



INTERTEK FISHERIES CERTIFICATION

June 2014

Auditor: Ian Scott

Pre-Assessment Report for The Campeche Grouper Fishery Final

Completed by: Intertek Fisheries Certification Ltd
10A Victory Park
Victory Road
Derby
DE24 8ZF
UK

Client: Sea Delight, LLC
8195 N.W. 67th Street Miami, FL 33166
P: (305)594-9797 | F: (305)594-4301

Contact: Adriana Sánchez-Lindsay
Sustainability Coordinator

Contents

EXECUTIVE SUMMARY	1
1. INTRODUCTION.....	3
Aims / scope of pre-assessment	3
Constraints to the Pre-assessment	3
Risk Based Approach.....	3
Unit(s) of certification.....	4
2. DESCRIPTION OF THE FISHERY	5
Scope of the Fishery in Relation to the MSC Programme	5
Overview of the Fisheries	5
3. PRINCIPLE 1.....	8
Introduction	8
Red Grouper	8
4. PRINCIPLE 2.....	12
Introduction	12
Retained Catch and Bycatch	12
Endangered, Threatened or Protected (ETP) species	12
Fishery Related Ecosystem and Habitat Issues	13
5. PRINCIPLE 3.....	15
Introduction	15
Legal Status	15
Administrative Status	16
User Rights.....	17
Fishers' Participation in Fisheries Management	17
Fishery Objectives.....	18
Subsidies	18
Monitoring, Control and Surveillance.....	19
6. EVALUATION PROCEDURE	20
Assessment Methodologies Used.....	20
Summary of site visits and meetings held during pre-assessment	20
Stakeholders to be consulted during a full assessment.....	20
Harmonisation with any overlapping MSC certified fisheries	21
7. TRACEABILITY.....	22
Eligibility of fishery products to enter further chains of custody.....	22
8. PRELIMINARY EVALUATION OF THE FISHERY	23
Introduction	23
Applicability of the Default Assessment Tree	23
Expectations Regarding the RBF	23
Recommendations & Conclusions	23
Recommendation.....	24
9. BIBLIOGRAPHY	25
APPENDIX 1: PROVISIONAL EVALUATION OF THE FISHERY AGAINST THE PERFORMANCE INDICATORS.....	27
TABLE 1: MEETINGS.....	20
TABLE 2: KEY TO LIKELY SCORING LEVEL.....	24
TABLE 3: SUMMARY OF PRE-ASSESSMENT SCORING.....	24

ACRONYMS

CAB	Certification Authorisation Body
CITES	Convention on International Trade in Endangered Species
CNP	National Fisheries Chart
CONAPESCA	National Commission of Aquaculture and Fisheries
CPUE	Catch per Unit Effort
CR	Certification Requirement
EEZ	Exclusive Economic Zone
ETP	Endangered, Threatened and Protected
FMP	Fishery Management Plan
GPS	Global Positioning System
hp	Horse power
IFC	Intertek Fisheries Certification
INAPESCA	National Institute of Fisheries
LGPAS	National Fisheries Law
LRP	Limit Reference Point
MSC	Marine Stewardship Council
mt	Metric tonne
NOM	Official Mexican Standard
PI	Performance Indicator
PSA	Productivity, Susceptibility Analysis
RBF	Risk Based Framework
SAGARPA	Ministry of Agriculture, Livestock, Rural Development, Fisheries & Food
SEMARNAP	Ministry of Environment, Natural Resources and Fisheries
SG	Scoring Guideline
SICA	Scale Intensity Consequence Analysis
TRP	Target Reference Point
UNCLOS	United Nations Convention on Law of the Sea
UoC	Unit of Certification

EXECUTIVE SUMMARY

The objective of this report is to provide a pre- assessment against the MSC standard for the long line Campeche Bank fishery for red grouper and black grouper by industrial and artisanal vessels based in the Mexican state of Yucatan. The main outputs of a pre-assessment are: (i) to outline the key components of the fishery; (ii) to recommend whether or not to move forward to a main assessment; (iii) to define the scope of any main certification; and (iv) to identify issues that may influence any main certification process.

The report was completed in June 2014 following a site visit to Merida in March to meet with stakeholders and gain the information required to provide an informed recommendation to the client on whether or not it was advisable to move forward to a main assessment process.

Red grouper and black grouper are two of the main species harvested in a mixed demersal fishery based on the resources of the highly productive Campeche bank located in the Gulf of Mexico to the north of the Yucatan Peninsula. Traditionally, three fleets have been active; Mexican industrial (about 515 vessels) and artisanal vessels (about 1,850 vessels) and a small fishery specific Cuban industrial fleet. It is reported that the latter is no longer active due to the obsolescence of the vessels and the poor condition of the stocks. In past years, red grouper was the most important species, but industry reports that more recently black grouper is predominant, although this is not the case in the artisanal sector.

In the 1970s the catch of red grouper reached 21,000 mt but has since declined to less than 6,000 mt. There are no data on the harvest of black grouper.

A number of management measures have been implemented – most notably limited entry (that is not effective in the artisanal fishery), a closed season to protect spawning aggregations, a minimum landing size (not effective) and a minimum hook size. The fishery is seasonal with the total level of effort in a year very much dependent on the opportunities in the more profitable fisheries for octopus and beche-de-mer. In fact, the option to switch fisheries is probably one of the most important management measures reducing effort on the grouper stocks and preventing their collapse.

In the past substantial research has been carried out on many aspects of the red grouper stock and the biology of the species is well known. From the research it is clear that the species is over fished and over fishing is continuing; the stock is below the limit reference point defined by INAPESCA of 78,000 mt and substantially below the target reference point of 124,478 mt (50 % of the estimated virgin biomass).

In contrast little is known about black grouper; this includes stock status although it must be assumed that it is the same as for red grouper.

While the need to implement a rigorous harvest strategy with associated harvest control rules for the fishery is well recognised and needed to support a stock recovery programme, for a variety of reasons there has been no real or effective response by the management authorities to the recommendations of the resource scientists.

In effect, this means that as matters now stand the red grouper fishery fails to meet the MSC standard. Stock recruitment has likely been impaired and there is not a rebuilding strategy in place. A harvest strategy to meet stock management objectives has not been applied and harvest control rules are not effective in controlling exploitation. There is insufficient data on the artisanal fishery. The stock assessment does not take uncertainty into account.

The lack of data on the species means that the black grouper fishery would be assessed using the risk based approach. On the basis of the evidence available, this fishery does not meet the MSC standard. Due to the biology of the species (high trophic level, long lived) it seems reasonable to conclude that it has high susceptibility to the fishery and would fail to meet the standard using PSA analysis. It would also likely fail to achieve a score of 60 using SICA analysis as it is considered likely that a stakeholder workshop would conclude that the fishery had adversely damaged the long term recruitment dynamics of the species.

Due to the selective nature of the fishery and the type of gear, the mixed demersal fishery by long line on the Campeche Bank would likely meet some of the criteria related to Principal 2 of the MSC standard that considers its impact on other elements of the ecosystem – specifically retained by-catch, discarded by-catch, ETP species, habitat and ecosystem.

The main issue related to the latter two P2 components is the current failure of management to protect the stocks and stop over fishing with the scale and intensity of the fishing effort potentially posing a risk to

the habitat and ecosystem. It is likely that a poorly managed fishery affects habitat structure and function and it would be possible to detect changes in the community species composition that result from the fishery. There is not a partial strategy to restrain the impact of the fishery. That being said, there is a lot of information on the two elements that is adequate to understand the impacts of the fishery.

While it is believed that the fishery has 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 as opposed to qualitative information. Furthermore, it would appear that 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.

In contrast, there are major issues for the certification of the fishery in relation to component 2.1 – retained by-catch species. Given lack of data on all the species involved the RBF would be used to score PI 2.1.1. 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. As with the main species, the fishery would fail PI 2.1.2 due to the lack of management.

P3 relates to the over arching management framework that establishes the conditions to maintain sustainability in the medium to long term. While the overall theoretical approach to fishery management in Mexico is good with a well established and defined regulatory system to support clear long term sustainability objectives, there is an issue relating to the effectiveness of stakeholder consultation and the degree to which stakeholders are, in practice, involved in the decision making process. There is a substantial issue that relates to the lack of incentives for sustainable fishing. The poverty of management measures and the lack of property rights mean that fishers see little merit in improving stewardship of the resources with the perspective of safeguarding long term fishing opportunities. The fuel subsidy will tend to support over fishing by financing fishing trips that would otherwise be unprofitable due to reduced catches. Concerning the fishery specific management system the basic elements are present and a defined FMP would go a long way to resolving many of the identified issues. However, if the fishery is to be certified and indeed if strong planning and regulations are to prove effective, compliance and enforcement must be strengthened.

On the basis of the foregoing the conclusion is that the fishery does not meet the MSC standard and should not move forward to a main assessment.

1. INTRODUCTION

Aims / scope of pre-assessment

This report sets out the results of a pre-assessment of the Campeche Bank Red Grouper (*Epinephelus morio*) and Black Grouper (*Mycteroperca bonaci*) fishery in relation to the Principles and Criteria for Sustainable Fishing (the 'MSC standard') of the Marine Stewardship Council's (MSC).

In a pre-assessment there is limited time available to research, meet with stakeholders and verify evidence. Accordingly, this report can only provide a provisional revision of a fishery against the MSC standard based on readily available information and a limited number of interviews with the client and selected stakeholders. On that basis, the main outputs of the pre-assessment are: (i) to outline the key components of the fishery; (ii) to recommend whether or not to move forward to a main assessment; (iii) to define the scope of any main certification; and (iv) to identify issues that may influence any main certification process.

This approach contrasts with a full assessment that is a transparent, lengthy and rigorous process open to public scrutiny and comment. Several expert team members assess whether or not a fishery meets the MSC standard after explicitly considering all the evidence provided by the client, stakeholders and background research. Stakeholders have the opportunity to review the draft report and later to object to the determination if they consider that the conclusion does not represent the evidence available and/or if, in their opinion, the expert team has not followed the MSC defined certification requirements.

In summary, this report provides guidance and would inform, but not influence, the team in any main assessment that may arrive at a different conclusion. It sets out:

- The information on which the pre-assessment report is based;
- The background to the fishery;
- The location and scale of the fishery;
- Fishery management arrangements;
- Other relevant fisheries;
- Key stakeholders in the fishery;
- Preliminary evaluation of the fishery against the MSC Principles and Criteria;
- Limit of identification of landings from the fishery;
- Obstacles or problems for certification; and
- A recommendation as to whether or not the fishery should move to main assessment.

It must be emphasised that in mid-2014 the MSC certification requirement (CR) will change. Given the findings of this report, any future assessment would fall under the then operating CR.

Constraints to the Pre-assessment

There were no constraints to the completion of the pre-assessment. The client provided a wide range of background material while the various meetings held during the site visit focussed on specific issues related to the potential of the two fisheries to meet the MSC standard.

Risk Based Approach

The risk based framework (RBF) was designed by MSC for use in association with the default assessment tree for Principles (P) 1 and 2. If it is determined by the assessment team that there is insufficient data to score a given outcome PI, this can be scored using the RBF. The following outcome PIs can be assessed using the RBF: 1.1.1 Stock status; 2.1.1 Retained species; 2.2.1 Bycatch species; 2.3.1 ETP Species; 2.4.1 Habitats and 2.5.1 Ecosystem

The RBF encompasses two methods for assessing the risk to each of these components from activities associated with the fishery under assessment. The methods range in complexity and information requirements from a system based on expert judgment (referred to as Scale Intensity Consequence Analysis or SICA), to a semi-quantitative analysis to assess potential risk (referred to as Productivity Susceptibility Analysis or PSA). Each of the methods provides a risk-based estimate of the impact of the fishery on the component addressed within the outcome PI (or on individual elements of that component, such as individual species or habitats). These risk estimates are in turn related to the specific scoring guideposts (SGs) used to assess the performance of the fishery against the PI for a particular component. Specifically, the risk estimates can be used to score the fishery against the 60, 80, and 100 SGs for the PIs

for P1 and P2. It should be noted that by its nature the RBF approach is more precautionary than the regular one involving the default assessment tree. More information on the RBF can be found in the document – MSC Certification Requirements Version 1.3, 14 January, 2013.

Unit(s) of certification

Four units of certification (UoC) have been identified to differentiate between the species and the semi-industrial and artisanal sectors. The eligible fishers who would be able to sell their catch as certified would be those with the required fishery license landing to processors who are members of the client group.

Species: Red Grouper (*Epinephelus morio*)
Fishing Method: Long line (Industrial)
Geographical Area: Campeche Bank
Management System: CONAPESCA
Client Group: To be defined
Eligible Fishers: All licensed fishers landing to client group

Species: Red Grouper (*Epinephelus morio*)
Fishing Method: Long Line (Artisanal)
Geographical Area: Campeche Bank
Management System: CONAPESCA
Client Group: To be defined

Species: Black Grouper (*Mycteroperca bonaci*)
Fishing Method: Long line (Industrial)
Geographical Area: Campeche Bank
Management System: CONAPESCA
Client Group: To be defined
Eligible Fishers: All licensed fishers landing to client group

2. DESCRIPTION OF THE FISHERY

Scope of the Fishery in Relation to the MSC Programme

Following review of the information, we determined that the proposed fishery would be within the scope of the MSC programme as: (i) they are not introduced species; (ii) the fishery takes place within the Mexican EEZ and is not a unilateral exemption to an international agreement; (iii) the fishery is not subject to management by an international management organisation; (iv) the fishermen do not use destructive fishing practices; and (v) the fishery under consideration has not been subject to a previous certification process. On that basis, it is confirmed that the fishery may be assessed within the scope of the MSC Principles and Criteria for Sustainable Fishing.

