

**Marine Stewardship Council
Pre-Assessment Report**

for the
Texas Shrimp Fisheries



For

**Galveston Shrimp Company
Cox's Wholesale Seafood
Big Easy Foods
Paul Piazza and Son, Inc.**

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Report Code: MSC Pre-20
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Glossary

B	Biomass (Spawning Stock Biomass)
BRD	Bycatch Reduction Device
BO	Biological Opinion
CEQ	Council on Environmental Quality
CPUE	Catch Per Unit Effort
CSAP	Crustacean Stock Assessment Panel
CZMA	Coastal Zone Management Act
DQA	Data Quality Act
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ELB	Electronic Logbook
EO	Executive Order
ESA	Endangered Species Act
F	Fishing Mortality
FMP	Fishery Management Plan
g/l	Grams per liter
GMFMC	Gulf of Mexico Fishery Management Council
GPS	Global Positioning System
GSMFC	Gulf States Marine Fisheries Commission
GSPM	Generalized Surplus Production Model
HAPC	Habitat Areas of Particular Concern
m	Meters
MBTA	Migratory Bird Treaty Act
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
OMB	Office of Management and Budget
OY	Optimum Yield
PRA	Paperwork Reduction Act
SEAMAP	Southeast Area Monitoring and Assessment Program
SEFSC	Southeast Fisheries Science Center of NMFS
SSAP	Shrimp Stock Assessment Panel
SSC	Scientific and Statistical Committee
TAC	Total Allowable Catch
TPWD	Texas Parks & Wildlife Department
TED	Turtle Excluder Device
VMEs	Vulnerable Marine Ecosystems
VPA	Virtual Population Analysis

1. Executive Summary

This report details the MSC pre-assessment for the Texas Shrimp Fisheries against the MSC Principles and Criteria for sustainable fisheries. The report outlines the background, results of the pre-assessment, the rationales that substantiate the scores for each performance indicator, and the recommendations of the pre-assessment team regarding a decision on moving to a full assessment of the fisheries.

This pre-assessment was led by Dr. Virginia Polonio, an experienced and qualified MSC lead assessor and was carried out using the MSC Fisheries Certification Requirements v2.0 (Effective April 1, 2015). A short bio of Virginia is provided in the Appendix 1.

Recommendation

For the purposes of this evaluation, a weakness is defined where there is likelihood that a score for a performance indicator (PI) falling below an 80 score but achieving a greater than 60 score. These are termed conditional scores in a full assessment and would require the applicant to present a corrective action plan that demonstrates how the fishery will be improved and achieve an unconditional pass (>80 score). Below 60 scores can be described as major weaknesses and which would result in a failed fishery in a full assessment. MSC Pre-assessments are designed to provide 'likely' scores and do not represent the same level of detail and scrutiny as provided by a full assessment. However, they are considered sufficiently accurate as to base a firm recommendation. In this report, the assessor has ensured that a good level of confidence and objective basis is apparent in the information and evidence before a likely 80 score has been assigned. This is in order to provide assurance to the report sponsors prior to making any recommendation to proceed to full assessment.

Additionally, MSC Certification Requirements require that for each of the Principles, an aggregate score of minimum 80 is achieved in order to pass the assessment. Below 80 aggregate scores in any of the three Principles will result in a failed fishery at full assessment.

The pre-assessment found some deficiencies in Principle 1 regarding the harvest control rules, which although are generally available, are not well-defined at the Point where Recruitment Impairment (PRI) is reached. "Well-defined" is defined by MSC as: "pre-agreed rules and management actions that will be taken in response to changes in indicators of stock status with respect to explicit or implicit reference points, and MSC expects these elements to be part of HCRs".

The stock can be described as healthy and not overfished, nor is overfishing occurring but the MSC Performance Indicator (1.2.2) requires that the harvest control tools are well defined even despite low risk of PRI occurring. The pre-assessment did not identify further weaknesses in Principle 1 and all remaining PI's were give likely scores of at least 80.

There were a number of weaknesses associated with Principle 2 identified. MSC V2.0 requires that non target species (regardless of whether they are retained or discarded) are differentiated into Primary (PI 2.1.1) and Secondary (PI 2.2.1) and under each of these categories, then into main (representing >5% of target catch) and minor (representing <5% target catch).

Overall, there are information deficiencies to enable quantitative classification of these primary and secondary species with the current level of data coming from the fishery. Pre-assessment is based on data provided in studies that are + 15 years old (for state waters) and the fishery would benefit from more recent data. Federal bycatch data is more recent; however, includes some larger categories of unidentified finfish and invertebrates, making it difficult to evaluate all primary and secondary species and since observer coverage is low (approx. 2%) this may impact on the statistical accuracy of the data. These issues open a gap in the scoring of the Principle 2 PIs, outcome and information, for Primary and Secondary Species.

Similarly, information deficiency is identified in PI 2.3.3 ETP Information. Again, observer coverage remains low for the Federal fishery. PI 2.5.3 Ecosystems- Information has been identified as a weaker score and could result in a border line pass in a full assessment. The fishery should improve the information regarding the interactions between the UoA and the ecosystem element and this fact should be investigated in detail. On the other hand, the information regarding the impacts of the UoAs on P1, P2 and ETPs and their habitats or key elements of their ecosystems should be identified and investigated in detail with review of information to identify possible changes in the ecosystems over the years due to the impacts or the fishery or indirect impacts associated with it.

Whilst none of the likely scores in an individual PI of Principle 2 were below 60 (fail), the cumulative result of a number of weaker scores across Principle 2 does result in a significant enough risk that the overall Principle 2 aggregate score will fall <80 pass score, which in a full assessment would fail the fishery.

Therefore, SAI Global recommends that the gaps in performance in Principle 2 are addressed prior to the fishery proceeding to a full MSC assessment.

Positively, the pre-assessment found few identified obstacles to be addressed in Principle 3 before proceeding to a full assessment and this does provide confidence that the improvements in weaker areas identified could be achieved by the combination of sponsors and management agencies.

The main weakness in P3 was associated with PI 3.2.1 Fishery Specific- Objectives. Short and long term objectives which are consistent with achieving the outcomes expressed in the principle 2 are not well-defined. As noted, there are several likely conditional scores within P2. The pre-assessment identifies some explicitly defined objectives regarding P2; therefore, PI 3.2.1 is not a likely conditional score, but some of these objectives must be properly implemented to score as much as possible in P2 indicators. However, there are several research projects identified and these projects may provide activities that support the implied objectives for P1 and P2, so an unconditional pass score is met.

In summary, SAI Global advises caution if moving toward a full assessment and recommends that a more confident approach would be to address the issues relating to the PI's achieving likely weaker scores, prior to entering into a full assessment.

2. Introduction

2.1. Aims/scope of pre-assessment

The pre-assessment of the Texas Shrimp Fishery does not attempt to duplicate a full assessment against the MSC standard. A full assessment involves expert team members and public consultation stages that are not included in a pre-assessment. This pre-assessment provides a provisional assessment of a fishery based on a limited set of information provided by the client and public information available in the main management agencies and scientific website which could be involved in the fishery.

2.2. Constraints to the pre-assessment of the fishery

Most of the information used in the completion of this pre-assessment was obtained from the client, Gulf of Mexico Fisheries Management Council and Texas Parks & Wildlife Department. This report also provides an up-date of an earlier Pre-assessment carried out by MRAG in 2011 under MSC V1.3. That report was also reviewed as part of this pre-assessment. There was also information obtained from e-mail exchanges with the sponsors and their representatives during the final draft stages of the report which SAI Global expresses gratitude for. The last full stock assessment for this stock occurred in December 2015 with the next full assessment scheduled for December 2016. However, there were stock status updates available for 2014 and 2015. Therefore, no constraints to the pre-assessment of this fishery were found.

2.3. Unit(s) of Assessment

Under the new version of MSC requirements, the CAB has to define the UoC as follows:

“The target stock or stocks (=biologically distinct unit/s) combined with the fishing method/gear and practices (including vessel type/s) pursuing that stock and any fleets, groups of vessels, or individual vessels of other fishing operators.”

