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Pre-Assessment of the Red Snapper (*Lutjanus campechanus*) Fishery in the Campeche Bank, Gulf of Mexico, Mexico, using Bottom and Vertical Longlines

Prepared for:

Cooperativa de Producción de Bienes y Servicios Pescadores de Nuevo Campechito SC de RL de CV and Comunidad y Biodiversidad, AC

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MRAG Americas, Inc.

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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

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.

GOM: Gulf of México

Health of the ecosystem: a measure of the ecosystem's adaptability (its capacity to maintain its structure and behaviour pattern under stress), the organization (number and diversity of the interactions between components of the ecosystem) and the vigour (a measure of the activity, the metabolism or primary productivity). A healthy ecosystem is capable of maintaining its structure (organization) and function (vigour) over time during situations of stress (adaptability).

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.

LGEEPA: General Law for Ecological Equilibrium and Environmental Protection

LGPAS: General Law of Sustainable Fishing and Aquaculture.

Bottom Longline = Red snapper longline= *Palangre huachinanguero*

Vertical Longline= Handline= *Ristra = Rosario = Línea de mano*

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

MC: Caribbean Sea

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.

SCPBS: Cooperative Society for the Production of Goods and Services

SCPP: Cooperative Society for Fishery Production

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, in this case it is the Northern Red Snapper fishery in the south of Campeche and Tabasco.

1 Executive summary

This report sets out the results of a pre-assessment of the red snapper (*Lutjanus campechanus*) vertical and bottom longline fishery located in the Campeche Bank, in the Gulf of Mexico, Mexico in relation to the Marine Stewardship Council's (MSC) Principles and Criteria for Sustainable Fishing. This pre-assessment describes the fishery in the Mexican Gulf of Mexico, focusing on the South of Campeche and Tabasco, where the vessels from the Cooperative of Nuevo Campechito operate. The cooperative has six commercial vessels that are directly engaged in the fishery.

The Client Group consists of the "*Cooperativa de Producción de Bienes y Servicios Pescadores de Nuevo Campechito*" and "*Comunidad and Biodiversidad A.C.*"

As part of a FIP that the fishery has undertaken, COBI conducted site visits in August and December 2018, prior to initiating this pre-assessment. The team members did not participate in meetings or conduct any interviews with stakeholders. All information was received from COBI, including a preliminary pre-assessment report (Fernández et al. 2018) that provided part of the introductory material for this (comprehensive) report.

The assessment team consisted of Dr. Mónica Valle-Esquivel, and Dr. Sara Adlerstein-González. Qualifications of the team are as follows:

Dr. Mónica Valle-Esquivel (Team Leader and Principles 1 and 3) 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 seven 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.

Dr. Sara Adlerstein (Principle 2) has been a research faculty at the School of Natural Resources and Environment (SNRE) at the University of Michigan for 17 years. She obtained MS degrees in Biology at the University of Concepcion, Chile, and MS and PhD in Fisheries at the University of Washington. She has previously worked in academia (Universidad Catolica de Chile, University of Hamburg in Germany) as well as in organizations devoted to fisheries management (Chilean Fishery Ministry, and the International Pacific Halibut Commission) and as expert at the European Commission. She teaches statistics, applied ecology and classes that explore multilayer relationships between culture and the environment. Her research programme is centred on applied aquatic ecology, with emphasis on population assessments and ecosystem dynamics with the goals of: (i) improving

monitoring and increasing the value of available information; (ii) understanding processes that determine distribution and abundance of aquatic organisms; and (iii) quantifying responses of aquatic communities to stressors and management. Major contributions of her research are in applications for management, including diagnostics of environmental quality and advances in concepts related to fish movement and ecosystem food web models. Dr. Adlerstein has served for a number of Marine Stewardship Council certifications for sustainable fisheries as expert on ecosystem effect of fisheries (P2) and fishery management systems (P3), and also has conducted MSC certification peer reviews. MSC assessments in which she has participated include the Sian Ka'an and Banco Chinchorro Biosphere Reserves Spiny Lobster (artisanal) Fishery (P3), two separate assessments for the Chilean Hake industrial Fishery (P2 and P3), and the Louisiana Blue Crab Trap Fishery (P2). Most recently she participated in the assessments of Lake Erie Commercial Fisheries (P2) and the Chilean Squat Lobsters and Nylon Shrimp Modified Trawl (industrial and artisanal) Fishery (P2 and P3).

Dr. José Francisco Chávez Villegas (FIP leader, drafted preliminary PA report and conducted stakeholder meetings and interviews). 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 molluskecology and biology at the National University of Colombia for academics and fishermen groups (2010), was an associate professor at Cinvestav-IPN theaching 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).

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

<u>Principle 1:</u>

Strengths: There are a couple of positive features in P1: red snapper fisheries in the entire Gulf of Mexico are of great economic importance, so there is a wealth of biological and fishery information from the US GoM. Although it´s a different stock, many life-history and population dynamics features are similar, and the US fishery has undergone major recovery efforts, which might provide guidance to the Mexican fishery. In the Mexican GOM, there is sufficient information on the biology and ecology of the species, and landing statistics and fishing information have been collected since 1980. Appropriate stock assessments were conducted in the past, so it is likely that there is enough data to update analyses and assess current status; else RBF is recommended.

Weaknesses: The last (available) stock assessment was carried out in 2000, and current stock status is not known. Assessments are not generally available to the public and if the authorities do not release this information, it will be difficult to assess P1 indicators appropriately. Reports suggest that the stock has been overfished for at least two decades, and overfishing has continued despite existing regulations; the 2018 CNP defines the stock as "deteriorated". In addition, the red snapper fishery does not have clear objectives, 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. It is essential to use the available information to

analyze the current status of the stock and to develop a suitable rebuilding or harvest strategy, with short and long-term objectives and appropriate tools to meet them. This principle requires the foremost attention.

Principle 2:

Strengths: Due to the selective nature of the fisheries and the type of gear, the longline UoAs on the Campeche Bank 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. It is believed that the UoAs have limited interaction with ETP species, and in line with Mexican policy the potential for this is well regulated. Available information suggests that the level of discards from the fishery is negligible.

Weaknesses: There no data to identify specific interactions with the fisheries and ETP species in the red snapper bottom and vertical longline UoAs (potentially four species of turtles and one species of coral). Furthermore, the potential for indirect interactions of the fishery with ETP species has not been considered. The only source of information available to determine the catch species composition separately for the Nuevo Campechito UoAs using vertical and bottom longline and determine main and minor secondary species are sale records from the cooperative (avisos de arribo). Thus, although it is reasonable to say that there are no primary species in the UoAs targeting red snapper with vertical and bottom longlines are no official catch statistics for species associated with to determine secondary species. Further, there is no information on the amount used by species to determine if they would constitute main or minor secondary species. Last there is a lack of supporting quantitative data as evidence for the level of discards. Given lack of data on all the species involved the RBF would be used to score PI 2.2.1. While a SICA analysis may conclude that the fishery achieves a score of 60 (i.e. pass with condition), due to the overfished nature of the Campeche Bank and the species' characteristics it is considered probable that the fishery would fail to achieve a score of 60 in a PSA.

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 a Fishery Law (LEGEPAS) 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. Importantly, red snapper in the GOM and Caribbean does not have a NOM or a FMP, and fishery-specific objectives have not been defined. The fishery is managed under the grouper NOMs and FMP, with general, *ad hoc*, management measures laid out in the 2018 CNP, which have likely been ineffective. A FMP must be developed (or published if it already exists), with clear objectives and 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 may need to be reinforced and better documented.

Conclusion:

Overall, the team concludes that at this time the fishery is NOT consistent with 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.

2 Introduction

The Fishermen's Cooperative of Nuevo Campechito, in association with Community and Biodiversity A.C., Mexico (the Client) contracted MRAG Americas to conduct a pre-assessment, following the standards of the Marine Stewardship Council, for of the the Red Snapper (*Lutjanus campechanus*) fishery, captured with vertical longline (*"ristra"* or *"rosario"*, Campeche local name) and bottom longline in the southern region of Campeche and Tabasco in the Gulf of Mexico.

In this report , the fishery is analysed with the aim of obtaining a comprehensive view that allows responsible decision making for the implementation of a fishery improvement program. The Client selected to follow the MSC methodology because it uses the most rigorous and demanding standards available.

An additional objective is to identify any obstacles to certification and provide recommendations to improve each of the indicators that are assessed, which are provided in each of the performance indicators In addition, once a sustainable framework is implemented, it would be desirable for the Client to seek access to new and better national and international markets.

2.1 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.

In this case, the Client stated that at this moment the fishery is not pursuing MSC certification but rather, to use the pre-assessment as the first step towards a Fishery Improvement Project (FIP), which is a formal requirement according to the sustainable fisheries program. The Client's main

objective is to identify information gaps to subsequently develop a management strategy to promote the biological and economical sustainability of the resource.

There were a few constraints for this analysis. First, trained specialists from COBI had already produced a thorough description of the fishery and the target species in a preliminary pre-assessment report (Fernández et al 2018) and an analysis of the fishery (Chávez et al 2018), which were used as a basis to develop this introductiory section of the report. However, some of it was lost in the Spanish-English translation, and also, in the transfer from the old pre-assessment format to the current one used in this report (v. 3.0). The pre-assessment team reorganized and edited the information, making it suitable to the new standard and requirements.

In August 2018, COBI conducted a site visit independently from this pre-assessment, as part of the FIP process the fishery is engaged in. The team members did not participate in stakeholder meetings or conduct any interviews, thus, they did not receive any information directly from stakeholders. COBI, however (via Dr. Chávez), provided significant insight and information for this work, gained through continued interaction with the cooperative, scientists, and the management authority. COBI also provided a preliminary document for the fishery, which was used as a basis to populate sections the introductory material in this report.

Another limitation was that the information available for the fishery is scarce or not public, and a large part of the scientific research produced at the national level is at least 15 to 20 years old. Therefore, the information presented in this document is based on the contributions from American and Cuban research groups, who have more recently described the species and the state of the stocks. On the other hand, despite the existence of substantial data from the management authority (CONAPESCA/ INAPESCA), the (official) figures do not match the information generated by the fishing cooperative. In addition, the official database is not updated, and contains records only through year 2014. Thus, the statistics presented here are outdated, and perhaps the analysis too.

Finally, it is important to note that MRAG Americas did not conduct a site visit with the fishery, so this work was a desk review only. COBI however, held stakeholder meetings prior to collaborating with MRAG Americas to produce the preliminary report. Representatives from the government, research and OSC sectors participated, and provided COBI with documents and evidence used in this pre-assessment. The constraint is that the team did not receive the information first-hand, and assessors were unable to discuss some important issues directly with stakeholders. This may be reflected in the analysis and in the lack of sufficient evidence (documents or anecdotal information) to evaluate some indicators.

2.2 Version details

Fisheries program documents 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**

3 Unit(s) of Assessment

3.1 Unit(s) of Assessment

The Unit of Assessment (UoA) analyzed in this pre-assessment is the Red Snapper fishery in the southeast Gulf of Mexico, harvested by small vessels using bottom and vertical longlines. The fishery is conducted by fishermen of southern Campeche and Tabasco that are members of the cooperative *"Cooperativa de Producción Bienes y Servicios Pescadores de Nuevo Campechito S.C. of R.L. of C.V."* The UoA is configured as follows:

Species: *Lutjanus campechanus* (Poey 1860)

Common name: Red Snapper (In Spanish: *Huachinango del Golfo, Huachinango de Castilla, Guachinango, Pargo del Golfo, Pargo Real, Pargo Colorado, Acara aya, Chillo*)

Geographical Area: Gulf of Mexico (South of Campeche and Tabasco, Mexico). The fishermen's cooperative of Nuevo Campechito operates in the Campeche Bank, within the EEZ in the Gulf of Mexico (**Figure 1**).

Fishing Method: Vertical longline (*ristra* or *rosario*) and bottom longline.

Stock: Campeche Bank, in the southeast region of the Gulf of Mexico.

Management System: SAGARPA is the fishery management authority in Mexico, and operates through two main entities: CONAPESCA and INAPESCA.

Client: *Cooperativa de Producción de Bienes y Servicios ,Pescadores de Nuevo Campechito SC de RL de CV* and *Comunidad y Biodiversidad AC*

This UoAs was selected because the fishing cooperative of Nuevo Campechito has the largest and most organized membership in the area, and is interested in initiating a FIP. Other eligible fishers would likely include the additional commercial vessels with similar characteristics that fish in the same fishing grounds but are not members of the cooperative.

There is a good possibility that other artisanal and semi-industrial fleets from the west coast of Yucatán will join the ongoing FIP led by COBI in the short term. The cooperatives that will likely be incorporated in the UoA are those of Puerto Progreso, Yucaltepén, Chelém and Chuburná. Their fleets also operate in the Campeche Bank using similar fishing methods and gears as the fleet of Nuevo Campechito, except that the semi-industrial fleet of Puerto Progreso also uses bicycle gear[1].

[1] If other fleets/cooperatives join the FIP, COBI will update the pre-assessment to include them in the UoA and update the analysis if and where required, particularly to describe the P2 effects of the bicycle gear.

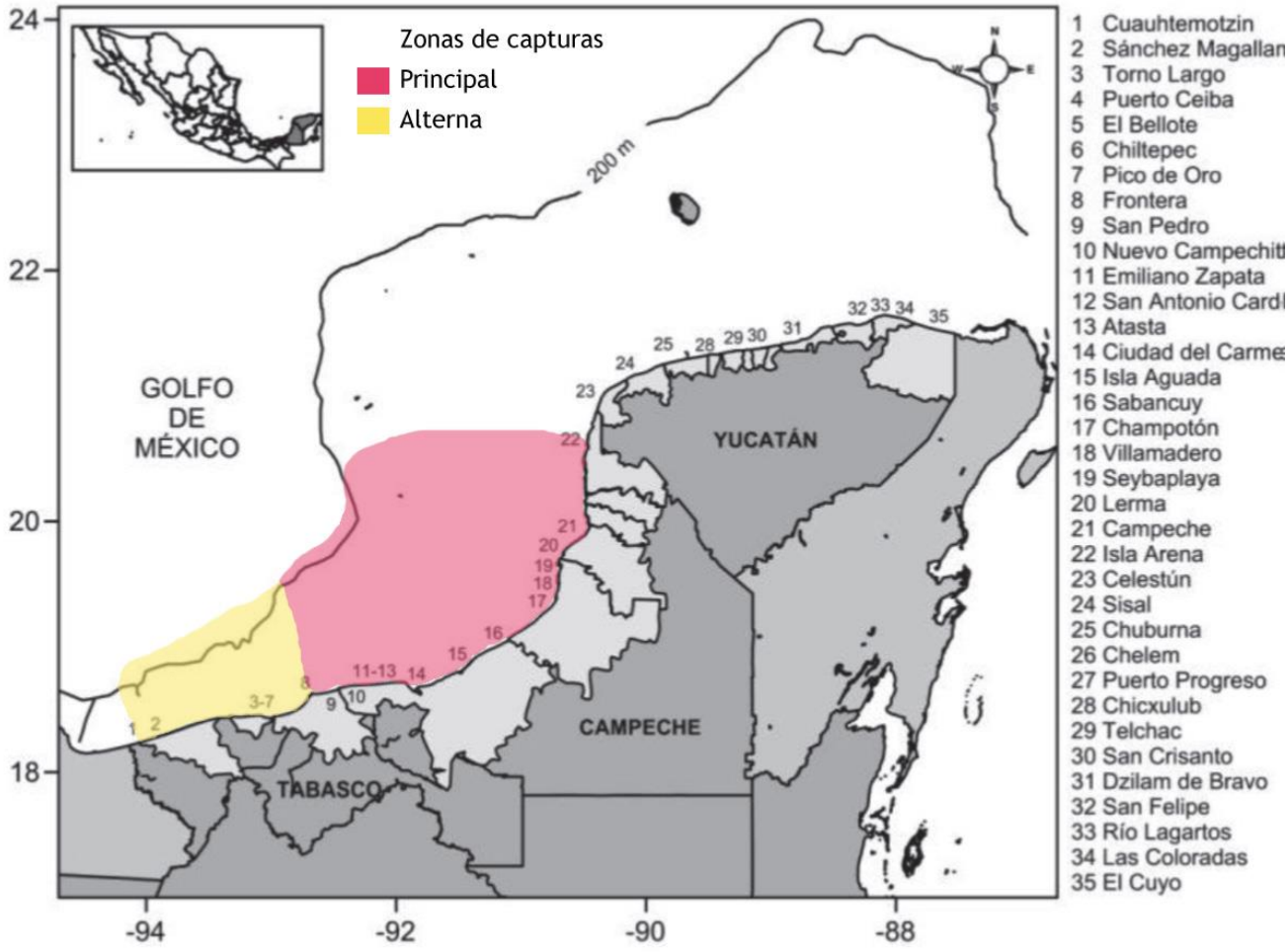

Figure 1. Main fishing areas for bottom and vertical longline UoAs in states of Tabasco, Campeche and Yucatan in the Gulf of Mexico. Fishers from the Nuevo Campechito Cooperative land their catch in Nuevo Campechito (num. 10). (Modified from Perez et al 2016).

4 Traceability

4.1 Traceability within the fishery

The chain of custody of the red snapper fishery, caught with bottom longline and vertical longline in the GOM and MC, begins at the point of landing and are the same SCPP who prepare the product for delivery directly to the buyer.

In accordance with records of the SCPBS Fishermen of Nuevo Campechito, the red snapper is collected and subsequently transported to intermediaries in Mexico City (at the "*La Viga*" Market, *Mercado de la Viga*). In the past few years, part of the product has been commercialized abroad, mainly in the United States and Canada, where the product can be sold at higher prices.

In an analysis of the reported catches in the Gulf of Mexico, it was observed that the income generated during 2006 was from $23.80 to $59.88 (Q. Roo and Yucatan, respectively) per kg of landed product, with an average value of $41.77 per kg. Near 2014, a small variation in prices was observed (from $42.43 to $47.07), with an average value of $44.65 per kg landed (Table 1).

Table 1. Relationship between catch (t), total value (MXN Pesos) and price per kg for the red snapper resource in the Gulf of Mexico. Data obtained from the CONAPESCA portal (2018).

State	2006			2014		
	Catch (t)	Value (MXN)	Price (kg)	Catch (t)	Value (MXN)	Price (kg)
Tamaulipas	501	$ 21,408,316	$ 43	724	$ 31,512,379	$ 44
Veracruz	260	$ 11,397,975	$ 44	367	$ 16,774,072	$ 46
Tabasco	1020	$ 47,915,652	$ 47	1042	$ 48,602,821	$ 47
Campeche	240	$ 8,011,727	$ 33	645	$ 27,364,635	$ 42
Yucatán	552	$ 13,140,086	$ 24	505	$ 21,459,541	$ 42
Quintana Roo	35	$ 2,095,848	$ 60	32	$ 1,506,191	$ 47
Average	**435**	**$ 17,328,267**	**$ 42**	**553**	**$ 24,536,606**	**$ 45**

Related to commercialization at the national level, an average value of $167.91 per kg of red snapper filet in 2011, with lower sales prices in Guanajuato and Oaxaca $130.00 and higher prices in Mexico City ($269.98) (PROFECO 2011), with differences of 14-16% reported for sales prices at the national level, and variations of up to 136% in Mexico City (Table 2). According to the National System of Market Information and Integration, SNIIM-SE; in 2016, the average value of the Gulf red snapper exhibited a monthly variation of 2.74% (from $117.0 to $120.2 per kg) at the national level. On the other hand, an increase of 30.79% (from $91.9 to $120.2 per kg) was observed during the period 2015-2016 (Mercado Rural 2016). In August 2018, the product was bought from the fishermen for $160.0 per kg, and the average sale price in the market was $210 (Personal comm., fishermen of Nuevo Campechito, Campeche).

Table 2. Commercialization of red snapper from the Gulf of Mexico (PROFECO 2011).

City	Price min. (MXN)	Price max. (MXN)	Difference (MXN)	Difference (%)
Guadalajara	$94.60	$109.90	$15.30	16%
Mérida	$96.00	$109.90	$13.90	14%
Mexico City	$145.00	$342.50	$197.50	136%

Table 3. 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	*No* *The red snapper is caught only with bottom and vertical longline in this region*

same vessels, or during the same season; - How any risks are mitigated.	
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* *The main fishing area for the UoA is within Campeche waters. When the availability/ abundance of snapper decreases in this area, fishing trips are directed to the Tabasco region. Fishing occurs year-round, with a peak between October and February.*
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.	*None of the species captured by the Nuevo Campechito Cooperative are certified at the moment. Red snapper is one of the main targets in a multi-species fishery. Thus, different species are mixed in the catch.* *Among the activities covered by the client are storage, processing, landing and transportation, as well as sale to large retail companies (eg.,Walmart Mexico and La Viga Market in Mexico City).* *Fishermen sort their catch and the receiving/processing SCPBS facility separates landings by species and size category. There are three size categories, the first two captured with vertical longline and the third, with bottom longline:* *Medium*= 350-490 g; *Ración*= 500-990 g, and *Parguete* <1KG. *Since there are no certified products at the moment, a plan to mitigate risks of mixing of certified red snappers has not been explicitly developed. However, it is likely that the product from the UoA would be identified from the moment of capture, to landing and processing at the coop facility and throughout the rest of the supply chain.*
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; - How any risks are mitigated.	*No* *The snapper is harvested only by SCPBS fishers, and then process and stored at the SCPBS facility and shipped to markets in Mexico City.* *Other fishers/vessels outside the UoA land and sell their product at other facilities. Some fishers ship their product to Puerto Progreso (Yucatan), but most sell it to La Viga Market in Mexico City.*

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*

5 Pre-assessment results

5.1 Pre-assessment results overview

5.1.1 Overview

Analysis of the information showed that this fishery has several areas where it does not meet the MSC Standard that could prevent the fishery from being certified at this time. These areas would need improvements before moving to a full assessment. A number of performance indicators (PIs) in P1 and P2 scored below 60. There were no areas of non-conformance in P3. As noted in **Table 4**, 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 individual scoring tables for Principles 1, 2 and 3 (Sections 5.4, 5.5, and 5.6).

Table 4. Key to likely scoring level in **Table 5** 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

The majority of the Principle 1 indicators (except Information) are unlikely to meet the MSC standard, but there are a few positive features in P1. Red snapper fisheries in the entire Gulf of Mexico are of great economic importance, so there is a wealth of biological and fishery information from the US GoM, which might provide guidance to the Mexican fishery, especially because the US fishery has undergone major recovery efforts. In the Mexican GOM, there is sufficient information on the biology and ecology of the species, and landing statistics and fishing information have been collected since 1980. Appropriate stock assessments were conducted in the past, so it is likely that there is enough data to update analyses and assess current status; else RBF is recommended.

This principle requires foremost attention. Key points arising from the analysis are: i) Unavailability or lack of an updated stock assessment to determine the current stock status. CONAPESCA collects catch and effort data since 1980, so it is likely that there are sufficient data to conduct analysis, else RBF is recommended; ii) There have been signs of overfished and overfishing conditions for at least two decades, and the 2018 CNP defines the stock as "deteriorated"; iii) There are no fishery objectives, 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, all of the P1 indicators are likely to fail, which would also fail the fishery as a whole. It is essential to analyze the current status of the stock and to develop a suitable rebuilding or harvest strategy, with short and long-term objectives and appropriate tools to meet them.

Description of PIs< 60 in P1:

PI 1.1.1 Stock status –The last assessment (from 2000) showed that the red snapper stock in the GOM was overfished and overfishing was occurring. The stock is currently classified as "deteriorated" by CONAPESCA and the species is listed as "Vulnerable" by the IUCN. There are signs that the stock has not recovered. The (limited) evidence suggests that the stock is not above the PRI or fluctuating around MSY levels. If updated catch and effort data are not available and a quantitative stock assessment is not possible or available, then RBF should be applied to score this indicator.

PI 1.1.2 Stock rebuilding - Current stock status is unknown, but some evidence suggests that the stock is overfished and in need of rebuilding. There is no harvest strategy or a plan to rebuild the stock.

PI 1.2.1 Harvest Strategy - A robust and precautionary harvest strategy for red snapper in the Campeche Bank in not in place, but monitoring occurs and there are some management measures (fishing licenses and vessel/ gear restrictions). These may not be working, considering that declines in abundance have been reported, MSY values have been exceeded, and that the stock has been described as depleted or overfished for decades.

PI 1.2.2 Harvest control rules and tools -There are no (formal or implicit) harvest control rules for this fishery, and there is no evidence that the tools available are effective in controlling exploitation.

1.2.4 – Assessment of stock status – The last available stock assessment is from 2000, and used a biomass-dynamic model. While the analysis is appropriate for the stock and estimated MSY reference points, it is obsolete and needs to be updated. If new catch and effort data are not available and a quantitative stock assessment is not possible or available, then RBF should be applied to score PI1.1.1.

Principle 2

Key points for P2 arising from the analysis are lack of data to: i) identify specific fishery interactions with ETP species and that the potential for indirect interactions with ETP species has not been considered, ii) determine the catch species composition separately for the Nuevo Campechito UoAs to identify secondary species, iii) determine the amount of bait species used to identify main or minor secondary species, and iv) evaluate the level of discards. Given lack of data on all the species involved the RBF would be used to score PI 2.2.1. While a SICA analysis may conclude that the fishery achieves a score of 60 (i.e. pass with condition), due to the overfished nature of the

Campeche Bank and the species' characteristics it is considered probable that the fishery would fail to achieve a score of 60 in a PSA.

Description of PIs< 60 in P2:

PI 2.2.1. Secondary Outcome- For BL there are two main secondary grouper species classified as VU by the IUCN not likely to be above biological limits. For VL there is a main secondary snapper species classified as VU by the IUCN not likely to be above limits. There are no measures in place expected to ensure that the UoAs do not hinder recovery and rebuilding.

PI 2.2.2. Secondary Management- For BL and VL. a) While there are measures in place that could limit the impacts on secondary species (hook size, licensing, closed seasons and closed areas), given their failure to protect the target species and several of the other fish species recorded in the landings, it must be reasonable to conclude that the fishery may hinder their recovery and rebuilding. b) Given the precarious conservation status of the target species and several other species recorded in landings it must be reasonable to conclude that measures in place are not likely to work. E) The only species that is known to be unwanted and that is discarded is *Lagocepahalus laevigatus*, which is toxic. There is no review of the potential effectiveness of alternative measures to minimize unwanted catch.