Overview of the Fisheries

Fishing Area

The demersal fishery of Yucatan harvests the resources found on the Campeche Bank that is in the Gulf of Mexico adjacent to the Yucatan Peninsula. The Bank lies within the Mexican Exclusive Economic Zone (EEZ) (Figure 1). The Campeche Bank forms an extensive continental platform which is 250 km wide and extends over an area of approximately 175,000 km². The slope of the bank is about 1 m per km, with the first step at 18 m depth. From that point, the slope is steeper. The state of Yucatan has 373 km of coastline (Salas *et al* 2006).

The Campeche Bank is recognised as an excellent habitat for a wide variety of commercial species that have a marine estuarine dependent life cycle. About 90% of the commercial catch consists of coastal and estuarine species that spawn off-shore, migrate in-shore to bays and lagoons as larva before migrating once again as juveniles.

Traditionally, resources were harvested by tree fleets operating in different areas. The Mexican artisanal fleet operates in shallow waters of less than 28 m, the Mexican industrial fleet in 28 m. to 56 m. and Cuban vessels (reportedly no longer active) in 37 m. to 56 m. The size of the fish caught increases with depth and the artisanal fleet tends to catch smaller examples (Zetina Moguel *et al*).

Figure 1: Location of the Campeche Bank



Source: http://upload.wikimedia.org/wikipedia/commons/f/fe/Bay_of_Honduras.jpg

Species

In Yucatan State, the fishery harvests 21 grouper species from 5 distinct genus, that together are called the grouper fishery.¹ In 2009, the total catch from the three fleets of “grouper” was 10,356 mt, or 81 % of the national total.

Fernández *et al* report that one of the most important fisheries in the Gulf of Mexico targets grouper and related species found in reef areas and rocky areas that are usually reported in a group called “escama”.² The number of species complicates data collection and affects the ability to assess the individual stocks, which, in turn, further affects the definition and implementation of effective management strategies to regulate effort. (Monroy *et al* 2000a). It has been reported that in certain locations in the Gulf of Mexico, between 35% and 70% of the total catch of escama is made up of the red grouper (*E. morio*), although in recent years (see below) in industrial fishery it appears that black grouper (*M. bonaci*) has become more important.

Fishing Fleet & Gear

Historically, three fleets participate in the fishery: “artisanal” and “industrial” Mexican fleets, as well as a Cuban fleet (López-Rocha *et al*). Entry to the fishery is now limited with restrictions on the type of gear used. Trawling is prohibited. The small scale fleet uses short lines and long lines with 150 fishhooks. The small boats may carry small non-motorised craft (caches). Similarly, many of the mid-sized fleet use 7 to 10 rowboats (alijos), each operating a long line of about 150 fish hooks. Since 1990, the use of alijos has been reduced by single long lines attached to hydraulic reels containing 1,500 to 2,000 fishhooks. The Cuban fleet used large fishing vessels with six small boats (cherneras) operating long lines with 350 fish hooks. At the site visit, we were informed that the Cuban fleet is no longer active due to obsolescence.

The industrial fleet consists of 515 vessels with mixed characteristics; constructed from wood, metal or fibre glass with a length of 10 a 22 m. They have modern technology. The artisanal fleet consists of wooden or fibre glass vessels with a length of 6.5 – 7.0 m. There are about 1,835. They use GPS.

The artisanal fleet engages in days trips up to 35 km from their landing base; the larger vessels have autonomy for 15 to 18 days trips.

Fishing Patterns

Seasonal effort shifting from one target species to another is common in many small-scale fisheries of Mexico. This reflects three main factors: (i) closed seasons; (ii) changes in stock abundance (or resource availability in coastal areas); and (iii) changes in relative prices of harvested species. This brings in an element of management as the ability to shift to another fishery (for example the high valued beche-de-mer, lobster and octopus) reduces effort on the overfished groupers. Due to reproduction-linked aggregations, groupers are more vulnerable to fishing from January to March. This led to a closed season being established between mid-February and mid-March. From the end of July, fishing efforts on demersals shift to the other species.

Management History

Fernández *et al* summarise past trends in fisheries management and planning.

Fisheries management in Mexico has undergone changes of emphasis and approaches several times in the last decades. In the 1970s, the aim was to promote small-scale fisheries and the harvest of the most valuable species (shrimp, lobster, abalone, oyster, totoaba, pismo clam, cabrilla and sea turtles) was limited to cooperatives. Emphasis subsequently placed on increasing production led to a total catch in 1979 of 1.4 million mt; five times the amount recorded 10 years previously.

The Ministry of Fisheries was established in 1982.

From the 1980s however, national catches were about 1.2 million mt. This led to a change in policy in the early 1990s that favoured private investment and “industrial” fishers and reversed the ‘reserved species’ regime. In 1994, the newly formed Ministry of Environment, Natural Resources and Fisheries (SEMARNAP) assumed responsibility for fisheries with the aim of attaining sustainable development. A new fisheries plan defined sustainability as a goal and the Precautionary Principle as a guideline. Main activities related to making the decision-making process more scientific-based, introducing a new legal

¹ http://invipisca.blogspot.mx/2011/07/analisis-de-otolitos-de-meros-en_12.html

² The demersal species under “escama” group are: groupers (*Epinephelus flavolimbatus*, *E. morio*, *E. itajara*, *E. adscencionis*, *E. drummondhayi*, *E. nigritus*, *Mycteroperca bonaci*, *M. microlepis*, *M. venenosa*, *M. interstitialis*); snappers (*Lutjanus bucanella*, *L. vivanus*, *L. synagris*, *L. analis*, *L. griseus*, *L. jocu*, *Ocyurus chrysurus*, *Rhomboplites aurorubens*); porgies (*Calamus bajonado*); grunts (*Haemulon plumieri*); banded rudderfish (*Seriola zonata*); hogfish (*Lachnolaimus maximus*); and tilefish (*Lopholatilus chamaeleonticeps*).

instrument (the National Fisheries Chart - Carta Nacional Pesquera CNP) and encouragement of greater stakeholder participation in the decision-making process. The intention was to include fisheries in a broader framework of natural resources management.

From 2000, the majority of small-scale fisheries shifted from an open access to restricted access through the introduction of licenses.

In 2000, fisheries were transferred to the Ministry of Agriculture: Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA), with policy shifting again to development of “incentives” (SAGARPA Plan Sectorial, 2001). The agency responsible for fisheries management, monitoring and enforcement is the National Commission of Aquaculture and Fisheries (CONAPESCA).

A variety of instruments may be used to regulate the individual fisheries. The Official Mexican Standards (NOM) was developed and included the usual regulations such as permits, gear type restrictions, season and area closures, and legal size limits. Until 2000, only 14 fisheries were regulated by NOMs, including shrimp, lobster and octopus.

Historic Catches

Albañez-Lucero & Arreguín-Sánchez note that the red grouper fishery has historically been the most important finfish fishery in the Mexican waters within the Gulf of Mexico. Growth of the fishery was observed from 1947 to 1972, when the highest yields were recorded. The largest catches of red grouper were in the 1970s, with up to 21,000 mt per year, but there was a notable reduction by the end of the 1980s and early 1990s.

Since then, the fishery has been depleted; by 2004, yields were less than 6,000 mt. This resulted from the number of new entrants and fisheries being used as a social instrument to support the population migrating from other States with the stock being fished at all life stages. The industrial fleet affects older adults while, by reason of their area of fishing, artisanal boats target juveniles and young adults. Until recently, the fishery was shared with the Cuban fleet under an agreement signed in 1976. In 1964, the Cuban fleet had 65 units; in 1975 55 units; and in 1995 44, before reducing to 16. Due to the status of the stocks and their vessels, Cuba does not currently have a quota.

Present stocks are about a third of those estimated in the early 1970s. In the early 1990s some authors reported a decreasing trend in stock abundance, reflected in decreasing catch ratios. In a Federal Government report, Burgos-Rosas and Pérez-Pérez (2006) suggest the exploration of restriction-of-fishing areas as a potential management tool for stock recovery.

From 2000 to 2005, the catch of red grouper on the Campeche Bank averaged about 8,000 mt per year (Fernández *et al*). As reported in <http://www.inforural.com.mx/spip.php?article86488> Yucatán produced 13,384 mt of grouper in 1995, 10,922 mt in 2005 and 5,500 mt in 2011.

On the site visit, one processor reported that in the past 3 years the catch of black grouper has increased to the extent that it is now a main species for the industrial fleet.

3. PRINCIPLE 1

Introduction

Principle 1 reviews the target species under two considerations covering seven PIs:

- The status of the stock (in relation to defined indicators such as target and limit reference points), the existence of biological reference points and, if the stock is below the target reference point, the success of management to recover the stock; and
- The management of the stock in terms of harvest strategy, harvest control rules and tools, the information available to develop those approaches and the nature of the actual resource assessment.

Red Grouper

Biology¹

As noted above, a substantial body of literature is available on any aspects of the biology of red grouper, with a variety of investigations. For example, catchability is covered by Lopez-Rocha and Arreguín-Sánchez); Rios Lara *et al* analyse the fishing communities in the red grouper fishery on the Campeche Bank. Gimenez-Hurtado E. & F. Arreguín-Sánchez report on natural mortality.

Distribution. Red grouper is distributed from Massachusetts (USA) to Rio de Janeiro (Brazil); however, the highest densities are located within the Bank Campeche. There are major fisheries for red grouper in the eastern Gulf of Mexico, Campeche Bank, Isla Margarita and off Brazil. It is the most abundant grouper (along with the Gag, *Mycteroperca microlepis*) in West Florida commercial catches; frequently caught in the Florida Middle Grounds, eastern Gulf of Mexico.

Habitat. The species is an inhabitant of the benthic community in tropical waters temperatures above 20 °C and higher densities are between 20 and 25° C. By their demersal habits, this species has high affinity for hard bottoms, coral reefs and any shelter fund. Juveniles of 3 to 20 cm standard length are occasionally found on shallow seagrass beds and inshore reefs. Larger juveniles (20 to 40 cm standard length) are commonly found in crevices and under ledges on rocky reef bottoms in depth of 5 to 25 m. At 40 to 50 cm standard length and to 4 to 6 years of age, females become mature and begin to migrate to deeper water (50 to 300 m) where they also occur over sandy or mud bottom.

Length. Maximum reported total length was 125 cm. Maximum age 25 years.

Maturity. The first observation of 100% mature female was made at fish age four and total length of 450–499 mm (five fish). The next observation of 100% maturity was made of fish age five and total length of 400–449 mm (two fish). The majority of red grouper observed in the fishery range from approximately age five to eight years. Size and age of sexual transition are 301–676 mm SL and 3–13 years respectively.

Generation time. The generation time of this species is estimated to be between 8 and 11 years.

Spawning. The species is a protogynous hermaphrodite and, although not demonstrated to be an aggregation spawner, may be caught in greater numbers during the reproductive season. The fertility average is 253,350 eggs per female. Spawning takes place from February to April in the Eastern part of the Campeche Bank, between 20 and 90 m depth. Another report (Seafood) notes red grouper spawn multiple times per year in waters deeper than 25 m. Annual fecundity ranges from 631,400 to 17,141,170 eggs per female individual. There are conflicting reports whether red grouper aggregate to spawn; one researcher concluded that red grouper are one of the few grouper species that do not aggregate to spawn but another argues that it does aggregate to spawn off Mexico, and this is a key aspect for management of this resource.

Recruitment & Migration. Recruitment fishing for grouper occurs between the first two years of their life cycle in the coastal zone. Although it has territorial behavior, on the continental shelf of Yucatan there are seasonal movements within its distribution. Albañez-Lucero & Arreguín-Sánchez note that appropriate management measures require a foundation of strong scientific evidence. There is a need for greater knowledge of the spatial distribution of red grouper and information about the distribution of the stock in a non-declining state close-to-optimal habitat usage that can be used as reference when comparing stock recovery hypotheses. The information identifies the potential for restriction of fishing areas to protect zones with greater probability of survival, growth and reproductive success. In general terms, juveniles show two main regions of high abundance near the coast. According to the literature,

¹ Using Garcia – Molliner *et al* 2004 & INAPESCA 2002

these areas of aggregation are probably associated with food availability. The central and eastern regions of the northern Yucatan coasts are well known for their relatively high abundances of fishes and invertebrates, probably associated with coastal systems and related to coral substrates. Except during the autumn, when fish appear to be dispersed, aggregations of juveniles are present throughout the year in the identified locations. Pre-adults show a single area of high abundance during the winter on the eastern-central region of the continental shelf, due to reproductive aggregation behaviour. It is suggested that fishes of all ages present east to west seasonal movements associated with the reproductive process. During other seasons, pre-adult fish are dispersed along the continental shelf. Adults show aggregation during the winter and early spring, relatively far from the coast in deeper waters on sandy-type substrates. Such concentrations are present on the northern continental shelf. During other seasons, adult fish are dispersed throughout the continental shelf. Young individuals that are distributed near the coast move to greater depths as they grow larger. Young fish (1 to 3 years) are found in shallow waters near the coast between 10 and 30 m depth and adults (over 4 years) are at depths of up to 130 m.

Prey. This species is an opportunistic carnivore, not specialized, that mainly consumes crustaceans, fish and molluscs. Giménez *et al* 2001 found that fishes (28%), crabs (43%), and shrimps (18%) integrated the main feeding groups in the stomach contents, with no preferential prey-feeding pattern observed. Crabs (33%) are the preferred prey for fish smaller than 55 cm. From this size on fishes (42%) become the most represented items. A significant difference was found in the frequency distributions of preys by regions, with the central region showing the highest abundance. No significant differences in the prey frequency distributions by depth were observed. Feeding activity occurs all around the year, with fish between 32 and 52 cm showing the greatest activity.

Stock Status & Management Strategy

It is clear from a large number of reports that the red grouper fishery in the Campeche Bank has been overfished over an extended period.

Zetina Moguel *et al* 1996 reported that analyses of the stocks of red grouper did not take into account the interactions between the three fleets that take different sizes of fish although there was some over lapping. They found the exploitation level to be below the optimal biological and economic levels and any increase in fishing mortality by the artisanal fleet would have the smallest negative impacts on the catches of the other two fleets.