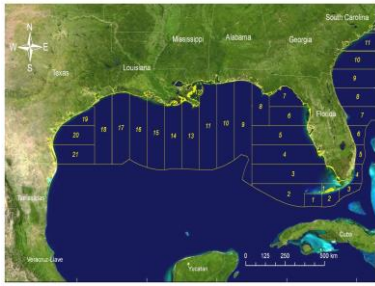
The UoA must be defined and it is therefore equal to or larger than the UoC and can be larger, if any eligible fishers are included it.

In the fishery under assessment the CAB has described the following UoAs and UoCs. Although the fishery has three target species, they are considered as a single stock and the catches are not always segregated when sold. Following the data that can be consulted in the reports, the main species are white and brown shrimp. Pink shrimp are less than 15 % of the total composition of catches and this species will be assessed as primary main species in this fishery.

The white and brown shrimp sometimes are not considered as different species when sold, but they have different stock assessments and may be considered different UoAs and UoCs.


For all these reasons the CAB has defined 2 UoAs and UoCs as follows:

– **White shrimp**

UoA 1	
Target species	[<i>Penaeus setiferus</i> , (Limaeus 1767)] White shrimp
Geographic area	Gulf of Mexico – Federal waters= 9 and 200 nautical miles in the Exclusive Economic Zone (EEZ) Texas State waters= up to 9 nm offshore 
Stock	Gulf of Mexico stock
Fishing gear	Otter trawl
Management system	Gulf of Mexico Fishery Management Council, as established by the Fishery Conservation and Management Act of 1976, NOAA Fisheries, the Texas state legislature, and associated regulatory bodies, including the Texas Parks and Wildlife Department (TPWD).
Client group and other eligible fishers	Galveston Shrimp Company Cox's Wholesale Seafood Big Easy Foods Paul Piazza and Son, Inc

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Client group	Galveston Shrimp Company Cox's Wholesale Seafood Big Easy Foods Paul Piazza and Son, Inc They are around 1400 vessels holding federal permits to catch shrimp (NOAA) all of them are included in the UoC

— **Brown shrimp**

UoA 2	
Target species	[<i>Farfantepenaeus azteus</i> (Ives,1891)] Brown shrimp
Geographic area	Gulf of Mexico – -Federal waters= 9 and 200 nautical miles in the Exclusive Economic Zone (EEZ) -Texas State waters= up to 9 nm offshore 
Stock	Gulf of Mexico stock–
Fishing gear	Otter trawl
Management system	Gulf of Mexico Fishery Management Council, as established by the Fishery Conservation and Management Act of 1976, NOAA Fisheries, the Texas state legislature, and associated regulatory bodies, including the Texas Parks and Wildlife Department (TPWD).
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2.4. Total Allowable Catch (TAC) and Catch Data

TAC's are not used in the management for these species under assessment but the catches are known and can be obtained at NOAA Fishery Statistics. The data are detailed in the table below per year and species.

Table 2.4 a) Catch Data from Texas States and Federal waters

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Catches	Species	Year	[n, unit]
22,279.2	Brown Shrimp	2013	Metric tons
19,874.6	Brown Shrimp	2014	Metric tons
9,939.9	White Shrimp	2013	Metric tons
8,227.8	White Shrimp	2014	Metric tons
54.8	Pink Shrimp	2014	Metric tons
18	Pink Shrimp	2013	Metric tons

3. Description of the fishery

3.1. Scope of the fishery in relation to the MSC programme

~ Eligibility for Certification against the MSC Standard

The fishery is eligible for certification and able to be assessed within the scope of the MSC Principles and Criteria for Sustainable Fishing as:

- The fishery is not conducted under a controversial unilateral exemption to an international agreement
- Fishing operations do not use destructive fishing practices such as fishing with poisons or explosives
- The fishery applying for certification is not the subject of controversy and/or dispute
- The fishery has not previously failed an assessment or had a certificate withdrawn
- The Client Group is prepared to consider how other eligible fishers may share the certificate but at the moment all the vessels are included in the certification and no other eligible fishers are defined

The assessment of the Texas Shrimp Fisheries will not result in an overlapping assessment with other fisheries, as there are no certified shrimp fisheries in the Gulf of Mexico at this time. However, in the event of other State/Federal fisheries entering assessment, the fisheries must be harmonized in the federal waters; both are regulated under the same laws in Federal waters.

~ Eligible fishers

The interested companies funding the pre-assessment are: Cox, Big Easy, Paul Piazza & Son and Galveston Shrimp. These are collectively termed 'the sponsors'. The associated vessels that land catches to each of these companies either exclusively or are purchased from fishers, either by pre-agreement to sell the shrimp or via trip tickets from the dealers would be the 'eligible fishers' in a certified fishery. The numbers of licensed vessels targeting both species of shrimp are noted in the UoCs.

~ Scope of Assessment in Relation to Enhanced Fisheries

The fishery under assessment is not an enhanced fishery.

~ **Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)**

The fishery under assessment is not an Introduced Species Based Fishery.

3.2. Overview of the fishery

The warm-water shrimp harvesting industry in the Gulf of Mexico represents one of the most economically important components of all of the domestic commercial seafood harvesting sectors in the United States. The shrimp harvest sector is reportedly comprised of over 20,000 vessels and craft that actively target shrimp in near-shore and offshore waters with trawls and other gear in the region (Gulf of Mexico Fishery Management Council, (GMFMC) 1994). Around 1492 licenses are granted by Federal regulation and less than 9500 in State waters (across all five Gulf states: TX, LA, MS, AL, and FL). The majority of the fleet in Texas is offshore. Over 60% of TX license holders also hold federal permits (850 state licenses, 539 federal TX registered permits). The vessels must have a state license to land in TX, so federal permit holders also have state licenses.

The shrimp industry contributes to local coastal economies on several levels. Shrimp are offloaded by shore-side handling facilities, which then set in motion a myriad of economic activities associated with processing, packing, wholesale distribution, and consumer expenditures. Vessel maintenance, repair, refuelling, and other activities also contribute to the overall economic activities associated with the industry. Previous studies have suggested that the commercial shrimp industry plays an important role in the economy of the Gulf region.

Thus, the commercial shrimp industry is an important natural resource-based contributor to the economy of the nation and the region, and provides an important source of employment and income to the coastal communities in which the vessels homeport, provision, and offload.

The main fishery offshore is carried out with otter trawl. Prior to the introduction of the otter trawl in 1917, most shrimp were commercially harvested in shallow inshore areas with haul seines. White shrimp were the main shrimp caught and marketed until -the early 1950s. Quantities of seabobs and brown shrimp were used for dried products.

During these years, fishing efforts were concentrated in areas where white shrimp were abundant. From 1917 to the late 1940s, most shrimp were caught from vessels rigged with single otter trawls, which operated within about six miles of shore. However, vessels occasionally went out about ten miles and, in some instances (off Louisiana), out fifty miles. By the early 1950s, increased markets for brown and pink shrimp and the discovery of new fishing grounds initiated a period of rapid expansion of the shrimp industry. As a result, some vessels began to move farther offshore because of the increasing difficulty of making profitable catches on traditional fishing rounds. By the early 1960s, U.S. shrimp vessels were fishing off the coasts of Mexico and South America. A major change in gear methodology took place in the late 1950's with the introduction of double-rig trawling. Two small trawls were pulled instead of a single large net, resulting in a substantial increase in catch

efficiency and a reduction of handling problems. Double-rig trawls were used by most vessels fishing for pink and brown shrimp. More recently the twin-trawl has become popular in the offshore Gulf shrimping fleet because of its efficiency (Figure 1). With this arrangement four small trawls are towed instead of two from a single vessel. The inshore shrimp fishery is primarily confined to the territorial waters of each of the Gulf States. There are numerous small boats rigged with single otter trawls which harvest shrimp commercially from the bays and marshes. Some of the boats may fish in the Gulf during favourable weather conditions, especially for white shrimp.