PI 2.2.3. Secondary Information- For BL and VL a) b) In the absence of official records on catch it is unclear if the information to estimate the impact of main secondary species and to support measures is adequate.

PI 2.3.2. ETP Management- For BL and VL. There are four species of turtles considered ETP: Hawksbill turtle: Loggerhead turtle, Green turtle, and Leatherback turtle and one species of coral, Staghorn coral. E) There was no information found indicating that there is a review of potential; effectiveness of the measures in place to minimise related mortality by the UoAs.

Principle 3

There were no areas of non-conformance in P3. The management system has an appropriate legal and customary framework, based on a Fishery Law (LEGEPAS) 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 that would raise conditions are that red snapper in the GOM and Caribbean does not have a NOM or a FMP, and fishery-specific objectives have not been defined. The fishery is managed under the grouper NOMs and FMP, with general, *ad hoc*, management measures laid out in the 2018 CNP, which have likely been ineffective. A FMP must be developed (or published if it already exists), with clear objectives and 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.

5.1.2 Recommendations

Based on the results of this pre-assessment, several areas were identified where the fishery does not meet the MSC standard. The team does not recommend the fishery to proceed with a full assessment at this time. However, 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 to focus on key indicators and provide the general basis for actions that need to be undertaken in order to meet the MSC standard.

5.2 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, rasing 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 5** shows the number of PIs scoring <60 for each principle.

Table 5. Summary of Performance Indicator level scores

Principle of the Fisheries Standard	Number of PIs with draft scoring ranges <60
Principle 1 – Stock status	**5**
Principle 2 – Minimising environmental impacts	**4 for each UoA** Bottom Longline: 4 PIs Vertical Longline: 4 PIs
Principle 3 – Effective management	**None**

5.3 Summary of Performance Indicator level scores

Table 6. Summary of Performance Indicator level scores

Performance Indicator	Draft scoring range	Data deficient?
PRINCIPLE 1		
1.1.1 – Stock status	**<60**	**Yes**
Rationale or key points		
The most recent stock assessment available is from year 2000, which showed catches exceeding MSY and a significant decline in biomass. Since then, references suggest that the stock has not shown signs of recovery, and is currently classified as "deteriorated" by the management authority (CNP 2018). Also, the species is listed as "Vulnerable" by the IUCN. With this (limited) evidence, it is precautionary to assume that the stock is not above the PRI or fluctuating around MSY levels, and probably overfished and undergoing overfishing. If updated catch and effort data are not available and a quantitative stock assessment is not possible or available, then RBF should be applied to score this indicator.		
1.1.2 – Stock rebuilding	**<60**	**Yes**
Rationale or key points		
Current stock status is unknown, but some evidence suggests that the stock is overfished and in need of rebuilding. There is no harvest strategy specifically for red snapper in the Campeche Bank or a plan to rebuild the stock, and the limited monitoring of the fishery would be insufficient to determine stock status or trends.		
1.2.1 – Harvest Strategy	**<60**	**Yes**
Rationale or key points		
A robust and precautionary harvest strategy, with regular monitoring, reference points, stock assessments, and harvest controls does not exist for red snapper in the Campeche Bank. Catch is monitored through landing tickets and there are a few ad hoc management measures, consisting of fishing licenses and vessel/ gear restrictions, which may not be sufficient to maintain the stock at a sustainable levels. Given that steady declines in abundance have been reported, that MSY values have been exceeded for decades, and that the stock has been described as depleted or overfished, the harvest strategy does not appear to be working, although the objectives are not defined either.		
1.2.2 – Harvest control rules and tools	**<60**	**Yes**
Rationale or key points		
Neither stock status indicators nor reference points are available for the red snapper fishery of the Gulf of Mexico. 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. There are no (formal or implicit) harvest control rules for this fishery, and there is no evidence that the tools available are effective in controlling exploitation.		
1.2.3 – Information and monitoring	**60 – 79**	**Yes**
Rationale or key points		
Some information is available related to stock structure, stock productivity and fleet composition to support the harvest strategy for red snapper in the GOM. Landing statistics have been collected since 1980. However, development of an improved strategy would require updated stock productivity assessments. Currently, the harvest strategy is limited to fishing licenses, vessel and gear restrictions and does not take any biological, stock productivity, or environmental information into account. Essentially, key data to inform the harvest strategy is available, but needs to be updated and used to carry out assessments. If RBF is used instead, sufficient information for PSA and CA is available.		
1.2.4 – Assessment of stock status	**<60**	**Possibly**
Rationale or key points		
Stock assessment reports are not readily available from the fishing authorities, so we were unable to confirm if INAPESCA has conducted any new analysis since 2000. While that last assessment is appropriate for the stock, it is possibly obsolete. The method used then was a biomass dynamic model that does not take into account the biology of the species, but is appropriate for the stock and allows estimation of MSY reference points. The assessment is approximately 20 years old and needs to be updated. It is likely that the basic catch and effort data required for a similar (biomass dynamic) analysis are available, since landing statistics and effort information are collected regularly by CONAPESCA since 1980. If such data is not available and a quantitative stock assessment is not possible or available, then RBF should be applied as a proxy for stock status.		
PRINCIPLE 2		
2.1.1 – Primary Outcome	**>80**	**Yes**
Rationale or key points		
There are no primary species >80		
2.1.2 – Primary Management	**>80**	**Yes**
Rationale or key points		
There are no primary species >80		
2.1.3 – Primary Information	**>80**	**Yes**
Rationale or key points		

There are no primary species >80		
2.2.1 – Secondary Outcome	**<60**	**Yes**
Rationale or key points		
In addition to the great deal of uncertainty about number and contribution of species in the catch of both UoAs and about species used for bait, there is insufficient knowledge of the status of many of the stocks. Thus RBF would be employed with both a PSA and a SICA. Further, measures in place that could limit the impact of the UoAs on secondary species (hook size, licensing, closed seasons and closed areas) are not expected to ensure the UoAs do not hinder recovery and rebuilding given the overfished nature of the Campeche Bank.		
2.2.2 – Secondary Management	**<60**	**Yes**
Rationale or key points		
It must be reasonable to conclude that the fishery may hinder recovery and rebuilding despite measures in place (hook size, licensing, closed seasons and closed areas), given their failure to protect the target species and several of the other fish species recorded in the landings. The only species that is known to be unwanted and that is discarded is *Lagocepahalus laevigatus*, which is toxic. There is no review of the potential effectiveness of alternative measures to minimize unwanted catch.		
2.2.3 – Secondary Information	**<60**	**Yes**
Rationale or key points		
In the absence of official records on catch it is unclear if the information to estimate the impact of main secondary species and to support measures is adequate. While unofficial records were used to identify which species would be evaluated under this component as main or minor, an independent sampling study should be conducted to compare/verify.		
2.3.1 – ETP Outcome	**60 – 79**	**Yes**
Rationale or key points		
Species in the area that can be considered ETP are Hawksbill turtle, Loggerhead turtle, Green turtle, and Leatherback turtle, and Staghorn coral. Government of Mexico has taken a number of steps to protect ETP species in the area of the fishery. However, effects of the UoAs are not known. Given the small scale of the fishery, particularly relative to the wide ranging turtle populations, they are likely to be within limits of national and international requirements for protection of ETP species.		
2.3.2 – ETP Management	**<60**	**Yes**
Rationale or key points		
There are a number of steps to protect ETP species implemented by Mexico to protect all ETP species, consisting mostly on refuge zones and closures. In the case of the UofAs these would be to protect nesting habitat for turtles. While a main assessment would revise this issue in detail, there is an apparent lack of		

concern about the fishery and fishers reporting limited interactions with ETP species. Nevertheless, there was no information found indicating that there is a review of measures in place for the UoAs.		
2.3.3 – ETP Information	**60 -79**	**Yes**
Rationale or key points		
There is no qualitative information available to estimate related mortality on ETP species; nevertheless there is population-level information about ETP turtle species indicating that populations are thought to be increasing or stable. While it might be the case that the UoAs do not interact with ETP species present in the area, according to FishSource there are turtles and corals affected by fisheries catching red snapper in the Gulf of Mexico.		
2.4.1 – Habitats Outcome	**60 – 79**	**No**
Rationale or key points		
There is evidence to suggest that the UoAs may damage habitat by removing species such as grouper and that the gears used may damage coral. The key question in any main assessment will be the extent of potential damage and whether or not there would be serious or irreversible harm.		
2.4.2 – Habitats Management	**60 – 79**	**No**
Rationale or key points		
Although there are marine protected areas and no fishing zones, that on the basis of experience might work, there is not a partial strategy i.e. restricting catch to recover and maintain the stocks would serve to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.		
2.4.3 – Habitats Information	**60 – 79**	**No**
Rationale or key points		
The habitat of the Campeche bank has been studied in detail. From experience elsewhere and from regional studies it would be possible to identify the nature of the impacts of the fishery. Nevertheless, information is missing on the extent of interaction of fishing activities and the spatial and temporal use of gear and there is no adequate information that continues to be collected to detect any increase in risk to the main habitats.		
2.5.1 – Ecosystems Outcome	**>80**	**Yes**
Rationale or key points		
While there is insufficient information to assess the impact of the fishery on the ecosystem, it is highly unlikely that the UoAs would disrupt the key elements of the ecosystem given the small scale of the fisheries.		
2.5.2 – Ecosystems Management	**60 – 79**	**No**
Rationale or key points		

There are measures in place that are considered likely to work but no partial strategy in place.		
2.5.3 – Ecosystems Information	**>80**	**No**
Rationale or key points		
From studies on the Campeche Bank and the experience in similar fisheries, the information available is considered adequate to identify and to broadly understand key ecosystem elements. Nevertheless the impacts of the UoAs are not identified given that information is only recorded from landings and not for each UoA separately.		
PRINCIPLE 3		
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, consistent with Principles 1 and 2. The system involves fishers and stakeholders in the deliberation process and in the resolution of disputes, but there is no information to know if it is effective. 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 fisheries management system and establishes the form of coordination with other Federal, State, and municipal entities. 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 of the supporting ecosystems.		
3.2.1 – Fishery specific objectives	**60 – 79**	**No**
Rationale or key points		
The red snapper fishery of the GOM does not have an official standard (NOM) or a Fishery Management Plan with explicit objectives. It is currently managed only through the 2018 CNP, and falls under the NOM		

and the FMP regulations for grouper and associated species in the GOM and the Yucatan Penisnsula. General objectives are explicit and broadly consistent with desired outcomes from MSC P1 and P2, but not specific to the red snapper fishery, and possibly only long-term. Short-term objectives have not been developed or documented. A NOM and a FMP need to be developed, and the CNP must be updated with specific requirements for the red snapper fishery of the GOM.		
3.2.2 – Decision making processes	**60 – 79**	**Yes**
Rationale or key points		
Despite the high economic value and ecological importance of the red snapper fishery, the decision-making process has not been effective, since the existing measures and strategies are very weak or generic, and do not appear to be precautionary or to address serious issues, such as steady declines in abundance. However, some measures are in place (eg., permitting and vessel/ gear specifications), which implies that some general management decisions are made for the fishery. Clear objectives must be developed before implementing any new measures. The lack of incidents, violations or sanctions in the red snapper fishery of Nuevo Campechito suggests that the fishery complies with the law and disputes are unnecessary. More information is required to score this indicator.		
3.2.3 – Compliance and enforcement	**60 – 79**	**Yes**
Rationale or key points		
CONAPESCA in collaboration with SEMAR, SCT and SEMARNAT, has MCS mechanisms that are implemented in Nuevo Campechito and are expected to be effective because there are no reports of violations within the UoA. There is some evidence that sanctions are applied, and are thought to provide effective deterrence within the UOA, because compliance with regulations is reported to be high. This is not the case in the shrimp fishery, where a number of violations have been detected and sanctioned. Also, anecdotal information suggests that there is a high number of illegal fishers that have not been deterred by the existing MCS system and that are largely unaccounted for. Evidence for this indicator was scarce and the rationale is based on results from a few interviews. The scale and nature of illegal fishing, and the efficacy of sanctions need to be investigated and evidence presented. Further interviews with cooperative leaders and fishers of Nuevo Campechito, and with the local management authorities would be helpful to better inform this indicator.		
3.2.4 – Management performance evaluation	**60 – 79**	**Yes**
Rationale or key points		
Updates to the CNP are the only evidence that some parts of the management system for the red snapper fishery of the GOM are reviewed. The most recent update is the 2018 CNP, which includes revised management measures for the fishery. Stakeholder participation in the management process at the national level in Mexico suggests that the management system is subject to internal and external review, but the form and frequency in which reviews occur for this fishery are not known. This has to be confirmed with evidence from INAPESCA and CONAPESCA, showing the nature and regularity of internal and external reviews, for example through Annual Operative Plans, minutes from stakeholder meetings, etc.		

5.4 Principle 1

5.4.1 Principle 1 background

a. Biological characteristics of *Lutjanus campechanus*

Taxonomy

Phylum: *Chordata*

Class: Actinopterygii
Order: Perciformes
Family: *Lutjanidae*
Genuso: *Lutjanus*
Species: *Lutjanus campechanus* (Poey 1860)

Synonym: *Mesoprion campechanus* (Poey 1860); *L. campechianus* (Poey 1875); *L. aya* (Blonch 1975); *L. blackfordii* (Goode and Bean 1878)

Common names (Anderson et al. 2015; CNP 2018):

Spanish	Huachinango del Golfo, huachinango de castilla, guachinango, pargo del Golfo, pargo real, pargo colorado, acara aya, chillo
English	Red snapper, bream, Mexican red snapper, mutton snapper, Northern red snapper, pensacola red snapper

Stock Structure

In the Gulf of Mexico and Atlantic, the red snapper population is considered to consist of three separate stocks: the US Atlantic, the US Gulf of Mexico, and the Mexican Gulf of Mexico (Anderson, et al. 2016). This is corroborated with results from:

1) Genetic studies using allelic variation that support the hypothesis of a single metapopulation in the northern GOM (Camper et al 1993, Gold 2001, Saillant and Gold 2002, Gold and Saillant 2007);

2) Studies of otolith chemical signatures, which suggest that there is little mixing between the populations in US and Mexican waters and that the larger red snapper population in the northwestern Gulf may be serving as a source region of recruits for the north central region. It is likely that the populations east and west of the Mississippi are metapopulations. Connectivity between populations in the northern Gulf and Campeche Banks is not yet confirmed, but is suspected to be low (Patterson et al. 2012, Patterson, W.F., III 2007);

3) A biophysical model of the GOM, which showed that red snapper larvae released in the Campeche Bank are primarily retained in the bank (Patterson, W.F., III 2007).

4) Current research from CINVESTAV-IPN (E. Mendoza, *in prep.*) showing genetic and morphological differentiation between the northern and southern GOM stocks, and possibly among sub-populations within the Campeche bank (COBI, pers. comm., 2019)

Life history

Larvae and juveniles. The recently spawned eggs of *L. campechanus* have an average diameter of 0.82 mm (0.77-0.85). They are transparent, spherical and pelagic, with a single oil globule, with a diameter of 0.15-0.19 mm, clear and homogenous yolk. The embryo does not exhibit pigmentation until 21.5 hours after hatching, when some melanoforms appear above the somites. The larvae present spines in the preoperculum, operculum, post-temporal and in the supracleithrum, without notchs on the spines of the head. The jueniles have a large dorsolateral discoloration and are pale with diffuse bands that are generally present (Rabalais et al. 1980; Drass et al. 2000).

Adult. Large body, moderately compressed, red iris, slightly projecting lower jaw, somewhat pointed snout, elevated loin (Fig. 5). Copper red coloration on superior surface, pink on the inferior surface, reddish fins, the dorsal fin with yellow outer rim, the caudal fin can have a dark boarder; with some blue lines on the head and along the rows of scales, large pectoral fins, without reaching the level of the anus. Specimens with sizes <350 mm exhibit a dark discolouration on the lateral line (Claro y Lindeman 2008).

Figure 2. Red snapper, *Lutjanus campechanus* (Poey 1860), specimen caught by nearshore fishermen of Campeche (Source: Mendoza-Barrera, E.)

Table 7. Biological characteristics of the red snapper in the Campeche Bank (sources below).

Characteristics		Data	Sources
Biology	*Maximum recorded size*	90-100 cm	Patterson et al. 2001
	Longevity	39 to 53 years 22 years in Campeche Bank	González et al. 1994; Claro y Lindeman 2008
	Ratio F : M	1 : 0.95	Brulé et al. 2010
	Size of sexual maturity	F: 24.7 cm / M: 23.8 cm	Brulé et al. 2010
	Type of reproduction	External fertilization, free living larvae	González and de la Rosa and Ré-Regis 2001
	Reproductive period	April to October (greatest pulse from June to August)	González and de la Rosa and Ré-Regis 2001
	Larval time	≈ 26 days	Szedlmayer and Conti 1999; Schirripa 2000

Distribution and Habitat

Red snapper is distributed from Yucatan, the southeast Gulf of Mexico to Key West, and along the Atlantic Coast to the north, reaching Cape Hatteras, North Carolina (**Figure 3**). The preferred habitat is along the continental platforms bordering the Gulf of Mexico,).

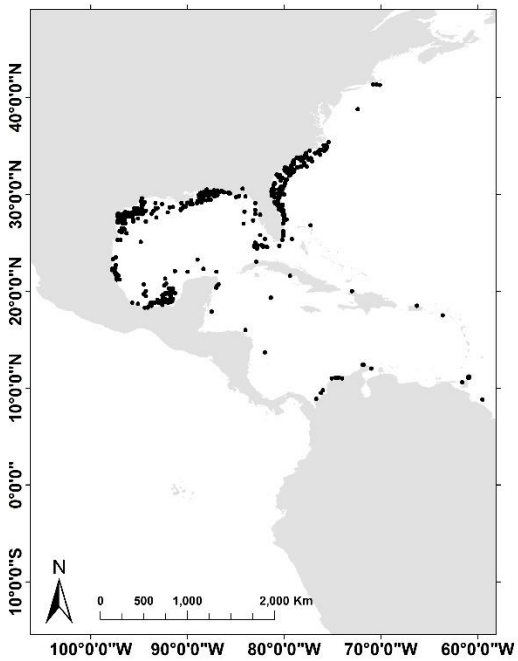

Figure 3. Distribution of *L. campechanus.*Map elaborated from occurrence data obtained from GBIF, iobis and eol portals.

Larvae and juveniles. The larvae are distributed in coastal areas, exhibiting negative phototropism, recorded in deep waters during the day and on the surface during the night (Szedlmayer and Shipp 1994). The small juveniles with up to 200 mm total length (TL) live in low relief microhabitats, mainly with soft or sandy bottoms (with the presence of seashell fragments), to depths of 18 to 64 m (preferably from 28 to 37) with temperatures from 24 to 26°C, salinity of 35 ppm and 5 mg/L of dissolved oxygen, observing migration of the juveniles to deepest zones during the autumn (Schirripa 2000; Claro and Lindeman 2008).

Adults. The organisms with sizes greater than 180-299 mm of TL (~18 months of age) are distributed in zones with depressions and high relief structures, such as reefs, rocks, artificial shelters and oil platforms, abundant in the north of the Gulf of Mexico. Organisms of 1 to 2 years are recruited on the oil platforms of the Gulf, whilst the older and larger fish appear to avoid the platforms and remain in more uniform areas. They are found at depths from 40 to 110 m (Max. 190m) with greatest abundance at 90 m. Exhibiting a range of thermotolerance from 12.5 to 33.5°C and salinities of less than 45 ppm (Huff and Burns 1981; Moran and Morais 1988; Johnston et al. 1995).

Life cycle

L. campechanus is a species with separate sexes (gonochoric), with paired gonads, surrounded by adipose tissue; their shape and size are similar in male and females. Reproduction is reported throughout the year in the Campeche Bank, with greatest frequency from April to October and a peak from June to August (Gónzalez-de la Rosa and Ré 2001; Brulé et al. 2010).

Reproduction

Eggs and Larvae. The incubation period is from 20-27 hours in the temperature range of 23-15 ºC (Richards et al. 1994). The larval life period (platonic) is approximately 26 days, once they reach 18 mm of LE the organism undergoes a metamorphosis, acquiring its juvenile-benthic shape (Szedlmayer and Conti 1999).

Adults. *L. campechanus* reaches partial sexual maturity by the first year (sizes 230-325 mm of LH), observing that the males mature at a smaller size than the females (M= 238 mm/F= 247 mm) (Claro and Lindeman 2008; González-de la Rosa and Ré-Regis 2001; Brulé et al. 2002; Brulé et al. 2010). In **Figure 4** and **Table 7**, the main characteristics observed during the life cycle of *L. campechanus* are shown.

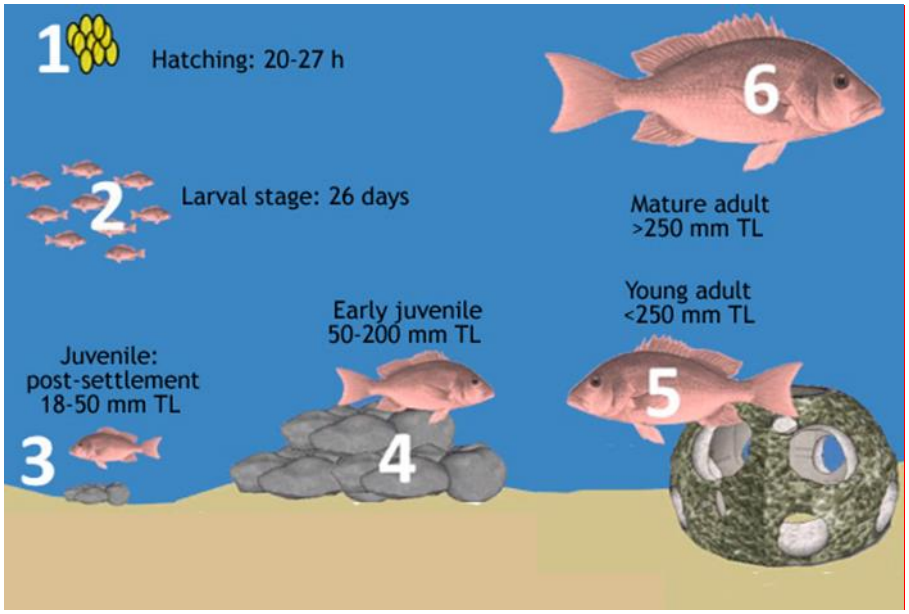

Figure 4. Life cycle of *Lutjanus campechanus*. Scheme adapted from Dr. J. Dindo (https://slideplayer.com/slide/7677356/) from the description of *L. campechanus* in the GM.

b. Description of the Fishery

The red snapper fishery is considered as a multispecies fishery in the Gulf of Mexico and the Caribbean Sea. The red snapper resource in the GM is composed of three species (**Table 8**), of which *L. campechanus* represents approximately 89% of the catch (Mexicano-Cintora et al., 2007). According to the CNP data (2017), there are 36 species associated with the red snapper fishery of the GOM.

Table 8. Target species of the red snapper fishery of the Gulf of Mexico. Numbers in superscript indicate catch zones. [1]Tamaulipas and Veracruz; [2]Tabasco, Campeche and Yucatán; [3]Quintana Roo.

Common name (Spanish)	Common Name (English)	Scientific name
Huachinango de castilla [1, 2, 3]	Red snapper	*L.utjanus campechanus*
Huachinango ojo amarillo [2, 3]	Silk snapper	*L. vivanus*
Huachinango aleta negra [2, 3]	Blackfin snapper	*L. buccanella*

Official reports show that red snapper is still the most important species targeted by the industrial Yucatan fleet, after red grouper, which is the main target species (CNP 2018). In 2014, around 46% of the total snapper catch in the GOM was labelled as red snapper, although, according to managers' reports, the percentage of red snapper in landings has declined (from ~90% of the catch in the past) (DOF 2012). The percentage of other snappers such as yellowtail snapper (*Ocyurus chrysurus*), have been increasing in landings reports (~30% in 2014) particularly from the artisanal fleet (CONAPESCA statistics, 2016)[2].

The red snapper is fished throughout the area of distribution, being Campeche Bank the main fishing area at the national level since the 50s (Anderson et al. 2015). The main fishing grounds are in the west and northwest regions of the bank. The coastal fleets concentrate their fishing activities in the outer reefs of the Gulf, to depths from 40 to 110m, preferably around 90 m at the limits of the exclusive economic zone of Mexico (**Figure 5**), in the states of Tamaulipas (ports: Tampico, Aldama, Soto la Marina and San Fernando), Veracruz (Tamiahua, Tuxpan, Tecolutla, Nautla, Veracruz, Antón Lizardo and Coatzacoalcos), Tabasco (San Pedro and Barra Chiltepec), Campeche (Champotón, Sabancuy and Isla Aguada), Yucatán (Progreso) and Quintana Roo (from Holbox to Isla Contoy) (CNP 2012).

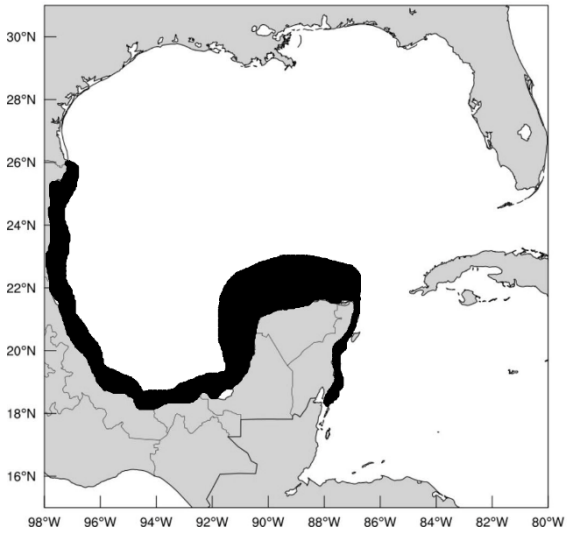

Figure 5. Fishing area for red snapper in the Gulf of Mexico (Adapted from CNP 2012).

During the 90s, *L. campechanus* was considered the second highest contributor to the finfish catch of the Campeche Bank (González-de la Rosa et al. 1994). Currently, Tabasco supports 33.0% of the total regional catch; Campeche, Tamaulipas and Yucatán contribute 18.0% per state, and Quintana Roo only contributes to 1% of the total catch (**Figure 6**).