Salas highlighted that a number of assessments of resource status have shown significant reductions in biomass from 240,000 mt in 1958 to 61,000 mt by 2000. In 2002, the National Fishing Charter (Alvarez-Torres *et al.*, 2002) (an instrument of the federal government that describes the condition of and management objectives for Mexican fisheries) defined the red grouper fishery as overfished and stated that recovery is the primary objective for its management. Burgos *et al.* 2003 indicated that in the early 2000s the average annual catch was 7,900 mt, with a total available biomass of 52,500 mt. This was considered a critical figure. The decrease in the vulnerable biomass led to a decrease in the catch per unit effort (CPUE) and over-exploitation of the resource. In 2003, the estimated biomass of red grouper was 45,500 mt which was well below the Limit Reference Point (LRP) of 74,500 mt and about one third of the stock size in the early 1970s (INAPESCA 2005). This led INAPESCA to propose the establishment of catch quotas with a defined LRP. This measure was considered inappropriate due to the need for accurate assessments of biomass and to ensure accurate monitoring to set and manage quotas. The fishery lands to a large number of places.

The main causes of overfishing are considered to be high fishing pressure in areas of reproductive aggregation and juvenile nursery zones. An analysis of the spatial-seasonal variation in catchability was undertaken using data from 1973 to 1977 (Albañez-Lucero & Arreguín-Sánchez) to detect areas of higher vulnerability to fishing, taking into account the red grouper developmental stages (juvenile, pre-adults, and adults). Results showed that the adult catchability was higher during the reproductive period (January-March) in the eastern part of the Campeche Bank. High catchability zones for juveniles were found along the year in coastal areas near Celestún, Dzilam de Bravo, Río Lagartos, and El Cuyo (Fernández).

INAPESCA 2005 concluded that the stock was over exploited. The LRP was set at 78,000 mt or about 30 % of the unfished biomass. The target reference point (TRP) was set at 124,478 mt (about 50% of the unfished biomass of 248,548 mt). A Management Strategy Evaluation (MSE), led to a proposal to recover the biomass to the LRP within 5 years and to the TRP in 20 years. This would be possible by increasing the minimum landing size, extending the closed season to cover all the reproductive period and

introducing closed areas to protect reproduction and recruitment areas. However, even closure of the fishery would not lead to recovery to the TRP with the short to medium term.

Black Grouper¹

Distribution. *Mycteroperca bonaci* is a western Atlantic species distributed from Bermuda and Massachusetts (USA) to Brazil (Villa des Remedios Island (northeast of Natal), to about 28°S), including the Brazilian off-shore islands, the southern Gulf of Mexico, Florida Keys, Bahamas, Cuba and throughout the Caribbean. Adults are unknown from the northeastern coast of the USA.

Habitat. *Mycteroperca bonaci* is a solitary species inhabiting rocky and coral reefs and can withstand some degradation in its habitat. Their depth ranges was found from 6 to 75 m. Juveniles sometimes occur in estuarine seagrass and oyster rubble habitat in North Carolina and South Carolina. In the Florida Keys, juveniles settle on patch reefs, similar to those in Brazil.

Feeding. Adults feed primarily on fishes, including grunts, snapper, and herrings. Juvenile black groupers feed solely on crustaceans.

Reproduction, age and maturity. The species is a monandric, protogynous hermaphrodite that forms spawning aggregations. According to a study in Campeche Bank, females changed sex between 85.5 and 125.0 cm FL, with median length of 103.3 cm FL. At 114.5 cm FL, 50% of the females in the sample had transformed into males. The age at sex change was 15.5 years. The smallest size of *M. bonaci* in transition reported in Brazil by Teixeira *et al.* (2005) was 64 cm (LF). This size is similar to the size of the Cuban *M. bonaci* (LT of 65 cm) determined by García-Cagide and García (1996), but smaller than the Floridean type observed by Crabtree and Bullock (1998) with a LT of 94.7 cm (92.3 cm LF). In Campeche Bank the size at which 50% of the females transformed to males was 111.4 cm, and in Florida 119.9 cm.

Spawning. Black grouper probably spawn throughout the year; however, peak spawning in the Campeche Bank, the spawning season for black grouper is also from December to March. Brulé *et al.* (2003) did not observe spawning aggregations for *M. bonaci* from the Campeche Bank.

Age. In South Florida, black grouper appears to reach a maximum age of at least 33 years, and its growth was most rapid for the first ten years and then slowed considerably. The von Bertalanffy growth equation was $TL = 1,306.2(1 - e^{-0.169(Age + 0.768)})$. In Florida Keys, the most rapid growth was in the first three to four years, and then gradually trended downward throughout the remaining years, and the maximum age estimated was 14 years.

Maturity. Age of first maturation was 5.2 at a size of 82.6 cm, and age of transition was 15.5 years by a length of 121.4 cm. The size of first maturation for black grouper from Campeche Bank was 72.1 cm.

Natural mortality. This is estimated to be 0.15. It has been found that black grouper live for at least 33 years and attain sizes as great as 151.8 cm TL. Females ranged in length from 15.5 to 131.0 cm TL and males range in length from 94.7 to 151.8 cm TL.

General. *Mycteroperca bonaci* occurs in several marine protected areas throughout its range.

Stock Status

There is limited information on the status of the stock. It is assumed to be over fished.

Harvest Strategy & Harvest Control Rules

Ferreira *et al* report that as grouper landings in the Campeche Bank decreased between 1991 and 1997, the Mexican government proposed management measures to protect the grouper resource, but without considering the biological characteristics and fishery aspects of each exploited species.

López-Rocha reports that the fishery was regulated through issuing fishing permits and a minimum legal size of 30 cm total length. From 2003, a closed season was implemented from 15th February to 15th March, to protect red grouper during reproductive season. The Cuban fleet was governed by an agreement that set an annual catch quota; in the mid 2000s this was 3,500 mt of demersal fish of which red grouper comprised around 70%.

Alternative harvest strategies have been proposed to promote population recovery, e.g. closed areas covering waters <20 m deep to protect juveniles and greater than 70 m deep to protect adults. Other suggestions were to identify and protect critical areas for nursery and spawning aggregations. It has been demonstrated that the catchability of red grouper in the Campeche Bank is affected by their aggregation

¹ Mainly from Ferreira *et al*

reproductive behavior when fish density increases. Estimates of spatial and seasonal variation of catchability could be useful in developing management actions, since catchability reflects areas and seasons when red grouper is more vulnerable to fishing and is related to high yields. López-Rocha & Arreguín-Sánchez focused on determining spatial and seasonal variation of catchability and its implication for fishery management by considering Fishing Restricted Areas (2008).

In May 2007 a draft standard was presented for the grouper fishery to strengthen the management of grouper and associated species under Federal control in the Gulf of Mexico and the Caribbean.

This was based on the needs identified by INAPESCA (2006). The draft limited the fishery to the use of industrial vessels with accompanying small vessels and artisanal boats using a single small outboard motor. This is 15 hp; in practice vessels use much larger motors. Larger vessels were allowed to use a maximum of 4 long lines with 500 hooks, or a single long line with a maximum of 2,000 hooks. Smaller vessels (< 10 GRT) could use up to 750 m of line with 250 hooks, with a defined circle hook size 7 to reduce the catch of small fish. Fishing was not allowed in protected areas. The minimum size was to 51 cm. Bait was restricted to sea product.

Comments on the draft led, in 2009, to a change with the initial minimum size defined as 30.9 cm, with an increase to 36.3 cm in the second year and further increases as announced (Diario Oficial 2009). This responded to concern about the impact of the increased minimum size on the catch possibilities of artisanal fishers who tend to take the smaller fish found closer to the coast. On the site visit, the auditor was told that there is consideration of increasing the minimum size to 42 cm. The impact of the use of the new hooks was evaluated by Brulé *et al* 2011.

The CNP (2010) proposed a harvest strategy for all species in the “escama” fishery. The identified harvest strategy was not to allow any increase in fishing effort, with a precautionary approach. The basic need was to improve the information available on all species and develop appropriate biological reference points. To improve management, there would have to be better biological information and an estimate of exploitable biomass. Indications of spatial distribution would provide the basis for regional differences in management approach. Ecosystem modelling was needed to understand the relationships between the various species. To reduce the catch of juvenile species, more selective gear was needed. There should be consideration of the potential for quotas – either community or individual. The various measures should be defined in a Fishery Management Plan (FMP).

One form of management has been dependence on alternative fisheries such as sea cucumber (Quintal *et al* 2013) and octopus. However, there is no guarantee that these resources will not be overfished leading to a domino effect on other stocks.

4. PRINCIPLE 2

Introduction

Principal 2 considers the impact of the fishery under assessment on five other elements of the ecosystem; retained by-catch species, discarded by-catch species, endangered, threatened and protected (ETP) species, habitat and the ecosystem. Each component is considered against three PIs – the status of the relevant element, the management strategy and the availability of information. In scoring the fishery (see below), if more than one element is considered to be impacted by the fishery then each of those elements is scored, with the resulting score being based on the average of the individual scores.

Retained Catch and Bycatch

In MSC terminology, retained species (Component 2.1) are that part of the by-catch that is retained by the fishing vessel rather than being discarded (which is termed bycatch) (Component 2.2).

MSC requires that the target fishery does not pose a risk of serious or irreversible harm to the retained non-target species and the discarded non-target species and do not hinder the recovery of the stocks of those species when they are depleted. When scoring each PI at scoring guideposts SG60 and SG80, there is consideration of the main species which are defined as those that contribute more than 5 % of the total catch when the target species is landed, or those that have a high value valuable or are considered vulnerable. Scoring at SG100 considers all retained species. The fish used as bait is considered as a retained species and in some fisheries it can be the main retained species.

In any main assessment, the targeted fishery for the two species under consideration will be covered separately, and the experts will look for information on the by-catch in each. To identify main species, the team will look at the most recent data available, annual trends and any marked seasonal variation (e.g. over a year the retained catch of a species may be less than 5 %; however in the case that it is only harvested on a seasonal basis the expert team may decide that it is a main species).

In the industrial fishery it was reported that up to 60 per cent of the catch was red grouper, with the remainder mixed (mainly Serranidae and Lutjanidae) with variation by ground and season. The usual bait is sardine, with a high proportion used in relation to the catch. Because of the low selectivity and diversity of fishing gears and methods in the small-scale fisheries, the catches contain a considerable number of different species. Given the informal nature of the artisanal fishery it is difficult to identify other species and their relative importance in the total catch. However, it is likely that a low proportion of red grouper is caught. Fernandez *et al* comment that most of the products harvested by the small-scale fleet are sold and rarely discarded. In multispecific fisheries, as many stocks are diminishing and catch-per-unit effort continues to decline, fishers tend to keep those resources that can be traded in such a way that the travel costs can be compensated and a profit generated from every fishing trip.

Endangered, Threatened or Protected (ETP) species

The team in any main assessment will define endangered, threatened or protected (ETP) species as: Species that are recognised by national ETP legislation; or Species listed in under Appendix 1 of the Convention on International Trade in 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, any other species which have interactions with the fishery are assessed under retained by-catch and discarded by-catch. Impacts may be direct (i.e. through catch) or indirect (e.g. the effect of ghost fishing or through collisions with the boat and/or gear). Species include such as birds, corals and cetaceans.

The Mexican agency charged with compliance is La Procuraduría Federal de Protección al Ambiente (PROFEPA).¹ A list of protected species in Mexico as noted in NOM-059-SEMARNAT-2010 is at http://www.profepa.gob.mx/innovaportal/v/429/1/mx.wap/especies_marinas_protegidas.html. It includes all types of turtle, corals (*Acropora cervicornis* and *A. palmata*), whales and sea lions (*Arctocephalus townsendi*). A third of all corals off Yucatan are found in seven marine protected areas.

Interviews with stakeholders during the site visit indicated limited interaction between the fishery and ETP species, and reference was made to the strong sanctions for damaging coral and killing turtles.

¹ See http://www.profepa.gob.mx/innovaportal/v/1161/1/mx/acerca_de_profepa.html

Fishery Related Ecosystem and Habitat Issues

The team in any main assessment would assess the impact of each of the fishery in relation to its potential to the effect the structure and role of the habitats. Serious harm means substantial change in habitat types or abundances, and disruption of the role of the habitats. Irreversibility implies some sort of regime change from which recovery may not automatically occur.

Potential ecosystem impacts of the fishery are from removals of a highly abundant species that plays a significant role as predator and prey. There are also effects on other target and non-target species from a high yield fishery.

As exemplified by the Moreno & Salles, a wide range of work completed on Oceanographic conditions on the Campeche Bank. Their study includes 10 papers on a wide range of issues that are non-fishery specific. Pinerio *et al* 2001 highlight the importance of currents in the timing of fish migrations.

As described by Zetina Rejón *et al* “Although, *some studies carried out in this region had recognized two typical ecosystems, the Campeche Sound and the Continental Shelf of Yucatan, there are evidences based on the life history of several species (shrimps, Spanish and king mackerels, octopus, red grouper among others) that suggest that both systems functions in synchrony or even could be consider like one ecosystem*”.

Tunnell & Chapman describe the Campeche Bank as an extensive submarine continuation of the limestone plateau that forms the Yucatan Peninsula that extends for about 650 km along the western and northern coasts off the Yucatan in the southeastern Gulf of Mexico. The bank is characterized by relatively shallow waters with many shoals and coral reefs, but few emergent islands. Within the Campeche Bank there are only four groups of islands that are large enough and sufficiently elevated to support terrestrial floras and faunas; 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.