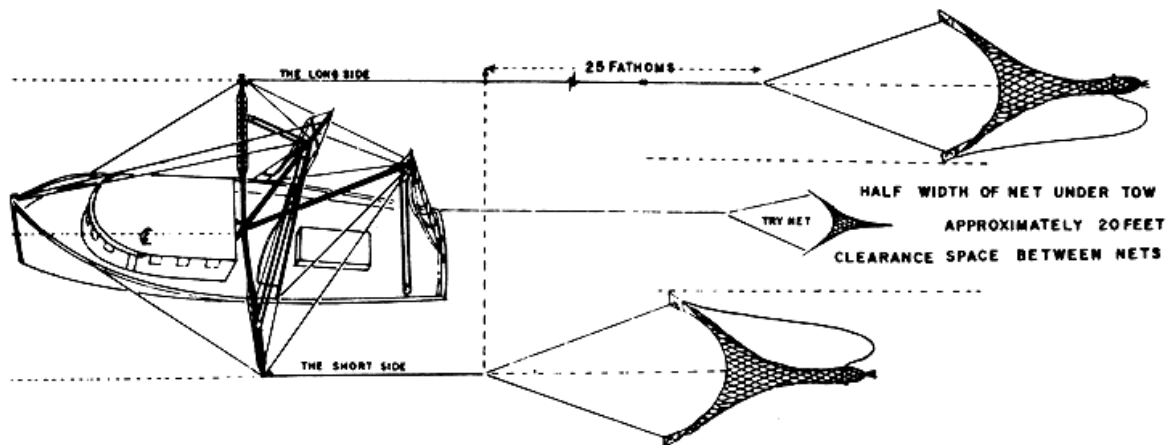


Figure 1. Example of vessel with double-rig trawls. The effort can be higher, with 4 meshes two in each trawl. Source: FAO.org

Nowadays, the vessels need permission to fish shrimp. There are around 1452 vessels holding permits in the Federal waters and 850 TX licenses. NOAA Fisheries SERO Permits Office is tasked with managing federal fishing permits of the Gulf of Mexico. The Southeast Permits Office issues permits for 7 to 17 months. By renewing a permit before the expiration date, the permit may be extended for another year. Limited access (or moratorium) permits are allowed to be transferred, which means the permit holder may change ownership of the permit or the vessel the permit is assigned to for fishing purposes. Amendment 17A extended moratorium for additional 10 years; Amendment 17B is still in draft form but it was published for consultation on August 6th of this year and it is available in the website of GMFMC. The purposes are to define the optimum yield, determine the appropriate number of permits to achieve optimum yield on a continuing basis, consider measures to maintain the appropriate number of permits for the federal Gulf shrimp fishery without increasing bycatch, and to develop provisions for non-federally permitted shrimping vessels to transit through federal waters while not actively shrimping. The needs for this action are to ascertain the appropriate metric(s) to manage the shrimp fishery, maintain increases in catch efficiency without substantially reducing landings, promote economic efficiency and stability in the fishery, provide flexibility for state registered shrimp vessels, and protect federally managed Gulf shrimp stocks. The Southeast Permits Office also manages the Catch History for vessels and permits, which can be requested by the permit or vessel owner. Vessel permits are not only kept internally, but also available online. Information regarding the vessel, permit holder address, permit effective date and expiration date are listed on the NOAA Fisheries SERO website.

The fishery in Texas State is very important as an economic factor. The legislation in Texas waters is similar to federal waters and the State defers to Federal regulations. The Texas Legislature kept the basic framework of the Shrimp Conservation Act of 1959 largely intact until the State granted management authority over shrimp to TPWD in 1985. The new authority was contingent upon development of a shrimp fishery management plan (FMP) which was adopted by the TPWD Commission (Commission) in 1989. Based on continued overfishing trends documented in the FMP, the Commission adopted additional fishery restrictions in 1990 and 1994, currently the stocks seem healthy and the same stock assessment is adopted by Federal and State regulations.

3.3. Principle One: Target species background

The target shrimp species caught in the warm water of the U.S. Gulf of Mexico include: white (*Litopenaeus setiferus*), brown (*Farfantepenaeus aztecus*).

~ **White shrimp**

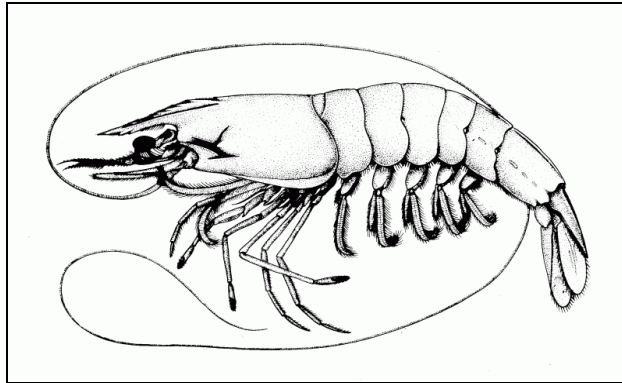


Figure 2. White shrimp (*Penaeus setiferus*) drawing. Source FAO.org

The white shrimp is located between depths of 2 to 90 m. The preference substrate is bottom mud or peat, sometimes with sand or clay. When they are adults the life offshore, in marine regions and while they are juveniles they are in the estuarine areas. White shrimp eggs are demersal and larval stages are planktonic in nearshore marine waters. Post-larvae migrate through passes mainly from May until November with peaks in June and September. Juveniles are common in all Gulf estuaries from Texas to the Suwannee River in Florida. Post-larvae and juveniles commonly occur on bottoms with large quantities of decaying organic matter or vegetative cover such as mud or peat. Juvenile migration from estuaries occurs in late August and September and is related to juvenile size and environmental conditions (e.g., sharp temperature drops in fall and winter). Adult white shrimp are demersal and inhabit nearshore Gulf waters to depths of 16 fathoms on soft bottoms.

The size must be around maximum total length of 17.5 mm (male), 200 mm (female); maximum carapace length of 41 mm (male), 60 mm (female).

The distribution area is shown in the map (figure 3): Western Atlantic: East coast of U.S.A. from New Jersey to Texas; east coast of Mexico from Tamaulipas to Campeche; especially abundant in the Gulf of Mexico.



Figure 3. Distribution of white shrimp. Source: FAO.org

The species is fished along the Atlantic coast of U.S.A. from North Carolina to Florida and in the Gulf of Mexico. It is of great economic importance in the United States and Mexico. In 1975 almost 27,000 t were landed in the U.S.A. alone. In Mexico, the most important fishery is in the Gulf of Campeche. The species is mostly frozen and canned and exported all over the world. Culture experiments with this species seem to meet with some success (Bardach et al. 1972). The total catch reported for this species to FAO for 1999 was 44,633 t. The countries with the largest catches were USA (44,663 t).

The last update report for white shrimp provides evidence that the Gulf of Mexico white shrimp stocks are not overfished or undergoing overfishing. Fishing Mortality (F) is fluctuating over the years, after decreasing in 2010 last report shows an increase in the last report although a decreasing trend in F during the later portion of the time series is shown (Figure 4).

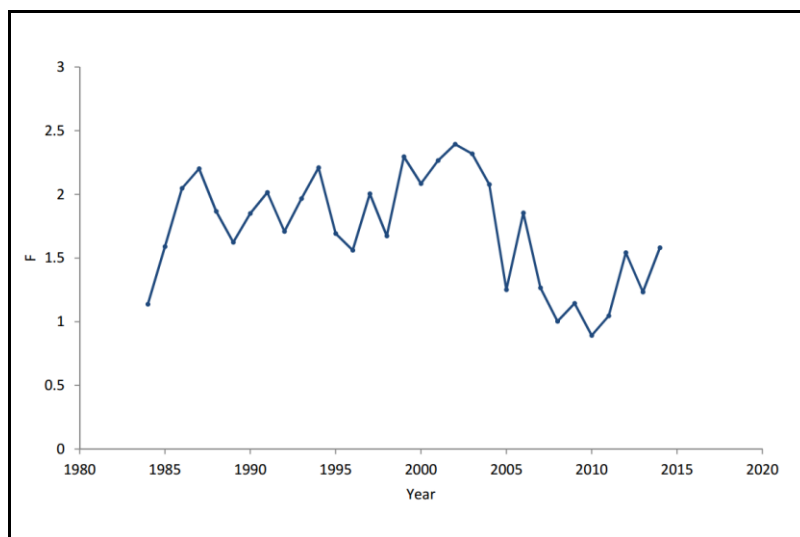


Figure 4. White shrimp weighted annual F-values across ages for 1984-2014

Further, the model update reveals increasing spawning biomass and recruitment in recent years (Figure 5).