[2] https://www.conapesca.gob.mx/wb/cona/estadisticas_de_produccion_pesquera

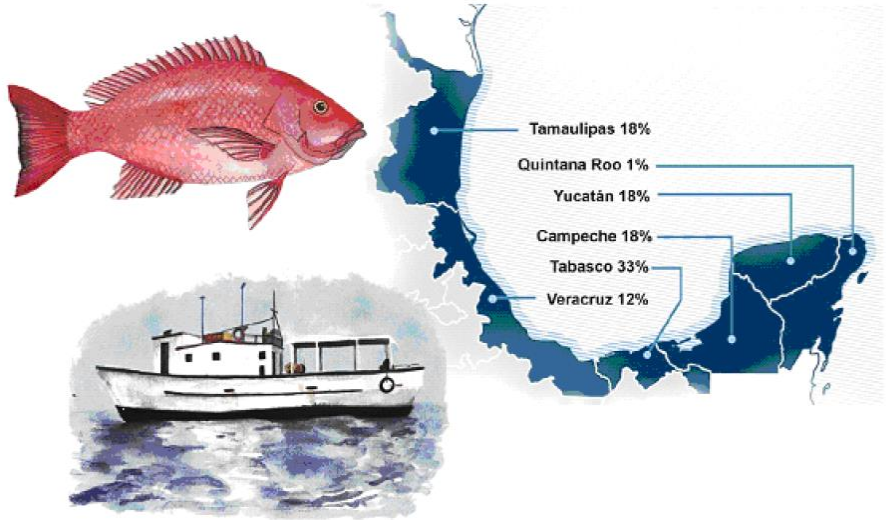

Figure 6. Contribution (%) of the Gulf of Mexico states to red snapper landings at the national level (CNP 2018).

The snapper fishery in the GOM occurs year-round. While in Tabasco and Campeche snappers are targeted by artisanal fleets, in Yucatan an industrial fleet also actively targets red snapper (SAGARPA-INAPESCA 2000), which is the main source of snapper exported to the US (DOF 2012).

The commercial fleet he has traditionally used lines (cords and hooks), manually manipulated or through electric or hydraulic devices (from 2 to 40 hooks per line) and in a smaller proportion, with bottom longline, especially during the 80s (Claro and Lindeman 2008; Anderson et al. 2015). In the Campeche Bank, three main methods have been used: hand line (same as vertical longline, or *ristra* or *rosario*, according to fishermen´s comments), bottom longline (red snapper longline), and bicycle (**Figure 7**). The bicycle method was introduced in the 90s by 12% of the Yucatan vessels, obtaining 45% of the total catch of *L. campechanus* with a CPUE of 366 kg/trip of fish (Monroy-García et al. 2002; Mexicano-Cintora et al. 2007).

It is important to note that different nomenclature is used by the fishermen for each fishing gear, and often differs from the official terms. This report attempts to consolidate different terms into Vertical and Bottom Longlines[3].

[3] According to 2018 CNP nomenclature, but in this report (from local fishers´ input):

Handline= Vertical Longline= *Ristra = Rosario = Línea de mano*

Red snapper longline= Bottom Longline = *Palangre huachinanguero*

Table 9. Permitted fishing gears described in the 2018 CNP (DOF 2018) for the commercial capture of red snapper in the Gulf of Mexico.

Fishing Gear[4]	Description	Region of the GM
Handline	1-15 hooks, size 6/0 to 9/0; circular, eagle claw or straight type	Tamaulipas, Veracruz and Campeche
	2-4 hooks, size 5/0 to 7/0,straight type, or size 6/0 to 8/0, circular or eagle claw type	Veracruz and Tamaulipas
Red snapper longline	300-1,000 hooks, size 7/0, 8/0 ,and 9/0 circular or eagle claw type or size 5/0 to 11/0, Japanese or straight type	Not specified

The CNP (2018) allows two fishing gears for the capture of red snapper in waters within federal jurisdiction: handline and red snapper longline (**Table 9**), which are regulated through commercial fishing permits. Fishers in the south of Campeche (Isla Aguada, Cd. del Carmen and Sabancuy) use both gears. Fishers in Nuevo Campechito, Campeche and Frontera, Tabasco use red snapper (bottom) longlines.

Bottom longlines (with 800-1000 hooks, size 9/0 and 11/0) are deployed for 3-5 hours and catches fish between 600g and 9kg. The main species captured with bottom longlines include: red snapper (large individuals >28cm, between 1 -4 kg, named *´pargo´* or *´parguete´*), Goliath grouper, yellowedge grouper, bonehead shark, southern stingray,Gafftopsail sea catfish, and Crevalle and horse-eye jacks.

Vertical longlines (known locally as *ristra*, *rosario* or handline) consist of a line (cord calibre of 150 – 160lb) to which 25 hooks (size 10/0 or 11/0) and a lead as a ballast are attached (**Figure 7**). This gear is deployed in the water column for approximately 30 minutes and can catch up to 20 kg of fish per set. This gear is much more selective for these species: red, vermillion snapper, lane, and yellowtail snappers, and catches fish smaller than 28 cm, including juveniles, which (according to fishermen) are generally released (Nuevo Campechito cooperative, pers. comm., 2019).

[4] According to 2018 CNP nomenclature, but in this report (from local fishers´ input):

Handline= Vertical Longline= *Ristra = Rosario = Línea de mano*

Red snapper longline= Bottom Longline = *Palangre huachinanguero*

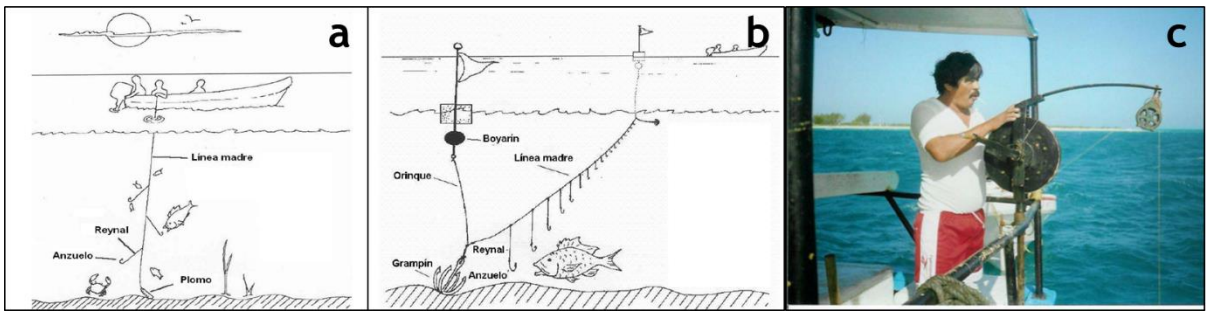

Figure 7. Fishing gears used in the red snapper fishery in the Gulf of Mexico. a: Vertical longline (*ristra or rosario*); b: Bottom longline; c: Bicycle (Source: Mexicano-Cintora et al. 2007; Monroy et al., 2010).

Fleets participating in the red snapper fishery

Fishing Unit: Small vessel with outboard engine, with 3 or 4 fishermen.

Number of vessels: According to data from CONAPESCA (2018), in 2016 there were a total of 10,903 vessels, pertaining to both the artisanal (small scale) and semi-industrial (large vessel) fleets (Salas and Gaertner 2004,, and Monroy 2010 fleet classifications) in the Gulf of Mexico. The small scale fleet is predominant in Veracruz, while the large scale fleet stands out in Yucatan (**Table 10**). The Government of the State of Campeche, in their Sectorial Program for Fishing and Aquaculture 2016-2021, reported that in 2015 the state had 3,959 fishing vessels, of which 96.89% were artisanal (small-scale). There were 7,428 individuals holding fishing permits, suggesting that there were between 11,000 to 15,000 fishermen without permits.

Table 10. Small-scale and large vessels registered by CONAPESCA through 2016 in the states of the Gulf of Mexico (CONAPESCA, 2018). These fleets are multi-specific; they do not target red snapper exclusively.

State	Vessels	
	Small-scale (artisanal)	Large (semi-industrial)
Tamaulipas	1,359	238
Veracruz	3,778	95
Tabasco	835	36
Campeche	2,821	250
Yucatan	385	611
Q. Roo	374	21
n	9,552	1,251

Historic trends

During the decade of the 1970´s, the red snapper landings from the Bank of Campeche consisted of 93% of *Lutjanus campechanus*, and there were no signs of stock decline (Anderson, 2015). In the 80´s. the stock was considered under-exploited and the fishery was expanding in northern Yucatan,

with landings increasing from 1.8 to 4.5 mt (González-de la Rosa et al.,1994; Monroy-García et al., 2002, 2004).

At the regional level (Gulf of Mexico and Caribbean), red snapper landings showed a historical peak in 1993. During the period 1986-1996 annual landings averaged 4,956 mt, and in 2000-2015 a 39% decline was observed, to 2,996 mt on average per year (**Figure 8**) (CNP, 2018).

Figure 8. Average catch of red snapper in the Gulf of Mexico 1986-2015 (CNP, 2018).

From the analysis of the last ten years of available data (2005 to 2014), each state has contributed to the total landings as follows: Tabasco (34%), Tamaulipas (19%), Campeche (17%), Yucatan (16%), Veracruz (13%) and Q. Roo (1%). Thus, the states of Tabasco, Campeche, and Yucatan are the most representative of the red snapper fishery in the southern GOM (Estadísticas pesqueras CONAPESCA, 2016).

Historical landings records from CONAPESCA show fluctuations during the period 1980-2014, with the greatest landings recorded in Yucatan and the smallest ones in Quintana Roo (**Figure 9**). Average landings by state over this period are provided in **Table 11**, and landings by state for year 2014 are shown in **Figure 10**.

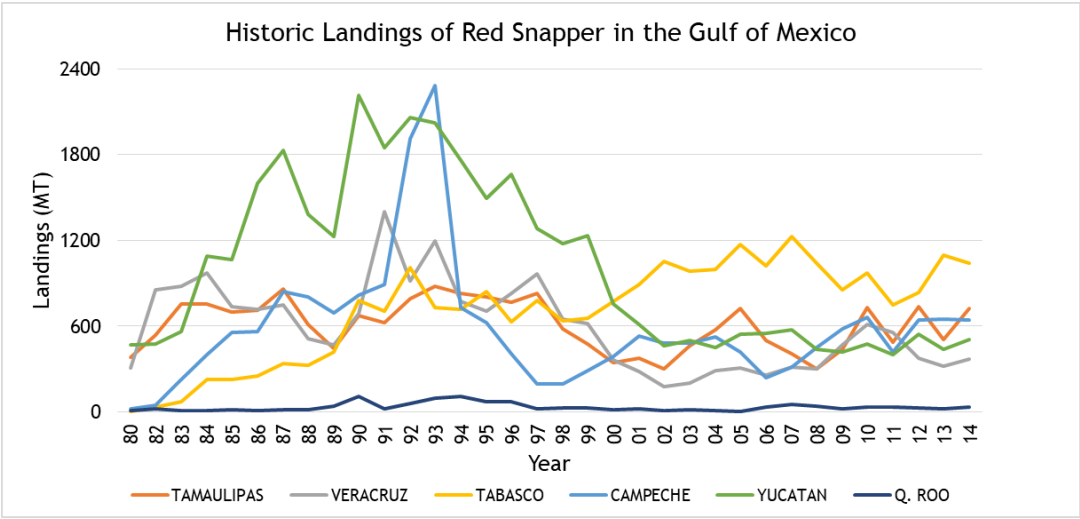

Figure 9. Annual red snapper landings by state in the Gulf of Mexico (CONAPESCA statistical data 2016; landings in metric tons).

Table 11. Historic catch (MT) in the Gulf of Mexico and Mexican Caribbean. N=years with catch records; Mean= arithmetic mean for red snapper catches reported from 1980-2014; Min and Max= minimum and maximum catch values (Source: Estadisticas Pesqueras CONAPESCA, 2016).

State	n	Mean	Min	Max
Tamaulipas	35	603.0±172.3	301.0	880.0
Veracruz	35	585.9±295.9	176.0	1,399.0
Tabasco	33	730.4±325.7	35.0	1,227.0
Campeche	35	568.9±447.4	10.0	2,282.0
Yucatán	35	988.4±588.8	399.0	2,213.0
Q. Roo	35	32.3±28.1	8.0	109.0

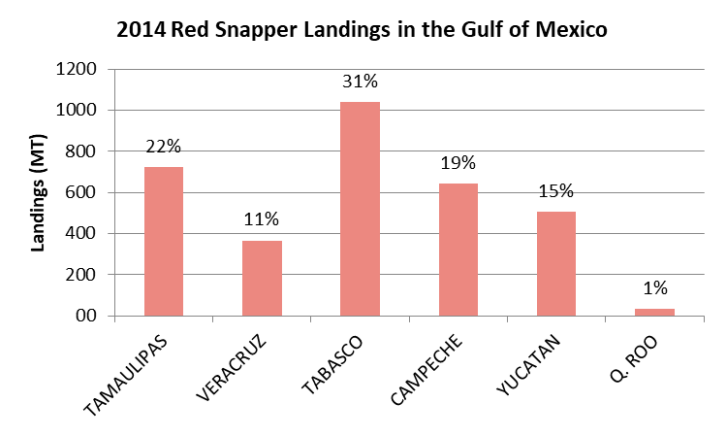

Figure 10. Red snapper landings (MT) by state in the Gulf of Mexico in 2014. (Source: : Estadisticas Pesqueras CONAPESCA, 2016).

c. Stock Status and Harvest Strategy

Currently, *L. campechanus* is classified as vulnerable on the red list of threatened species by the IUCN (Anderson et al. 2015). The CNP (2018) indicates that the resource is declining in the states of Tamaulipas, Veracruz, Campeche and Yucatán and is at the maximum level of sustainable exploitation in Tabasco; however, it has yet to be listed as a species at risk in the NOM-059-SEMARNAT-2010.

The red snapper fishery does not have a management plan or a harvest strategy in place. The only measures listed in the CNP (2018) are fishing licenses and vessel/ gear specifications. It is regulated through the grouper (*Epinephelus morio*) fishery management plan of the Yucatan Peninsula, which includes associated or bycatch species, with. *L. campechanus* representing a 15.06% dominance, 100% occurrence and 5.0% of the commercial value of the associated species in the region (Giménez-Hurtado and Monpie-Nueva 2010; Arreguín-Sánchez and Arcos-Huitrón 2011; INAPESCA 2014; SAGARPA 2016). This regulation establishes a closure period from 15th February to 15th March and covers a total fishing area that comprises the states of Tabasco (Frontera), Campeche, Yucatan and Quintana Roo, between 18º20’ and 24º00’ N and 86º00’ and 93º00’ W, limited to the coastline and the isobath of 200m depth and approximately 175,000 km^2 surface area (**Figure 11**).

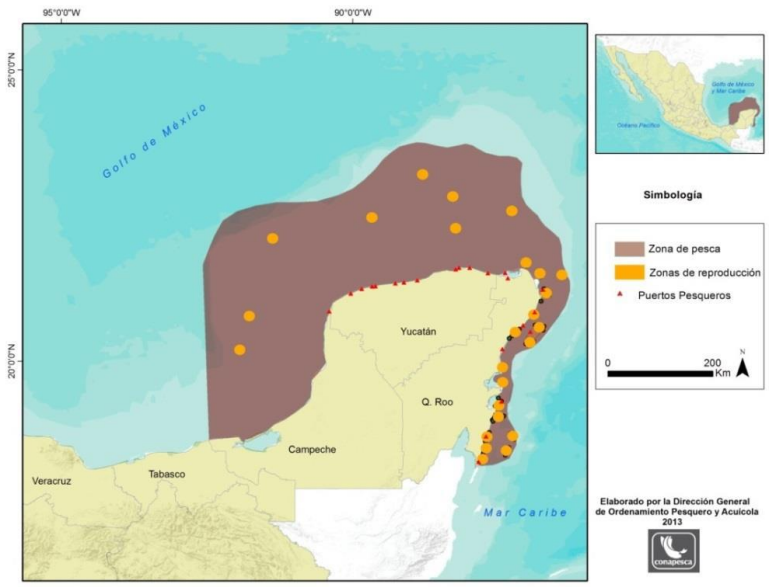

Figure 11. Fishing area (brown) for grouper and associated species (Source: SAGARPA 2016).

5.4.2 Catch profiles

The table below shows the annual red snapper catch data from the town of Nuevo Campechito, obtained from landing tickets and categorized according to observations provided by local fishermen. An increase in landings was detected from 2008 to 2018 (from 1.5 to 34 mt). According to the reported sizes, it was possible to determine the volume by fishing gear, with the highest volume (of 91.5% on average) corresponding to the vertical longline (*ristra* or *rosario*) gear (**Table 12**, **Figure 12**).

Table 12. Red snapper landings (kg) in Nuevo Campechito, Campeche from 2008 to 2018.

Fishing Gear		Vertical longline	Bottom longline	Σ
Fish size	**(cm)**	***20 – 28***	***> 28***	
Year (kg)	**2008**	1504	50	1554
	2009	8264	570	8834
	2010	3582	100	3682
	2011	3095	25	3120
	2012	1450	900	2350
	2013	5740	1700	7440
	2014	3249	0	3249
	2015	350	0	350
	2016	8287	200	8487
	2017	35496	1521	37017
	2018	29968	4334	34302
Σ		100985	9400	110385

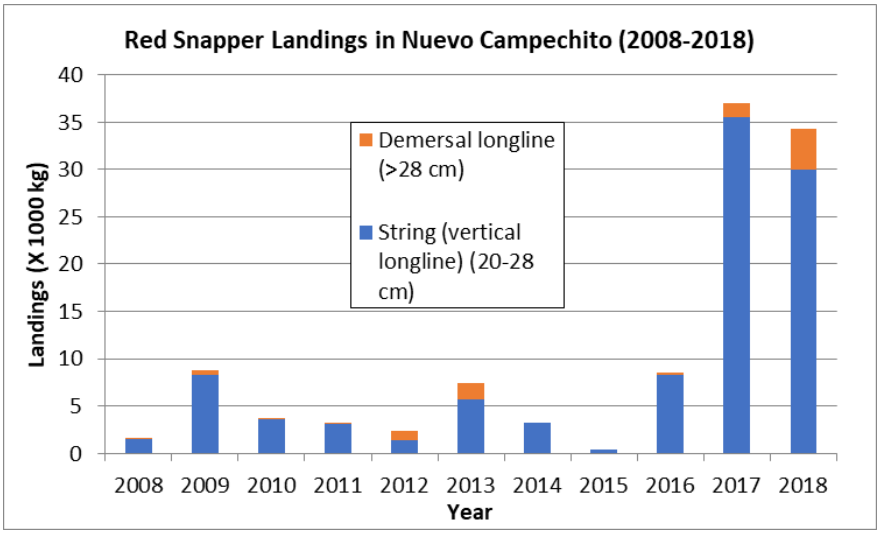

Figure 12. Red snapper landings (thousand kg) in Nuevo Campechito, Campeche from 2008 to 2018.

5.4.3 Total Allowable Catch (TAC) and catch data

Table 13. Total Allowable Catch (TAC) and catch data- Vertical longline

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)	**2018**	Amount	**29,968 kg**
Total green weight catch by UoC	Year (second most recent)	**2017**	Amount	**35,496 kg**

Table 14. Total Allowable Catch (TAC) and catch data- Bottom longline

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)	**2018**	Amount	**4,334 kg**
Total green weight catch by UoC	Year (second most recent)	**2017**	Amount	**1,521 kg**

5.4.4 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?	**No**	**No**	**No**

Rationale

According to MBA (2018) the red snapper stock in the GOM was most recently assessed in 2013 by INAPESCA and CONAPESCA. Managers concluded that the fishery showed signs of being overfished and has been experiencing overfishing for several years. The CNP (DOF, 2018) states that landings off Yucatan, Campeche, and Veracruz have been declining, and recognizes the fishery as deteriorated (not at its optimum in terms of abundance and fishing effort) in Tamaulipas, Veracruz, Campeche, and Yucatan, and at the maximum sustainable level of utilization in Tabasco. The 2018 CNP recommends reducing fishing mortality.

Stock assessment reports are not readily available from the fishing authorities, thus details of the latest assessments are not available to provide an analysis of the stock relative to reference points for this report. Some information is available from the SAGARPA-INAPESCA (2000) biomass dynamic assessment, carried out 19 years ago. At that time, exploitation rates exceeded those that produced maximum sustainable yield, suggesting that overfishing was occurring. Biomass declined by 49.2% on the Campeche Bank between 1984 and 1999, and landings have declined by 49% between 1984-1999, and at least 58% between 1993 and 2013.

Scientists from INAPESCA published a similar assessment in the scientific literature (Monroy et al 2002), also suggesting a biomass decline of 51.2% between 1984 and 1999. The exploitation rate increased from 0.04/year in 1984 to 0.15/year in 1992. Both the Yucatan and Campeche fleets exceeded MSY during that period, which likely produced the steep stock decline.

It has been assumed that effort has remained stable or increased since 1993, such that the decline in landings is proportional to a similar decline in the population. Therefore, it is inferred that a population decline of at least 58% has occurred in the Mexican component of the GOM fishery over the past three generation lengths. Given this significant decline, and the fact that no remedial measures have been introduced, the threat of overfishing continues (Anderson *et al,* 2015).

The PRI is not known, but based on the available references, the (limited) trends in catch and effort, and old stock assessments (INAPESCA 2000, Monroy-García et al. 2002) it appears that the stock has been subject to intense exploitation and has declined by at least 58% since 1993 (Anderson et al 2015).

Considering the limited availability of stock assessment information and/or given the limited data situation, a preliminary RBF analysis for red snapper was conducted by COBI (Chávez, pers. comm., 2019), including a Productivity-Susceptibility Analysis (PSA) and a Consequence Analysis (CA). Main RBF results are shown below, and details are provided in Appendix 7.3:

RBF results for red snapper (*Lutjanus campechanus*) in the GOM. Catch data from Nuevo Campechito were used as a proxy to weight the two scoring elements (bottom and vertical longlines).

Scoring Element	MSC PSA Score	Risk Category	MSC Scoring Guidepost	Consequence Score (CA)	MSC Score per scoring element (gear)
Bottom LL	91	Low	≥80	60	76
Vertical LL	72	Med	60-79	60	66

Final MSC score	70
Status	Pass with condition

Based on the PSA, the risk category appears to be low for bottom longline and medium for vertical longline. The consequence score was high risk, and the final score was 70, a conditional pass. However, considering the observations by scientists and managers over the past 20 years, as well as the data limitations, it is precautionary to assert that it is not likely that the stock is above the PRI and that SG60 is not met. If data limitations persist and it is not likely that an updated stock assessment will be carried out, a full PSA should be conducted with the best available biological and fishery information for the southern GOM.

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?		**No**	**No**

Rationale

Recent stock assessments of the red snapper stock have not occurred or are not available. Results from a SAGARPA-INAPESCA (2000) dynamic biomass assessment are shown below (MBA, 2018):

Factor	Estimate	Lower Limit	Upper Limit
Initial biomass	33,740 t	30,000	35,500
Carrying capacity (K)	32,258	28,500	46,000
Growth rate (r)	0.158	0.078	0.175
Catchability rate (q)	3.65E+05		
MSY	1,271 t/yr	850	1,425
FMSY	2,191 trips/yr		

The model assumed that changes in stock size are due to the interaction of several factors: growth, recruitment, and natural and fishing mortality. Using CPUE data, managers found that red snapper biomass declined considerably on the Campeche Bank from an estimated initial biomass of 33,740 t in 1984 to ~17,000 t in 1999, a decline of 49.2%. The MSY for Red snapper was estimated to be 1,271 t/year. If this MSY value was still a benchmark, annual landings during the period 1986-1996 averaged 4,956 mt, and average landings between 2000-2015 were at 2,996 mt per year, more than twice the value required to maintain the stock at the MSY level.

Another stock assessment (Monroy García et al., 2002) estimated that the biomass of *L. campechanus* decreased from 32,957 t in 1984 to 16,877 in 1999, suggesting that the population did not exhibit signs of recovery. In addition, a MSY 1,271. t/ year was calculated. The catch from both, the Yucatan and Campeche fleets exceeded MSY during that period, which likely produced the steep decline in biomass. The study proposed biomass (50% B0) and MSY reference points and conducted Montecarlo simulations with alternative quota scenarios. This has been the

only attempt to design a harvest strategy.

By 2013, landings in the GOM had declined by 71- 80% (Anderson et al. 2015), but it is not clear that more recent stock assessments have been undertaken, and there is no evidence that the status of the stock has improved since these (outdated) (2000 and 2002) analyses. In addition, managers recognize the fishery as “deteriorated” (CNP 2018). Current fishing mortality is also unknown, but evidence suggests that overfishing has been occurring, and managers recommended that fishing effort in the region should be reduced. Although the meaning of “deteriorated” is unclear, it is clear that the abundance has been declining for at least two decades and exploitation rates have increased. In addition, the species is listed as "Vulnerable" by the IUCN. With these arguments, it is unlikely that the stock is fluctuating around a level consistent with MSY and SG80 is not met.

If updated catch and effort data are not available and a quantitative stock assessment is not possible or available, then RBF should be applied to score this indicator.

References

Anderson et al. 2016, CNP 2018, MBA 2018, Monroy-García et al. 2002, SAGARPA-INAPESCA 2000

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)	*N/A*	*N/A*	*N/A*
Reference point used in scoring stock relative to MSY (SIb)	*N/A*	*N/A*	*N/A*

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

Draft scoring range	**<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 1.1.2 – 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?	**No**		**No**
Rationale				
Based on (limited) published statements by managers and scientists, and the available, although outdated trends in CPUE (from a 2000 and a 2002 assessment), there is some evidence that the stock is reduced (or "deteriorated"). However, there is no harvest strategy specifically for red snapper in the Campeche Bank or a plan to rebuild the stock. The fishery is only managed as an associated component of the grouper fishery of the Gulf of Mexico and Caribbean Sea..				
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?	**No**	**No**	**No**
Rationale				
CONAPESCA has been monitoring red snapper catches in the GOM since the 1980s, through a landing-report system ("Avisos de arribo"). The form requires fishing effort information (eg., trip duration, days fished), but official statistics do not compile this data or the number of active vessels accurately, so CPUE information is not readily available as an indicator of abundance. Fishery-independent indices of abundance are not monitored either and stock assessments are not conducted regularly. Current stock status is unknown, but some evidence suggests that the stock is overfished and in need of rebuilding. There are however no rebuilding strategies in place and the limited monitoring of the fishery would be insufficient to determine stock status or trends. SG60 is not met.				
References				
Formato Aviso de Arribo (FF-CONAPESCA-00S), Estadisticas pesqueras CONAPESCA 2016, Monroy-García et al. 2002,				

SAGARPA-INEPESCA 2000, NOM-065-PESC-2007 (DOF, 2009).