Fisheries in the region are complex due its multi-species nature (Albañez-Lucero & Arreguín-Sánchez). The use of alternative methods and gear is a common practice in the Yucatan, making it difficult to perform and obtain reliable estimates of effective fishing effort applied on the various resources exploited. Additionally, the fishery resources have a high dependence on various ecosystems (wetlands, estuaries and coral reefs, etc.) at different life stages, and these are increasingly impacted by human activities and meteorological phenomena. This means that the evaluation of fisheries must consider several external elements that may affect the sustainability of the resources. There has been some work on this with studies that integrate habitat assessments and interactions between species and / or fleets. It is important to also take into account the dynamic nature of ecosystems, with evaluations considering the spatial and temporal components of the dynamic processes that occur. Salas *et al* 2006 report that variations in the distribution and abundance of organisms can be viewed as being conditioned by various coastal processes and oceanographic features. On the Yucatan coast those natural phenomena that have had more impact include red tides, wind and hurricanes. These may play a fundamental role in determining the catch recorded in the area and the success or failure of fisheries.

A number of ecosystem models based on trophic webs have been developed with emphasis on fishing activity using an ‘Ecopath with Ecosim’ platform (Fernandez *et al*). Some ecosystem trophic models based on the Ecopath-Ecosim software have been applied to different ecosystems on both coasts of the country: Campeche Bank, the coasts of Veracruz and Yucatán, the northern and central Gulf of California, La Paz Bay, Huizache-Caimanero system of lagoons, and the coasts of Jalisco and Michoacán, among others. Several of them have been used for modelling fisheries dynamics in the context of the ecosystem approach management strategies or assessing fisheries impact on the ecosystems. A number of trophic ecosystem models have been constructed along both littorals, putting emphasis on the role of fish resources. Generally most of these models consider functional groups at the level of families with the exception of target or overfished species which are considered individually. The research has been focused to investigate the role of some stocks within the ecosystem, concentrating on fisheries management and conservation, and to evaluate the impact of fishing of some resources on the ecosystem.

The Campeche Bank, Gulf of Mexico, is a region with abundant coral reef ecosystems that haven’t been studied despite providing goods and services to some human communities. The Sisal Reefs provide habitats for diverse species that would otherwise be absent from the near-shore region group of the

Campeche Bank (Zarco- Perelló *et al*).

ArreguínSánchez & Valero analyse the trophic role of red grouper that occupy a high trophic level in the ecosystem, together with mojarras, king mackerels, snappers, sharks and octopuses.

Mazurek notes that a review of the fishing gear used in the Southeastern U.S. concluded that the weights and lines associated with these gears 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.*” It is possible that with the kind of commercial and recreational effort observed for the grouper fisheries, damage to and fouling of coral structure do occur. The extent of these effects however, is unknown at this time. Although the ecosystem-level effects of reduced grouper biomass remain somewhat uncertain, a few studies provide evidence that reductions can have important direct and indirect impacts. Several groupers, including red and yellowedge, 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, vermilion 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.

Groupers also function as top predators. One author experimentally demonstrated that reduced abundances of the intensively-fished Nassau grouper resulted in a strong trophic cascade, with drastic negative effects on entire communities and populations of reef fishes. Given their roles as ecosystem engineers and top predators, it is possible that reduced biomass of groupers could have substantial impacts on the marine systems in which they live. Bianchi *et al* find evidence that changes in demersal fish community structure may be related to fishing.

5. PRINCIPLE 3

Introduction

Principle 3 covers the governance and policy aspects of each of the fisheries under assessment.

The first part (Component 3.1) is intended to capture the broad, high-level context of the fishery management system within which each of the fisheries under assessment is found. As stated by MSC “*Performance elements within this Component include the legal and/or customary framework that overarches the fishery, and possibly other fisheries under the same management framework; the consultation processes and policies, as well as the articulation of the roles and responsibilities of people and organizations within the overarching management system and other overarching policies supporting fisheries management.*” On that basis, the same analysis would be relevant to each of the species covered by this pre-assessment.

The second part (component 3.2) deals with the fishery specific management system, and thus relates to each of the three individual fisheries. At the same time, it may be expected many of the elements will be common to each of the three, especially the decision making processes, compliance and enforcement, and management performance evaluation.

Legal Status

The Mexican Republic comprises 31 states and the Federal District. Each of these states is free and sovereign, and has its own constitution and congress. Although the Federal District has no constitution, it does possess a local congress that houses the three federal government powers (Federal Executive, Legislative and the Supreme Court of Justice). 17 of the States are on the coast. The states are divided into municipalities (Ponce Diaz).

Despite this, the direct responsibility for fishing management has resided with the federal government.

As described by Centro de Colaboración Cívica *et al* (CCC) La Ley General de Pesca y Acuacultura Sustentables (“LGPAS”) was published in the Federal Gazette on 24 July 2007, entering into force in October of the same year. It replaced the 1992 Law. LGPAS maintains the basic structure already established by the previous law, but acknowledges the sustainable use of fishing resources as a cornerstone to promoting economic activities from a perspective that enables better living standards and quality of life for future generations.

The defined objectives of the new law include: (OECD):

- Establish and define principles to promote and regulate all of the management and sustainable use of fisheries resources, by taking into account social, technological, biological and environmental aspects.
- Fix the basis for the regulation, conservation, protection and the sustainable use of fishery resources as well as protecting and rehabilitating ecosystems.
- Fix basic norms for planning and regulating the sustainable use of fisheries.
- Provide right of access for indigenous groups.
- Establish basis and coordination mechanisms between federal authorities, states and municipalities.
- Determine and establish bases for the creation, operation and functioning of participative structures for fisheries.
- Support and facilitate scientific research.
- Establish the National System of Fisheries Information.
- Determine offences and related penalties for non-compliance.

LGPAS introduced National and State Fishery Councils to improve the decision making process. CCC considers that the inoperability of the established system promoted illegal fishing activity and postulates that improving the system will help resolve the problem.

In 1982, Mexico signed the United Nations Convention on the Law of the Sea (UNCLOS) and the Agreement regarding the implementation of Part XI of the Convention. Previously in 1976, the National Constitution was modified to include the 200-nautical-mile EEZ. In 1999, Mexico signed the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas. In 1995, Mexico signed the FAO Code of Conduct for Responsible Fisheries. Mexico

has been an active promoter of this Code (Fernández *et al*).

In addition, Mexico is party to other international treaties relating to fisheries (Ponce-Diaz *et al*), of which the following may be considered relevant to this pre-assessment.

- Fishing Agreement between the Mexican United States Government and the United States of America Government (1976);
- Fishing Agreement between the Mexican United States and the Republic of Cuba (1976);
- Government and the United States of America Government on Traditional Fishing in the Exclusive Fishing Zones Adjacent to the Territorial Seas of Both Countries (1967);
- Agreement on Fishing and Conservation of Open-Sea Living Resources (1958).

Similarly, membership of the following International Agencies may be considered relevant to this assessment.

- COFI – Comité de Pesca de la Organización de las Naciones Unidas para la Agricultura y la Alimentación (UN FAO Fishing Committee); and
- OLDEPESCA – Organización Latinoamericana de Desarrollo Pesquero (Latin American Organization for Fisheries Development).

Administrative Status

A number of identified government agencies have direct power and obligations in relation to the use, management and conservation of fishery resources (Ponce-Diaz *et al*).

CONAPESCA (National Commission of Aquaculture and Fisheries). The administrative structure of CONAPESCA includes one commissioner, different offices such as planning and evaluation, promotion, fisheries management, physical infrastructure, surveillance, and a legal department. CONAPESCA's powers and obligations include: proposing and coordinating national policies in matters of rational and sustainable use of fishing resources; the development and promotion of fisheries; administering, regulating, and developing the use and conservation of fisheries resources; proposing general criteria for the establishment of economic instruments to promote the integral development of fisheries; proposing and executing the general surveillance and monitoring policy in commercial fisheries with the participation of other federal government agencies; and issuing fishing licenses.

SAGARPA. The commissioner is appointed and can be removed by the Federal Executive via the Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA).

Consejo Nacional de Pesca. CONAPESCA receives advice from the National Council of Fishing and Aquaculture. This Council is composed of representatives of social organizations, producers from the private sector, and governmental representatives.

INAPESCA. The National Institute of Fisheries is the Ministry's scientific and technical advisor. In addition to aquaculture related activities it: conducts research with an integral and interdisciplinary approach, linked to the fishing activity's natural, economic and social processes; supports, develops and promotes the transfer of research findings to fishers; drafts and updates the National Fisheries Chart; support the administrative units involved in the conduct of ecological management and environmental impact studies for any activities carried out by the National Commission of Aquaculture and Fisheries in fishing matters; contributes to risk analyses related to the introduction, establishment and spread of pests and diseases affecting fisheries; and offers professional services to private and public users in scientific and technological research, technical opinions and verdicts, and advice in the Institute's competence areas.

SEMARNAT. The Ministry of the Environment and Natural Resources is a federal government agency in charge of marine protected flora and fauna. Its tasks are to promote the protection, restoration and conservation of ecosystems, natural resources, and environmental goods and services, to foster their sustainable use and development, and to issue and lead national policies in matters of natural resources, provided these have not been explicitly assigned to another agency (as in the case of CONAPESCA).

Other Federal Agencies. Federal government agencies include the Ministry of Maritime Affairs, the Federal Attorney's Office for Environmental Protection, the Republic's General Attorney's Office, the Federal Preventive Police, and other local police forces which may assist in enforcing the Fishery Law with special regards towards sanctions.

State Agencies. State level there are a series of institutions that have been established in relation to fishing activities. They are mostly oriented towards development, supporting investments to get licenses,

approvals, and other requirements from the federal government, as well as obtaining funds for these productive activities. The Consejo Estatal de Pesca y Acuicultura has two industry representatives. The one in Yucatan is looking to increase its role in fisheries.

Enforcement. Before the mid-1990s, the Secretariat of Fisheries had an inspection and enforcement body. After being incorporated into SEMARNAP, fisheries inspection and regulation enforcement was incorporated in PROFEPA (within the Ministry of Environment). When the fisheries regulation was transferred to SAGARPA, most former fisheries inspectors remained in PROFEPA or were transferred to SAGARPA's delegations with no formal links to CONAPESCA (CCC).

Research. Several research centres have developed scientific research efforts on fisheries issues. However, although scientists from those institutions have been participating with fisheries (federal and states) authorities and advising enterprises or fishers about management in the last decade, there are no institutional schemes to completely formalize the use of this scientific infrastructure (CCC). The grouper fishery has been studied in depth. Early studies date back to the 1960s. Later studies include growth, catchability, the state of the fishery, and interaction of fleets (Zetina *et al*). Monroy *et al* summarize many important aspects of the fishery. Mexicano-Cintora *et al* (2007) also integrate a list of references of studies related to grouper and other demersal fishes from the Yucatán shelf (Fernández *et al*).

Statistics. Statistics are gathered periodically by local fishery offices, subordinated to SAGARPA's delegations. This information is processed by CONAPESCA to produce, among other things, statistical year documents. INAPESCA gathers data from samples on some fisheries included in research projects.

The CNP was authorised by an Official Decree in 2000. It has the function of defining levels of fishing effort applicable to species and groups of species in specific areas and giving guidelines, strategies and provisions for conservation, protection, restoration and management of aquatic resources that could affect their habitat and ecosystems. The CNP has a binding character that must be considered in the process of decision making by management authorities. Initially it was thought that it would be updated regularly, i.e. it would be evergreen with modifications as required. However, the CNP has been updated one time – in 2010.

The efficiency of the system is reported to be hampered by poor inter- and intra- institutional cooperation (OECD and <http://www.inforural.com.mx/spip.php?article86488>). There is also reported to be a poor understanding of the respective roles of the various agencies in the management framework. This is said to be especially the case in relation to compliance duties (OECD). A recent comment (January 2012) notes a continued inability to fix objectives and implement management activities based on a regional and an inter-sectoral vision (<http://www.inforural.com.mx/spip.php?article86488>).

OECD noted that there is a need to improve agency coordination; there are many overlapping areas of responsibility.

User Rights

The second article of the Mexican constitution confirms the preferential right of indigenous peoples and communities to the sustainable use of fisheries resources. The Fishery Law (2007) considers that all Mexican indigenous communities have preferential access rights to fishing resources in their areas and there are programmes that promote fishing activities in those communities that use traditional fishing gear and practices. Indigenous communities must be consulted if a concession or license has the potential to impact them. Also, federal authorities must ensure that the native communities understand the process and the documentation (Ponce-Diaz *et al* 2009).

Fishers' Participation in Fisheries Management

Both artisanal and industrial fishers have representative organisations such as the National Fishing Cooperatives Confederation and the National Fishing and Aquaculture Chamber. There are several thousand registered fishing cooperatives in Mexico, and a similar number of other organisations such as Fishing Production Societies, Fishing Production Unions, Social Solidarity Societies and others (Fernández *et al*). To enhance stakeholder participation, the Federal Metrology and Standardization Law requires that there should be committees to allow them to participate in decision-making processes (such as issuing Mexican Official Norms or the definition and implementation of management decisions e.g. establishing closed seasons) and confer with CONAPESCA that is responsible for the final decision. CCC considers this process is far from perfect with artisanal fisher organisations having limited support on yet technical issues and reported that full representation of those invited to attend the meetings had not been

achieved.

Ponce Diaz notes that fishermen are grouped into a number of organizations; some with commercial interests, others more orientated to providing social benefits to their members. He reports that both types of organization may attain *“a certain degree of influence in fisheries policies established by the government. In recent years these organizations have been consulted with increasing frequency regarding both inshore... and offshore ... fisheries policies. In practice, however, there are only a few cases of indigenous populations actually being shown exceptional treatment in relation to fishing activities”*.

Hernández and Kempton (2003) identified difficulties in implementing effective stakeholder participation in the shrimp fishery, due particular to poor relations between artisanal and industrial fishers.

Implementation of the concepts of co-management, community management and shared responsibility in the administration of fishery resources in Mexico has been fairly limited (Ponce Diaz). The most important bodies, the State Fisheries Councils, did not function as planned. Article 6 Section IV of the Decree that created CONAPESCA stipulated the creation of participatory Consulting Committees on fishing matters. Any main assessment would look at how these were functioning and if there was effective stakeholder participation in the decision making process. Certainly, the response to consultation on the draft 2007 norm led to changes due to concern about the potential impact on the incomes of fishers.