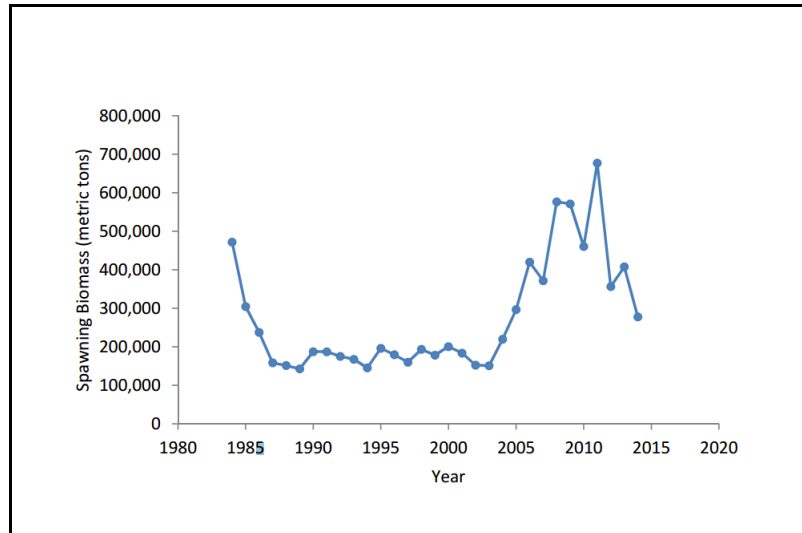


Figure 5. White shrimp spawning biomass estimates, 1984-2014

~ **Brown shrimp**

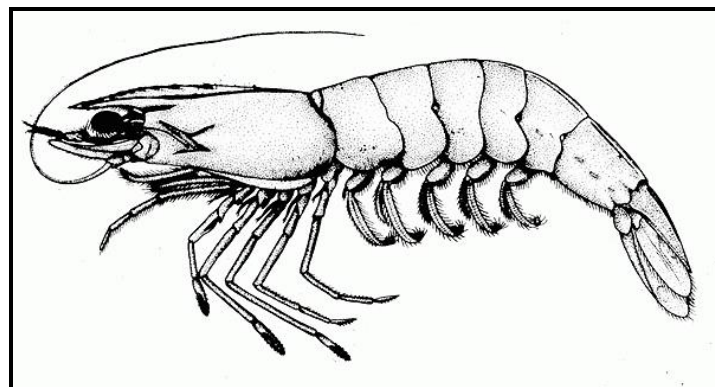


Figure 6. Brown shrimp (*Penaeus aztecus*) drawing. Source FAO.org

The brown shrimp is located in depths of 4 to 160 m, highest densities between 27 and 54 m. The preferred substrates are bottom mud or peat surfaces, often with sand, clay or broken shells. When the life cycle reaches the adult status, they are offshore in marine areas with high salinity. The juveniles are normally in the estuarine areas. The sizes are around maximum total of length 195 mm (male) and 236 mm (female). Brown shrimp eggs are demersal and occur offshore. Post larvae migrate to estuaries through passes on flood tides at night mainly from February until April; there is another minor peak in the fall. Post-larvae and juveniles are common in all U.S. estuaries from Apalachicola Bay, Florida to the Mexican border. Brown shrimp post-larvae and juveniles are associated with shallow, vegetated, estuarine habitats, but may occur on silt, sand, and non-vegetated mud bottoms.

The distribution of brown shrimp is widely known; they are distributed in Western Atlantic: Atlantic coast of U.S.A. from Massachusetts to Texas; east coast of Mexico from Tamaulipas to Campeche.



Figure 7. Distribution of brown shrimp. Source: FAO.org

It is a commercial species with high interest in the fishery. Off North Carolina, this is the most important *Penaeus* species. Also along the north and east coast of the Gulf of Mexico it is of great commercial value, although sometimes surpassed by *P. setiferus*; the grounds off Texas are by far the most important. In 1976, 61,873t of the species were landed in the U.S.A. Aquaculture experiments with *P. aztecus* have been undertaken in the U.S.A. The total catch reported for this species to FAO for 1999 was 61,206t. The countries with the largest catches were USA (61,206t).

The last update report from brown shrimp stock assessment shows the Stock Synthesis model developed provides outputs for new overfished and overfishing definitions for the Gulf of Mexico brown shrimp fishery. This assessment revealed the fishery is not overfished nor undergoing overfishing. Spawning biomass and recruitment have fluctuated in recent years (Figure 8). Spawning stock biomass and recruitment have decreased in recent years while fishing mortality (F) increased during the later portion of the time series (Figure 9)

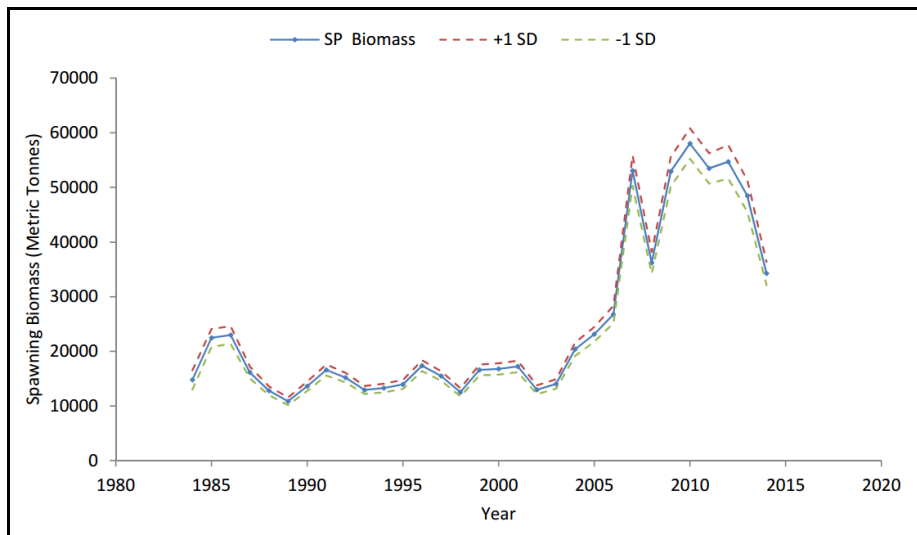


Figure 8. Brown shrimp spawning biomass estimates. Source NOAA

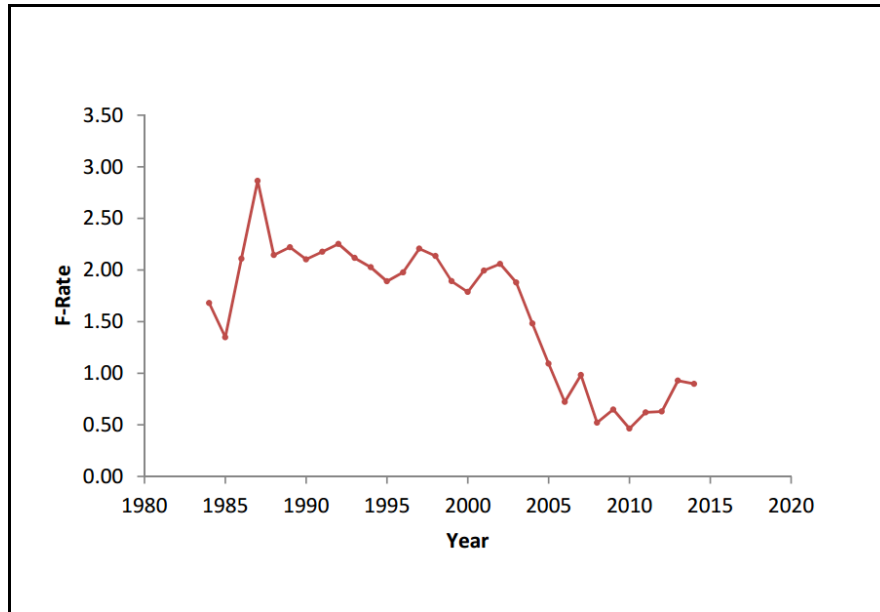


Figure 9. Brown shrimp annual F value. Source: NOAA

3.4. Principle Two: Ecosystem background

The FCR V2.0 evaluates the principle two into 5 sections as follows:

1. Primary species
2. Secondary species
3. ETP
4. Habitats and
5. Ecosystems

New version of MSC requirements divided the non- target species into primary and secondary species and at the same stage into main, if the catches are more than 5 % or more than 2% is the species is less resilient, or minor for all the species that do not comply with the previously explained.