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 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

According to the fishery management standard for groupers and associated species of the Gulf of Mexico and the Caribbean Sea (NOM-065-SAG/PESC-2014), the general management objectives are to promote the responsible use of these species, to promote their preservation and ability of renewal, as well as the preservation of the environment and other biological resources. The Management Plan for Groupers and Associated Species in the Yucatan Peninsula (DOF 2014, SAGARPA 2016) outlines the recovery and rebuilding of grouper stocks as the main objective. Stock-specific objectives are not outlined for red snapper in these management instruments. Some general measures, applicable to groupers and associated species in the GOM and Caribbean Sea are in place, including: fishing licenses, permitted gears, hook size, and fishing methods, fishing areas, effort controls, closed season, a closed refuge area (see **Table 22**, DOF 2018, and NOM-065-SAG/PESC-2014).

SAGARPA currently manages the red snapper as part of the multispecies fishery known as “snapper” or “huachinango” in the Gulf of Mexico, with the (limited) harvest strategy described in the CNP (DOF 2012, 2018), a document that provides a technical description of the fishery, updated status and regulations approximately every 5 years. There is no fishery-specific management plan in place and it’s unclear if the few available regulations (e.g., vessel-gear specifications, hook size) are based only on red snapper biology, due to its historical importance in terms of volume.

The 2012 CNP recommended a harvest strategy with precautionary measures to reduce fishing mortality and bycatch. A proposed strategy was the reduction in fishing mortality by 30% over a five-year period. A reference level for total annual catch was provided: “ total annual catch in the GOM must be maintained below 4,295 t (82% of the maximum historic catch of 5,252 t)”. Other recommendations were to issue permits specific to red snapper, to reduce the sales of fishing licenses, to introduce the the use of appropriate bycatch reduction devices in shrimp trawls, to evaluate the effectiveness of these measures, and establish benchmarks for a management plan.

The 2018 CNP update (DOF, 2018), narrows down the list of target snapper species from 13 to only 3 and outlines the specifications of the fishing gears (longlines and hand lines), as well as the type, number, and size of hooks permitted in each state. As indicators of the fishery, this document describes that maximum historic catch was recorded in 1993, with average annual catch of 4,956 during the period 1986-1996, and a 39% decline between 2000-2015, to an average of 2,996 t/ year. A fishery management plan has not been developed and there are no updated reference points.

A comprehensive harvest strategy, with regular monitoring, reference points, and harvest controls does not exist for red snapper. Considering that the harvest strategy is limited and that there are no explicit stock-specific

objectives, the existing measures may not be sufficient to maintain the stock at a sustainable (yet to be defined) level or above the (unknown) PRI. Given that marked declines in abundance have been reported, that (old MSY) values have been exceeded for decades, and that the stock has been described as depleted or overfished, the harvest strategy has not achieved (default) management objectives. Thus, 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

As described in issue (a) above, the harvest strategy for red snapper is limited to a few generic management measures which have not been tested directly, except perhaps for the permitted gear specifications (eg., hook type, number and size per gear and state) There is limited monitoring of the stock, with sparse and outdated assessments indicating that the stock was in decline since the last assessment in 2000 or before. At that time, assuming constant or increasing effort, a 58% reduction in landings suggested a similar decline in abundance between 1993 and 2000. Other information, such as reports of lower catches and CPUEs by fishers in the Campeche Bank, and status reports provided in the CNPs (DOF 2012, 2018) also suggest continued declines in abundance and the prevalent threat of overfishing (Anderson et al. 2015).

Scientists from INAPESCA (Monroy et al 2002) published a biomass-dynamic assessment in the scientific literature, and proposed biomass (50% B0) and MSY reference points. They also conducted Montecarlo simulations with alternative quota scenarios. This is possibly the only attempt to design a formal harvest strategy, based on a quantitative analysis of the stock and management strategy evaluation.

The Grouper FMP (DOF 2014, SAGARPA 2016) describes that the generic (and grouper-specific) measures implemented in 2007 (NOM-065-PESC-2007) were insufficient to revert the decline of the (grouper an associated species) resource, and that low productivity and yield called for immediate action and more stringent measures. Grouper regulations were reissued in 2014 through NOM-065-SAG/PESC-2014 (DOF, 2015), but still no stock-specific objectives for red snapper were provided. There are no plausible arguments to assert that the (limited) harvest strategy is likely to work, and prior experience, based on outdated stock assessments, managers' reports, and anecdotal information also suggest that the red snapper stock is depleted and not in the process of recovering. Thus SG60 is not met.

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

Rationale

CONAPESCA has been monitoring red snapper catches in the GOM since the 1980s, through a landing-report system ("Avisos de arribo"), which includes landings and fishing effort information. The last (available) stock assessments occurred in the early 2000, so stock status is not assessed frequently or regularly, despite the economic importance of red snapper and the probably dire condition of the stocks.

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 (i.e., rebuilding a possibly depleted stock). Thus, data are insufficient to assess if the harvest strategy is working, and SG60 is not likely to be met.

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

Rationale

The current harvest strategy for red snapper is an ad hoc strategy that is not based on quantitative analysis of the stock. The 2012 CNP described the access controls and gear restrictions as the existing management measures, and recommended a precautionary harvest strategy with precautionary measures to reduce fishing mortality and bycatch, as well as the review of these measures and the development of reference points and a specific FMP. The updated CNP (DOF, 2018), narrows down the target species from 13 to only 3 snapper species, but the harvest strategy and management measures were not improved or reviewed.

Red snapper is also managed as one of the species associated to the grouper fishery of the Gulf of Mexico and the Caribbean Sea. The original regulations for groupers and associated species were issued in 2009 through NOM-065-PESC-2007 (DOF, 2009), and were reviewed in 2015 through NOM-065-SAG/PESC-2014 (DOF, 2015). In addition, stemming from the need for further review, the Fishery Management Plan for Groupers and Associated Species in the Yucatan Peninsula was developed in 2016 (SAGARPA, 2014, 2016). These management documents focus on improving the harvest strategy for groupers, and only marginally for associated species. Thus, the HS for red snapper fishery is not reviewed periodically or improved as necessary, 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

The target species are not sharks; this issue is not applicable.

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?	**Yes**	**No**	**No**

Rationale

Minimum size is outlined in the 2018 CNP and in the generic grouper regulation as one of the tools to manage the stocks, but appropriate size limits have not been established for each of the species associated to the grouper fishery. The grouper FMP describes excess juvenile mortality as one of the main factors that has contributed to overfishing (of groupers). This can likely be extrapolated to snappers, since it is a multi-species fishery that uses the same methods and gears in the same fishing areas. The FMP also presents an analysis of selectivity ogives for different gears (handline and longline), hook sizes, and fleets (artisanal and mid-range), but focuses on grouper catches. NOM-065-SAG-PESC-2014 establishes a minimum size of 36.3 cm for red grouper (*Epinephelus morio*).

The 2012 CNP describes as part of the fishery indicators that in Yucatan the snapper hooks of sizes 7/0 and 8/0 allow 50% of the catch to be greater than the minimum size of 38.4 cm (fork length) and 40.6 (total length), in accordance with international market demands. This size corresponds to 3 years of age (mature adults). This minimum size for snappers is not, however, described elsewhere in the existing regulations, except that research is in progress to set up a minimum size. The CNP includes a recommendation to introduce appropriate bycatch reduction devices in shrimp trawls to reduce bycatch.

The 2018 CNP regulation includes specifications for hook size, type of hook, and number of hooks per line, depending on the gear type, fleet and state (DOF 2018). These restrictions are aimed at controlling fishing effort and also at protecting undersized (young) fish.

While a full review of the potential effectiveness of these measures to minimize UoA-related mortality of unwanted catch of the target stock has not occurred, it is clear that research has been conducted on gear selectivity as an alternative measure. Gear specifications provided in the regulations are evidence that this has occurred, so this issue likely meets SG60. However, regular review of alternative measures is unlikely, so SG80 is not met.

References

Anderson *et al.* 2015, NOM-065-SAG/PESC-2014 (DOF 2015), DOF 2012, DOF 2018, SAGARPA 2014, 2016

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 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 snapper fishery of the Gulf of Mexico. 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 2012 CNP were related to mainaining total annual catch below 4,295 t (82% of the maximum historic catch of 5,252 t). As a "precautionary"strategy, the CNP back then recommended the implementation of measures to reduce fishing mortality by 30% over a five-year period in Yucatan, Campeche, and Veracruz. This could be assumed as a generally understood HCR, but the analysis behind this (threshold) catch value, or how/ when/ why it triggered such effort reduction is unknown. It is not likely to be precautionary or focused on preventing recruitment impairment, but rather recommended as an *ad hoc* measure resulting from observed stock declines, observed catches, and economic objectives. In addition, there is no clear link between effort reductions and achieving the desired catch (or stock abundance level), especially with no plans for improved monitoring or assessment. The 2018 CNP does not provide updated reference levels for catch or effort, but stock status remains as "deteriorated" over most of the fishing grounds. This suggests that if effort reductions had in fact been implemented after 2012, they did not reduce the exploitation rate sufficiently to prevent exceeding the PRI. Based on this interpretation of the (limited) information available, there are no (formal or implicit) harvest control rules for this fishery, and thus SG60 is not likely to be met.			
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 this fishery, so they can´t be robust to uncertainties. SG80 is not likely to be met.

	HCRs evaluation			
c	Guide post	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	**No**	**No**	**No**

Rationale
While a number of generic tools are available in the regulations (DOF 2015, 2014, 2018, SAGARPA 2016) to intituively control exploitation (i.e., effort controls such as limited access, restrictions on vessels, methods, and gears; restricted fishing areas; size limits), there is no evidence that they are appropriate or effective. Also, it is not known how these tools might be tuned when fishery indicators (catch, CPUE, abundance) show declines or if there are signs that the stock is overfished or overfishing might be occurring. The fact that the stock is 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. The only attempt at conducting a management strategy evaluation was presented in a 2002 assessment (Monroy Garcia et al 2012), where the authors used Montecarlo simulation to evaluate the probability of meeting proposed (0.5 Bo) and MSY reference points for the fishery under alternative quota scenarios. Such analysis, with updated information, would be critical to develop robust reference points and harvest control rules, and to evaluate their performance. At present, there is no evidence that the tools used or available are appropriate or effective in controlling exploitation, thus SG60 is not met.

References
CNP 2012 (DOF 2012), CNP 2018 (DOF 2018), SAGARPA (2016)

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 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**	**Yes**	**No**

Rationale

Red snapper fisheries in the entire Gulf of Mexico are of great economic importance, and there is a wealth of biological and fishery information from the US GoM. This information might provide guidance to the Mexican fishery, especially because the US fishery has undergone major recovery efforts. In the Mexican GOM, there is sufficient information on the biology and ecology of the species, and landing statistics and fishing information have been collected since 1980. Appropriate stock assessments were conducted in the past, so it is likely that there is enough data to update analyses and assess current status; else RBF would be recommended.

Some information is available related to stock structure, stock productivity and fleet composition to support the harvest strategy for red snapper in the GOM. A description of the available information follows:

Stock structure: In the Gulf of Mexico and Atlantic, the red snapper population is considered to consist of three separate stocks: the US Atlantic, the US Gulf of Mexico, and the Mexican Gulf of Mexico (Anderson, et al. 2016). This conclusion was corroborated through genetic studies using allelic variation; otolith chemical signatures; a biophysical model of the GOM, and current research of genetic and morphologic variations of *L. campechanus* in the GOM. Connectivity between populations in the northern Gulf and the Campeche Banks is not yet confirmed, but is suspected to be low

Stock productivity: CONAPESCA has been monitoring red snapper catches in the GOM since 1980, through a landing-report system (“Avisos de arribo”), which includes the fishing license and vessel registration number, landings by species in kilograms, type of product, price of sale, fishing and landing loction, and fishing effort information (trip duration and time fishing). CONAPESCA compiles this data by state, port of landing, and month.

Size composition data is not collected regularly by the fishing authority, and fishery independent surveys are not carried out regularly. Research surveys by INAPESCA have focused on groupers. There are few stock assessments available for red snapper, with the last official one conducted in 2000. Other analyses of the fishery have examined size composition and CPUE by fleet and conducted independent assessments (Monroy et al. 2002, 2004). The artisanal fishery of Campeche and Tabasco was studied more recently (2018). Stock status is not assessed frequently or regularly.

Port sampling, and sampling at processing facilities to gather morphometric data have been carried out for

snappers and groupers in the GOM. Other sources of information (for groupers and associated species) are logbooks, research cruises, fishery-independent surveys (during closed seasons), and socio-economic surveys (see Dictamen de Veda de Mero, 2006; 2016; Monroy et al 2004).

During the previous administration (through 2018), the INAPESCA research centers (CRIPs) of Lerma and Cd. del Carmen had plans to develop a fishery management plan and conduct a stock assessment for *L. campechanus*, but this has not occurred yet (Chávez J.F, pers. comm., 2019). It is possible that the new managers have set different research priorities.

The Nuevo Campechito Fishing Cooperative keeps records of catch by species, but catch by gear type and size are not generally recorded. COBI recently seggregated catch data by type of gear and size with advice from cooperative fishers (eg., see **Table 12**, catches with bottom and vertical longlines in Nuevo Campechito, 2008-2018).

Biological information: Research from INAPESCA and Mexican Universities on red snapper in the GOM and the Campeche Bank in particular, includes studies on reproduction, age and growth, population dynamics, larval development and transport, habitat, feeding habits; general life-history traits, fishing methods, gears and selectivity; description of the fisheries in the area, independent stock assessments. Studies on species composition and trophic structure, ecological interactions, and ecosystem function including red snapper have also been produced, in addition to studies on geomorphology, bathymetry, and other oceanographic research in the Campeche Bank. Most of the relevant biological information for red snapper in the region is at least 9 years old.

Fleet composition: CONAPESCA maintains a database with the number of (commercial vessels registered in each state, classified by fleet (large and small-scale vessels). The database also includes a list of the individuals holding fishing permits.

As noted above, most of the stock productivity information is outdated, so development of an improved harvest strategy for red snapper in the GOM would require updated population dynamics and fishery analyses. The harvest strategy is limited to fishing licenses, vessel and gear restrictions and does not take any biological, strock productivity, or environmental information into account. Considering that there is sufficient information to support the harvest strategy, this issue might meet SG60 and SG80.

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?	**Yes**	**No**	**No**

Rationale

Fishery removals of red snapper in the GOM have been collected by CONAPESCA since 1980. Landing statistics by species, state, CONAPESCA office, year and month through 2014 are publicly available through the CONAPESCA portal. Data from 2015-2017 can be segregated by fleet and origin of the product. Nominal fishing effort (in fishing trips and/or effective fishing days) has been estimated from logbook data. Catch per

unit effort (in kg/trip) by gear (longline, alijo and bycicle) has been calculated and has been used in stock assessments to calibrate biomass dynamic models. There is sufficient information on removals from the commercial and artisanal fleets (vessels reporting < 10 tons) in the GOM, but it is unlikely that removals for subsistence of from the recreational fleets are reported or monitored.

The only abundance indicator available for the stock has been CPUE. Catch and effort are monitored regularly, but CPUE is not estimated with sufficient frequency to monitor abundance, conduct regular assessments, support the harvest strategy, or to develop an appropriate harvest control rule. In addition, it is unlikely that reporting from all fleets in every GOM state is complete, so both catch and effort may be underestimated. This issue meets SG60. If RBF is used, all the information required for PSA is available, and the indicator would receive a higher score.

C	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		**No**	

Rationale

Commercial catches are reasonably well monitored and are sufficient for stock assessment. Catches from the artisanal, subsistence, or recreational fleets are unknown. The existing monitoring program does not collect information on snapper discards or bycatch of other species, so the volume and composition are also unknown. There are no fishery-independent studies or observer coverage to estimate these removals. The level of monitoring is not sufficient for the harvest strategy, and therefore does not meet SG80.

References

Biology/Life History/Population Dynamics: Brulé et al 2010; Chávez-Villegas et al 2018, Claro and Lindeman 2008, Fischer 2010, González et al 1994, González and Ré 2001, Leonce and Defeo 1997, 2005, Mendoza-Barrera 2018, in prgress, Pérez et al 2007

Fishing methods: Campbell et al 2014

Fishery statistics: https://www.conapesca.gob.mx/wb/cona/informacion_estadistica_por_especie_y_entidad

Fishery analyses and stock assessments: Anderson et al 2015, Caballero y Morales 2018, Díaz y Lara 2018, Dictamen de Veda Mero (2006), Monroy et al 2002, 2004, MBA 2004, 2018,

Stock structure: Anderson, et al. 2015, Camper et al 1993, Gold 2001, Saillant and Gold 2002, Gold and Saillant 2007, Patterson et al. 2012, Patterson W.F.III 2007, Mendoza, in prog.

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

Draft scoring range	**60 – 79**
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?		**No**	**No**

Rationale

According to MBA (2018) the red snapper stock in the GOM was most recently assessed in 2013 by INAPESCA and CONAPESCA. Managers concluded that the fishery showed signs of being overfished and has been experiencing overfishing for several years. The previous assessment occurred in 2000. None of these assessments were available for this analysis, but summaries presented elsewhere helped us to understand the general methods used and the main results.

Some sources (Anderson et al 2015, MBA 2018) describe the SAGARPA-INAPESCA (2000) assessment. It consisted of a biomass dynamic model which assumed that changes in stock size were due to the interaction of several factors: growth, recruitment, and natural and fishing mortality. Using CPUE data, managers found that red snapper biomass declined considerably (by ~49%) in the Campeche Bank between 1984 and 1999. The MSY was estimated at 1,271 t/year (see PI 1.1.1b).

A similar assessment available from the scientific literature (Monroy García et al., 2002) also demonstrated through a biomass-dynamic model that stock abundance and catches had exhibited steep declines (~51%) during the 1984-1999 period. These authors also proposed biomass and MSY reference points and carried out Montecarlo simulations using alternative catch quotas to meet these benchmarks. This has been the best (and perhaps the only) attempt to conduct management strategy evaluation, and to develop a harvest strategy based on a quantitative analysis of the fishery. Length-frequency analysis and analysis of trends in relative abundance indices by gear for Campeche and Yucatan were conducted in 2004 (Monroy et al 2004), complementing the previous assessment.

It is not clear if more recent stock assessments have been undertaken, but in general, official reports are not readily available from the fishing authorities, thus the team does not have details to properly evaluate this indicator based on current information. While the 2000/ 2002 assessment (possibly by the same authors from INAPESCA) is appropriate for the stock, it is probably obsolete. Also, there are no (formal or implicit) harvest control rules, so this aspect cannot be evaluated and it is not likely that SG80 can be met.

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?	**No**	**No**	

Rationale
The stock assessments conducted in 2000/2002 estimated stock status relative to MSY reference points. A CPUE index was used to estimate trends in relative abundance and to calibrate a biomass-dynamic model . MSY was calculated at 1,271 t/yr and effort E_{MSY} at 2,039 trips/yr. These benchmarks have however not been used to manage the red snapper stock in the Gulf of Mexico. Generic (fishing licenses, closed and permitted areas) or *ad hoc* measures (catch limits, gear restrictions) have been used instead. While the reference points calculated in those assessments are appropriate to the stock and can be estimated, they are approximately 20 years old, and are possibly obsolete. Thus, neither SG60 nor SG80 can be met because the analysis is too old. The assessment needs to be updated and new reference points must be estimated, based on current information.

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?	**No**	**No**	**No**

Rationale
The original SAGARPA-INAPESCA (2000) assessment was not available for this report, so the team cannot determine if the analysis identified the major sources of uncertainty. Based on the assumption that the same authors from INAPESCA produced the 2002 assessment (Monroy et al., 2002), their results don't show that uncertainty was taken into account, since confidence intervals for management benchmarks are not provided or discussed. The authors, however, applied Montecarlo analysis to evaluate the probability of meeting proposed biomass (0.5 Bo) and MSY reference points under alternative catch quota scenarios. Such management strategy evaluation, with updated information, would be critical to develop robust reference points and harvest control rules. Considering that those assessments did not identify the sources of uncertainty, that they are about 20-years old, and that an updated analysis does not exist or is not available, SG 60 is not met.

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?			**No**

Rationale
The information reviewed for this report does not suggest that the (old) assessments were tested and shown to be robust. It appears that only empirical methods (such as analysis of trends in catch and relative abundance) and biomass dynamic models have been applied to assess the red snapper stock in the GOM. Considering the prevalent data limitations in the fishery, these may be the only methods that can be used. Alternative hypotheses

and assessment approaches have not been explored, thus SG100 is not met.

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?		**Yes**	**No**

Rationale
It is likely that stock assessments undergo peer reviews within INAPESCA, but there is no evidence to support this statement. SG80 is likely to be met. It is not known whether the latest assessments have been internally and externally reviewed, but it is highly unlikely because this information is confidential within the management authorities in Mexico, so SG80 is not met.

References
Anderson et al 2015, DOF 2012, DOF 2018, MBA 2018, Monroy et al. 2002, 2004

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

Draft scoring range	**<60**
Information gap indicator	**More information sought** (Note: If RBF is used for 1.1.1, this score would default to 80).

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

Overall Performance Indicator score	
Condition number (if relevant)	

5.5 Principle 2

5.5.1 Principle 2 background

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

The bottom and vertical longline UoAs operate on the Campeche Bank (CB). The bank is an extensive submarine continuation of the limestone plateau that forms the Yucatan Peninsula. The CB extends for about 650 km along the western and northern coasts off the Yucatan Peninsula in the southeastern Gulf of Mexico (GOM). The slope of the bank is about 1 m per km, with the first step at 18 m depth (**Figure 13**). From that point, the slope is steeper.The state of Yucatan has 373 km of coastline (Salas et al 2006). The bank extends roughly over a surface area of 129,500 km2 (Soto et al 2014) and is characterized by relatively shallow waters with many shoals and coral reefs, but few emergent islands.

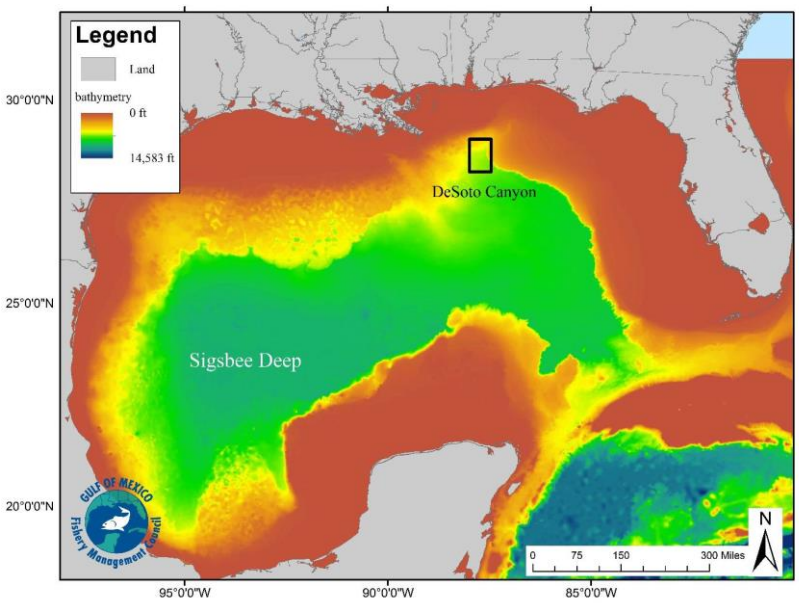

Figure 13. Bathymetry of the Gulf of Mexico (Gulf of Mexico Fishery Management Council)

The oceanographic conditions on the Campeche Bank (CB) are well studied (Moreno & Salles 2010). Currents play an important role in fish distribution and the timing of migrations in the area (Piñiero et al 2001). Although, some studies recognize two typical ecosystems in this region, the Campeche Sound and the Continental Shelf of Yucatan, there is evidence based on the life history of several species (shrimps, Spanish and king mackerels, octopus, red grouper among others) that suggest that both systems function in synchrony or even could be considered as a single ecosystem. There have been significant changes in the CB over the last six decades (Arreguín- Sánchez et al 2015). There is evidence of climate change effects and re-organization of communities in response to environmental change, indicating that sustainable fishing and management must be adapted (Arreguín-Sánchez et al 2018).

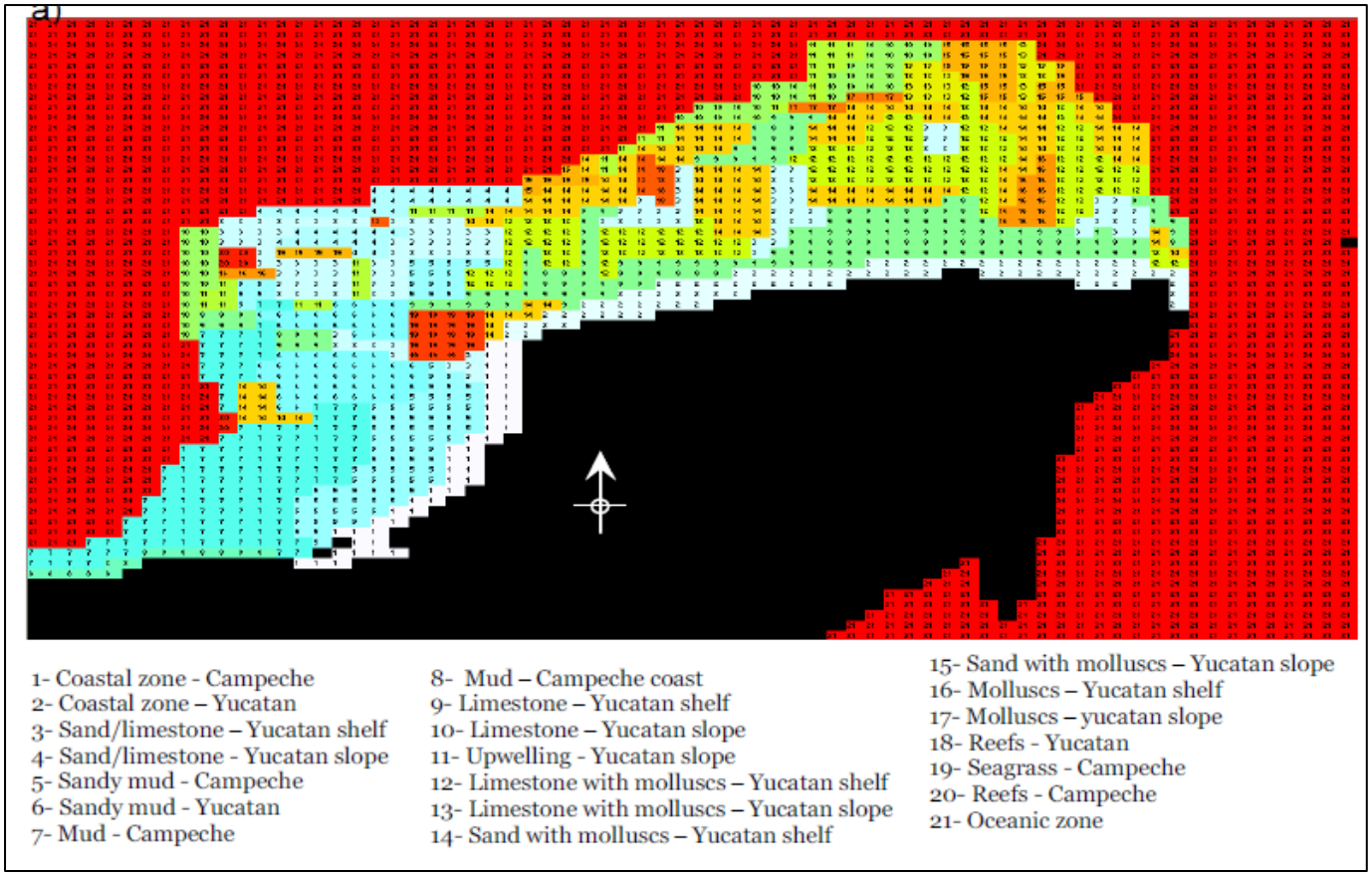

Figure 14. Characterization of the Campeche Bank seafloor (From Le Quesne et al 2008).