LPGAS requires transparency in decision making, with a National Fisheries Record that details individual and business interests in fishing, including concessions, permits and licenses, and are legally obliged to register themselves in the Record. Likewise, since 2002, all federal offices (including those related to fishing activities) must provide information generated with public resources.

OECD notes that *“a significant feature of the institutional arrangements for the sector (in a recent administration) has been an increased focus on decentralization of fisheries administration and management. There has been increased focus on the development and implementation of mechanisms for consultation and stakeholder involvement. Consultative mechanisms are in place for improving dialogue between Federal, state and municipal governments in setting NOMs, allocating funds under the various programmes and implementing management arrangements. Stakeholders also have a number of forums in which they have limited potential to influence policy development.”* There remains a lack of a cohesive plan.

On the site visit however representatives from the industrial and artisanal sectors considered that the consultation process was acceptable.

Fishery Objectives

OECD comments that a main characteristic of the Mexican approach to fisheries in recent decades has been change. Successive administrations have not found the fit for fisheries in the federal administration. There has not been a stable policy framework. *“One of the main causes of such policy shifts is the lack of a clear vision for the long term future of fisheries ... shared by government and stakeholders alike. Multiple sets of objectives for the fisheries sector are contained (in various documents). While these objectives are a step in the right direction, they do not provide a coherent and directed vision for the future.”*

Subsidies

MSC defines that the key issue in regard to subsidies is if the management system provides for the possibility to incentivise fishers to fish sustainably. For example do fishers have a sense of stewardship of the resources, do policies provide stability and security for fishers, and are information gaps filled? Are there rights-based measures may contribute to sustainable fishing such as quotas, territorial Use Rights in Fisheries or other community-based or collective rights-based measures. At the same time, the management systems should not include subsidies that may contribute to unsustainable fishing.

Quotas have been sparingly used in Mexico’s fisheries management. The grouper fishery did have a quota for Cuban vessels fishing.

Fernández *et al* report that subsidies to fisheries (in the form of reduction in diesel fuel prices) went from 468 million Mexican pesos in 2001 to 887 million in 2002. Initially, subsidies were directed towards supporting the operations of the industrial fleet (as it only used diesel). However, gasoline was included at the end of 2003, using the justification of increased competitiveness. Ponce Diaz report that Mexico’s expenditure budget in 2007 was US\$ 103 million, with emphasis on aquaculture and adding value to seafood through processing and commercialization rather than through expanding fishing fleets. At the

same time, the fuel subsidy cost US\$ 66 million in 2005. There were also shrimp vessel buy back programmes.

The 2012 Federal budget provided 750 million pesos as fuel subsidy. CCC argues that this contributed to over fishing, with a per capita share among 105,000 fishers of 7,000 pesos per year equal to 17 % of their average income. The Censo Económico de 2009 (INEGI) found that fuel subsidies represented 14% of the total income of large boats and 12% de of smaller boats. CCC viewed this as a regressive subsidy.

CCC reports also that a study of the Federal budget found that the major part (83 %) of the cost of the various programmes promoted fish harvesting while just 14 % contributed to maintaining fishery status. The CONAPESCA budget was found to 80 % dedicated to fishery development and just 5 % to compliance.

There is a public cost to the annual grouper fishery closure. In 2012, 12,000 fishers received 300 pesos and food support for 4 weeks. The need to finance the closure impacts the possibility to respond to resource needs – the length of the closure is governed by the available finance.

Monitoring, Control and Surveillance

In 2010, CONAPESCA and the navy signed an agreement on monitoring and enforcement.

Concern has been expressed in the media about a lack of respect for closed seasons and illegal fishing in general in Yucatan e.g. <http://mexicorojo.mx/resienten-pesquerias-en-yucatan-violacion-de-vedas.html>.

VMS is installed on the industrial vessels since 2010. However, in Yucatan there are only 8 inspectors to enforce regulations with 4,000 vessels.

The 2013 report by CCC and other is critical of the ability of the Mexican authorities to enforce fishing regulations and impose sanctions on those who are found not to comply. The report claims that up to 56 % of the total marine production of fish and shellfish in Mexico could be caught illegally. The major reasons for this are identified as insufficient or inexistent enforcement, lack of management, corruption and lack of participation by fishers in the design and implementation of regulations. Also important was the economic and financial pressure for artisanal fishers to work on a regular basis.

On the site visit it was reported that municipalities are supporting compliance by providing assistants for the inspectors.

Research Plan

This PI is concerned with the presence or otherwise of overall strategic research planning within the fishery-specific management system. From the site visit and review of the literature it is clear that there is a substantial body of research on the Campeche Bank – its fisheries, habitat and ecosystem. Resources are limited and there has been concentration on red grouper in the “escama” fishery. The National Fisheries Charter identifies some priority areas.

Review of the Management System

This PI relates to the management system having a process to monitor and evaluate management performance, appropriate to the cultural context, scale and intensity of the fishery, and relevant to the whole system not just management outcomes. Relevant parts of the management system fishery-specific can include MCS, research plan, feedback, response, and monitoring systems. Also for consideration whether there are opportunities and/or forums for decision-makers to receive feedback on the management system. It should also consider other practices such as exchange of information between the community and the management institution. The regularity of such opportunities should be considered in scoring fisheries against this PI.

Over recent years the management approach has changed on several occasions; however there does not appear to have been any specific actions to strengthen the management of the “escama” fishery to support a programme aimed at stock recovery. The requirement has been recognised, with the CNP and INAPESCA highlighting the need for an FMP. The closest that the fishery has to an FMP are the limited coverage in the CNP and the Norma passed in 2009. This latter initiative did indicate that there was an opportunity for feedback on the management proposals. However, the auditor has not found any other evidence to support the notion that the possibility for comment occurs on a regular basis.

6. EVALUATION PROCEDURE

Assessment Methodologies Used

The document MSC Certification Requirements Version 1.3, January, 2013 was used to conduct this pre-assessment.

Summary of site visits and meetings held during pre-assessment

The site visit was arranged by the client. On the first day, meetings were held with the client, local processors, the authorities and the research institute. On the second day there were visits to the fishing locations and meetings with the private sector together with a viewing of the catching sector.

Table 1: Meetings

March 24	Merida	
09.00	Ian Scott	IFC
	Ernesto Godelman	CEDEPESCA
	Adriana Sanchez-Lindsay	Sea Delight
	Rodrigo Gamboa	Atlantida
	Daniel Gamboa	Atlantida
	Ian Scott	IFC
11.15	Ernesto Godelman	CEDEPESCA
	Adriana Sanchez-Lindsay	Sea Delight
	Rodrigo Gamboa	Atlantida
	Daniel Gamboa	Atlantida
	Mínerva Alonso Alemán	Comité Estatal Sust Prod.
	Delfin Querada Dominguez	Comité Estatal
	Ian Scott	IFC
13.15	Ernesto Godelman	CEDEPESCA
	Adriana Sanchez-Lindsay	Sea Delight
	Rodrigo Gamboa	Atlantida
	Daniel Gamboa	Atlantida
	Mínerva Alonso Alemán	Comité Estatal Sust Prod.
	Victor M. Alvccantar C	Sub-Delegado de Pesca SAGARPA
	Ian Scott	IFC
16.00	Ernesto Godelman	CEDEPESCA
	Adriana Sanchez-Lindsay	Sea Delight
	Rodrigo Gamboa	Atlantida
	Daniel Gamboa	Atlantida
	Mínerva Alonso Alemán	Comité Estatal Sust Prod.
	Alvaro Hernandez Flores	Jefe Centro Regional de Investigación Pesquera, Yucalpetén.
	Silvia Salas Marquez	INAPESCA / SAGARPA
	Carmen Monroy García.	INAPESCA / SAGARPA
	Thierry Brulé	CRIP
March 25	Progreso	
11.00	Ian Scott	IFC
	Ernesto Godelman	CEDEPESCA
	Adriana Sanchez-Lindsay	Sea Delight
	Rodrigo Gamboa	Atlantida
	Daniel Gamboa	Atlantida
	Jose Manuel Sanchez Gonzalez	MAPESCA
12.30	Ian Scott	IFC
	Ernesto Godelman	CEDEPESCA
	Adriana Sanchez-Lindsay	Sea Delight
	Rodrigo Gamboa	Atlantida
	Daniel Gamboa	Atlantida
	C. José Luis Carrillo Galaz	Federación Reg. Coops Centro-Poniente
	Sisal	
14.00	Ian Scott	IFC
	Ernesto Godelman	CEDEPESCA
	Adriana Sanchez-Lindsay	Sea Delight
	Rodrigo Gamboa	Atlantida
	Daniel Gamboa	Atlantida
	Adriano Canul Padernilla	Buying agent

Stakeholders to be consulted during a full assessment

Stakeholders involved should include; fishers, scientists, conservationists, indigenous representatives, managers, local residents, fish processors and others as necessary, noting that those interested must have a valid and established interest in the fisheries under assessment.

INAPESCA 2002 identified a large number of potential stakeholders in the fishery: Businesses, cooperatives, federations, societies, independent fishers, suppliers, government (Federal and State) and research institutes. Clearly, there is the potential to involve a large number of stakeholders. In any fishery improvement project (FIP) designed to respond to the shortcomings identified in this report in relation to the MSC standard, a priority is to identify stakeholders involved in the processing and marketing of the product. The stakeholder list should be completed in consultation with those identified,

If a main assessment was to go ahead the RBF would likely be implemented to score the fishery against some PIs. A SICA is best conducted with the participation of a diverse group of stakeholders that provide a range of knowledge about the fishery under assessment.

Harmonisation with any overlapping MSC certified fisheries

As information to the client, to ensure the harmonisation of approaches, MSC requires that Certification Audit Bodies (CABs – such as IFC) coordinate assessments if another is taking place for the same stock but with a different client. At present, there is no indication that there will be a need to harmonise with another assessment.

7. TRACEABILITY

Eligibility of fishery products to enter further chains of custody

Clearly, with the suspicion of an illegal fishing effort, there is concern about the integrity of the chain of custody in a fishery where it is probable that not all fishing vessels will be part of the client group. While landings by the industrial fleet have lower risk, artisanal vessels may land along a lengthy coast without any monitoring. The collection of fishery landing data is largely carried by the companies themselves. If the fishery is to be certified there will have to be strong consideration of how to guarantee traceability. This may imply that individual companies establish their own system, potentially with independent monitoring of the landings of the supplying vessels.

8. PRELIMINARY EVALUATION OF THE FISHERY

Introduction

The certification of a fishery depends upon its compliance with the MSC Principles and Criteria. A series of performance indicators (PIs) have been developed to determine:

- the availability of sufficient information to measure the fishery against the requirements of the Principles and Criteria; and
- the implementation of management measures to ensure that the fishery is both well managed and sustainably managed

During the certification assessment, compliance with the Principles and Criteria will be determined by applying a scoring system to these PIs. For a pre-assessment, the information available is used to determine the general position of the fishery in relation to those PIs, and the findings are presented in the annex that comprises analysis that indicates the availability of information in relation to the various requirements of the MSC Principles and Criteria for Sustainable Fishing and provides an indicative scoring; highlighting the view of the audit team as to how the fishery will measure up against the MSC standard.

Applicability of the Default Assessment Tree

Where applicable, there would be no requirement for revision to the default assessment tree to be used in any main assessment process.

Expectations Regarding the RBF

It is expected that if the fishery was to go forward to main assessment, due to data deficiencies the RBF would be used to score PI 1.1.1 (black grouper), PI 2.1.1 (retained species), PI 2.4.1 (habitat) and 2.5.1 (ecosystems).

Recommendations & Conclusions

Careful analysis of the information available has led the auditor to estimate the score for the fishery under consideration against the various PIs.

To be certified a fishery must achieve a score of at least 80 for each of the three Principals. This score is the weighted average score for the PIs that comprise each Principal. If any Principal scores less than 80 the fishery cannot be certified. If all three Principals achieve a score ≥ 80 , it is possible for individual PIs to score less than 80 if the score is ≥ 60 ; in that case the fishery would be certified with conditions so that the specific PI would achieve a score of 80 within a set time, no longer than the 5-year duration of the certificate (a fishery has to be recertified every 5 years, while every year there is an audit to measure progress in meeting the conditions while ensuring that the status of the fishery has not changed). The client action plan to meet the conditions is part of the assessment report. If any PI fails to gain a score of at least 60 then the fishery cannot be certified.

The meaning of the allocated scores is as in table 1. Table 2 shows the findings for this pre-assessment.

The level of the scores indicates that the auditor considers that the four Units of Certification fisheries would not meet the MSC standard. Some PIs would fail to achieve the minimum score of 60 (red grouper 9) and many would only pass with conditions (red grouper 14).

The main issues are clear. The stocks are overfished and this means that the fishery cannot meet the MSC standard for P1, and, due to the mixed fishery, the standard for retained species as covered in P2. Regular changes in policy band, the failure to establish an adequate approach to fishery management planning leads to problems with P3, and subsidies and MCS are major concerns. At the same, not everything is pessimistic. It is clear that all of the short comings have been identified by technical staff and resource scientists who are aware of the failing of the fishery. While the problems may not be resolved overnight, especially in the artisanal fishery due to the social implications, it may be that a step wise approach over a number of years may yield positive results.

The raising of conditions means that the client would have to define a client action plan with the objective of raising the score on each of the PIs to 80 or above in a time period to be defined by the CAB. Many of the conditions will require action by an external agency. In order to facilitate their engagement it is considered important that these be involved in any main assessment process from the start.