The shrimp fishery has many bycatch species. To make the classification of this species easier, the assessment team has reviewed different reports available from Texas and Federal waters and the table below was made (TPWD report 2002, Scott-Denton 2012):

Table 1. Classification of the species described in the shrimp vessels by different research projects. Classifications by primary/secondary species and by main/minor.

Species	Federal waters	State waters	Source	Gear types	Primary	Secondary	Main	Minor	RBF
White shrimp	X	X	Assessment report /NMFS	Commercial	X	-	X	-	NO
Brown shrimp	X	X	Assessment report /NMFS	Commercial	X	-	X	-	NO
Pink Shrimp	X	X	Assessment report /NMFS	Commercial	X	-	-	X	NO
Royal Red Shrimp	X	-	Assessment report /NMFS	Commercial	X	-	-	X	NO
Gulf Menhaden	X	X	Texas report 2002	Commercial	X	-	-	X	NO
Atlantic Croaker	X	X	Scott-Denton (2012), Texas report 2002	Commercial		X	X		YES
Bay Anchovy	-	X	Texas report 2002	Bay and Bait fishery		X	-	X	YES
Spot	-	X	Texas report 2002	Bay and Bait fishery		X	-	X	NO
Lesser blue Crab	-	X	Texas report 2002	Bay and Bait fishery		X	-	X	NO
Blue crab	X	X	Scott-Denton (2012), Texas report 2002	Commercial	X		-	X	NO
Atlantic brief squid	-	X	Texas report 2002	Bay and Bait fishery		X	-	X	NO
Hardhead Catfish	-	X	Texas report 2002	Bay and Bait fishery		X	-	X	NO
Pinfish	X	X	Scott-Denton (2012), Texas report 2002	Commercial		X	-	X	NO
Blacknose shark	X	-	Scott-Denton (2012) & MRAG pre-assessment	Commercial	X		X	-	NO
Red snapper	X	-	NOAA/ MRGA pre-assessment	Commercial	X		X		NO
SeatROUT (genus)	X	X	Scott-Denton (2012) & Texas report 2002	Commercial		X	X		YES
Longspine porgy	X		Scott-Denton (2012)	Commercial		X		X	YES

In the table, the CAB also splits the species depends on whether they are present in Federal or State waters. The classification of species captured in the fisheries was realized with the data available for the Federal observer program and different studies carried out in the State waters. Total

composition of catches directly from the fishery is not available. For this reason, some species need RBF to assess how the fishery can affect the stock status.

3.4.1 Primary Species

Following the table above and as MSC defines primary species as “Primary species are those where management tools and measures are in place, expected to achieve stock management objectives reflected in either limit or target reference points.” If the % of catches is more than 5% it will be classified as main primary species. Less than 5 % will be minor primary species.

The CAB will analyze as primary species the listed below:

- Pink Shrimp- primary minor
- Brown Shrimp when is not target species in the UoA- primary main
- White shrimp when is not target species in the UoA- primary main
- Royal Red Shrimp- primary minor
- Gulf Menhaden - primary minor
- Blacknose shark-primary minor
- Red snapper-primary main
- Blue crab- primary minor

Therefore, the primary retained species under Principle 2 in the Texas Shrimp Fishery in the U.S. Gulf of Mexico includes: pink shrimp (*Farfantepenaeus duorarum*).

~ **Pink shrimp**

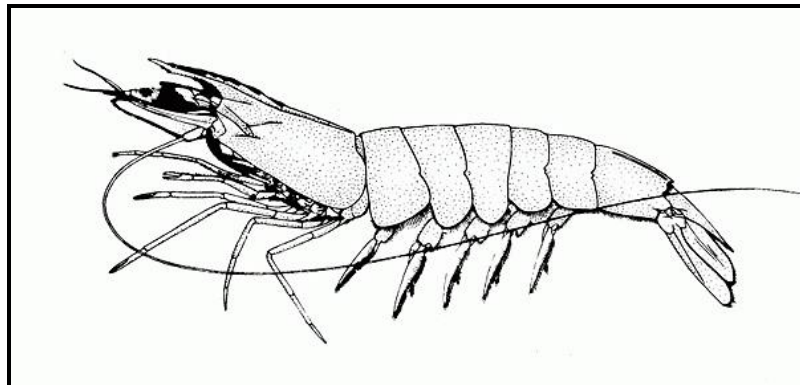


Figure 10. Pink shrimp (*Penaeus duorarum*) drawing. Source FAO.org

Pink shrimp is located between of depth 3 to 100 m, rarely as deep as 700 m, usually between 3 and 50 m. They prefer bottom surface of mud or sandy mud, and sandy patches among rocks. As the other species when they are adults they life in offshore in marine areas and when they are juveniles in the estuarine areas. The sizes are the maximum total length 175 mm (male), 192 mm (female); maximum carapace length 41 mm (male) and 48 mm (female).



Figure 11. Distribution of pink shrimp. Source: FAO.org

The distribution of pink shrimp is located in the Eastern Atlantic: West African coast from Mauritania to Angola; Western Atlantic: Greater Antilles from Cuba to the Virgin Islands; Atlantic coast of Middle and South America from S. Mexico (Quintana Roo) to Brazil (S. to Rio de Janeiro). It is a fishery interest to the fishery with *Penaeus (litopenaeus) schmitti* the most important commercial shrimp of the Greater Antilles and the Atlantic coast of Central America, Venezuela and various areas of Brazil, both on a local and commercial scale. The species is also the subject of important fisheries in West Africa, both locally and by foreign trawlers. Aquaculture experiments with this species have been undertaken in Cuba. The total catch reported for this species to FAO for 1999 was 34,900t. The countries with the largest catches were Nigeria (27,341t) and Senegal (4,887t). Pink shrimp eggs are demersal, and early larvae are planktonic, and post-larvae are demersal in marine waters. Juveniles inhabit almost every U.S. estuary in the Gulf but are most abundant in Florida. Juveniles are commonly found in estuarine areas with seagrass, where they burrow into the substrate by day and emerge at night. Adults inhabit offshore marine waters with the highest concentrations in depths of 5 to 25 fathoms.

The last Stock assessment for Pink shrimp carried out by NOAA shows that no overfished or overfishing conditions are occurring. The model, stock synthesis (SS-3), runs with a historical series of data from 1984 to 2014. The results of the model are that the SSB has a slight decrease; there are increases in recruitment and decreasing trends in fishing mortality. Better understanding of these conclusions, given in the stock assessment, is shown in the next plots (Figure 12 and Figure 13).