The Campeche Bank unique ecological conditions are best reflected in a rich primary productivity (>40.4 mgCm−2 d−1), the presence of important coral reef systems and the activity of one of the most important industrial penaeid shrimp fisheries in the Gulf of Mexico (>16,000 t/y−1). There is information about the Campeche Bank seafloor characteristics (Le Quesne et 2008) (**Figure 14**). The bank reefs lie in between a tropical and temperate environment, receiving waters from the Caribbean through the Yucatan Channel that then travel to the inner areas of the GOM, reaching the Tuxpan Reef and Veracruz Reef Systems (**Figure 15**). Since the late 1970s, this marine province has served as the primary field for major national offshore oil and gas operations with an increasing annual production of more than 1000×10^5 barrels (Soto et 2014).

Within the bank there are four groups of islands large enough and sufficiently elevated to support terrestrial flora and fauna; Arrecife Alacranes, Cayo Arenas, Arrecifes Triangulos and Cayos Arcas. A fifth, Cayo Nuevo, consists of a low, barren sand cay that probably is inundated by storm tides and wave action and a submergent reef flat that may be exposed during extremely low tides. All of the islands in these groups are located more than 120 km from the mainland. Commercial fishermen fish around the islands, primarily the Alacranes and Arenas groups.

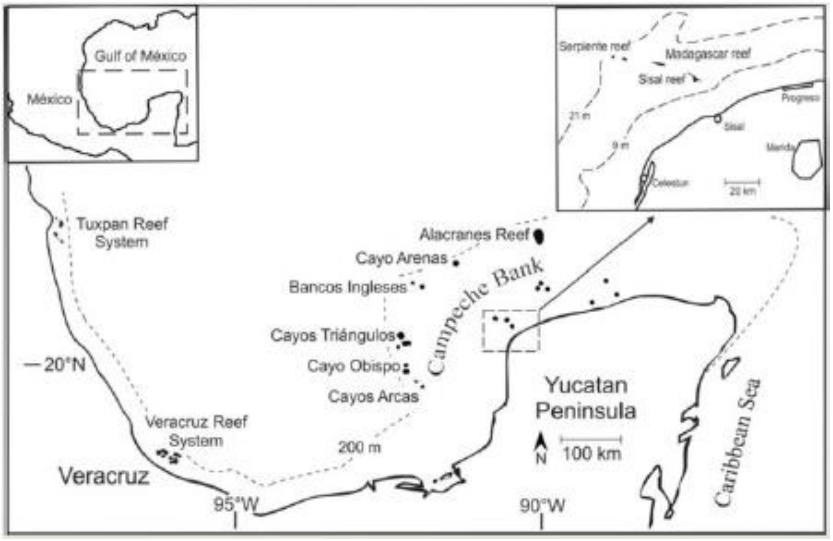

Figure 15. Reef systems of the Mexican Atlantic highlighting the Sissal Reefs (Zarco Perello et al 2014).

The continental platform of the Yucatán Peninsula is characterized by a high number of fish species: up to 31 epecies of elasmobranch and 370 species of teleosts (SAGARPA, 2014). The complexity and structure of the assemblages is poorly known. Most of the available studies are for the coastal lagoon areas of Yucatan (Vega-Cendejas & Hernández de Santillana, 2012, 2014). Icthyological studiesin the CB are scarce and limited to just a few reefs: Cayo Arcas (Garduño and Chávez 2000), Cayo Arenas (Garduño and Chávez 2000), Triángulos Oeste (Garduño and Chávez 2000) and Alacranes Reef (González-Gandara and Arias-González 2001). At least nine other recognized reefs within this system do not have information about their fish communities (Tunnell Jr 2007), and a further indefinite number of reefs remain to be described even at the most basic level (Zarco-Perelló et al 2013). Three reefs known as Sisal Reefs have being researched, but only regarding some aspects of their benthic communities **Figure 15** (Duarte et al. 2014, González-Muñoz et al. 2013, Ortigosa et al. 2013, Santana-Moreno et al. 2013, Zarco-Perelló et al. 2013, Zarco Perello et al. 2014).

There is little information on composition of assemblajes afected by the longline fishery on the Campeche bank, in particular for the area of operation of the artisanal fleet (Giménez Hurtado & Mompíe Nueva 2016). Jiménez Sosa (2017) analyzed the fish composition associated with longline targeting red grouper (*Epinephelus morio*) in coastal waters of Yucatán (Celestún and Río Lagartos). The dominant species was red grouper, while red snapper (*Lujanus campechanus*) was not recorded.

Fisheries in the region are complex due to their multi-species nature (Albañez-Lucero & Arreguín-Sánchez 2009). Five groups of organisms make up the majority of the commercial fisheries on the bank: Penaeid shrimps, octopus (*Octopus maya and O. vulgaris*), red grouper, red snapper, and mackerels (*Scomberomorus cavalla and S. maculatus*) (Le Quesne et al 2008). In general, the fishery consists of artisanal fisheries operating in inshore waters and industrial fisheries operating in offshore waters. The use of alternative methods and gear is a common practice, making it difficult to obtain reliable estimates of effective fishing effort applied on the various resources. Additionally, the species caught have high dependence on various ecosystems (wetlands, estuaries and coral reefs, etc.) at different life stages, that are increasingly impacted by human activities and meteorological phenomena. Further, variations in distribution and abundance of organisms are conditioned by various coastal processes and oceanographic features (Salas et al 2006). This means

that fishery evaluations must consider several external elements that may affect the sustainability of the resources. On the Yucatán coast natural phenomena that have had impact include red tides, wind and hurricanes. Some studies have integrated habitat assessments and interactions between species and/ or fleets.

Red snapper is considered an ecosystem top predator and changes in its population can generate drastic changes in community structure and function (Claro & Lindeman 2008). It is an oportunistic predator on benthonic prey feeding on a large variety of species of tunicates, coelenterades, crabs, shrimps and small fish. Adults and large juveniles form schools close to reef areas and feed on benthic organisms inhabiting soft substrates. Arreguín-Sánchez & Manickchand-Heileman (1998) estimated a trophic level of 4.2 for the southeast Gulf of Mexico based on food web models, and ratios of production/biomass of 0.35 and consumption/ biomass of 1.075. The principal competitor *is* Grey snapper *(L. griseus)* during juvenile stages (except in interior waters) (Claro & Lindeman 2008) and main predators are mahi-mahi (*Coryphaena hippurus*), lizardfishes (Synonontidae), and sharks (Bradley & Bryan 1976). Other species in the fish assemblages are several groupers, including red and yellowedge goupers, which function as "ecosystem engineers" by burrowing and excavating bottom substrate. These excavations support increased abundances of fishes and invertebrates including commercially-important black and snowy groupers, vermillion snapper, and spiny lobster. Reductions in the biomass of these ecosystem engineers will possibly have direct and indirect effects on the biodiversity and biogeochemistry of their local systems.

A number of ecosystem foodweb models have been developed for the region using Ecopath with Ecosim with emphasis on evaluating effects of fisheries (Fernández et al 2011). Some trophic models have been applied to the Campeche Bank ecosystems and used for modelling fisheries dynamics in the context of the ecosystem approach and assessing fisheries impact on the ecosystems. Le Quesne et al (2008) used Ecospace to evaluate effects of MPAs. Arreguín Sánchez & Valero (1996) investigated the trophic role of red grouper, a species that occupies a high trophic level in the ecosystem, together with mojarras, king mackerels, snappers, sharks and octopuses.

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

MSC definitions for bycatch species

Bycatch species are defined by the MSC, according to their characteristics, as primary, secondary, or ETP species. Species used as bait are also defined as primary or secondary species (**Figure 17**).

Primary Species are those bycatch species for which management tools and measures are in place, intended to achieve stock management objectives reflected in either limit or target reference points.

Secondary Species are those bycatch species with no objective fishery management. They are determined by biological biomass reference points. Although they are defined as secondary species or out of scope species, they will not, however, be defined as ETP species.

ETP Species (Endangered, Threatened or Protected) are determined by the MSC Standard as follows:

- Species that are recognised by national ETP legislation;
- Species listed in the binding international agreements given below relevant to Gulf of Mexico red snapper fishing:

o Appendix 1 of the convention on International Trade of Endangered Species (CITES) unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered.

o Binding agreements, relevant to Mexican legislature

- Species classified as 'out of scope species' (amphibians, birds, reptiles and mammals) that are listed in the IUCN Red List as vulnerable (VU), endangered (EN) or critically endangered (CR).

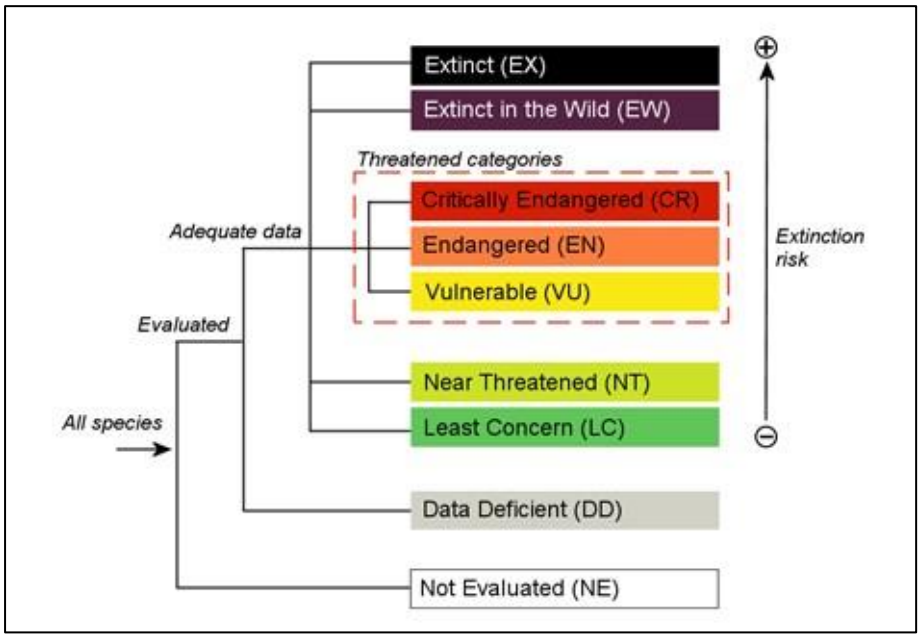

Figure 16. IUCN scale of conservation status.

MSC standard requirements for the definition of main and minor species

The primary species and secondary species components of Principle 2 can be defined as main or minor species. Minor species are only assessed in SG100. Primary or secondary species are considered 'main' if (**Figure 17**):

- The catch of a species by the UoA comprises 5% or more by weight of the total catch of all species by the UoA. In cases where the catch composition is not known quantitatively and accurately, the MSC Standard states that a process of gathering qualitative information for estimating catch percentages of primary and secondary species should be conducted. Application of the precautionary principle should apply in situations of uncertainty.
- The species classified as 'Less resilient' and the catch of the species by the UoA comprises 2% or more by weight of the total catch of all species by the UoA.

The following criteria are applied to determine whether a species should be classified as 'Less resilient':

- The productivity of the species indicates that it is instrinsically of low resilience, for instance, if determined that the productivity obtained through a Productivity Susceptibility Analysis (PSA) has a score equivalent to low or medium productivity; or

- Even if its intrinsic resilience is high, the exisiting knowledge of the species indicates that its resilience has been lowered due to anthropogenic or natural changes to its life history.

In cases where a species does not meet the designated weight thresholds of 5% or 2%, the species will be classified as main if the total catch of the UoA is exceptionally large, such that even small catch proportions of a Principle 2 species significantly impacts the affected stocks/populations. All other primary species not considered 'main' shall be considered 'minor' species.

Species defined as 'Out of Scope' (amphibians, reptiles, birds, and mammals) that are not classified as ETP species affected by the UoA, should be considered as secondary 'main' species.

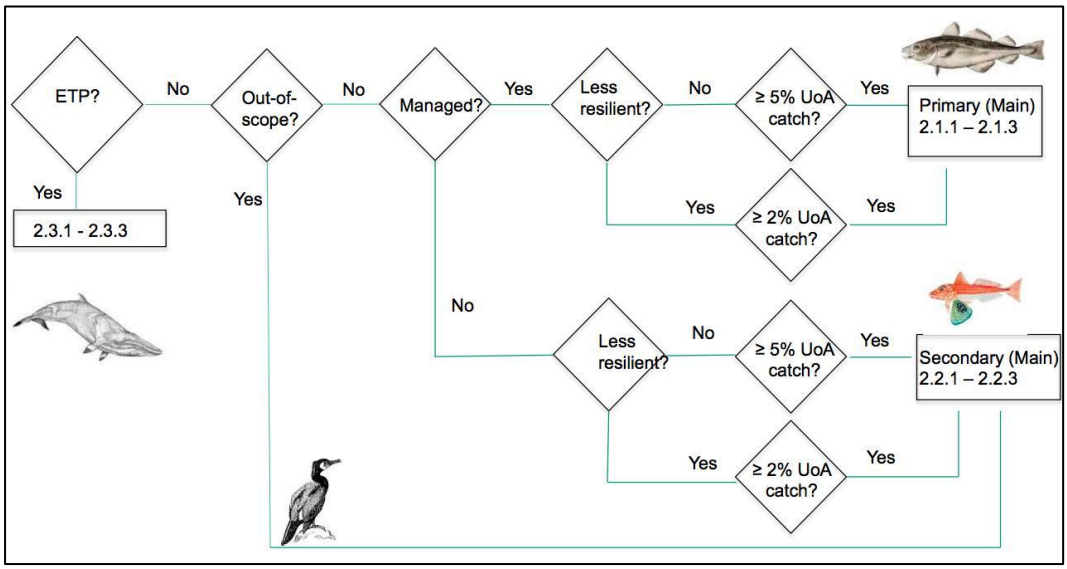

Figure 17. Decision tree for classification of Priniciple 2 main and minor species (MSC Training Course 2014).

c. Endangered, Threatened or Protected (ETP) Species in the red snapper vertical and bottom longline UoAs

According to FishSource (2018), there are four species of turtles, one species of dolphin, and 11 species of corals that are afected by fisheries catching red snapper in the Gulf of Mexico (**Table 15**). These are MSC out of scope species and potentially ETP depending on the conservation status. Among these species, the dolphin species is LC=Least Concern and thus will not be considered ETP but will be classified as main secondary species for the assessment. Among the coral species nine are DD= Data deficient and one LC=Least Concern and thus will not be considered ETP but will be classified as main secondary species for the assessment.The turtle species are *Eretmochelys imbricat*a CR=Critically Endangered and *CITES I listed*, *Caretta caretta* EN=Endangered, *Chelonia mydas* EN=Endangered, and *Dermochelys coriacea* VU=Vulnerable and CITES I listed and are all considered ETP. One of the coral species is CITES listed and IUCN CR and also considered ETP. Although all these species are present in the area of operation of the UoAs, data are not available to determine the degree of interaction with the UoAs and if they are affected by the longline fisheries.

Thus based on the information available, the ETP species in the red snapper bottom and vertical longline UoAs are four species of turtles and one species of coral. The species composition varies

significantly between the UoAs but the ETP species are considered to be the same as they operate in the same area and there no data to identify specific interactions with the fisheries.

Table 15. Out of scope species that interact with fisheries catching red snapper in the Gulf of Mexico (FishSource 2018) evaluated for ETP classification. DD= Data deficient, LC=Least Concern, are main secondary species. VU=Vulnerable, EN=Endangered, CR=Critically Endangered) are ETP.

Taxonomic group	Common name	Scientific name	Status IUCN CITES	P2 category
Turtles	Hawksbill turtle	*Eretmochelys imbricata*	*CR- CITES I*	*ETP*
	Loggerhead turtle	*Caretta caretta*	*EN*	*ETP*
	Green turtle	*Chelonia mydas*	*EN*	*ETP*
	Leatherback turtle	*Dermochelys coriacea*	*VU -CITES I*	*ETP*
Dolphins	Common bottlenose dolphin	*Tursiops truncatus*	*LC*	*Secondary main*
Corals	Staghorn coral	*Acropora cervicornis*	CR –CITES II	ETP
	Fragile saucer coral	*Agaricia fragilis*	DD	*Secondary main*
	Lettuce coral	*A. agaricites*	LC	*Secondary main*
	Grooved brain coral	*Diploria labyrinthiformis*	LC	*Secondary main*
	Symmetrical brain coral	*D. strigosa*	LC	*Secondary main*
	Smooth flower coral	*Eusmilia fastigiata*	LC	*Secondary main*
	Spiny flower coral	*Mussa angulosa*,	LC	*Secondary main*
	Mustard hill coral	*Porites astreoides*	LC	*Secondary main*
	Finger coral	*P. porites*	LC	*Secondary main*
	Lesser starlet coral *Millepora alcicornis*	*Siderastrea radianes*	LC	*Secondary main*
		Millepora alcicornis	LC	*Secondary main*

Turtles

Among the species of turtles found in the general area of the distribution of the fishery operations by the UoAs, hawksbill and loggerhead turtles are the main marine species within Biosphere Reserve "Ría Celestún (**Table 15**). Green turtle, leatherback and hawksbill turtles nest in all islands of the Marine National Park Arrecife Alacranes *(*SEMARNAP 1998*),* the largest coral reef system in the southern Gulf of Mexico (**Figure 18**).

Loggerhead subpopulation in the general area after a significant increase in nesting from 1979 to 1997 experienced a 41 % decline from 1998 through 2003, but levels remained stable through 2011 (Valverde anf Holzwart 2017). A review of the green turtle nesting data through 2001 indicated that all three western Atlantic Ocean subpopulations were increasing. Also, there is an increasing trend in the number of leatherback nests recorded on beaches on both the Gulf and Atlantic coasts (separating Gulf of Mexico data was not possible). Finally, long-term trends of hawksbill nesting on Yucatán Peninsula beaches and along the entire Mexican Gulf coast indicate a gradual increase in nesting.

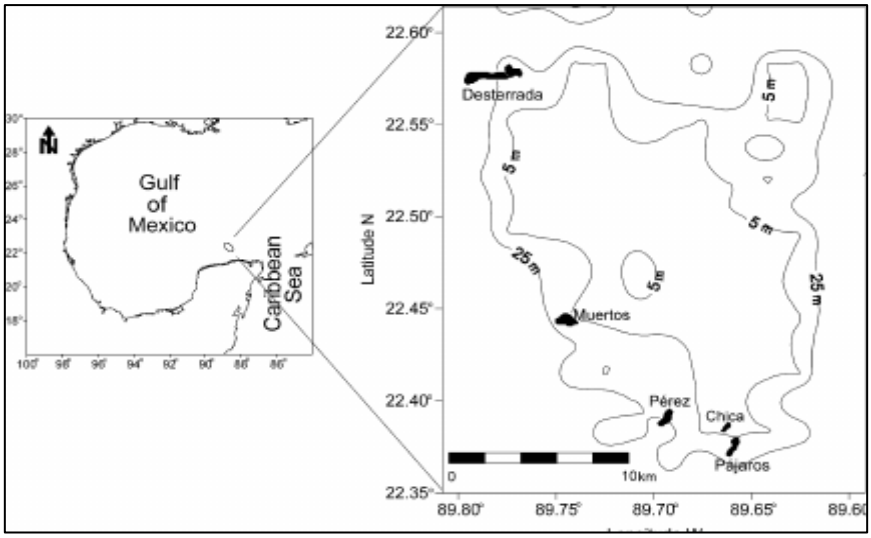

Figure 18. Marine National Park Arrecife Alacranes (from Sanvicente et al 2012).

Corals

A review of the fishing gear used in the Southeastern U.S. concluded that the weights and lines associated with longlines could damage coral habitat by "*breaking or abrading delicate coral (gorgonian) structures and fouling of discarded/lost fishing line, which accretes coralline algae and eventually overgrows the coral*." Tropical coral reefs in the Gulf of Mexico within the fishing area are considered to be subject to a "low level" and "high level" of threat *(SEMARNAP 1998)*. Among the coral species identified, staghorn coral is the one in critical conservation status, while the others are of least concern or data deficient and will not considered ETP species (**Table 15**) .

Birds

A review of seabird bycatch in longline fisheries does not list fisheries in the Gulf of Mexico as one area were bird mortality is occurring (Anderson et al 2011).The southern Gulf of Mexico remains one of the areas of the world least understood ornithologically (Tunnell and Chapman 2000). Although colonies of breeding seabirds have long been known from the islands on the Campeche Bank reefs, relatively small breeding populations have been reported. The Campeche Bank islands are significant nesting areas for marine birds, and the seabird populations in the Gulf of Mexico are much larger than previously believed. There are 395 bird species recorded for the Gulf, and 31 % occur along all coasts of the Gulf. The highest avian diversity is along the Mexican Gulf Coast (Burger 2017). The continental platform off the coasts of Campeche and Yucatán contains reefs and keys (cays or small islands) used by nesting seabirds, including Red-footed Booby (*Sula sula*) and Least Tern, which are both on the Mexican endangered species list. There are no records of interaction of birds with the UoA fisheries and there are no species of birds considered ETP or secondary species.

Protection measures for ETP species

Mexico accenssion to CITES was in 1991. A list of protected species in Mexico is noted in NOM-059-SEMARNAT-2010. Specific studies about the interaction of the fishery with Protected, Endangered and Threatened species in Mexico are required *(*SAGARPA 2012).

The Mexican agency charged with compliance of regulations for protected species is La Procuraduría Federal de Protección al Ambiente (PROFEPA). It includes provisions for turtles, corals, whales and sea lions. Provisions include the listing of all the species of turtles reported to interact with red snapper fisheries as Endangered (*En Peligro de Extinción*) (NOM-059-SEMARNAT-2010) and the one species of coral (*A. cervicornis*) as listed with special protection (*Protección Especial* en la NOM-059-SEMARNAT-2010) http://www.profepa.gob.mx/innovaportal/v/429/1/mx.wap/especies_marinas_protegidas.html. A third of all corals off Yucatan are found in seven marine protected areas (**Figure 19**).These protections relate to habitat protection.

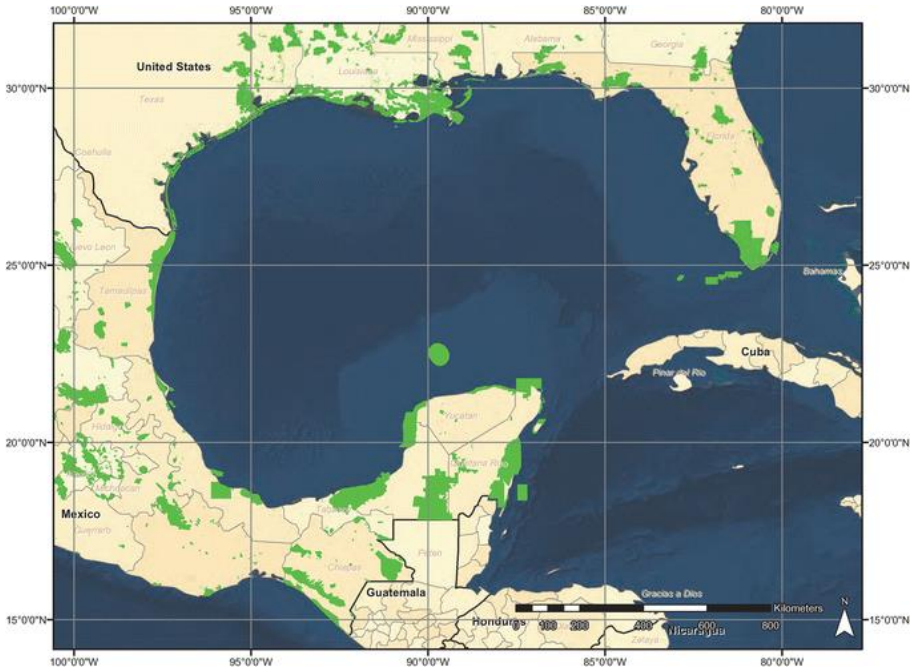

Figure 19. Protected coastal areas of the Gulf of Mexico, shown in green (Burger 2017).

d. Primary and Secondary Species in the red snapper vertical and bottom longline fisheries

For the purposes of this pre-assessment, all “In- Scope" bycatch species that are not red snapper and are caught by the fleet using vertical and bottom longlines, bait species, and “Out of Scope” species that are not considered ETP are defined as primary or secondary species.