Recommendation

On the basis of the available information collected from a site visit and internet research, **the auditor recommends that the fishery does not go forward to a main assessment.**

Table 2: Key to Likely scoring level

Information suggests fishery is not likely to reach SG60 and therefore would fail on this PI	<60
Information suggests fishery will reach SG60 but may need a condition for this PI	60-79
Information suggests fishery is likely to exceed SG80 resulting in an unconditional pass for this PI	≥80

Table 3: Summary of pre-assessment scoring

P	Component	Performance Indicator		Likely scoring level		
				Industrial		Artisanal
				RG	BG	RG
1	Outcome	1.1.1	Stock status			
		1.1.2	Reference points			
		1.1.3	Stock rebuilding			
	Management	1.2.1	Harvest Strategy			
		1.2.2	Harvest control rules and tools			
		1.2.3	Information and monitoring			
		1.2.4	Assessment of stock status			
2	Retained species	2.1.1	Outcome			
		2.1.2	Management			
		2.1.3	Information			
	Bycatch species	2.2.1	Outcome			
		2.2.2	Management			
		2.2.3	Information			
	ETP species	2.3.1	Outcome			
		2.3.2	Management			
		2.3.3	Information			
	Habitats	2.4.1	Outcome			
		2.4.2	Management			
		2.4.3	Information			
	Ecosystem	2.5.1	Outcome			
		2.5.2	Management			
		2.5.3	Information			
3	Governance and Policy	3.1.1	Legal and customary framework			
		3.1.2	Consultation, roles and responsibilities			
		3.1.3	Long term objectives			
		3.1.4	Incentives for sustainable fishing			
	Fishery specific management system	3.2.1	Fishery specific objectives			
		3.2.2	Decision making processes			
		3.2.3	Compliance and enforcement			
		3.2.4	Research plan			
		3.2.5	Management performance evaluation			

9. BIBLIOGRAPHY

Albañez-Lucero M, F. Arreguín-Sánchez 2009. Modelling the spatial distribution of red grouper (<i>Epinephelus morio</i>) at Campeche Bank, México, with respect substrate Ecological Modelling 220 (2009) 2744–2750
Arias-González E., E. Nuñez-Lara, C. González-Salas, R. Galzin 2004 Trophic models for investigation of fishing effect on coral reef ecosystems Ecological Modelling 172 (2004) 197–212
Arreguín-Sánchez. F. & E. Vaelro. 1996. Trophic role of the red grouper (<i>Epinephelus morio</i>) in the ecosystem of the northern continental shelf of Yucatan, Mexico [Papel trófico del mero Americano (<i>Epinephelus morio</i>) en el ecosistema del norte de la plataforma continental de Yucatan, Mexico], p. 19-27. In F. Arreguín-Sánchez, J.L. Munro. M.C. Balgos and D. Pauly (eds.) Biology, fisheries and culture of tropical groupers and snappers. ICLARM Conf. Proc. 48. 449 p.
Arreguín-Sánchez F., M. Contreras, V. Moreno. R. Burgos and R. Valdes Population dynamics and stock assessment of red grouper (<i>Epinephelus morio</i>) fishery on Campeche Bank. Mexico
Arreguín-Sánchez. F., J.L. Munro, M.C. Balgos and D. Pauly, Editors. 1996. Biology, fisheries and culture of tropical groupers and snappers. ICLARM Conf. Proc. 48, 449 p.
Bianchi, G., Gislason, H., Graham, K., Hill, L., Jin, X., Koranteng, K., Manickchand- Heileman, S., Paya, I., Sainsbury, K., Sanchez, F., and Zwanenburg, K. 2000. Impact of fishing on size composition and diversity of demersal fish communities. – ICES Journal of Marine Science, 57: 558–571.
Brulé T., J. Montero-Muñoz, N. Morales-López, A. Mena-Loria 2011 Selectivity of Circle Hooks Used for the Capture of Red Grouper by the Small-craft Fishery Fleet from the Yucatan Peninsula, México
Burgos Rosas M., V. Moreno C. García, J.C. Mena González, L. A. Pacheco Rivas E. F. Cob Pech Veda de la pesquería de mero (<i>Epinephelus morio</i>) en el Banco de Campeche para el 2003. SAGARPA INAPESCA
Centro de Colaboración Cívica, A.C., Comunidad y Biodiversidad, A.C., Environmental Defense Fund de México, A.C., Fundación Idea, A.C., Sociedad de Historia Natural Niparajá, A.C. 2013. La pesca ilegal e irregular en México: una barrera a la competitividad
CONAPESCA 2006: Proyecto de Norma Oficial Mexicana NOM-065-PESC-2006, Para regular el aprovechamiento de las especies de mero y especies asociadas, en aguas de jurisdicción federal del litoral del Golfo de México y Mar Caribe, and 2009 Respuestas a los comentarios y modificaciones efectuadas al proyecto de norma oficial mexicana proy-nom-065-pesc-2006.
CONAPESCA 2010. Carta Nacional Pesquera 2010. Jueves 2 de diciembre de 2010 DIARIO OFICIAL
Fernández, J.I., Álvarez-Torres, P., Arreguín-Sánchez, F., López-Lemus, L.G., Ponce, G., Díaz-de-León, A., Arcos-Huitrón, E. and del Monte-Luna, P. 2011. Coastal fisheries of Mexico. In S. Salas, R. Chuenpagdee, A. Charles and J.C. Seijo (eds). Coastal fisheries of Latin America and the Caribbean. FAO Fisheries and Aquaculture Technical Paper. No. 544. Rome. pp. 231–284.
Ferreira, B.P., Rocha, L., Gaspar, A.L.B., Sadovy, Y. & Craig, M. 2008. Mycteroperca bonaci. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. <www.iucnredlist.org>. Downloaded on 5 May 2014. http://www.iucnredlist.org/details/full/132724/0
García-Moliner, G. & Eklund, A.-M. (Grouper & Wrasse Specialist Group) 2004. Epinephelus morio. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. <www.iucnredlist.org>. Downloaded on 5 May 2014. http://www.iucnredlist.org/details/44681/0
Giménez-Hurtado E. & F. Arreguín-Sánchez. Natural Mortality Rates during Life History Stage of the Red Grouper on Campeche Bank, Mexico
Giménez, E.; B. Anderes; V. Moreno y R. Burgos. 2001. Aspectos de la conducta alimentaria del mero (<i>Epinephelus morio</i>) del Banco de Campeche. INAPESCA. SAGARPA. México. Ciencia Pesquera No. 15.
Hernandez, A. & Kempton, W. (2003). Changes in fisheries management in Mexico: Effects of increasing scientific INAPESCA input and public participation. Ocean and Coastal Management.
INAPESCA 2002 Plan de manejo de la pesquería de mero <i>epinephelus morio</i> en la península de Yucatán v2 Dec. 2002.
INAPESCA 2006 Sustentabilidad y Pesca Responsable en México Evaluación y Manejo
Lopez-Rocha J. & F. Arreguín-Sánchez 2008 partial distribution of red grouper <i>Epinephelus morio</i> (Serranidae) catchability on the Campeche Bank of Mexico Appl. Ichthyol. 24 (2008), 282–289
López-Rocha J., M. Albañez-Lucero, F. Arreguín-Sánchez & J. de Anda-Montañez 2009. Analysis of

the spatial and seasonal variation in catchability of red grouper, <i>Epinephelus morio</i> (Valenciennes, 1828), in the Campeche Bank before overfishing (1973-1977). <i>Revista de Biología Marina y Oceanografía</i> 44(3): 751-761, 2009
López-Rocha J., M. Albañez-Lucero, F. Arreguín-Sánchez & J. de Anda-Montañez. Análisis de la variación espacio-temporal en capturabilidad del mero, <i>Epinephelus morio</i> (Valenciennes, 1828) en el Banco de Campeche antes de su sobrepesca (1973-1977). <i>Revista de Biología Marina y Oceanografía</i> 44(3): 751-761, diciembre de 2009
Mazurek R. 2011. Commercially Important Groupers of the Gulf of Mexico & South Atlantic Regions. <i>Seafood Watch Seafood Report</i> .
Monroy C., V. Moreno, Á. Hernández, M. Garduño. 2000 Mero. In: <i>Sustentabilidad y Pesca Responsable en México; Evaluación y Manejo, 1999-2000</i> . Instituto Nacional de Pesca. México.
Moreno G. & P. Salles. 2010 <i>Oceanografía del Banco de Campeche y su Zona Litoral</i> . Sesión Especial. <i>Geos</i> , Vol. 30, No. 1, Noviembre, 2010
Organisation for Economic Cooperation and Development (OECD) 2011. <i>Fisheries Policy Reform National Experiences</i> . http://www.keepeek.com/Digital-Asset-Management/oced/agriculture-and-food/fisheries-policy-reform/reforming-mexico-s-fisheries_9789264096813-6-en#page1
Piñero, R; E. Giménez; V. Moreno; R. Burgos y A. Betanzos. 2001. Características térmicas del Banco de Campeche. <i>INAPESCA . SAGARPA. México. Ciencia Pesquera No. 15</i> .
Ponce-Díaz G., F. Arreguín-Sánchez, A. Díaz-de León & P. Alvarez Torres 2009. Promotion and Management of Marine Fisheries in Mexico. Winter, Gerd (Ed). 2009. <i>Towards Sustainable Fisheries Law. A Comparative Analysis</i> . IUCN, Gland, Switzerland. xiv + 340 pp.
Quintal López R., L. Burgos Suarez & J. Lagunés Vega 2013 El pepino de mar en Yucatán: Una pesca alternativa en desarrollo <i>Bioagrociencias Vol. 6. No. 2 julio – diciembre de 2013</i>
Rios Lara G., C. Zetina Moguel, M. Contreras Gutiérrez, V. Moreno Castejón, J. Pol, P. Salhange. 1996. Análisis de la Comunidad de peces ligados a la pesquería palangrera de mero (<i>Epinephelus morio</i>) en el Banco de Campeche. <i>INAPESCA SEMARNAP Ciencia Pesquera No 13</i> .
Salas S. G. Mexicano-Cíntora, M. Cabrera 2006 ¿Hacia donde van las pesquerías en Yucatán? <i>Tendencias, Retos y Perspectivas</i>
Tunnell, J. and B. Chapman. <i>Seabirds of the Campeche Bank islands, southeastern Gulf of Mexico</i>
Zarco-Perelló S., M. Mascaró, R. Garza-Pérez and N. Simoes. 2013. Topography and coral community of the Sisal Reefs, Campeche Bank, Yucatán, México. <i>Hidrobiológica</i> 23 (1): 28-41
Zetina Moguel C., G. Ríos L., L. Capurro F. 1996. Red Grouper (<i>Epinephelus morio</i>) population in Campeche Bank, Gulf of Mexico and different management strategies considering the technological interaction of the three fishing fleets. <i>INAPESCA SEMARNAP Ciencia Pesquera No 13</i> .
Zetina Rejón M., F. Arreguín-Sánchez, V.H. Cruz-Escalona, M.O. Albañez-Lucero, J.A. López-Rocha and César López-Ferreira <i>Campeche Bank Ecosystem, on the Southern Gulf of Mexico</i>

Appendix 1: Provisional Evaluation of the Fishery Against the Performance Indicators

Component	Outcome		
PI 1.1.1- Stock status	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring issues	SG60	SG80	SG100
a. Stock status	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
b. Stock status in relation to target reference point		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years .
Justification/Rationale			
<p>Red Grouper. Given that it is overfished, until such time as the stock recovers above the LRP, the finding will be that recruitment is being impaired.</p> <p>Black Grouper. There is no stock assessment and the RBF would be used. For PI 1.1.1 both PSA and the SICA are used. Under the SICA, given available knowledge it appears likely that any workshop would conclude that population size is the most vulnerable component and that the conclusion would be that the fishery fails to achieve SG60 i.e. it could not be concluded that long-term recruitment dynamics have not been adversely damaged. The PSA score will also be low. Review of the 7 parameters is likely to conclude that the species is of medium to low productivity. Susceptibility will be high due to the activities of the two main fleet segments and the overlap of the fishery with the species distribution. Without undertaking a shadow scoring – on the basis of experience it seems logical to conclude that the PSA score would be below 60.</p>			
RBF Required? (✓/✗/)	Red Grouper: No Black Grouper: Yes	Likely Scoring Level (pass/pass with condition/fail)	Red Grouper: Fail Black Grouper: Fail

Component	Outcome		
PI 1.1.2 Reference points	Limit and target reference points are appropriate for the stock		
Scoring issues	SG60	SG80	SG100
a. Appropriateness of reference points	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
b. Level of limit reference point		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant precautionary issues.
c. Level of target reference point		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level , and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
d. Low trophic level species target reference point		For key low trophic level species, the target reference point takes into account the ecological role of the stock.	
Justification/Rationale			
Neither of the species is considered as a key LTL species and SID would not be scored. Red Grouper. The reference points have been estimated and are appropriate for the stock (LRP = 30 % B_0 ; TRP = 50% B_0). It is probable that the LRP is set above the level where recruitment would be impaired, but there is no evidence of this as the stock has been over fished during a long period and has not recovered. The TRP is normal for a species of this type. It would maintain a high productivity of the stock and would be at a level well above the point at which recruitment might be impaired. As there is no consideration of precautionary issues in the setting the LRP the fishery would not meet SG100 Sib; nor would it meet SG100 Sic as there is no consideration of the stocks ecological role. Black Grouper. When PI 1.1.1 is scored using the RBF, PI 1.1.2 is scored at 80.			
RBF Required? (✓/✗/)	Red Grouper. No Black Grouper. Yes	Likely Scoring Level (pass/pass with condition/fail)	Red Grouper. Pass Black Grouper. Pass