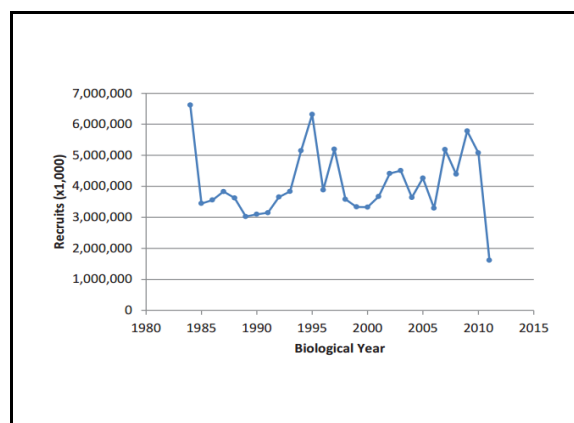


Figure 12. Pink shrimp biological year recruitment estimates. Note that biological year 2011 only includes 6 months of recruitment data, hence the low value seen in the figure. Source: NOAA

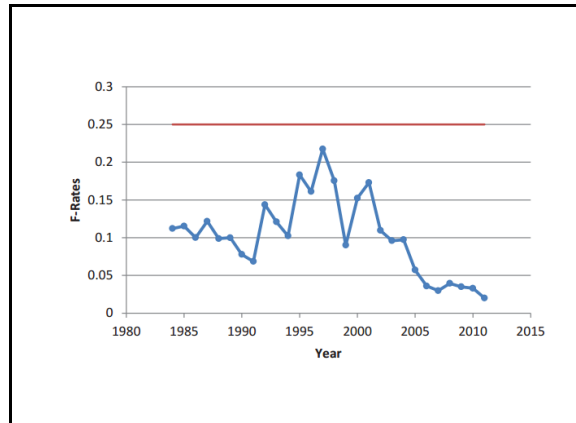


Figure 13. Pink shrimp weighted monthly apical F-values across ages 1-19 for 1984-2011. Source NOAA

Brown and white shrimp species are described as target species and they are primary main species of each other. The stock status of both is described in the section above and both are above the reference points where the stock can be hindered (section 3.3).

~ **Royal Red Shrimp**

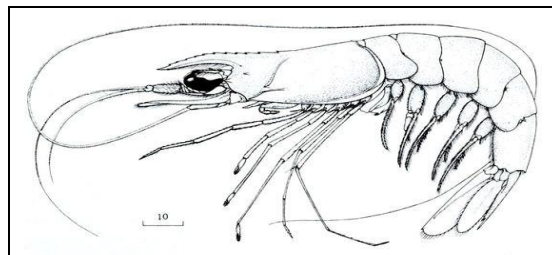


Figure 14. Royal Red Shrimp (*Pleoticus robustus*) drawing. Source FAO.org

The distribution of shrimp is located over the Gulf of Mexico in deeper between 40 and 2000 meters (Figure 15) but normally is captured offshore. The range of temperature is between 25 to 4 Celsius degrees.

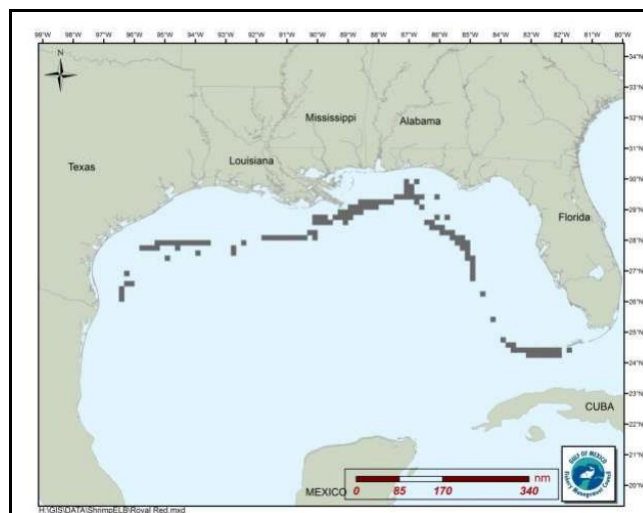


Figure 15. Map of areas of shrimp effort in the depth zones where royal red shrimp occur (150-800 m). Source: SEFSC-Galveston, electronic logbook data.

Royal Red shrimp is primary minor in the Federal waters, the distribution of this species is deeper than the white and brown shrimp; therefore, the overlapping with the distribution areas of target species is not more common. The amendment 16 established by the Gulf of Mexico shrimp FMP described several adjustments to the Annual Catch Limit and Accountability Measure for Royal Red Shrimp. This amendment concludes that the harvest of royal red shrimp has been below the preferred ACL in all years since 1962 and well below it in recent years. Therefore, the likelihood of reaching the ACL and triggering accountability measures is very low then the shrimping is not hindering the stock status of this species.

On the other hand, the amendment 17A established the moratorium of Royal Red Shrimp permits; this final rule extends the current Gulf commercial shrimp permit moratorium for 10 more years. The intent of this final rule and Amendment 17A is to protect federally managed Gulf shrimp stocks while promoting catch efficiency, economic efficiency, and stability in the fishery of Royal Red shrimp.

Red snapper would normally be minor as the percentage of catches is less than 5% in the shrimp fishery but, due to the vulnerability of this stock, it is considered as a main primary species. The same situation is occurring with the blacknose shark. The catches of blacknose shark established by the management plan is 0, the limited access permit (LPA) for the last year was 0 catches because in 2015 the catches of blacknose exceeded of the TAC therefore the management plan has established this measures to control the stock. Amendment 6 of the Highly Migratory Species (HMS) FMP now prohibits take of blacknose shark in GOM.

The shrimping does not hinder the rebuilding plan of the red snapper, the historical overview that NOAA published shows how the population of juveniles is increasing over the years since the rebuilding plan was set up and the shrimping effort has decreased. The juveniles' specimens were the most affected by shrimp fisheries when the stock was depleted. Further, the federal system has set a requirement to maintain shrimp fishing effort at a sufficiently low level that it does not result in high catches of red snapper. The last stock assessment of red snapper concludes that the projections indicate that as the target SPR for red snapper becomes more conservative, the associated FProxy declines, SSBProxy increases, the time to rebuild becomes longer, and associated OFL, ABC, and equilibrium yields decrease. The MSY-link scenario resulted in an SPR of 23%, but produced lower equilibrium landings than when shrimp bycatch and closed-season discarding are assumed to remain at recent levels. This is because, under the linked scenario, any change in directed fishing mortality is assumed to be accompanied by a proportionate change in non-directed fishing mortality (in this case the change is an increase over recent levels). Accordingly, the MSY-link scenario does not appear to be a robust proxy for the global MSY when there is substantial bycatch mortality (SEDAR Red Snapper 2014 Update Assessment).

Blacknose shark- Catches of blacknose shark in the Gulf of Mexico were dominated by discards in the shrimp trawl fishery. These discard estimates should be considered superior to those used in the 2007 stock assessment because they stemmed from a collaboration between NOAA and the shrimp industry. The Review Panel did not feel that the projection methods presented for their review were appropriate and uncertainties in the models were described in the report. However, NMFS scientists conclude that the shrimp fishery does not impede the recovery of the blacknose shark. Given the

reduction of effort in the shrimp fishery over past years and the requirement for use of BRDs, the Gulf Council has tentatively concluded that the shrimp fishery has reduced bycatch of blacknose shark to appropriate levels.

Other primary species described as primary but with catches with less than 5%, therefore, are considered minor, are Gulf Menhaden and blue crab. These are considered primary species but with the percentage of catches that the CAB has collected are minor species.

Gulf Menhaden- Based on the suite of benchmarks presented in the last stock assessment in 2013, the results suggest that generally the current stock status is not overfished. Because no benchmarks have been defined, the stock relative to targets could not be provided. The history of SSB in this report of 2013 suggests that the population may have been considered overfished in the past, depending upon the benchmark considered. The results indicate that the fecundity estimates for the terminal year are well above SSB_{MED} threshold, therefore nowadays the stock of Gulf menhaden is within biological limits, well above the point of recruitment impairment and fluctuating around the target reference point.

Blue crab- in 2007 the Texas stock assessment concluded with the recommendations cited as follows “Resource managers should be concerned that crab populations have not rebounded despite a reduction in both crab trap and shrimp trawl effort. Numerous reasons exist for low populations, but results of this assessment point to one plausible explanation excess effort. Stock abundance is at an all-time low, production is reduced, and any surplus growth in the stock is quickly absorbed by the crab trap fishery, which is estimated at 15% above E_{msy} . While it is recognized that this and other models have limitations, finding ways to reduce effort would benefit the resource and ultimately the fishermen”. After this assessment several actions were directly established to reduce the effort in the fishery.