There are no official catch statistics for species associated with the UoAs targeting red snapper with vertical and bottom longlines. Information sources considered to identify primary and secondary species in the UoAs are:

i) SEMARNAT annual landing statistics reported in the Carta Nacional Pesquera for the grouper-red snapper fishery complex in the Gulf of México and the Caribbean Sea and landed in the State of Campeche. There were over 40 species reported for 2017 (**Table 16**). Data include all fisheries in the state. Thus, it would not be reasonable to consider that they represent the catch composition of the UoAs.

ii) CONAPESCA landings recorded for Nuevo Campechito fisheries since 2016. Records for 2016 are incomplete and 2017 records include 14 species (**Table 17**). Nuevo Campechito

operates as a collection center and information recorded by CONAPESCA includes aggregated landings from both fishing gears from cooperative fishers and also by non-cooperative fishers. These data are just for one year and include landings for several gears, thus they are not considered representative of the UoAs' catch..

iii) Nuevo Campechito cooperative 2008 to 2018 sales records. These statistics are registered separately for bottom longline and vertical longline landings (**Table 18**, **Table 19**). These data are only for sale records and thus, they are an incomplete representation of the UoAs' catch. While it is not expected that discarding is significant, there are discrepancies with CONAPESCA records that preclude judging how representative these records are of the catch.

Primary Species: Although there are no offical data on the composition of the catch for the UoAs, it resasonable to say that there are no Primary species because none of the species that are reported in landings, sales records, or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points. In particular, there are no biological reference points to manage any of the species listed in CONAPESCA records in Nuevo Campechito (**Table 17**). Thus, there are no Primary species in the bottom longine UoA or in the vertical longline UoA.

Secondary Species: Without CONAPESCA catch or landing statistics for Nuevo Campechito that are registered separately for the UoAs, it is not possible to define the secondary species for each UoA with any degree of confidence and a precautionary approach should be applied. To guide the definition of secondary species it is important to note the following:

i) species composition of the sales records by the Nuevo Campechito cooperative indicates that there is no overlap in the species caught in the BL and VL UoA other than red snapper (**Table 18** vs **Table 19**);

ii) all species registered in the BL and in the VL UoA are species that are also recorded by CONAPESCA for the Nuevo Campechito fishery for all gears and non-cooperative fishers combined;

iii) there are nine species that are registered in the Nuevo Campechito records by CONAPESCA that are not registered in neither of the two UoAs (Gafftopsail sae catfish, yellowedge grouper, Atlantic Goliath grouper, common snook, king mackerel, Atlantic mackerel, yellowfin morraja, weakfish, and yellowtail snapper); and

iv) there are species reported by CONAPESCA in the Nuevo Campechito landings that are not reported in the red snaper-grouper complex fishery in the Gulf of Mexico, Tabasco and Campeche by SEMARNAT, which speaks to the complexity of the communities in the area and difficulties to study these fisheries

Accordingly, Secondary species in the bottom longline (BL) UoA would be all the species reported in sales records by the Nuevo Campechito Cooperative in the BL fishery other than red snapper: Gafftopsail sea catfish, Southern stingray, Yellowedge grouper, Atlantic Goliath grouper and Bonnehead shark (**Table 18**). Also, because of the uncertainty about other species in the BL UoA catch and based on a precautionary approach, secondary species will also include all species recorded by CONAPESCA for Nuevo Campechito that are not recorded in the VL sales records (**Table**

17). A full assessment would have to obtain information to identify which species are actually caught in the BL UoA to refine the list.

Similarly, Secondary species in the vertical longline (VL) UoA would be all the species recorded in sales records by the Nuevo Campechito Cooperative in the VL fishery other than red snapper (**Table 19**). And because of the uncertainty on other species in tha catch, secondary species will also include all species recorded by CONAPESCA for Nuevo Campechito that are not recorded in the BL sales records (**Table 17**). A full assessment would have to obtain information to identify which species are actually caught in the BL UoA to refine the list.

Bait species: Species used as bait in both UoAs are Black kingfish (*Rachycentron canadum*), Atlantic spadefish (*Chaetodipterus faber*), Inshore lizardfish (*Synodus foetens*), and Black jack (*Caranx crysos*) (Jose Chavez, COBI, pers. comm.). It is puzzling that non of these species are listed in CONAPESCA landings for Nuevo Campechito and that only Black kingfish is listed in the CONAPESCA statistics for Campeche. There is no management for bait species to be classified as Principal, so they would be Secondary species.There is no information to discriminate on which species are used as bait in each UoA and it is assumed that all of these species are secondary species for both UoAs.

"Out of Scope" species:

Mammals:-Common bottlenose dolphin *(Tursiops truncatus)* is distributed in Gulf of Mexico. There are recorded interactions (death and permanent injuries) with fishing vessels operating in the area *(SAGARPA 2012)*. It is not a ETP species as conservation status is LC and it would constitute a Secondary main P2 species for both UoA in this pre-assessment.

Corals: The Gulf contains both coral reef communities and solitary coral colonies. These exist from nearshore environments to continental slopes and canyons, including intermediate shelf zones. The Campeche Bank is a region with abundant coral reef ecosystems that haven't been well studied. Species that are potentiall affected by the UoAs and that are in conservation status DD or LC and are considered main Secondary species are: *Agaricia fragilis, A. agaricites, Diploria labyrinthiformis, D. strigosa, Eusmilia fastigiata, Mussa angulosa, Porites astreoides, P. porites, Siderastrea radianes, and Millepora alcicornis.*

While these species are classified here as secondary main, a full assessment should consider if they might better be classified as potential VME habitat. Although there is no mentioning of VME in the Campeche Bank, this is a subject that that is not well defined within the MSC standard.

Identification of low resilience species

Of the species shown in **Table 17**, **Table 18**, and **Table 19**, shark and ray species would be classified as low resilience due to low productivity: *Sphyrna tiburo, Dasyatis Americana.*

Table 16. Species registered in 2017 red snaper-grouper complex fishery landings in the Gulf of Mexico, states of Tabasco and Campeche (SEMARNAT 2018). IUCN designation is indicated (DD= Data defiecient, LC= Least concern, NT=Near threatened, VU=Vulnerable, EN=Endangered).

Common name Spanish and English		Common name Spanish and English	
Huachinango ojo amarillo Silk snapper LC	*Lutjanus vivanus*	Pargo mulato, parguete Grey snapper LC	*L. griseus*
Huachinango aleta negra Blackfin snapper DD	*L. buccanella*		
Lengua, brótula, rótula Beard brotula LC	*Brotula barbata*	Pargo perro, caballera Dog snapper DD	*L. jocu*
Mojarrón Jolthead porgy LC	*Calamus bajonado*	Rubia, villajaiba Lane snapper NT	*L. synagris*
Mojarra tigre Knoobed porgy LC	*C. nodosus*	Negrillo Black grouper NT	*Mycteroperca bonaci*
Tigre, pluma jorobada Littlehead porgy LC	*C. proridens*	Cabrilla Yellow grouper VU,	*M. interstitialis*
Jurel amarillo, vaca Crevalle Jack LC	*Caranx hippos*	Abadejo Gag VU	*M. microlepis*
Jurel blanco, jurel ojón Horse-eye Jack LC	*C. latus*	Abadejo garropa Scamp DD	*M. phenax*
Blanquillo ojo amarillo Goldface tilefish LC	*Caulolatilus chrysops*	Canané Yellowtail snapper	*Ocyurus chrysurus*
Blanquillo payaso Anchor tilefish LC	*C. intermedius*	Cobia Cobia LC	*Rachycentrum canadum*
Raya grande Southern stingray DD	*Dasyatis americana*	Cazón tripa, ley Atlantic sharpnose shark LC	*Rhizoprionodon terranovae*
Mero rojo Red grouper VU	*Epinephelus morio*	Besugo Vermillion snapper VU	*Rhomboplites aurorubens*
Cabrilla, payaso Rock hind LC	*E. adscensionis*	Esmedregal Greater Amberjack LC	*Seriola dumerili*
Seda, pejerrey Blear-eyed snapper DD	*Etelis oculatus*	Esmedregal Longfin yellowtail LC	*S. rivoliana*
Boquilla, cha-chí White grunt LC	*Haemulon plumierii*	Medregal rayado Banded rudderfish LC	*S. zonata*
Cherna prieta Warsaw grouper NT	*Hyporthodus nigritus*	Barracuda, picuda Great barracuda LC	*Sphyraena barracuda*
Pargo criollo, lunarejo Mutton snapper NT	*L. analis*	Cornuda, martillo Scalloped hammerhead EN – CITES II	*Sphyrna lewini*
Pargo Schoolmaster snapper LC	*L. apodus*	Cornuda cabeza pala Bonnethead shark LC	*S. tiburo*
Cubera, pargo colmillón Cubera snapper VU	*L. cyanopterus*	Cazón cubano Cuban dogfish DD	*Squalus cubensis*

Table 17. Landings registered by CONAPESCA in Nuevo Campechito in total weight (t) and % of the total (%). 2016 records are incomplete.

Common name (Spanish)	Common name (English)	Species	2016		2017	
			t	%	t	%
Huachinango	Red snapper VU	*Lutjanus campechanus*	1.87	25.65	39.03	25.35
Bandera	Gafftopsail sea catfish LC	*Bagre marinus*	0.30	4.11	21.95	14.26
Balá	Southern stingray DD	*Dasyatis americana*	0.50	6.85	1.45	0.94
Extraviado	Yellowedge grouper VU	*Hyporthodus flavolimbatus*	0.00	0.00	12.97	8.42
Cherna	Atlantic Goliath grouper VU	*Epinephelus itajara*	0.00	0.00	1.20	0.78
Cazón	Bonnehead shark LC	*Sphyrna tiburo*	0.00	0.00	0.00	0.00
Besugo	Vermillion snapper VU	*Rhomboplites aurorubens*	1.25	17.13	14.13	9.18
Robalo	Common Snook LC	*Centropomus undecimalis*	1.40	19.13	37.47	24.34
Peto	King mackerel LC	*Scomberomorus cavalla*	1.31	17.94	2.30	1.49
Mojarra	Yellowfin morraja LC	*Gerres cinereus*	0.45	6.17	0.00	0.00
Corvinas	Spotted weakfish LC Silver seatrout LC Sand seatrout LC	*Cynoscion sp.* *C. nebulosus* *C. nothus* *C. arenarius*	0.00	0.00	13.47	8.75
Sierra	Atlantic mackerel LC	*Scomberomorus maculatus*	0.00	0.00	0.85	0.55
Biajaiba	Lane snapper NT	*Lutjanus synagris*	0.22	3.01	9.14	5.94
Canané o rubia	Yellowtail snapper DD	*Ocyurus chrysurus*	0.00	0.00	0.00	0.00
Total catch (t)			7.30		153.96	

Table 18. Species composition in % commercial sales weight from the bottom longline in Nuevo Campechito. Data provided by the cooperative.

English name	Species	IUCN	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Red snapper	*Lutjanus campechanus*	VU	0.3	0.9	3.7	0.3	44.8	8.7			6.1	4.1	20.5
Gafftopsail sea catfish	*Bagre marinus*	LC	66.3	59.6	60.7	78.6	27.4	61.0	71.1	69.2	54.7	51.4	17.9
Southern stingray	*Dasyatis americana* *Hypanus americanus*	DD	33.4	38.0	27.9	21.2	21.2	22.5	26.0		15.2	3.7	
Yellowedge grouper	*Hyporthodus flavolimbatus*	VU		0.97	7.6			3.9		30.8	24.1	34.1	56.4
Atlantic Goliath grouper	*Epinephelus itajara*	VU							1.5			6.7	
Bonnehead shark	*Sphyrna tiburo*	LC		0.49			6.6	3.9	1.4				5.3
Total Landings (t)			17.50	61.67	2.69	9.95	2.01	19.41	10.87	0.65	3.30	37.53	21.17

Table 19. Species composition in % weight of the total recorded sales from the vertical longline by Nuevo Campechito fishers. Data provided by the cooperative.

English name	Species	IUCN	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Red snapper	*Lutjanus campechanus*	VU	26.6	45.7	57.6	59.9	67.4	58.3	92.9	48.6	51.1	63.2	80.7
Vermillion snapper	*Rhomboplites aurorubens*	VU	69.7	43.7	36.2	38.2	18.6	12.7		23.6	42.9	20.9	11.7
Lane snapper	*Lutjanus synagris*	NT	3.6	10.6	6.3	1.9	13.9	28.9	7.1	27.8	6.0	14.6	0.01
Yellowtail snapper	*Ocyurus chrysurus*	DD										1.3	7.6
Total Landings (t)			5.65	18.09	6.22	5.17	2.15	9.84	3.5	0.72	16.22	56.13	37.15

e. Identification of main and minor secondary species

The only source of information available to determine the catch species composition separately for the Nuevo Campechito UoAs using vertical and bottom longline and determine main and minor secondary species are sale records from the cooperative (avisos de arribo). These records are considered reliable (Jose Chavez COBI Personal communication) but do not represent the actual catch as they exclude species that are discarded, kept for consumption and used as bait (Personal communication, fishermen from Nuevo Campechito). This explains the absence of these species in the CONAPESCA and Nuevo Campechito cooperative records.

All the species reported in sales records by the Nuevo Campechito Cooperative in the bottom longline fishery and in the vertical longline fishery would be considered main for the respective UoA given that they constitute >5% of the total (**Table 18**, **Table 19**). It is reasonable to assume that the proportion of the species that are registered in **Table 16** but not registered in the Nuevo Campechito statistics from CONAPESCA or in the sales records by the cooperative, if caught by the UoAs would have a low representation in the catch and would be minor secondary species.

Bottom longline UoA: there are five species identified as secondary species based on Nuevo Campechito cooperative sales records: Gafftopsail sea catfish, Southern stingray, Yellowedge grouper, Atlantic Goliath grouper and Bonnehead shark (**Table 18**). Total landings recorded in the last 10 years fluctuated between < 1 t to 62 t. The composition varied greatly among years and all species have reached > 5% of the total sales and would be considered main secondary species. Also, among species in the 2017 CONAPESCA landings for Nuevo Campechito there are four species and one species group that are not recorded in the Vertical Longline UoA: *Centropomus undecimalis, Scomberomorus cavalia, Gerres cinereus, Scomberomorus maculatus* and *Cynoscion sp.* Three *Cynoscion* species are known to Campeche *C. nebulosus, C. nothus* and *C. arenarius (*CONAP-SERMANAT 2000, Ayala-Perez et al 2005*)* but records are an aggregate (**Table 17**). All the species recorded by CONAPESCA would be considered minor secondary species for the BL UoA.

Vertical longline UoA: only three species are registered in the Nuevo Campechito sales records excluding red snapper: Vermillion snapper, Lane snapper and Yellowtail snapper (Table 2.5). Total landings recorded in the last 10 years fluctuated between 3.5 t and 56.13 t. The composition varied greatly among years and all species have reached > 5% of the total composition and would be considered main secondary species. Among species in the 2017 CONAPESCA landings for Nuevo Campechito there are four species and one species group that are not recorded in the Vertical Longline UoA: *Centropomus undecimalis, Scomberomorus cavalia, Gerres cinereus, Scomberomorus maculatus* and *Cynoscion sp.* There are three *Cynoscion* species known to Campeche *C. nebulosus, C. nothus* and *C. arenarius (*CONAP-SERMANAT 2000, Ayala-Perez et al 2005*)* but the records are an aggregate (**Table 17**). All these species recorded by CONAPESCA would be considered minor secondary species for the VL UoA.

Other species that have been reported as bycatch for bottom longline targeting red snapper and Gafftopsail sea catfish in the area of operation of the UoAs and not reported in the records made available for this assessment are *Rhinoptera bonasus*, *Aetobatus narinari*, *Gymnura micrura, Himantura schmardae and Mobula hypostoma (*Martinez Cruz et al 2014. It is not know if these species are caught by the UoAs.

Shark species and finning: The Nuevo Campechito cooperative fishers do not target sharks and use gear that is not selective for sharks as they do not have permits. Nevertheless, bonnehead shark (*Sphyrna tiburo)* is a shark species in the Bottom longline UoA and it constitutes over 5% of the sales records in some years. Sharks are caught incidentally, around two per month, during the north winds season from October to February (Jose Chavez COBI, pers. comm). Further, hammerhead (*Sphyrna lewini*) is a species found in southern Gulf of Mexico and known to be caught by fisheries in the area, among them the fisheries operating in Campeche (**Figure 20**). It is a CITES II listed species. It is not known if the species is caught in the UoAs.

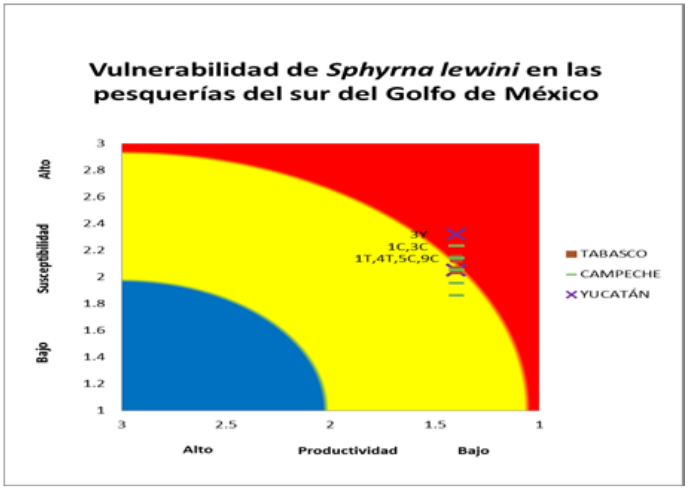

Figure 20. Vulnerability of *Sphyrna lewini* in southern Gulf of Mexico fisheries (Carito/cazón in Yucatán (3Y); sierra (1C) and cazón red seda (3C) in Campeche; bandera/balá (1T) and sierra (4T) in Tabasco, raya/tiburón (5C) and multiespecífic (9C) in Campeche).

***Bait Species*:** There is no information on the amount used by species to determine if they would constitute main or minor secondary species. Based on a precautionary approach they would be considered main secondary species. Given the reduced scale of the fishery is unlikely that the UoAs fishery would affect their population status and none of these species is in critical conservation condition.

f. Issues for certification

Due to the selective nature of the fisheries and the type of gear, the longline UoAs on the Campeche Bank 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. Nevertheless, there is no partial strategy to restrain the impact of the fishery. That being said, the scale of the fishery is limited and there is some information on these elements that is adequate to understand the impacts of the fishery.

While it is believed that the UoAs have limited interaction with ETP species, and in line with Mexican policy the potential for this is well regulated, an issue is the lack of supporting evidence in the sense of quantitative data. Furthermore, the potential for indirect interactions of the fishery with ETP species has not been considered. Similarly, while available information would suggest that the level of discards from the fishery is negligible, there is a lack of supporting quantitative data as evidence.

Other major issues for the certification of the UoAs are in relation to bycatch species. Given the lack of data on all the species involved the RBF would be used to score PI 2.2.1. While a SICA analysis may conclude that the fishery achieves a score of 60 (i.e. pass with condition), due to the overfished nature of the Campeche Bank and the species' characteristics it is considered probable that the fishery would fail to achieve a score of 60 in a PSA.

g. Scoring elements

Table 20. Scoring elements.

Component	Scoring elements	Designation	Data-deficient
Primary ***Bottom Longline UoA*** ***Vertical Longline UoA***	 No Primary Species No Primary Species	 No Primary Species No primary Species	No
Secondary Corals ***Bottom Longline UoA*** ***Vertical Longline UoA***	*Agaricia fragilis* *A. agaricites* *Diploria labyrinthiformis* *D. strigosa* *Eusmilia fastigiata* *Mussa angulosa,* *Porites astreoides* *P. porites* *Siderastrea radianes* *Millepora alcicornis*	Main	All Yes
Secondary Mamals ***Bottom Longline UoA*** ***Vertical Longline UoA***	*Tursiops truncatus*	Main	All Yes
Secondary In Scope ***Bottom Longline UoA***	*Bagre marinus* *Dasyatis americana* *Hyporthodus flavolimbatus* *Epinephelus itajara* *Sphyrna tiburo*	Main	All Yes
Secondary In Scope ***Vertical Longline UoA***	*Rhomboplites aurorubens* *Lujanus synagris* *Ocyurus chrysurus*	Main	All Yes
Secondary In Scope ***Bottom Longline UoA*** ***Vertical Longline UoA***	*Centropomus undecimalis* *Scomberomarus cavalia* *Gerres cinereus* *Cyonoscion spp* *Scomberomus maculatus*	Minor	All Yes
Secondary Bait ***Bottom Longline UoA*** ***Vertical Longline UoA***	*Rachycentron canadum* *Chaetodipterus faber* *Synodus foetens* *Caranx crysos*	Minor	All Yes

ETP Turtles ***Bottom Longline UoA*** ***Vertical Longline UoA***	*Eretmochelys imbricat*a *Caretta caretta* *Chelonia mydas* *Dermochelys coriacea*	NA	All Yes
ETP Corals ***Bottom Longline UoA*** ***Vertical Longline UoA***	*Acropora cervicornis*	NA	Yes
Habitats ***Bottom Longline UoA*** ***Vertical Longline UoA***	*Minor habitat*	NA	Yes
Ecosystems ***Bottom Longline UoA*** ***Vertical Longline UoA***	*Foodweb dynamics*	NA	No

5.5.2 Principle 2 Performance Indicator scores and rationales

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? BL VL	**Yes** **Yes**	**Yes** **Yes**	**Yes** **Yes**
Rationale				
There are no primary species in the *Lutjanus campechanus* Units of Certication, neither Main nor Minor. Although there is no offical data on the composition of the catch for the Units of certification, any of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points.				
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 primary species in the Bottom and Vertical *Lutjanus campechanus* units of certification, Minor o Main. Although there are no offical data on the composition of the catch for the Units of certification, none of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the				

stock at biomass levels determined by biological reference points.
References
2016-2017 CONAPESCA landing statistics for Nuevo Campechito; 2008-2018 Sales records from Nuevo Campechito Cooperative.

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 2.1.2 – 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? BL VL	 **Yes** **Yes**	 **Yes** **Yes**	 **Yes** **Yes**
Rationale				
There are no primary species in the *Lutjanus campechanus* Units of Certication, neither Main or Minor. Although there are no offical data on the composition of the catch for the Units of certification, none of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points				
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? BL VL	 **Yes** **Yes**	 **Yes** **Yes**	 **Yes** **Yes**
Rationale				
There are no primary species in the *Lutjanus campechanus* Units of Certication, neither Main nor Minor. Although there are no offical data on the composition of the catch for the Units of certification, none of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points.				

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 overall objective as set out in scoring issue (a).**
	Met? BL VL		**Yes** **Yes**	**Yes** **Yes**
Rationale				
There are no primary species in the *Lutjanus campechanus Units of Certication*, neither Main nor Minor. Although there are no offical data on the composition of the catch for the Units of certification, none of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points.				
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? BL VL	**NA** **NA**	**NA** **NA**	**NA** **NA**
Rationale				
There are no shark species that constitute primary species for the UoAs.				
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? BL VL	**NA** **NA**	**NA** **NA**	**NA** **NA**
Rationale				

There are no primary species in the *Lutjanus campechanus Units of Certication,* neither Main nor Minor. Although there are no offical data on the composition of the catch for the Units of certification, none of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points.

References
2016-2017 CONAPESCA landing statistics for Nuevo Campechito; 2008-2018 Sales records from Nuevo Campechito Cooperative.

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 2.1.3 – 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 specieseihdcchulkjghcclhcekhjvukvhnfeehncnrcggbrurheihdcchulkjgegheduutrbvgudifjhbddltdcvlehunc		
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? BL VL	**Yes** **Yes**	**Yes** **Yes**	**Yes** **Yes**
Rationale				
There are no primary species in the *Lutjanus campechanus* Units of Certication, neither Main nor Minor. Although there are no offical data on the composition of the catch for the Units of certification, none of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points.				
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 primary species in the *Lutjanus campechanus* Units of Certication, neither Main nor Minor. Although there are no offical data on the composition of the catch for the Units of certification, none of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points.				

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?	**Yes**	**Yes**	**Yes**

Rationale

There are no primary species in the *Lutjanus campechanus Units of Certication,* neither Main nor Minor. Although there are no offical data on the composition of the catch for the Units of certification, none of the species that are reported or potentially caught in the fisheries are managed with the objective of maintaining the stock at biomass levels determined by biological reference points.

References

2016-2017 CONAPESCA landing statistics for Nuevo Campechito; 2008-2018 Sales records from Nuevo Campechito Cooperative.

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 2.2.1 – 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
	Main secondary species stock status			
a	Guide post	Main secondary species are **likely** to be above biologically based limits. OR If below biologically based limits, there are **measures** in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are **highly likely** to be above biologically based limits. OR If below biologically based limits, there is either **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.	There is a **high degree of certainty** that main secondary species are above biologically based limits.
	Met? BT VT	**No** **No**	**No** **No**	**No** **No**
Rationale				

For the bottom longline UoA, 2008-2018 sales records recorded five species: Gafftopsail sea catfish (*Bagre marinus*), Southern stingray (*Dasyatis americana*), Yellowedge grouper (*Hyporthodus flavolimbatus*), Atlantic Goliath grouper (*Epinephelus itajara*) and Bonnehead shark (*Sphyrna tiburo*). The composition varied greatly among years and all species have reached > 5% of the total sales' weight and would be considered main secondary species. The two grouper species are classified as VU by the IUCN and not likely to be above biological limits. Other main secondary species are "Out of Scope" species of coral: *Agaricia fragilis, A. agaricites, Diploria labyrinthiformis, D. strigosa, Eusmilia fastigiata, Mussa angulosa, Porites astreoides, P. porites, Siderastrea radianes,* and *Millepora alcicornis.* These species are classified as DD or LC by IUCN, thus would be likely to be above biological limits. Another main secondary species is an "Out of Scope" species of mammal Tursiops truncatus. It is classified as LC and would be also likely to be above biological limits. Thus, there are two main

secondary species that are not likely to be above biological limits.

For the vertical longline UoA sales records recorded three species: Vermillion snapper (*Rhomboplies aurorubens*), Lane snapper (*Lutjanus synagris*) and Yellowtail snapper (*Ocyurus chrysurus*). The composition varied greatly among years and all species have reached > 5% of the total composition and would be considered main secondary species. Vermillon snaper is classified as VU by the IUCN, while the other species are NT and DD.Thus, at least one main secondary species is not likely to be above biological limits. Other main secondary species are "Out of Scope" species of coral: *Agaricia fragilis and A. agaricites, Diploria labyrinthiformis, D. strigosa, Eusmilia fastigiata, Mussa angulosa, Porites astreoides, P. porites, Siderastrea radianes,* and *Millepora alcicornis. These species are DD or LC*, thus would be likely to be above biological limits. Also main secondary species is an "Out of Scope" species of mammal *Tursiops truncatus.* It is classified as LC and would be also likely to be above biological limits. Thus, there is one main secondary species that is not likely to be above biological limits.