Component	Outcome		
PI 1.1.3 Stock Rebuilding	Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe.		
Scoring issues	SG60	SG80	SG100
a. Rebuilding strategy design	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success are in place.	Where stocks are depleted rebuilding strategies are in place.	Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be completed within the specified timeframe .
b. Rebuilding timeframes	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time . For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted 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 depleted stock.
c. Rebuilding evaluation	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 highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within the specified timeframe .	
Justification/Rationale			
<p>Red Grouper. While there has been a great deal of discussion about a rebuilding strategy there has been limited effort to implement one; given the past record is currently no basis to presume that any rebuilding strategy would have a reasonable expectation of success. The fishery would not meet SG60 SIa and fail the assessment. If the INAPESCA rebuilding strategy was to be implemented, the fishery would meet SG80 SIb. Given the reality one cannot consider SG60 Sic.</p> <p>Black Grouper. Where the RBF is used to score PI 1.1.1, PI 1.1.3 is not scored.</p>			
RBF Required? (✓/✗/)	Red Grouper. No Black Grouper. Yes	Likely Scoring Level (pass/pass with condition/fail)	Red Grouper. Fail Black Grouper. Not scored

Component	Harvest strategy (management)		
PI 1.2.1 Harvest strategy	There is a robust and precautionary harvest strategy in place		
Scoring issues	SG60	SG80	SG100
a. Harvest strategy design	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
b. Harvest strategy evaluation	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.
c. Harvest strategy monitoring	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
d. Harvest strategy review			The harvest strategy is periodically reviewed and improved as necessary.
Justification/Rationale			
<p>Red Grouper / Black Grouper This PI scores the overall performance of the harvest strategy, particularly the way that the different elements (the control rules and tools in place; the information base and monitoring; and the assessment method). work together to keep the stock at levels consistent with reference points. To date the proposed harvest strategy that would cover all escama stocks has not been applied; there are a series of ideas and measures but limited practical experience beyond a limited number of measures that may not reflect the reality of the individual species. There are acknowledged weaknesses in monitoring, information and stock assessment. The harvest strategy applied to date certainly has not worked, and the monitoring in place lacks the precision to consider whether or not any strategy is working. Both fisheries would likely fail to meet any of the SG60 SIs.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper. Fail Black Grouper. Fail

Component	Harvest strategy		
PI 1.2.2 Harvest control rules and tools	There are well defined and effective harvest control rules in place		
Scoring issues	SG60	SG80	SG100
a. Harvest control rules design and application	Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.
b. Harvest control rules account for uncertainty		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules take into account a wide range of uncertainties.
c. Harvest control rules evaluation	There is some evidence that tools used to implement harvest control rules 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 harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
Justification/Rationale			
Red Grouper / Black Grouper. The harvest control rules are limited entry, gear selectivity and closed seasons. These are understood, but they have failed to reduce the exploitation rate even when scientific advice clearly states that the stocks are over fished. The fishery would not meet SG60 SIa. There are many uncertainties in the fishery (such as the true scale and intensity of the artisanal fishery, interactions between species and the impact of nature) but the selected harvest control rules do not take these into account. The fishery would not meet SG80 SIb. Given the long period of over fishing there is no evidence that the tools used to implement harvest control rules are appropriate and effective in controlling exploitation. The fishery would not meet SG60 SIc.			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper. Fail Black Grouper. Fail.

Component	Harvest strategy		
PI 1.2.3 Information / monitoring	Relevant information is collected to support the harvest strategy		
Scoring issues	SG60	SG80	SG100
a. Range of information	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 is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.
b. Monitoring	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery 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 the inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
c. Comprehensive ness of information		There is good information on all other fishery removals from the stock.	
Justification/Rationale			
<p>Red Grouper. There is a considerable amount of data available on red grouper and its fishery. This is sufficient to identify and support an effective harvest strategy. The fishery would meet SG80 SIa. The impact of environmental factors would need to be understood before the fishery could meet SG100 SIa, although there has been some ecosystem modelling. The lack of confidence in the artisanal landing data prevents the fishery meeting SG80 SIb, although data from the industrial fleet is more reliable and the monitoring of it could support the harvest control rule. The lack of precision on landing data from other States means that information may not be considered as good and the fishery would not meet SG80 SIc.</p> <p>Black Grouper. While there is some relevant information to support a harvest strategy this is not considered sufficient to support a harvest strategy. The fishery would meet SIa at SG60, but not at SG80. The lack of knowledge of stock abundance and removals prevents the fishery from meeting SG60 SIb. The lack of precision on landing data from other States means that information may not be considered as good and the fishery would not meet SG80 SIc.</p>			
Likely Scoring Level (pass/pass with condition/fail)			<p>Red Grouper. Pass with condition.</p> <p>Black Grouper. Fail.</p>

Component	Harvest Strategy		
PI 1.2.4 Assessment of stock status	There is an adequate assessment of the stock status.		
Scoring issues	SG60	SG80	SG100
a. Appropriateness of assessment to stock under consideration		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 fishery.
b. Assessment approach	The assessment estimates stock status relative to reference points.		
c. Uncertainty in the assessment	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.
d. Evaluation of assessment			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
e. Peer review of assessment		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
Justification/Rationale			
<p>Red Grouper. Substantial work has taken place to assess the stock and the assessments take into account the major features relevant to the biology of red grouper and the nature of the fishery. The status of the stock in the context of BRPs is known. The fishery meets SG100 SIa and SG60 SIb. While the assessment identifies uncertainty, it does not take all sources of this into account. The fishery meets SG60 SIc but not SG80 SIc. The auditor is not aware that the assessment has been tested with alternative approaches rigorously explored. The fishery would not meet SG100 SIc. The assessment is peer reviewed both internally and externally (e.g. at meetings with Cuban counterparts).</p> <p>Black Grouper. When the RBF is used to score PI 1.1.1, PI 1.2.4 is given a score of 80.</p>			
Likely Scoring Level (pass/pass with condition/fail)			<p>Red Grouper. Pass with condition.</p> <p>Black Grouper. Pass</p>

Component	Retained Species		
PI 2.1.1 Outcome Status	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.		
Scoring issues	SG60	SG80	SG100
a. Retained species stock status	Main retained species are likely to be within biologically based limits. If not, go to scoring issue c below.	Main retained species are highly likely to be within biologically based limits. If not, go to scoring issue c below.	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
b. Target reference points			Target reference points are defined for retained species.
c. Recovery and rebuilding	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
d. Measures if poorly understood	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
Justification/Rationale			
<p>Red Grouper & Black Grouper. As matters now stand there is a great deal of uncertainty about the level of retained species, and 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. Given the number of potential retained species and the process, it is not possible to undertake a shadow RBF. On the basis of understanding, it seems plausible to suggest that at best the SICA score will be equivalent to an MSC score of 60 i.e. if population size is considered to be the most vulnerable sub-component the conclusion may be that the bycatch species are at full exploitation rate but long-term recruitment dynamics not adversely damaged. As the SICA score would be below 80, the PSA score would be taken into account. It should be noted that MSC CR v 2 will look at the cumulative effects on species from all fisheries and not the marginal impact of a specific fishery and this may complicate the prospects for fisheries meeting the standard. Given the overfished nature of the Campeche Bank, the conclusion is that both fisheries would fail PI 2.1.1.</p>			
RBF required? (✓/✗)	Red Grouper & Black Grouper:	Likely Scoring Level (pass/pass with condition/fail)	Red Grouper & Black Grouper: Fail

Component	Retained Species		
PI 2.1.2 Management strategy	There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.		
Scoring issues	SG60	SG80	SG100
a. Management strategy in place	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
b. Management strategy evaluation	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 partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
c. Management strategy implementation		There is some evidence that the partial strategy is being implemented successfully .	There is clear evidence that the strategy is being implemented successfully .
d. Management strategy evidence of success			There is some evidence that the strategy is achieving its overall objective .
Justification/Rationale			
Red Grouper & Black Grouper: While there are measures in place that could limit the impact of the fishery on retained species (hook size, licensing, closed seasons and closed areas), given their failure to protect the target species it must be reasonable to conclude that the fishery may hinder their recovery and rebuilding. The fishery would not meet SG60 SIa and SIb.			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Fail

Component	Retained Species		
PI 2.1.3 Information/Monitoring	Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.		
Scoring issues	SG60	SG80	SG100
a. Information quality	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
b. Information adequacy for assessment of stocks	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty .
c. Information adequacy for management strategy	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a comprehensive strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
d. Monitoring		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species .
Justification/Rationale			
Red Grouper & Black Grouper: There is qualitative information on the amount of by-catch species and this would be adequate to support measures to manage them. There is some quantitative information from the purchase orders by processors and this may be sufficient to support a partial strategy, although it should be improved. The data that continues to be collected on vessel activity will be enough to detect any increase in risk level.			
NOTE: When RBF is used to score PI 2.1.1, scoring issue b. (text in brackets above) should not be scored.	Likely Scoring Level (pass/pass with condition/fail)		Red Grouper & Black Grouper: Pass

Component	Bycatch Species		
PI 2.2.1 Outcome Status	The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.		
Scoring issues	SG60	SG80	SG100
a. Bycatch species stock status	Main bycatch species are likely to be within biologically based limits. If not, go to scoring issue b below	Main bycatch species are highly likely to be within biologically based limits If not, go to scoring issue b below	There is a high degree of certainty that bycatch species are within biologically based limits.
b. Recovery and rebuilding	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
c. Measures if poorly understood	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
Justification/Rationale			
Given knowledge about the fishery, it is considered likely that no main species will be identified and this would allow the fishery to meet SG80.			
RBF required? (✓/✗)	Red Grouper & Black Grouper: No	Likely Scoring Level (pass/pass with condition/fail)	Red Grouper & Black Grouper: Pass

Component	Bycatch Species		
PI 2.2.2 Management Strategy	There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations.		
Scoring issues	SG60	SG80	SG100
a. Management strategy in place	There are measures in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.	There is a partial strategy in place, if necessary, that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.	There is a strategy in place for managing and minimising bycatch.
b. Management strategy evaluation	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 partial strategy will work, based on some information directly about the fishery and/or the species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
c. Management strategy implementation		There is some evidence that the partial strategy is being implemented successfully .	There is clear evidence that the strategy is being implemented successfully .
d. Management strategy evidence of success			There is some evidence that the strategy is achieving its objective .
Justification/Rationale			
Given the low level of by-catch, neither measures nor a partial strategy are considered as needed. The fishery would meet SG80.			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Pass

Component	Bycatch Species		
PI 2.2.3 Information/monitoring	Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.		
Scoring issues	SG60	SG80	SG100
a. Information quality	Qualitative information is available on the amount of main bycatch species affected by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.	Accurate and verifiable information is available on the amount of all bycatch and the consequences for the status of affected populations.
b. Information adequacy for assessment of stocks	Information is adequate to broadly understand outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty .
c. Information adequacy for management strategy	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a comprehensive strategy to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective .
d. Monitoring		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
Justification/Rationale			
Red Grouper & Black Grouper: While qualitative data indicates that there are no main by-catch species, there is no formal evidence that this is the case. This information gap should be filled if the fishery is to meet SG80.			
When RBF is used to score PI 2.2.1, SIb is not scored.	Likely Scoring Level (pass/pass with condition/fail)		Red Grouper & Black Grouper: Pass with condition

Component	ETP Species		
PI 2.3.1 Outcome Status	<p>The fishery meets national and international requirements for protection of ETP species.</p> <p>The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</p>		
Scoring issues	SG60	SG80	SG100
a. Fishery effects within limits	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
b. Direct effects	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
c. Indirect effects		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
Justification/Rationale			
<p>The Government of Mexico has taken a number of steps to protect ETP species in the area of the fishery. However, there is no specific evidence effects of the fishery are known and that they are highly likely to be within limits of national and international requirements for protection of ETP species. The fishery would meet SIA at SG60 but not at SG80. If the fishery was to be creating direct effects then it is plausible to consider that these would have been reported, and the auditor has not found any evidence that this is the case. Accordingly, the fishery may meet SG80 SI b. Indirect effects include issues such as the potential for vessel collisions with mammals, the results of discharging waste at-sea and the potential for damage from lost gear. Such indirect effects do not appear to have been considered. The fishery does not meet SG80 SI c.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Pass with condition.

Component	ETP Species		
PI 2.3.2 Management strategy	<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> - meet national and international requirements; - ensure the fishery does not pose a risk of serious or irreversible harm to ETP species; - ensure the fishery does not hinder recovery of ETP species; and - minimise mortality of ETP species. 		
Scoring issues	SG60	SG80	SG100
a. Management strategy in place	There are measures in place that minimise 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 fishery’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 fishery’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.
b. Management strategy evaluation	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 strategy will work, based on information directly about the fishery and/or the species involved.	The 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. There is clear evidence that the strategy is being implemented successfully.
c. Management strategy implementation		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
d. Management strategy evidence of success			There is evidence that the strategy is achieving its objective.
Justification/Rationale			
<p>Red Grouper & Black Grouper: The strategy is as implemented by Mexico to protect all ETP species. While a main assessment would revise this issue in detail, given apparent lack of concern about the fishery and fishers reporting limited interactions with ETP species, it may be concluded that the fishery meets SG80 SIa. It does not meet SG100 SIa as there is not a specific strategy for the fishery. The objective basis for confidence that the strategy is working is the lack of any reports to the contrary on a fishery that takes place on the Campeche Bank which is subject to a great deal of study. The fishery meets SG80 SIb, but as the strategy is not based on information about the fishery and there does not appear to have been any quantitative analysis it does not meet SG100 SIb. The evidence above also indicates that the fishery would meet SG80 SI c but it would not meet any of the SG 100 SIs.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Pass

Component	ETP Species		
PI 2.3.3 Information/monitoring	Relevant information is collected to support the management of fishery 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 issues	SG60	SG80	SG100
a. Information quality	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
b. Information adequacy for assessment of impacts	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
c. Information adequacy for management strategy	Information is adequate to support measures to manage the impacts on ETP species	Information is sufficient to measure trends and support a full 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.
Justification/Rationale			
Red Grouper & Black Grouper: While a lot of qualitative information is available, there is a lack of quantitative data. Thus the real impact of the fishery on ETP species cannot be quantitatively estimated. The fishery would not meet SG80 SIa. Nor is the information sufficient to measure trends. The fishery would not meet SG80 SIc. In contrast, the qualitative information is sufficient for the fishery to meet SG80 SIb.			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Pass with condition

