**2**
Average size at maturity Not scored for invertebrates	48-56 cm males; 41-48 cm females (Wertz y Kato, 2003).	**2**
Reproductive strategy	The whitefish uses a partial spawning reproductive strategy by which the females spawn two to three times throughout the reproductive seasons, which provides a greater probability of reproductive success (Elorduy-Garay and Ramirez-Luna, 1994). They have free-living larvae.	**1**
Trophic level	3.9 +/- 0.5, generalist, omnivorous and opportunistic predator; it feeds mainly on crustaceans and pelagic or epibenthic prey (Caraveo-Patiño y Elorduy-Garay, 1994).	**3**
Density dependence Invertebrates only		**NA**
Susceptibility		
Fishery Only where the scoring element is scored cumulatively	*Insert list of fisheries impacting the given scoring element (FCP v2.1 Annex PF 7.4.10)*	
Attribute	Rationale	Score
Areal Overlap	*C. princeps* is mainly subtropical; its wide distribution goes from Vancouver Island in British Columbia, Canada to Peru, including almost entirely the Gulf of California, Mexico, and the Galapagos Islands, Ecuador (Dooley, 1978). In Mexico it is captured throughout the entire Pacific coast, mainly by the states of Baja California, Baja California Sur, Sonora and Sinaloa (DOF, 2010).	**3**
Encounterability	The position of whitefish's stock in relation to the water column and the fishing gear are coincident.	**2**
Selectivity of gear type	Globally, bycatch with handline is around 2% (Kelleher, 2005).	**1**
Post capture mortality	The juveniles are returned to the sea with a high survival rate (CDFG, 2002; Chuenpagdee *et al*., 2003).	**1**
Catch (weight) Only where the scoring element is scored cumulatively	More than 90% of the catches reported for this species belong to BCS (Gulf and the West coast). To Guaymas, Sonora, was reported landings of 63-23 tons from 2006-2017.	**2**

Table 32 – PSA productivity attributes and scores of the Rooster hind		
Performance Indicator	1.1.1	
Productivity		
Scoring element (species)	Rooster hind, *Hyporthodus acanthistius* (Gilbert, 1892).	
Attribute	Rationale	Score
Average age at maturity	The maturity age reported to *Hyporthodus sp.* is 7 years to females and males (PANGAS, 2012).	**2**
Average maximum age	The maximum age reached for this genre is 28 to 46 years (PANGAS, 2012).	**3**
Fecundity	This data is not available for *H. acanthistius*, however, the Serranidae family has a fecundity of 24,000-240,000 oocytes per female (Whiteman et al., 2005).	**1**
Average maximum size Not scored for invertebrates	It was reported a maximum size from 110 to 130 cm in total length (PANGAS, 2012).	**2**
Average size at maturity Not scored for invertebrates	The size of maturity is 64 cm in total length to both sexes (PANGAS, 2012).	**2**
Reproductive strategy	External fertilization and free-living larvae; they are broadcast spawners (PANGAS, 2102).	**1**
Trophic level	According to FishBase data, *H. acanthistius* have a trophic level of 3.9 +/- 0.7 (1).	**3**
Density dependence Invertebrates only		**NA**
Susceptibility		
Fishery Only where the scoring element is scored cumulatively	*Insert list of fisheries impacting the given scoring element (FCP v2.1 Annex PF 7.4.10)*	
Attribute	Rationale	Score
Areal Overlap	It is distributed from southern California, including the Gulf of California, to Peru. The drumstick is a common species in the Gulf of California. Inhabits reefs with depths of 45 to 90 meters and occasionally reefs and sandy bottoms near the coast (2). In Mexico, all these species are mainly captured by the states of Baja California, Baja California Sur, Sonora and Sinaloa (DOF, 2010).	**3**
Encounterability	The position of the stock of this species in relation to the water column and the fishing gear is coincidental, the handline is usually placed at medium water or relatively close to the bottom (Grajeda-Coronado, pers. Comp.).	**3**

Selectivity of gear type	Globally, bycatch with handline is around 2% (Kelleher, 2005).	**1**
Post capture mortality	100% decompression mortality is reported in this species.	**1**
Catch (weight) Only where the scoring element is scored cumulatively	Catches recorded in 2002 reached only 20 tons. In the period 2015-2017, landings of this species range between 96 and 121 tons in Guaymas.	**2**