As matters now stand there is a great deal of uncertainty about the number and contribution of species in the catch of both UoAs. Further, even if the quantities were known there is insufficient knowledge of the status of many of the stocks. On that basis, the RBF would be employed with both a PSA and a SICA. There are measures in place that could limit the impact of the UoAs on secondary species (hook size, licensing, closed seasons and closed areas).

These measures in place are not expected to ensure that the UoA does not hinder recovery and rebuilding.Given the overfished nature of the Campeche Bank, the conclusion is that both fisheries would score <60 and fail PI 2.2.1.

	Minor secondary species stock status			
b	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? BL VL			 **No** **No**

Rationale

As matters now stand there is a great deal of uncertainty about the number and contribution of species in the catch of both UoAs and about the species used for bait. Based on available information from 2016-2017 CONAPESCA for Nuevo Campechito landings UoA minor secondary species both in the BL and VL UoA would be *Centropomus undecimalis, Scomberomorus cavalia, Gerres cinereus, Cyonoscion spp, and Scomberomus maculatus*. Also minor species for both UoAs would be bait species *Rachycentron canadum, Chaetodipterus faber, Synodus foetens, and Caranx crysos*. All these species are classified as LC by the IUCN and would highly likely to be above biological based limits. But there is incomplete information about quantities, if any, of these species in the UoAs catch, the amount of used for bait, and there is insufficient knowledge of the status of many of the stocks.

References
2016-2017 CONAPESCA landing statistics for Nuevo Campechito; 2008-2018 Sales records from Nuevo Campechito Cooperative.

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

Draft scoring range	**<60**
Information gap indicator	**More information sought**
Data-deficient? (Risk-Based Framework needed)	**Yes**

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? BL VL	**No** **No**	**No** **No**	**No** **No**
Rationale				
While there are measures in place that could limit the impact of the UoAs on secondary species (hook size, licensing, closed seasons and closed areas), given their failure to protect the target species and several of the other fish species recorded in the landings, it must be reasonable to conclude that the fishery may hinder their recovery and rebuilding. The bottom and vertical longline UoAs would not meet SG60				
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? BL VL	**No** **No**	**No** **No**	**No** **No**
Rationale				
Given the precarious conservation status of the target species and several of the other fish species recorded in the landings it must be reasonable to conclude that the measures in place (hook size, licensing, closed seasons and closed areas) are not likely to work. The bottom and vertical longline UoAs would not meet SG60.				

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? BL VL		**No** **No**	**No** **No**
Rationale				
Given the precarious conservation status of the target species and several of the other fish species recorded in the landings it must be reasonable to conclude that the measures in place (hook size, licensing, closed seasons and closed areas) are not implemented successfully. The bottom and vertical longline UoAs would not meet SG80				
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?	**Yes**	**Yes**	**Yes**
Rationale				
Sphyrna tiburo is caught in the Bottom Longline UoA as indicated by sale records. They are landed with fins. Based on personal communication by Nicolás Cordero, the Nuevo Campechito cooperative fishers do not target sharks and use gear that is not selective for sharks as they do not have permits. Sharks are caught incidentally, around two per month, during the north winds season from October to February.				
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? BL VL	**No** **No**	**No** **No**	**No** **NO**

Rationale
The only source of information available to determine the catch species composition for the Nuevo Campechito UoAs using vertical and bottom longline are sale records from the cooperative (*avisos de arribo*). These records are considered reliable but do not represent the actual catch.There is no information of discards. Based on information obtained by COBI, bycatch species of low value are used as bait. The only species that is known to be unwanted and that is discarded is *Lagocepahalus laevigatus*, which is toxic. There is no review of the potential effectiveness of alternative measures to minimize unwanted catch. The bottom and vertical longline UoAs would not meet SG60
References
Jose Chavez COBI Personal communication

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 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?	**No**	**No**	**No**
Rationale				
The only source of information available to determine the catch species composition for the Nuevo Campechito UoAs using vertical and bottom longline are sale records from the cooperative (avisos de arribo). These records are considered reliable but they do not represent the actual catch, so it is unclear even if all main secondary species are identified. So in the absence of official records on catch it is unclear if the information to estimate the impact on main secondary species is adequate.				
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				
The only source of information available to determine the catch species composition for the Nuevo Campechito UoAs using vertical and bottom longline are sale records from the cooperative (avisos de arribo). These records do not represent the actual catch, and the information to estimate the impact onf minor secondary is not adequate.				
c	Information adequacy for management strategy			
	Guide	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 **all**

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

Rationale
The only source of information available to determine the catch species composition for the Nuevo Campechito UoAs using vertical and bottom longline are sale records from the cooperative (avisos de arribo). These records do not represent the actual catch, and the information is not adequate to support measures to manage main secondary species.

References
J.F. Chávez COBI, Personal communication 2019

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 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.
		Yes	**No**	**No**
Rationale				
There are four species of turtles classified as IUCN VU=Vulnerable, EN=Endangered, or CR=Critically Endangered potentially affected by the UoAs and are considered ETP: Hawksbill turtle: Loggerhead turtle, Green turtle, and Leatherback turtle. There is one species of coral, Staghorn coral also listed in CITES and considered ETP. Although these species are present in the area of operation of the UoAs, data are not available to determine if these ETP species interact with the UoAs and if they are affected by the longline fisheries. The Government of Mexico has taken a number of steps to protect ETP species in the area of the fishery. However, the effects of the fishery are not known, although given the small scale of the fishery they are likely to be within limits of national and international requirements for protection of ETP species. If the fishery was to be creating direct effects then it is plausible to consider that these would have been reported, and there was no evidence found that this is the case. The fishery would meet SIa at SG60.				
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**	**No**	**No**
Rationale				
Species in the area that can be considered ETP are Hawksbill turtle, Loggerhead turtle, Green turtle, and Leatherback turtle, and Staghorn coral. Although these species are present in the area of operation of the UoAs, data are not available to determine if these ETP species interact with the UoAs and if they are affected by the longline fisheries. Given the small scale of the two UoAs it is pausible that they do not hinder recovery of these ETP species. The fishery would meet SIb at SG60. Given that the effects are not known it is not possible to establish what is the likelihood of not hindering recovery.				

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?		**No**	**No**
Rationale				
Indirect effects include issues such as the results of discharging waste at-sea and the potential for damage from lost gear. Such indirect effects have not been evaluated or considered.				
References				
SAGARPA 2012				

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

Draft scoring range	**60-79**
Information gap indicator	**More information sought**
Data-deficient? (Risk-Based Framework needed)	**Yes**

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; - ensure the 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?	**Yes**	**No**	**No**
Rationale				
There are four species of turtles considered ETP: Hawksbill turtle: Loggerhead turtle, Green turtle, and Leatherback turtle and one species of coral, Staghorn coral. Although these species are present in the area of operation of the UoAs, data are not available to determine if they interact with the UoAs and are affected by the longline fisheries. The strategy is as implemented by Mexico to protect all ETP species as indicated in NOM-059-SEMARNAT-2010. While a main assessment would revise this issue in detail, given the apparent lack of concern about the fishery and fishers reporting limited interactions with ETP species, it may be concluded that the fishery meets SG60 SIa. It does not meet SG80 as there is not a specific strategy for the fishery.				
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				

The strategy is as implemented by Mexico to protect all ETP species. While a main assessment would review this issue in detail, given the apparent lack of concern about the fishery and fishers reporting limited interactions with ETP species, it may be concluded that the fishery meets SG60 SIa. It does not meet SG80 as there is not a specific strategy for the fishery.

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**	**No**	**No**

Rationale

The plausible arguments that the measures are working is the lack of any reports to the contrary on fisheries that takes place on the Campeche Bank, which is subject to a great deal of study. The UoAs meet SG60 Sic, But there is there is no strategy and no objective basis for confidence (in absence of information) that the measures are working, and there does not appear to have been any quantitative analysis; thus the UoAs do not meet SG80 SIc.

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?		**No**	**No**

Rationale

The plausible argument that the measures are working is the lack of any reports to the contrary on fisheries that take place on the Campeche Bank, which is subject to a great deal of study. Thus, there is no evidence that measures are implemented successfully.

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?	**No**	**No**	**No**

Rationale
There was no information found indicating that there is a review of the measures in place for the UoAs.
References
NOM-059-SEMARNAT-2010, SAGARPA 2012.

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 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**	**No**	**No**
Rationale				
There is no qualitative information available for the UoAs but there is population-level information of ETP species such as turtles that indicate recovery trends. Thus, while the related mortality of the UoAs on ETP species cannot be estimated it is considered that the qualitative information is sufficient for the fishery to meet SG60 SIa				
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**	**No**	**No**
Rationale				

Population-level information is adequate to support management measures and to measure trends, even if not at the local level. This issue would likely meet SG60. While it might be the case that the UoAs do not interact with all the ETP species present in the area, according to FishSource there are ETP species of turtles, and corals that are afected by fisheries catching red snapper in the Gulf of Mexico.
References
FishSource (2018)

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 2.4.1 – 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**	**No**	**No**
Rationale				
There is evidence to suggest that the fishery may damage habitat by removing species such as grouper, which are categorised as ecosystem engineers that burrow and excavate bottom substrate and indirectly increase the abundance of a variety of species. Additionally, the gears used may damage coral. The key question in any main assessment will be the extent of potential damage and whether or not there would be serious or irreversible harm.				
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				
There are no known VME habitats in the fishing areas of the UoAs.				
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				
Although there have been some studies that cover this area, in all likelihood any main assessment would use the risk based approach with workshops used to gain a consensus on the impact on habitat from interactions with the fishery. Much will depend on coral related issues as these require an extended period of time to recover. It seems plausible to consider that habitat structure and function as opposed to habitat type will be found to be most at risk. The fishery would achieve a pass with condition if it was concluded that impact reduces habitat structure and function. For impacts on non-fragile habitat structure, this may be for up to 50% of habitat affected, but for more fragile habitats, to stay in this category the % area affected needs to be smaller-- up to 20%. Time to recover from impact could be up to two decades.				
References				
LeQuesne et al 2008, Zarco Perello et al 2014, Sotset et al 2014				

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

Draft scoring range	**60-79**
Information gap indicator	**More information sought**
Data-deficient? (Risk-Based Framework needed)	**Yes**

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**	**No**	**No**
Rationale				
There are marine protected areas and no fishing zones. However, the overfishing of the stocks indicates that there is not a partial strategy, i.e. restricting catch to recover and maintain the stocks would serve to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types. The lack of a partial strategy means that the fishery would not meet SG80 SI.				
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**	**No**	**No**
Rationale				
On the basis of experience, however, it may be concluded that the measures will work. The lack of a partial strategy means that the fishery would not meet SG80 SI.				
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?		**No**	**No**
Rationale				

There was no quantitative evidence that the measures are being implemented successfully.

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 operate in an area with known VMEs.

Le Quesne et al 2008, Nuevo Campechito Coop fishers (pers. comm., 2019)

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 2.4.3 – 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** **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.	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 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.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	**Yes**	**Yes**	**No**
Rationale				
The habitat of the Campeche bank has been studied in detail. From work carried out, it is likely that the team in any main assessment would conclude that there is sufficient information to meet SG80 at SIa. More study would be required to see whether or not the fishery could achieve SG100 at SIa.				
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				
From the experience elsewhere and from regional studies it would be possible to identify the nature of the impacts of the fishery, and a well attended workshop would likely provide the evidence available. Nevertheless, there is missing information on the extent of interaction of fishing activities and the spatial and temporal use of gear sufficient to meet SG80 SIb.				
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?		**No**	**No**
Rationale				
Although it can be considered that information on the scale and intensity of the fishery would allow to detect increases in risk to the main haitats, the impact of the UoAs on habitiat is not known. Also dynamic changes in the distribution of habitats are not known, and these may be affected by natural phenomena such as hurricanes. Thus it would be precautionary to conclude that there is no adequate information that continues to be collected to detect any increase in risk to the main habitats.				
Arreguín Sánchez & Valero 1996, Le Quesne et al 2008, Fernández et al 2011				

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

While there is insufficient information to assess the impact of the fishery on the ecosystem and despite overfishing of several species over an extended period of time, it is highly unlikely that the UoAs would disrupt the key elements of the ecosystem due to the small scale of the fishery.

N/A

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)	**Yes**

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 rational is the same as for 2.4.2 – there are measures but no partial strategy in place. A partial strategy would have to encompass reduced fishing effort if the impact of the fishery on the ecosystem was to be restrained. The fisheries would not meet SG80a. Although if the results of RBF or other evaluation of 2.4.1 were 80 or greater, then this score might also improve because there would then be information available to judge the fishery impact to the ecosystem				
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				
Measures are considered likely to work given the team´s experience in other similar fisheries. Nevertheless there is no objective basis of confidence given the compromised conservation status of most of the species that are known to interact or that can potentially interact with the UoAs. The fisheries would not meet SG80b.				
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 no evidence that the measures are being implemented successfully given the compromised conservation status of most of the species that are known to interact or that can potentially interact with the UoAs.				
References				
Albañez-Lucero & Arreguín-Sánchez 2009				

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**	**Yes**	
Rationale				
From studies on the Campeche Bank and the experience in similar fisheries, the information available is considered adequate to identify the key and to broadly undertand the elements of the Campeche Bank 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**	**Yes**	**No**
Rationale				
Research over recent years on ecosystem modelling has investigated the main impacts of the fisheries in the Campeche Bank, and those studies could help infer the main impacts of the UoAs. Neverthess the main interaction between the UoAs and ecosystem elements have not been investigated in detail and the fishery would not meet SG100b.				
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?		**Yes**	**No**

Rationale				
The main functions of the components in the Campeche Bank ecosystem are known from multiple studies in the area. Nevertheless the impacts of the UoAs are not identified as information is only recorded from landings and not for each UoA separately.				
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?		**Yes**	**No**
Rationale				
While the information on catch and other direct or indirect mortality imposed by the UoAs is incomplete and data available are for landings and interaction with ETP species are not recorded, information available on Campeche Bank fisheries allow some of the main consequences for the ecosystem to be inferred..				
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?		**Yes**	**No**
Rationale				
Information about the fishery (scale, intensity, and spatial distribution) would be enough to identify any increase in risk even when the information is not collected on catch specifically for each UoA or on interactions with ETP species.				
References				
Arreguín Sánchez & Valero 1996, Le Quesne et al 2008, Fernández et al 2011, Giménez Hurtado & Mompíe Nueva 2016, Jiménez Sosa 2017				

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)	

5.6 Principle 3

5.6.1 Principle 3 background

a. Legal framework

Fisheries in Mexico are regulated by federal, state and municipal agencies; in addition, research groups and Civil Society Organizations play an important role in the management of the fishery resources (Arreguín-Sánchez 2006; Arreguín-Sánchez and Arcos-Huitrón 2011; Fernández et al. 2011).

In Mexico, there are 18 ministries at the federal level, two of which are closely linked to fishery management (SEMARNAT and SAGARPA) and two more have a secondary role (SEMAR and SCT). SEMARNAT (Ministry of the Environment and Natural Resources) 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.

SAGARPA (Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food) 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, INAPESCA and 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 National Institute of Fisheries and Aquaculture (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 Centres known as "CRIPs" (Centro Regional de Investigación Pesquera), which are subdivisions of INAPESCA.

INAPESCA serves as a technical advisory role to CONAPESCA. The information and guidelines generated by INAPESCA are submitted to the National Commission for Fisheries and Aquaculture (CONAPESCA), an agency that is responsible for the formal and legal development and implementation of fishery and aquaculture policies and programs. PROFEPA (*Procuraduría Federal de Protección al Ambiente*), the federal agency responsible for environmental protection, is the enforcement agency operating under the legal framework of the General Law for Sustainable Fishing and Aquaculture (LGPAS) and the General Act of Ecological Balance and Environmental Protection (LGEEPA-1996) (see below).

b. 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. There are two main laws linked to fisheries management:

1) LGPAS came into force in 2007, and aims at supporting the comprehensive and sustainable development of these activities. The LGEEPA, through article 94, confers authority to the LGPAS for the exploration, exploitation, use and management of Aaquatic 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. Finally, the General Wild Life Law (Art. 27, Fraction XIXX G; Art. 73), intervenes with laws focused in the conservation and sustainable use of wild life and its habitat in Mexico and areas of federal jurisdiction, as long as the species is at risk, otherwise, it only corresponds to the LGPAS.

2) 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.

c. Official Standards and Regulations

At the national level, the specific instrument for Mexican fisheries legislation is the LGPAS that 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 licences, limited entry, catch quotas, etc. NOMs are mandatory (legally binding), and consist of technical regulations that control specific fisheries.

The National Fisheries Chart (Carta Nacional Pesquera, CNP) is another binding instrument used by fisheries authorities. The CNP includes the diagnosis of a large number of fisheries and provides fisheries and conservation indicators, as well as recommendations by INAPESCA that must be observed by fishers and authorities. The CNP is updated with new fisheries, status, and regulations approximately every 5 years. The most recent CNP was issued in 2018 (DOF, 2018).

Fishery management plans are also elaborated by INAPESCA as a tool specified in the law to establish the management goals and the harvest strategy for each fishery.

d. Fishery-specific management system

The red snapper fishery of the GOM is currently managed through regulations outlined in the 2018 CNP (DOF 2018) (Tables 6 and 7), and falls under the grouper and associated species regulations for the GOM and Caribbean, including the NOM-065-SAG/PESC-2014 (DOF 2015) and the Fishery Management Plan for Groupers and Associated Species in the Yucatan Peninsula (DOF 2014, SAGARPA 2016). General measures include fishing permits, authorized vessels and gears, gear and effort limits per vessel, prohibited gears (gillnets and spears), prohibition to fish in protected and refuge areas, processing restrictions (no filleting onboard vessels), maximum catch (3 kg/day) for subsistence, and others.

According to the CNP (2018) access to the red snapper fishery is controlled through permits, restrictions of vessel and gear types in order to increase intraspecific selectivity, and definition of fishing areas and a Prevention and Exclusion Area in the Campeche Bait (DOF 2003, 2012, 2018). The CNP (2018) also indicates that minimum sizes, closed seasons, quotas, and fishing effort have not been defined and recommends the elaboration of an official standard (NOM) and a management plan (in development). Finally, it outlines the need to prevent increases in effort and to implement a monitoring, control, and surveillance program for the fishery, coordinated by INAPESCA.

Table 21. Thematic Consultation, SEMARNAT (2012). Status and management recommendations for the red snapper and grouper fishery of the Gulf of Mexico and the Caribbean Sea (2012).

Fishery	Fishing area	Status	Management measures	Reference points	Fishing effort (recommended)
Red snapper and grouper	Gulf of Mexico: coasts of Tamaulipas to Quintana Roo	Based on trends in production, in Yucatan, Campeche and Veracruz the fishery is in decline. In Tamaulipas, Quintana Roo and Tabasco the fishery is at the maximum sustainable level.	Controlled access through permits for commercial fishing, and specifications for fishing gears to increase intraspecific selectivity.	The total annual catch in the Gulf of Mexico should be maintained below 4.295 t (82% of the historical maximum catch of 5,252 t)	Yucatan Campeche, and Veracruz: decrease fishing effort. Tampico, Quintana Roo, and Tabasco: do not increase fishing effort through new permits, concessions or fishing units that affect the red snapper and grouper stocks.

Table 22. Management measures described in the CNP (DOF 2018) for the red snapper fishery in the Gulf of Mexico.

Management Control	YES/NO	Measures	Reference
Official Mexican Standard	No	N/A	
Fishery management plan	No	In development.	
Type of access	Yes	Commercial fishing permit for marine finfish.	Technical opinion from INAPESCA
Minimum size	No	Research in progress.	

Fishing gears and methods[5]	Yes	Red Snapper Longline and Handline, the number of lines and hook size vary by state. **Tamaulipas, Veracruz and Campeche:** *Handline* with 1-15 hooks, size 6/0 to 9/0, circular, eagle claw or straight type; *Red snapper longline* with 300-1,000 hooks, size 7/0, 8/0, and 9/0, circular or eagle claw type, or size 5/0 to 11/0 Japanese or straight type. **Veracruz and Tamaulipas:** *Red snapper longline* with 2-4 hooks, size 5/0 to 7/0, straight type, or size 6/0 to 8/0, circular or eagle claw type.	Commercial fishing permits
Closed season	NO	Research in progress	
Quota	No	N/A	
Fishing unit	Yes	Small and medium scale vessels.	Commercial fishing permits
Effort	No	Unknown	
Fishing zone	Yes	Marine waters of Federal jurisdiction along the coasts of Tamaulipas, Veracruz, Tabasco, Campeche, and Yucatan, considering the guidelines for the partial temporary fishing Refuge Zone in Akumal, Quintana Roo.	DOF: 13/04/2015

e. Monitoring, Control and Surveillance

The red snapper fishery of the GOM is regulated by SAGARPA, via INAPESCA and CONAPESCA, and through inter-ministerial 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 LEGEPAS (2018), CONAPESCA is the regulatory agency in charge of the management, coordination and development of marine resource policies (FAO 2005). Also, Article 7 of the NOM-065-PESC-2007 for groupers and associated species (DOF 2016) establishes that it is the duty of CONAPESCA to conduct 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 LEGEPAS and other applicable laws and regulations.

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,

[5] According to 2018 CNP nomenclature, but in this report:
Red snapper longline= Bottom Longline = *Palangre huachinanguero*
Handline= Vertical Longline= *Ristra = Rosario = Línea de mano*

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.

CONANP (*Comisión Nacional de Áreas Naturales Protegidas*) is the agency in charge of Natural Protected Areas, including marine areas. In case of violations within MPAs, PROFEPA (*Procuraduría Federal de Protección al Ambiente*), the federal agency responsible for environmental protection, is the enforcement agency. In Campeche MPAs, the state environmental agency (SEMARNAT) is also involved in enforcement of environmental laws.

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

5.6.2 Principle 3 Performance Indicator scores and rationales

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 (LEGEPAS). 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),* CNPs (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, consistent with Principles 1 and 2. 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**	**No**	**No**
Rationale				

The management system brings fishermen into the deliberations process. Fishermen and other stakeholders may challenge decisions during the deliberation process, requiring a response from the government, and subsequently through the courts.

The system has a transparent mechanism to resolve legal disputes, also in the case of sanctions, but there is not enough information to know if it is effective or appropriate to the context of the fishery. SG60 is likely met.

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 these people. The LGPAS sets the basis to 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 permit. The rights for indigenous peoples 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

LGPAS and reform (DOF 2007, 2018), LGEEPA and reform (DOF 1988, 2015), CNP (DOF 2018), FMP (DOF 2014), SAGARPA 2016, NOM-065-SAG/PESC-2014 (DOF 2015), OECD 2013. , SCS 2016

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				
The roles and responsibilities of the legislature, CONAPESCA, INAPESCA, local authorities, and stakeholders are explicitly defined and well understood, but not necessarily for all areas of responsibility and interaction. The roles and responsibilities of the main government agencies involved the fisheries management system are provided in the P3 background section of this report. Briefly, SAGARPA is in charge of administering fisheries and aquaculture legislation. CONAPESCA is an administrative entity of SAGARPA responsible for management, coordination and policy development related to the sustainable use and exploitation of fisheries and aquatic resources. CONAPESCA's responsibilities include enforcement, issuing quotas and permitting. INAPESCA is responsible providing scientific advice. SEMARNAT is the federal agency responsible for promoting the protection, restoration and conservation of ecosystems and natural resources and environmental goods and services. The fisheries law (LGPAS) explicitly describes the roles and responsibilities of the different agencies in the fisheries management system and establishes the form of coordination with other Federal, State, and municipal entities.SG100 is likely to be met.				
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
Development of laws and regulations requires an open consultation process that allows for stakeholder input at every stage. CONAPESCA holds multiple workshops involving fishermen and other stakeholders. The process includes national and state councils and advisory committees which provide an inter-sectorial forum for the support, coordination, consultation and assistance for the making of fisheries management decisions chaired by SAGARPA. They are responsible for the definition of management objectives in FMPs (DOF 2012). The management system both seeks and uses stakeholder input, and includes local knowledge. There is no evidence that the consultation process occurs regularly, that local knowledge is always accepted, or that the management system provides explanations of how information is used or not, so SG80 is likely to be met, but SG100 is not. NGOs often help to promote community involvement in the consultation process. COBI is serving this role in the red snapper fishery of Nuevo Campechito.

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 workshops and meetings and are given opportunities to participate. For example, during the development of FMPs, INAPESCA holds public consultation meetings. The Sub-committee of Responsible Fishing also facilitates the participation of stakeholders to propose, compile, review, approve and publish Mexican official norms related to fisheries (NOMs). 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
LGPAS and reform (DOF 2007, 2018), LGEEPA and reform (DOF 1988, 2015), CNP (DOF 2018), FMP (DOF 2014), SAGARPA 2016, SCS 2016

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 3.1.3 – 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 must adopt the precautionary approach for the conservation and protection of fishery resources and ecosystems, Clearly, the terms sustainable use, preservation, and conservation are used repeatedly in the management policy, implicitly and explicitly incorporating precautionary concepts. This indicator is likely to meet SG100.

References

LGPAS (DOF 2007).

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?	**Yes**	**Partial**	**No**

Rationale

The red snapper fishery of the GOM does not have a NOM or a Fishery Management Plan. It is currently managed only through the 2018 CNP (DOF 2018), and falls under the grouper and associated species regulations for the GOM and Caribbean, including (DOF 2015) and the Fishery Management Plan for Groupers and associated species in the Yucatan Peninsula (DOF 2014, SAGARPA 2016).

The main objective of the Mexican Official Standard for groupers and associated species in the GOM and Caribbean (NOM-065-SAG/PESC-2014) (DOF 2015) is to guarantee the conservation, preservation, ability of renewal, and optimal utilization of the different groupers and associated species and to promote the responsible use of these species, to promote their preservation and ability of renewal, as well as to promote the preservation of the environment and other biological resources.

The Management Plan for Groupers and Associated Species in the Yucatan Peninsula (DOF 2014, SAGARPA 2016) describes the recovery and rebuilding of grouper stocks as the main objective. Stock-specific objectives are not set out specifically for red snapper in the fishery-specific policy. The CNP (DOF 2018) does not describe management objectives or reference points for the fishery. It does recommend the publication and implantation of a FMP for the red snapper fishery in the GOM and Caribbean. The FMP would help to define the management objectives and to develop an appropriate and precautionary harvest strategy for the fishery, including reference points and harvest control rules.