Component	Habitats		
PI 2.4.1 Outcome Status	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.		
Scoring issues	SG60	SG80	SG100
a. Habitat status	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
Justification/Rationale			
<p>There is evidence to suggest that the fishery may damage habitat either by removing species that may be categorised as ecosystem engineers that burrow and excavate bottom substrate and indirectly increase the abundance of a variety of species. Additionally, the gear 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. 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. For component 2.4, only the SICA is used and there is limited readily available information to be able to gauge the possible outcome. 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 up to two decades.</p>			
RBF required? (✓/✗)	Red Grouper & Black Grouper: Yes	Likely Scoring Level (pass/pass with condition/fail)	Red Grouper & Black Grouper: Pass with condition

Component	Habitats		
PI 2.4.2 Management strategy	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.		
Scoring issues	SG60	SG80	SG100
a. Management strategy in place	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 the fishery on habitat types.
b. Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
c. Management strategy implementation		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
d. Management strategy evidence of success			There is some evidence that the strategy is achieving its objective.
Justification/Rationale			
<p>Red Grouper & Black Grouper: There are marine protected areas and no fishing zones. However, the over fishing 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 any of the SG80 SI. On the basis of experience, however, it may be concluded that the measures will work.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Pass with condition

Component	Habitats		
PI 2.4.3 Information / monitoring	Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.		
Scoring issues	SG60	SG80	SG100
a. Information quality	There is a basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
b. Information adequacy for assessment of impacts	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	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
c. Monitoring		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
Justification/Rationale			
<p>Red Grouper & Black Grouper: 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. 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 provide the evidence available. Although there are some illegal fishing activities, information on the extent of interaction and the spatial and temporal use of gear should be sufficient to meet SG80 SIb. Lack of quantification of the impacts would mean that the fishery would not meet SG 100 SIb. While dynamic changes in the distribution of habitats is not known, and these may be affected by natural phenomena such as hurricanes, it is considered that information on the scale and intensity of the fishery would allow the fishery to meet SG80 SIc.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Pass

Component	Ecosystem		
PI 2.5.1 Outcome Status	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring issues	SG60	SG80	SG100
a. Ecosystem status	The fishery 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 fishery 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 fishery 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.
Justification/Rationale			
<p>Red Grouper & Black Grouper: There is insufficient information to assess the impact of the fishery on the ecosystem due to overfishing over an extended period of time. The RBF would be used; for PI 2.5.1 only the SICA is employed. The MSC score for this PI would depend on the consensus of any workshop. The auditor has insufficient information to undertake a shadow SICSA analysis, however on the basis of experience it is considered that species composition would be identified as the most vulnerable sub component and the consequence score would relate to an MSC score of 60 – i.e. Detectable changes to the community species composition without a major change in function (no loss of function). Changes to species composition up to 10%. Time to recover from impact on the scale of several to twenty years.</p>			
RBF required? (✓/✗)	Red Grouper & Black Grouper: Yes	Likely Scoring Level (pass/pass with condition/fail)	Red Grouper & Black Grouper: Pass with condition

Component	Ecosystem		
PI 2.5.2 Management strategy	There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring issues	SG60	SG80	SG100
a. Management strategy in place	There are measures in place, if necessary.	There is a partial strategy in place, if necessary,	There is a strategy that consists of a plan , in place.
b. Management strategy design	The measures take into account the potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy , which consists of a plan , contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
c. Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	The measures are considered likely to work based on prior experience , plausible argument or information directly from the fishery/ecosystems involved.
d. Management strategy implementation		There is some evidence that the measures comprising the partial strategy are being implemented successfully .	There is evidence that the measures are being implemented successfully .
Justification/Rationale			
Red Grouper & Black Grouper: The rationale is the same as for 2.4.2 – a partial strategy would have to encompass reduced fishing effort if the impact of the fishery on the ecosystem was to be restrained. The fishery would not meet SG80 SIs.			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Pass with condition.

Component	Ecosystem		
PI 2.5.3 Information / monitoring	There is adequate knowledge of the impacts of the fishery on the ecosystem.		
Scoring issues	SG60	SG80	SG100
a. Information quality	Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
b. Investigation of fishery impacts	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail .	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
c. Understanding of component functions		The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known	The impacts of the fishery on target, Bycatch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are understood .
d. Information relevance		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
e. Monitoring		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
Justification/Rationale			
<p>Red Grouper & Black Grouper: From studies on the Campeche Bank and the experience in similar fisheries, the information available is considered adequate. The work over recent years on ecosystem modelling shows that some of the main impacts have been investigated in detail. The main functions of the main components are known, and on the basis of the current understanding the consequences of the fishery, especially over fishing of a top predator may be inferred. Information about the fishery (scale, intensity and spatial distribution) is enough to identify any increase in risk. It seems reasonable to conclude that the fishery would meet all SG80 SIs but without more work it would not meet any of the SG100 SIs.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Red Grouper & Black Grouper: Pass

Component	Governance and Policy		
PI 3.1.1 Legal and/or customary framework	<p>The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> - Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; - 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 issues	SG60	SG80	SG100
a. Consistency with laws or standards	The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.		
b. Resolution of disputes	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 fishery.	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 .
c. Approach to disputes	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 binding judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges.
d. Respect for rights	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 on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
e. Monitoring		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.

Justification/Rationale			
<p>Industrial & Artisanal. The Government of Mexico has shown its commitment to meet internationally accepted standards in the legal framework supporting sustainable fisheries taking into consideration both Principle 1 and principle 2. The auditor did not find any reference to legal disputes in the fishery indicating that the established policies and practises are effective. Nor was any evidence found to conclude that the authorities do not respond to legal issues in a timely manner. It is considered that in any main assessment it would be concluded that the fishery meets SG80 SIs a, b & c. Mexican fisheries policy is formally committed to respect the legal rights of indigenous people. The fishery meets SG100 at SIId.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal. Pass

Component	Governance and Policy		
PI 3.1.2 Consultation, roles and responsibilities	<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p>		
Scoring issues	SG60	SG80	SG100
a. Roles and responsibilities	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.
b. Consultation processes	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 .
c. Participation		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.
Justification/Rationale			
<p>Industrial & Artisanal. While organisations and individuals have been identified and their functions, roles and responsibilities are generally understood, the prevailing view is that these are not well understood (e.g. MCS) due to the number of changes in policy and the lack of a clear vision. The fishery does not meet SG80 SIa. While consultation procedures are said to have improved it is possible that the fishery will not meet SG80 SIb as the existing organisations may not be that effective. However, on the basis of the local industry confirming that the consultation process was acceptable, and the response of Government to the comments on the 2007 NOM, on balance it is concluded that the fishery would meet SG80 SIb, although probably improvements could be made. Given stakeholder representation on the various committees the fishery meets SG80 SIc.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal. Pass with condition.

Component	Governance and Policy		
PI 3.1.3 Long term objectives	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.		
Scoring issues	SG60	SG80	SG100
a. Objectives	Long term objectives to guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are implicit within management policy.	Clear long term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within management policy.	Clear long term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy
Justification/Rationale			
Industrial & Artisanal. LPGAS explicitly deals with long term objectives and this is also shown in the CNP. The fishery meets SG80. However, the lack of definitive action on a wide range of issues would indicate that various needs are not required by management policy.			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal. Pass

Component	Governance and Policy		
PI 3.1.4 Incentives for sustainable fishing	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.		
Scoring issues	SG60	SG80	SG100
a. Incentives	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices.
Justification/Rationale			
<p>Industrial & Artisanal. CCC and others (2013) is highly critical of the approach to fishery management in Mexico that has resulted in a large proportion of the fish stocks being over-exploited, including red grouper on the Campeche Bank. While the analysis does not relate directly to the fishery off Yucatan State, the figures quoted highlight the problem. In 2012, the Federal budget for fuel subsidy for the fisheries sector was 750 million pesos and if equally divided between the 105,000 coastal fishers the per capita annual benefit of about 7,000 pesos would represent about 17 % of the total annual income. The 2009 Economic Census showed that fuel subsidy represented about 14 % of the total earnings of the larger vessels and 12 % of the smaller ones. This situation may be considered as perverse: CCC calculates that 83% of the Federal budget promotes effective fisheries management while 83% supported overfishing.</p> <p>Under the MSC approach, a number of management aspects may be considered positive if they provide incentives to fish sustainably. This may include some type of fishing rights to encourage a medium to long term perspective rather than concentration on short term earning potential, effective stakeholder participation with an effective input into the decision making process, and improved information and communication with fisher awareness of the importance of sustainable activity. In their analysis, CCC <i>et al</i> argue that to improve the situation and reduce illegal fishing there is a need to create property rights, improve coordination between institutions, enhance stakeholder participation in the decision making process and improve information available to fishers.</p> <p>Such improvements may be critical in the Campeche fishery in a situation where there is a clear division in the interests of the artisanal and industrial fishers, within the context of the long standing nature of over exploited resources. There is continued competition to harvest the available stocks, with the main protection resulting from the existence of an alternative more profitable fishery that diversifies fishing effort.</p> <p>On the basis of analyses such as that completed by CCC, it is difficult to conclude that the fishery would achieve the 60 level – there are no medium to long term incentives for fishers to fish sustainably, and the continued high level of fuel subsidy runs contrary to sustainable fishing as it allows fishing operations to continue when the cost of unsubsidized fuel would make fishing uneconomic for a large number of vessels and reduce fishing activity.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal.: Fail

Component	Fishery- specific management system		
PI 3.2.1 Fishery-specific objectives	The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring issues	SG60	SG80	SG100
a. Objectives	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's 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's 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's management system.
Justification/Rationale			
<p>Industrial & Artisanal. It may be considered that the objectives of restoring fish stocks and protecting the ecosystem from negative effects arising from the fishery are implicit within the fishery management system and this has led to a number of policies (licensing, closed season, hooks, minimum sizes, etc.).The main official management planning has been implemented through the NOM or detailed in the CNP. However, there are no defined short and long term objectives. These could be defined in an FMP. The fishery does not meet SG80.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal. Pass with condition.

Component	Fishery- specific management system		
PI 3.2.2 Decision-making processes	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives.		
Scoring issues	SG60	SG80	SG100
a. Decision-making processes	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.	
b. Responsiveness of decision-making processes	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take <u>some</u> 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.
c. Use of precautionary approach		Decision-making processes use the precautionary approach and are based on best available information.	
d. Transparency of decision-making		Explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
Justification/Rationale			
Industrial & Artisanal. It is evident that there are some decision making processes and these have resulted in measures to achieve fishery specific objectives. However, given the lack of action and failure to respond to the over fishing of the species and the recommendations of INAPESCA it cannot be concluded that established decision making processes result in measures. For example, there is the continued delay in increasing the minimum landing size and quotas have not been established. Given the parlous state of the resource it cannot be claimed that the fishery meets SG80 SIc. There was an explanation of the response to the consultation on the 2008 NORM, but there appears to be no official response to recommendations from resource scientists. The fishery does not meet SG80 SI d.			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal. Pass with condition.

Component	Fishery- specific management system		
PI 3.2.3 Compliance and enforcement	Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.		
Scoring issues	SG60	SG80	SG100
a. MCS implementation	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment 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 under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
b. Sanctions	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.
c. Compliance	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.
d. Systematic non-compliance		There is no evidence of systematic non-compliance.	
Justification/Rationale			
<p>Industrial & Artisanal. While fishery management measures are in place it is widely accepted that there is a wide degree of non-compliance, with the catch of fish under the minimum landing size, non-respect for closed seasons and fishing by unlicensed vessels. This appears to be particularly the case in the small boat sector. The available sanctions are not used to deter illegal fishing. The problems appear to be widespread in Mexico and not peculiar to the Campeche Bank fishery. The CCC research provides background to the issue while anecdotal and empirical evidence suggests that non-compliance is widespread in the grouper fishery. On that basis, it may be concluded that while there are MCS measures, as matters now stand there is limited expectation that these are effective. Reasonable argument would indicate that while compliance is better in the semi-industrial sector due to the limited number of boats, data clearly indicates that below minimum size fish are harvested. The implemented management system has proven ineffective in implementing the minimum size regulation.</p> <p>While the auditor did not have the opportunity to analyse the specific situation in the grouper fishery, from the CCC report it can be surmised that sanctions in the Mexican fishery are not effectively applied. They are not an effective deterrent in the artisanal fishery.</p> <p>It is generally considered that artisanal fishers do not comply with the management system; however the larger boats do.</p>			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal.: Fail

Component	Fishery- specific management system		
PI 3.2.4 Research plan	The fishery has a research plan that addresses the information needs of management.		
Scoring issues	SG60	SG80	SG100
a. Research plan	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
b. Research results	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available .
Justification/Rationale			
Industrial & Artisanal. It is evident that research is undertaken as required, although funding restrictions limit the amount that has been done. The results of this research appear to be available. The fishery meets the SG60 SIs. However, apart from the annual research on red grouper there does not appear to be a research plan that is sufficient to meet the needs of SG80 SIa. Web research indicates that the results of all research are not readily available.			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal. Pass with condition.

Component	Fishery- specific management system		
PI 3.2.5 Monitoring and management performance evaluation	<p>There is a system for monitoring and evaluating the performance of the fishery-specific management system against its objectives.</p> <p>There is effective and timely review of the fishery-specific management system.</p>		
Scoring issues	SG60	SG80	SG100
a. Evaluation coverage	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system.	The fishery has in place mechanisms to evaluate all parts of the management system.
b. Internal and/or external review	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.
Justification/Rationale			
Industrial & Artisanal. The CNP is sufficient to meet the needs at SG60. However, there is no evidence to suggest that there are mechanisms to evaluate key parts of the management system (e.g. MCS and subsidies). The CNP may be considered to meet the needs of SG80 SI b.			
Likely Scoring Level (pass/pass with condition/fail)			Industrial & Artisanal. Pass with conditions.