3.4.2 Secondary species

Between 2007 and 2010, 185 species were observed as bycatch in the shrimp fishery (Scott Denton et al. 2012). By weight, approximately 57% of the catch was finfish, 29% was commercial shrimp, and 12% was invertebrates. The species composition is spatially and bathymetrically dependent, but for the Gulf overall, Atlantic croaker, sea trout, and longspine porgy are the dominant finfish species taken in trawls (approximately 26% of the total catch by weight). Other commonly occurring species include portunid crabs, mantis shrimp, spot, inshore lizardfish, sea-robins, and Gulf butterflyfish.

The GMFMC initially established regulations requiring BRDs specifically to reduce the bycatch of juvenile red snapper. In 1998, all shrimp trawlers operating in the EEZ, inshore of the 100-fathom contour, west of Cape San Blas, Florida were required to use BRDs. Only two Gulf States (Florida and Texas) require the use of BRDs in state waters.

Bycatch has been noted as a concern in the literature and the GMFMC is trying to reduce it as much as possible. One of the last reviews of the fishery was carried out in the amendment 13 where a

bycatch reporting methodology was established and improved collection of shrimping effort data in the exclusive economic zone.

To allow classification of the bycatch species under the new MSC v2.0 requirements the composition of catches needs to be known. Some of this information is available in Scott-Denton, 2012, and TPWD 2002 report of bycatch (Table 1).

However, there is a large percentage of the total composition of catches from the vessels under assessment that is not differentiated other than into general finfish and general invertebrates and not by species. Greater differentiation would support improved scoring for these Principle 2 performance indicators. The low coverage of observer program also results in further challenges in the fishery performance in Principle 2.

Programs are in development to reduce the bycatch and increase the % of coverage in the observer program. The implementation of the logbook in every vessel has been in place since 2007 in the Gulf of Mexico and the monitoring and control of the catches and the species retained have been improved. The outcome of these developments should be that more quantitative data on bycatch species in the shrimp fisheries will be available. Also, NOAA has programs to study the bycatch in the fishery and protect sensitive species. The Shrimp Bycatch Reduction Device Evaluation Research is an observer program organized and conducted via the Galveston Laboratory and is part of the National Observer Program run by NOAA. This project consists of on-board monitoring and scientific data analysis. This program evaluates the use of Turtle Excluder Devices (TEDs) and Bycatch Reduction Devices (BRDs) and documents bycatch volume and species composition. This observer program was initially established in 1987 as a voluntary program and has helped provide data for evaluating the economic impact of TEDs and BRDs (Figure 16) on the shrimping industry. The program became mandatory in 2005 and it can be consulted in the Amendment 13 a standardized bycatch reporting was defined.

All five Gulf States contribute to this effort and, in Florida and Texas, it is mandatory use these devices (oral communication by Benny J. Gallaway in Science & Sustainability, American Institute of Fisheries Research, 2014).

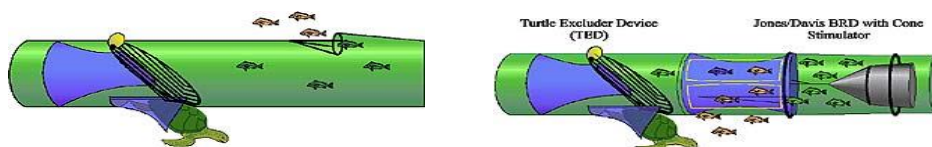


Figure 16. Different kind of BRDs approved in the Sates. Right- Fisheye model; Left Jones-Davis Model

On the other hand, the observer programs implemented in the fishery, coverage remains at around 2% for the Federal otter trawl fleet. Currently, the Deepwater Horizon Oil Spill Early Restoration Funds Sea Turtle Restoration Program is developing a program to increasing observer coverage. This money was only recently approved and has not been implemented yet. The funding would support

300 additional observer sea days per year for a 10-year period. This information can be consulted in this [link](http://www.gulfspillrestoration.noaa.gov/sea-turtle-early-restoration-project). (<http://www.gulfspillrestoration.noaa.gov/sea-turtle-early-restoration-project>)

3.4.3 ETP species

All marine mammals that reside in the Gulf of Mexico are under the protection of the Marine Mammal Protection Act of 1972 administered by NOAA. Manatees, however, are under jurisdiction of the U.S. Fish and Wildlife Service. Endangered or threatened marine mammals are further protected by the Endangered Species Act (ESA) as it was mentioned above.

The Endangered Species Act (ESA) includes: marine mammal species (sei, fin, humpback, sperm whales, minke whales, bottlenose dolphin and manatees); five sea turtles (Kemp's ridley, loggerhead, green, leatherback, and hawksbill); however just sperm whales are found in the Gulf and in Texas waters there are no reported interactions. Two fish species (Gulf sturgeon and smalltooth sawfish) are found; and four coral species (elkhorn coral, lobed star coral, boulder star coral, and mountainous star coral). Seven species of fish and invertebrates in the Gulf are currently listed as species of concern. Otter trawls may directly affect smalltooth sawfish that are foraging within or moving through an active trawling location via direct contact with the gear. The long toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in any type of netting gear, including the netting used in shrimp trawls. Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles are all highly migratory and are known to occur in areas subject to shrimp trawling. Bycatch of the species by commercial fisheries is a major contributor to past declines and a potential threat to future recovery (NMFS and USFWS 1991, 1992a, 1992b, 2008; NMFS et al. 2011). Historically, southeastern U.S. shrimp fisheries (both Gulf and South Atlantic) have been the largest threat to benthic sea turtles. Regulations requiring turtle excluder devices (TEDs) have reduced the catches of non-target species. (Shrimp Amendment 15: Status 31 Chapter 3).

During a four-year study period, 55 sea turtles were captured in shrimp trawls; 80% were released alive and conscious (Scott-Denton et al 2012). The most recent biological opinion evaluated the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters (NMFS 2014). The Gulf shrimp fishery was considered specifically as part of this larger consultation. The biological opinion, which was based on the best available commercial and scientific data, concluded the continued authorization of the Southeast U.S. shrimp fisheries in federal waters (including the Gulf shrimp fishery) is not likely to jeopardize the continued existence of threatened or endangered species (NMFS 2014). The biological opinion recommended measures to minimize the impacts of incidental take to sea turtle or smalltooth sawfish.

To make easy the understanding of which species are identified in the Gulf of Mexico the table below shows the species that the CAB found in the literature and where are common the interactions with them (

Class	ETPs Species	Federal	State
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		waters	waters
Mammals	Sei Whale	X	-
	Fin Whale	X	-
	Humpback Whale	X	-
	Sperm Whales	X	-
	Minke Whales	X	-
	Bottlenose dolphin	X	-
	Manatees	X	-
Turtles	Kemp's ridley	X	X
	Green	X	X
	Leatherback	X	X
	Hawsbill	X	X
	Loggerhead	X	X
Fish	Gulf Sturgeon	X	-
	Smalltooth Sawfish	X	-
Corals	Elkhorn coral	X	-
	Lobedstar coral	X	-
	Boulderstar coral	X	-
	Mountainous star coral	X	-

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Table 2. ETPs species identified in the Gulf of Mexico and State waters. * Sources: ESA, MRGA TX report from 2010 and Louisiana report.