General objectives which are broadly consistent with desired outcomes from MSC P1 and P2 are explicit, but not specific to the red snapper fishery, and possibly only long-term. Short-term objectives have not been developed or documented. SG 80 is only met partially. A NOM and a management plan need to be developed, and the CNP must be updated with specific requirements for the red snapper fishery of the GOM. Ecosystem interactions must be considered in these management instruments to comply with P2 requirements.

References

DOF 2014, DOF 2015, DOF 2018, SAGARPA 2016.

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 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 scoping 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; in some cases, by weakening 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 red snapper fishery in the Gulf of Mexico, the decision-making process may have had a number of obstacles, possibly stemming from conflicting interests among stakeholder groups, since the existing measures and strategies are very weak or non-existent. However, some measures are in place (eg., permitting and vessel/ gear/ specifications), which means that some general decisions were made for the fishery. Clear objectives must be developed before implementing any new measures. Thus, the fishery meets SG60 but not SG80, because the processes to implement measures do not seem clearly established or have been interrupted. Evidence from stakeholder meetings would perhaps be useful to score this issue, based on how successful they were or not in reaching agreements and why. Present FIP work (related to this PA) in Nuevo Campechito represents an initiative by NGOs, industry, and scientists to collaborate with authorities in the development of effective regulations based on scientific research.				
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: changes to laws and regulations, and emergency regulations, responding to critical issues. The regular process is described in Issue a above. Once draft laws or regulations are published in the official Gazette (*Diario Oficial*), they undergo 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 red snapper fishery in the GOM (eg., 2012 CNP), or to know what the management priorities are for the current administration. The updated 2018 CNP did not specify management recommendations or provide a clear idea if a red snapper NOM was under consideration or when the FMP, minimum size, or closed season regulations would be produced. SG60 is not met because no evidence is available to demonstrate that serious issues (such as a steady decline in abundance over a 20-year period) have been addressed. If they have, relevant monitoring, evaluation, and consultation have not occurred in a timely or adaptive manner, and the implications of decisions (or the lack thereof) have not been considered.				
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 red snapper fishery in the Gulf of Mexico. On the contrary, it appears that research and management recommendations have not been used to inform decisions in the past, especially because the (limited) harvest strategy is not configured to respond to stock status. Only gear-specific measures seem to be based on scientific research. 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 (than licensing or hook size) to protect the spawning stock or to prevent growth or recruitment 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 is generally available on request to stakeholders.	**Information on the fishery's performance and management action is 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	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

			review activity.	from research, monitoring, evaluation and review activity.
	Met?	**Yes**	**No**	**No**

Rationale

Information was not available to score this issue, but it is known that the management agency does not often provide information on fisheries' performance to stakeholders. For example, for most Mexican fisheries, INAPESCA is not known to share data, stock assessments, or results from research surveys with the general public, stakeholders, or with other research centers or government agencies.

SG 60 is likely to be met because some information is available upon request, such as some of the documents and data required for this pre-assessment, which were obtained by the Client. However, SG80 is not likely to be met, unless evidence is provided that reports of all management actions and decisions are shared with stakeholders. These would include minutes from technical meetings or public consultations, showing how decisions are reflected in changes in the CNP or in the development of the (proposed) FMP for red snapper.

e	Approach to disputes			
	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	**Yes**	**Yes**	**No**

Rationale

An interview with the representative of the Nuevo Campechito cooperative (N. Torcuato, pers. comm., 2019) indicated that the coop has not had any violations, and thus no legal disputes have occurred. He reported that only shrimp fishers have incurred in repeated violations by entering the lagoon and restricted areas and have been sanctioned by CONAPESCA.

Thus, anecdotal information suggests that there is no disrespect or defiance of the fishery regulations by the red snapper fishers, and SG60 is met. Even though there is no other evidence to evaluate this issue, the lack of incidents, violations, or sanctions suggests that the fishery is attempting to comply with the law, and thus disputes are unnecessary, meeting SG80. However, it is not known if the system acts proactively to resolve disputes or if judicial decisions occur rapidly. Documentation should be provided on the type and frequency of violations and how the disputes have been resolved for this fishery.

References

DOF 2012, 2018; N. Torcuato, Coop Nuevo Campechito (pers. comm., 2019)

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 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?	**Yes**	**No**	**No**

Rationale

SAGARPA, via INAPESCA and CONAPESCA, and through inter-ministerial agreements with SEMAR, SCT and SEMARNAT, regulates and carries out monitoring, control, and surveillance of the red snapper fishery in the GOM. The NOM-065-PESC-2007 for groupers and associated species establishes that it is the duty of CONAPESCA to conduct MCS activities in coordination with federal, state, and municipal entities. Fishery violations are sanctioned according to the LEGEPAS and other applicable laws and regulations.

Through interviews, COBI (Chávez, pers. comm. 2019) learned that a surveillance committee for the state of Campeche (with posts in Carmen, Sabancuy and Isla Aguada) had been created in the past to support the federal MSC system. It appears that this effort had limited results due to a large number of illegal (unlicensed) fishers who mostly capture juvenile organisms.

Currently the only measures for the red snapper fishery are fishing licences, fishing areas, and vessel and gear restrictions to control fishing effort and increase intraspecific selectivity. Currently, MCS activities in the region are carried out by the office of Control and Surveillance of CONAPESCA that also keeps records of good fishing practices and irregularities. According to interviews held by COBI with directors of INAPESCA research centers in Campeche and Yucatán (J.F. Chávez, pers comm., 2019), surveillance operations are carried out regularly and permanently at landing sites, cooperatives, storage facilities, and fishing vessels. Surveillace procedures are developed jointly with state and county authorities, the Navy, and SEMARNAT.

Anecdotal information provided by the Nuevo Campechito cooperative to COBI (Chávez, pers. comm. 2019) indicated that there have been no reports of violations by or sanctions within the UoA. This might suggest that MCS mechanisms exist, are implemented, and are somewhat effective, so SG60 is met. However, if illegal fishers exist, continue to harvest juveniles, and have not been sanctioned, the ability of the system to enforce measures or rules is compromised, and SG80 is not met.

The grouper FMP recommends strengthening MCS activities as a vital element to rebuild the resource, to guarantee that fishing activities follow the rules and regulations, to fight illegal fishing, and to limit the recreational fishery. It is important to document what MCS mechanisms are used by the authorities to enforce fishery regulations in the GOM, and Nuevo Campechito in particular. Results from enforcement activities undertaken in recent years would be helpful to better inform this indicator. More interviews with cooperative leaders and fishers and with the local management authorities are also recommended to understand the magnitude of illegal fishing in the area and why it has not been deterred.

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 LEGEPAS specifies how field fisheries officers should conduct surveillance activities, report fishery violations and apply sanctions. They have to summit the case to the Public Ministry, which is an independent body of the judiciary and the executive, responsible for investigating the offenses based on evidence. Fishery violations are sanctioned according to the LEGEPAS and other applicable laws and regulations. No hard evidence was available from the GOM red snapper fishery to know the nature of common violations, the frequency of occurrence, what sanctions are applied (eg., seizure of the catch, vessels, or gear, arrests, fines, prison time, etc.), or whether they provide effective deterrence. However, an interview with the Nuevo Campechito cooperative leader (J.F. Chávez, pers. comm. 2019) indicated that there have been no reports of violations by red snapper fishers. The only incident has been a stranded vessel with a broken engine that had to pay a fine to be towed. Most of the sanctions issued by CONAPESCA in Nuevo Campechito have been for shrimp vessels that enter the bay, which is illegal. Sanctions to shrimpers have included fines, withdrawal of fishing permits and seizure of vessels. This (anecdotal) information suggests that sanctions to deal with non-compliance exist and are consistently applied within this and other fisheries in the area. Given that there are no reports of violations within the UoA, sanctions appear to provide effective deterrence among legal fishers. However, neither the MCS system nor the existing sanctions have provided effective deterrence for illegal fishers. Thus, the fishery can only meet SG60, but the scale and nature of illegal fishing, and the efficacy of sanctions need to be investigated. Interviews with cooperative leaders and fishers in Nuevo Campechito, and with the local management authorities would be helpful to better inform this indicator.			
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				
Same rationale as above. Fishers within the UoA are generally thought to comply with the management system, however the only evidence available is from a few interviews with fishers and management authorities. Some reported that there is a high number of illegal (unlicensed) fishers in the area, who harvest juvenile organisms, do not comply with rules or regulations, and have not been deterred by the MCS system.				

d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		**No**	

Rationale
Systematic non-compliance within the Nuevo Campechito cooperative is not known to occur. However, interviewees noted that there are illegal fishers in the area that are unaccounted for, whose consistent IUU activities represent a systematic non-compliance with fisheries rules and regulations, so SG80 is not met. Interviews with cooperative leaders and fishers in Nuevo Campechito, and with the local management authorities would be helpful to inform this indicator.

References
LEGEPAS (2007), NOM-065-PESC-2007 (DOF 2016), SAGARPA (2016), J.F Chávez, pers comm. (2019).

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 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?	**Yes**	**No**	**No**
Rationale				
Updates to the CNP are the only evidence that some parts of the management system for red snapper fishery of the GOM are reviewed. The 2012 CNP described the snapper fishery as a whole, and the 2018 CNP focused on the three main red snapper species. The 2012 CNP provided trends in catch and stock status determination, as well as reference points, management measures, and management recommendations for the fishery. It is not clear if these benchmarks and recommendations were implemented between 2012 and 2018, but the last CNP presents current trends, status, and measures, and provided overarching recommendations for the fishery: to develop a NOM, to publish and implement a FMP, and to implement a monitoring and surveillance system to assess impacts. Progress related to these recommendations is not available from the fisheries management/ research authorities. While this update of the CNP is not a formal review of the fishery-specific management system, it suggests that there are mechanisms that evaluate and update parts of it, or at least the management measures are evaluated and somehow refined, particularly gear restrictions. The system however is still very basic, with components that are not structured or explicit, so a clear method to evaluate all of its parts and their performance is not in place.				
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** review.	The fishery-specific management system is subject to **regular internal and external** review.
	Met?	**Yes**	**No**	**No**
Rationale				
Stakeholder participation in the management process at the national level in Mexico suggests that the management system is subject to internal and external review, with scientists and managers from INAPESCA and other research and government agencies, NGOs, the industry and other stakeholders participating in the review process. However, the participants, form and frequency in which reviews occur for this fishery are not known. No evidence is available for this fishery, but assuming that the general fisheries management framework and the decision-making processes apply to this fishery, it is likely that it would meet SG60. This has to be confirmed				

with evidence from INAPESCA and CONAPESCA, showing the nature and regularity of internal and external reviews, for example through Annual Operative Plans, meeting minutes, etc. With the limited information available (CNPs, grouper FMP), only SG60 is met.
References
CNP 2012 (DOF 2012), CNP 2018 (DOF 2018)

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)	

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7 Appendices

7.1 Assessment information

7.1.1 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 23. – Small-scale fisheries. These percentages refer to the 6 vessels in the Nuevo Campechito cooperative. All vessels use both fishing gears. The fishing area for red snapper is between 20-60 nautical miles (40-60 km) offshore (see **Figure 1**).

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
Bottom Longline	100%	0%
Vertical Longline	100%	0%

7.2 Evaluation processes and techniques

7.2.1 Site visits

As part of the FIP project, COBI held meetings from August 20th to 23rd, 2018 with members of the fishing sector, government, research institutions and civil society organisations. The main activities conducted were:

- Presentation of the outlook of Fishery Improvement Projecs: What are they? How is the design implemented? (Francisco Fernández and Lorena Rocha, COBI)
- Presentation of the Key Stakeholders Map for the FIP project *L. campechanus* in the Gulf of Mexico (José F. Chávez, COBI),
- Development of proposals to strengthen the FIP, validation of the Key Stakeholders Map and define main acivities for the groups collaborating in the FIP (Participants).

An important result from the interaction among participants was that they expressed interest in participating in the project once the key issues in the red snapper fishery are identified.

COBI held a second site visit to the fishery from December 6th to 9th, 2018, meeting with the fishermen of Nuevo Campechito, Campeche, in order to obtain relevant information for the development of the FIP. In addition, COBI provided training sessions for recording catch information for red snapper and species associated with the fishery.

7.2.2 Recommendations for stakeholder participation in full assessment

Based on the analysis of the red snapper resource in the southern zone of Campeche and Tabasco (Sabancuy-Frontera), COBI produced a Map of Key Stakeholders, in which three proposed

categories were adapted from the sociograms by Tapella (2007), whose description is presented in **Table 24**.

Table 24. Categories proposed by Tapella (2007), adapted to the stakeholder groups participating in the red snapper fishery (COBI 2018).

Category	Description	Representative groups
Primary	Groups that make use of ecosystem services (ES)	Fishing communities and cooperative societies
Secondary	Groups that participate or influence the regulation or standardization of the ES	Governments and research sector
Tertiary	Individuals or institutions with less influence on the access and use of ES	Civil Society Organizations (OSC)

In accordance with the categorization proposed in this table, a brief description of the stakeholders that may participate in the project are outlined below:

Primary Organizations. Within this category, presidents and directors of diverse fishing cooperatives located in Frontera, Tabasco and in the fishing communities of Sabancuy, Isla Aguda, Ciudad del Carmen and Nuevo Campechito (**Table 25**) are included.

Secondary Organizations. This category includes government entities (**Table 26**) of the states of Yucatan (CRIP-INAPESCA), Campeche (CRIP-INAPESCA and SEPESCA) and Tabasco (CONAPESCA and SEDAFOP).

In addition, different research groups will participate(**Table 27**), consisting of experts in fisheries and biological aspects of Lutjanids:

- CINVESTAV-IPN, Merida (Lines of research: assessment of reproductive patterns, trophic chains, population genetics, selectivity of fishing gear and fishing management)
- UNAM-UMDI, Sisal (Spatial modelling of fishing resources, exploited population dynamics, fishery analyses, invertebrate population dynamics)
- ECOSUR, Campeche (Biology, ecology and socioeconomic analysis of fisheries)
- EPOMEX, Campeche (Biology and ecology of fishing resources).
- UNACAR, Cd. Del Carmen (Indicators and ecological models in aquatic ecosystems, Parasitology and Geographic Information Systems).
- ECOSUR, Villahermosa (Small scale fisheries, reproductive biology, age and growth of fish and trophic ecology of aquatic systems)

Tertiary Organizations. The last group comprises non-governmental organizations. From communications with fishing organizations in the region (CRIP, Ciudad del Carmen) it was concluded that there is no OSC currently focused on the management of fishery resources. However, CESAICAM (State Committee of Health and Aquaculture Safety of Campeche) is currently

in operation, an institution that works with sanitary and innocuous aspects of aquaculture and fishery resources in the state (**Table 28**).

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Table 25. Fishing society leaders in communities of Campeche and Tabasco (primary organizations).

Name	Cooperative	Position	Town
Luis Nicolas Cordero Torcuato	SCPBS PESCADORES DE NUEVO CAMPECHITO SC DE RL DE CV	Leader	Nuevo Campechito
Jose del Carmen Ulloa	PERMISIONARIO	Fisherman	San Pedro
Jose Quevedo Cruz	CPPBYS EL CHEJERE S.C. DE RL DE C.V.	President	Sabancuy
Francisco Requena Fajardo	COOP REINA DEL GOLFO	Leader	Sabancuy
Joaquin Guzman Abreu	COOP LAGUNA LA PUNTILLA	Leader	Cd. del Carmen
Joaquin Guzman Abreu	COOP CANAL DE LA PUNTILLA	Leader	Cd. del Carmen
Joaquin Guzman Abreu	COOP MALECÓN DE LA PUNTILLA	Leader	Cd. del Carmen
Santiago Jimenez Gonzalez	SPPRBSA DRAGADO CARACOL SC DE RL DE CV	Leader	Cd. del Carmen
Jose Luis Rebolledo Perez	SC DE BIENES Y SERVICIOS ALEJANDRA	Leader	Cd. del Carmen
Francisco Velazquez Inorreta	SC CARACOL ROJO	Leader	Cd. del Carmen
Tomas Jimenez	SC LOS DELFINES	Leader	Cd. del Carmen
Rolando Blanco Moreno	SC EL SALITRAL	Leader	Cd. del Carmen
Roman Alberto Solana Navarrete	COOP SIETE BARBEROS UNIDOS	Leader	Cd. del Carmen
Joaquin Ramon Acosta Reyes	CBS BELLA ISLA AGUADA SB DE RL DE CV	Leader	Isla Aguada
Santiago Sosa	SCPA MAR DE VIDRIO SC DE RL DE CV	Leader	Frontera

Table 26. Directory of the government sector in the states of Yucatan, Campeche and Tabasco (secondary organizations).

Institutions	Name	Position
CRIP, Yucalpeten	Dra. Carmen Monroy Garcia	Researcher
CRIP, Campeche	M. en C. Saul Pensamiento Villarauz	Leadership
	M. en C. Rosa Gpe. Morales Martinez	Researcher
	M. en C. Esteban Bada Sanchez	Auxiliary research
SEPESCA, Campeche	Ing. José del Carmen Rodriguez Vera	Secretary of Fisheries and Aquaculture
	Ing. Candelario Zumarraga	Director
	Ing. Ac. Juan Quintín Roman Tiburcio	Technical Secretary
	Ing. Gerardo Fernandez Quijano	Chief of Fish Registration
CRIP, Cd. Del Carmen	M. en C. Ana Gabriela Diaz Álvarez	Leadership
	M. en C. Vequi Caballero Chávez	Researcher
	Dr. Raul Enrique Lara Mendoza	Researcher
CONAPESCA, Campeche	Lic. Fernando Pizarro Peniche	Sub-delegate state
CONAPESCA, Sabancuy	C. Lizandro Valdemar Pech Pech	Office manager
CONAPESCA, Cd. del Carmen	Lic. Arely Beatriz Compañ Ruiz	Office manager
CONAPESCA, Tabasco	MVZ Eugenio Mier y Concha Campos	Fishing Sub-delegate
CONAPESCA, Frontera, Tab.	C. Víctor Hernandez Mena	Fishing office manager
CONAPESCA, Frontera, Tab.	C. Carmen Salvador Cruz	Specialized techniciane

Table 27. Research groups in the areas of biological, ecological, genetic studies of Lutjanids in the states of Yucatan, Campeche and Tabasco (secondary organizations).

Institution	Name	Position
CINVESTAV-IPN, Merida	Dr. Thierry Brulé Desmarest	Senior researcher
	Dra. Virginia Noh Quiñones	Research Associate
	M. en C. Luis A. Rincón Sandoval	Doctorate student
	Ing. Teresa Eulogia Colás Marrufo	Research assistant
	M. en C. Karina Macal Lopez	Doctoral student
	Dra. María Eugenia Vega Cendejas	Senior researcher
	cDR. Elvia Teresa Mendoza Barrera	Doctorate student

	Dra. Silvia Salas Marquez	Senior researcher
	Dr. Jose Ivan Velazquez Abunader	Senior researcher
	Dr. Daniel Quijano Quiñones	Research Associate
	M. en C. Eva Coronado Castro	Doctoral student
	M. en C. Miguel A. Cabrera Vazquez	Research assistant
UNAM-UMDI, Sisal	Dr. Jorge López Rocha	Senior researcher
ECOSUR, Campeche	Dr. Juan Carlos Perez Jimenez	Senior researcher
	M. en C. Angelina del C. Peña Puch	Doctoral student
	Dr. Alejandro Espinoza Tenorio	Senior researcher
	Biol. Romana G. Ehuan Noh	Postgraduate student
EPOMEX-UAC, Campeche	Dr. Atahualpa Sosa Lopez	Professor-researcher
UNACAR, Cd. del Carmen	Dr. Enrique Nuñez Lara	Profesor-researcher
	Dr. Lelio de la Cruz May	Director of graduate and postgraduate research
	Dra. Sandra Laffon Leal	Director, Faculty of Natural Sciences
	Dr. Rolando Gelabert Fernandez	Coordinator, Master in Ecological Restoration
	M. en C. Luis E. Amador del Angel	Profesor investigador
	Dr. Moises Frutos Cortes	Profesor investigador
	Dra. Ma. Amparo Rodriguez Santiago	Research chair CONACyT
	Dr. Eduardo A. Cuevas Flores	Research chair CONACyT
ECOSUR, Villahermosa	Dr. Manuel Mendoza Carranza	Senior researcher

Table 28. Non-governmental organizations focused on the management of finfish resources in the states of Campeche and Tabasco (tertiary organizations).

Institution	Name	Position
CESAICAM	Biol. Emilio Guzman Bayona	Coordinator of aquaculture and fishery safety projects

7.3 Risk-Based Framework outputs

7.3.1 Consequence Analysis (CA)

Table 29 – P 1.1.1 CA scoring template.

	Scoring element	Consequence subcomponents	Consequence score
Principle 1: Stock status outcome		Population size	< 60
		Reproductive capacity	
		Age/size/sex structure	
		Geographic range	
Rationale for most vulnerable subcomponent	Population size is the most vulnerable subcomponent that has been measured. Declines in CPUE and abundance have been observed for decades, and documented in the last (2000) stock assessment. The 2018 CNP classifies the stock as “deteriorated”, and it is likely that this condition is caused by overfishing.		
Rationale for consequence score	Overfished/ overfishing conditions have been reported since year 2000 or earlier. This may be a sign that recruitment has also been affected, because the stock has not recovered despite (ad hoc) management measures. Based on old assessments, low catches, declining CPUEs, constant or increasing exploitation rates, it is likely that the stock is below the PRI. Also, there are no harvest control rules, and the harvest strategy is very limited and has not been adapted to rebuild the stock.		

7.3.2 Productivity Susceptibility Analysis (PSA)

Table 30. PI1.1.1 – Preliminary PSA productivity attributes and scores.

Performance Indicator	1.1.1	
Productivity		
Scoring element (species)	*Lutjanus campechanus*	
Attribute	Rationale	Score
Average age at maturity	*L. campechanus* reaches partial sexual maturity from the first year of life and total maturity by the second year (Claro and Lindeman, 2008; Gonzalez-de la Rosa y Re-Regis, 2001; Brulé et al., 2010)	**1**
Average maximum age	*L. campechanus* have a longevity of 39 to 53 years old. In the Campeche Bank the average age is 22 years old (Gonzalez, Sanchez and Arreguin, 1994; Claro and Lindeman, 2008)	**3**
Fecundity	Claro and Lindeman (2008) noted that *L. campechanus* is a partial spawner and that the calculation of fecundity is not precise. Collins *et al.* (1996) reported an estimated partial fecundity of 458 to 1,700,000 oocytes at the SW Gulf of Mexico. Another estimate, taken from Fishbase (by Bohnsack, 1990) the absolute fecundity of snappers is 9,300,000 oocytes in the NW Gulf of Mexico (Mexican region).	**1**
Average maximum size Not scored for invertebrates	Patterson, Cowan, Wilson and Shipp (2001) reported maximum sizes from 90 to 100 cm for red snapper.	**2**
Average size at maturity Not scored for invertebrates	According to Brule et al. (2010), the red snapper reaches maturity between 24.7 cm (females) and 23.8 cm (males)	**1**
Reproductive strategy	Snapper have external fertilization and free-living larvae; they are broadcast spawners (Gonzalez-de la Rosa and Re-Regis, 2001).	**1**
Trophic level	Arreguín-Sanchez and Manickchand-Heileman (1998) calculated trophic levels of 4.2 and 4.6 for the populations of the southwest Gulf of Mexico and northern Yucatán	**3**

Density dependence- Invertebrates only		--
Susceptibility- Vessels use Bottom longlines and Vertical longlines that are deployed either simultaneously or according the species/ sizes available at any particular site. Bottom longlines harvest larger individuals and have more incidental catch than the vertical longlines, which capture smaller, younger fish.		
Fishery- Only where the scoring element is scored cumulatively	Bottom longline[6]	
Attribute	Rationale	Score
Areal Overlap	The fishery likely occurs in approximately 15-20% of the red snapper distribution in the Mexican GOM and Caribbean.	**2**
Encounterability	Red snapper (target species) is caught In 70% of the fishing trips, a value that increases between October-February. By default, the target species is high risk.	**3**
Selectivity of gear type	Based on fishermen's comments, the bottom longline seldom captures juveniles, it is aimed at larger organisms (>28 cm TL / 1-4 kg), which is due to the use of hooks 11/0 and 9/0 a – Low (1)- Individuals < size at maturity are rarely caught. b – Low (1)- Individuals < half the size at maturity can escape or avoid gear.	**1**
Post capture mortality	All red snappers are retained because it is the target species, so they are not released alive and PCM is high. The default for target species is high risk.	**3**
Catch (weight) Only where the scoring element is scored cumulatively	Average catch 2008-2018= 854.5 kg, representing approx. 8.5% on average of the total catch over that period.	**1**

[6] **Bottom Longline = Red snapper longline=** *Palangre huachinanguero*

- **Susceptibility**		
Fishery Only where the scoring element is scored cumulatively	Vertical longline[7]	
Attribute	Rationale	Score
Areal Overlap	The fishery likely occurs in approximately 15-20% of the red snapper distribution in the Mexican GOM and Caribbean.	**2**
Encounterability	Red snapper (target species) is caught In 70% of the fishing trips, a value that increases between October-February. By default, the target species is high risk.	**3**
Selectivity of gear type	Size at maturity is approx. 23-25 cm. Vertical longline is aimed at organisms between 20-28cm TL (500 a 980 g). Fishermen indicate that less than 5% of captured juveniles die because the majority of individuals <20 cm are released alive. However, the gear itself is not selective. a – High (3)- Individuals < size at maturity are frequently caught (in more than 50% of gear deployments). b – Medium (2)- Individuals < half the size at maturity are regularly caught (between 5-50% of gear deployments), and can escape or avoid gear. Juveniles are captured with vertical longlines, but fishermen report that smaller ones are released alive.	**3**
Post capture mortality	Red snappers of the desired sizes are retained because it is the target species, so PCM is high. The default for target species is high risk.	**3**
Catch (weight) Only where the scoring element is scored cumulatively	Average catch 2008-2018 = 9180.5 kg, representing an average of 91.5% of the total catch over that period.	**4**

[7] **Vertical Longline= Handline=** *Ristra = Rosario = Línea de mano*