Class	ETPs Species	Federal waters	State waters
Mammals	Sei Whale	X	-
	Fin Whale	X	-
	Humpback Whale	X	-
	Sperm Whales	X	-
	Minke Whales	X	-
	Bottlenose dolphin	X	-
	Manatees	X	-
Turtles	Kemp's ridley	X	X
	Green	X	X
	Leatherback	X	X
	Hawsbill	X	X
	Loggerhead	X	X
Fish	Gulf Sturgeon	X	-
	Smalltooth Sawfish	X	-
Corals	Elkhorn coral	X	-
	Lobedstar coral	X	-
	Boulderstar coral	X	-

	Mountainous coral	star	X	-
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3.4.4 Habitats

Habitats in the shrimp fishery are very different. Estuaries in Texas waters differ in several respects from a typical estuary. First, their connection with the open sea is more restricted, being confined to a few tidal channels that breach the offshore barrier islands. Secondly, Texas estuaries are often divided into at least primary and secondary basins. Primary bays vary in salinity from marine (30-40 parts per thousand-ppt) at the tidal inlets to polyhaline (12-30 ppt) or upper mesohaline (3-12 ppt) near their connections with secondary bays. Brackish to freshwater transition is completed within the secondary basins. Some of the best examples of primary-secondary bay systems on the Texas coast occur from Corpus Christi northward and include the Trinity-Galveston, Lavaca-Matagorda, Copano-Aransas and Nueces-Corpus Christi Bay systems. Secondary bay shores are often bounded by extensive low-lying marshlands bisected by numerous narrow drainage channels. Texas has approximately 365 miles of open Gulf shoreline and contains 2361 miles of bay-estuary. This is the most biologically rich and ecologically diverse region in the state and supports more than 601,000 acres (ac) of fresh, brackish and salt marshes and 1.5 million ac of open water. From the Louisiana border to Galveston, the coastline is comprised of marshy plains and low, narrow beach ridges. From Galveston Bay to the Mexican border, the coastline is characterized by long barrier islands and large shallow lagoons. Within this estuarine environment are found the profuse seagrass beds of the Laguna Madre, a rare hypersaline lagoon, and Padre Island, the longest undeveloped barrier island in the world (The Texas Shrimp Fishery. A report to the Governor and the 77th Legislature of Texas).

The shrimp trawl fishery in the northern Gulf of Mexico, including Texas, primarily trawls with smaller nets in shallower waters (less than 30 meters) and is active in primarily mud, sand, or peat bottoms in areas that are storm-prone and typically experience habitat disturbances from natural causes as well as other anthropogenic activities. While trawling does cause a sediment plume, the turbidity following the disturbance is comparable to that of a 25 mile per hour wind event (Dellapenna et al, 2006). While there is also potential to disturb benthic and epibenthic fauna, organisms in soft mud have the capability to burrow up to two meters (Jennings and Kaiser 1998). Otter trawl doors were found to have a maximum cutting depth of 50 – 300 millimetres (Drew and Larsen, 1994), and, according to Schubel et al. (1979), the footropes of shrimp trawlers in Texas disturbed approximately the upper 50 millimetres of the sediment (Barnette 2001). Additionally, epifauna are scarce in muddy sediment habitats (Barnette 2001). Trawls do have the potential to significantly impact reef and complex bottom habitats, but in Texas, the bottom area is well known. Obstructions and reefs are avoided and prohibited areas have been established to prevent damage to sensitive habitats. Overall, the habitat impacts otter trawls are potentially minor in Texas and Gulf waters.

3.4.5 Ecosystems

Otter and beam trawls are the most common gear used in both Texas state and federal waters (Texas Trawl Gear Characterization). Barnette (2001) compiled a review of habitat impacts of gear types commonly used in the South-eastern United States, including the Gulf of Mexico, as there is concern over what affect trawls have on the ocean floor and essential fish habitat (EFH). Beam trawls are similar in construction to otter trawls, but contain a metal frame that spreads the mouth of the net. The gear is not designed to contact the substrate (Texas Trawl Gear Characterization). The effect beam trawls have on the ocean floor is similar to that of otter trawls, so they are not discussed separately here (ICES 1973; Barnette 2001).

Otter trawls are one of the gear types commonly used in both Texas state and federal waters. The extent to which an otter trawl affects the ocean bottom is highly dependent on bottom type. Generally, trawls cause scraping and ploughing, sediment resuspension, physical habitat destruction, and removal or scattering of non-target benthos (Jones, 1992). The trawl doors have the most potential to impact bottom habitat due to their size, weight, and function (Barnette, 2001). As trawling occurs, the doors disturb the upper layer of sediment, causing it to suspend in the water column. The rate of settlement depends on the type of sediment; finer particles such as mud and silt settle much slower than sand. This does have the potential to affect water turbidity and compress the euphotic zone (North Carolina Division of Marine Fisheries 1999). The footrope does not have a major impact on a flat bottom (ICES, 1995), but may cause damage in more complex benthic habitats (Barnette, 2001). Trawls have the potential to more severely impact complex bottoms such as coral reefs. However, the use of trawls on coral reefs in the EEZ is prohibited and tickler chains are required to have a weak link (EFH- Amendment 3).

Regarding the key ecosystems there are several studies carried out by NOAA about the environmental conditions and fishing indicators. The areas more sensitive to turtles are established and closed to the fishery and also, some areas where stony corals are (Amendment 3). There are regulations preventing the catches of corals and hard corals such as Scleractinia corals and Stylasteridae. There have been additional studies of benthic habitats in the last 15 years and the characterization of the bottom surface in the Gulf of Mexico is increasingly known and researched (NOAA Technical Memorandum NMFS-SEFSC-653).

3.5. Principle Three: Management system background

The Texas shrimp fishery, which is fished within Texas state territorial waters and federal Exclusive Economic Zone (EEZ) waters of the Gulf of Mexico, is managed under the aegis of the Gulf of Mexico Fishery Management Council, as established by the Fishery Conservation and Management Act of 1976, NOAA Fisheries, the Texas state legislature, and associated regulatory bodies, including the Texas Parks and Wildlife Department (TPWD).

The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA (first enacted in 1976, and amended in 1996 and 2006) is the primary law governing fisheries management in the U.S.

Texas Parks and Wildlife Department (TPWD) is the state agency charged with management of the shrimp fishery in Texas waters and manages the fishery separately, but consistent with, federal management. TPWD representatives sit on the GMFMC and associated scientific and advisory panels, and participate in research activities.

TPWD Coastal Fisheries Division (CFD) conducts both fishery-dependent and fishery-independent data collection, which is reviewed annually to determine trends and status of stocks. Management recommendations made to the TPWC are based on this scientific evidence and protocols are reviewed annually to ensure that best methods are being utilized.

3.5.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ, an area extending 200 nautical miles from the seaward boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond the EEZ.

Responsibility for federal fishery management decision-making is divided between the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in Appendix A. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for fishery resources in federal waters of the Gulf. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the states of Texas, Florida and the three-mile seaward boundary of the states of Alabama, Mississippi, and Louisiana. The Council consists of 17 voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. Non-voting members include representatives of the U.S. Fish and Wildlife Service, U.S. Coast Guard (USCG), and Gulf States Marine Fisheries Commission.

The Council uses its Science and Statistical Committee to review data and science used in assessments and fishery management plans/amendments. Regulations contained within FMPs are enforced through actions of the NMFS' Office for Law Enforcement, the USCG, and various state authorities. The public is involved in the fishery management process through participation at public meetings, on advisory panels and through Council meetings that, with few exceptions for discussing personnel matters, are open to the public. The regulatory process is in accordance with the

Administrative Procedures Act, in the form of “notice and comment” rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

3.5.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments have the authority to manage their respective state fisheries including enforcement of fishing regulations. Each of the five states exercises legislative and regulatory authority over their state’s natural resources through discrete administrative units. Although each agency listed below is the primary administrative body with respect to the state’s natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. The states are also involved through the Gulf States Marine Fisheries Commission in management of marine fisheries. This commission was created to coordinate state regulations and develop management plans for interstate fisheries. NMFS’ State-Federal Fisheries Division is responsible for building cooperative partnerships to strengthen marine fisheries management and conservation at the state, inter-regional, and national levels. This division implements and oversees the distribution of grants for two national (Inter-jurisdictional Fisheries Act and Anadromous Fish Conservation Act). Additionally, it works with the Gulf States Marine Fisheries Commission to develop and implement cooperative State-Federal fisheries regulations: Texas Parks & Wildlife Department.

– Brief History of Management Changes

1930 – Texas Legislature enacted 5 ½ inch minimum size limit, shrimping closure in May-July, and maximum trawl width of 10ft.

1959 – Shrimp Conservation Act of 1959 attempts to better allocate resources between Gulf, bay, and bait shrimpers.

1985 – Authority for managing shrimp shifted from Texas Legislature to TPWD.

1989 – Shrimp FMP adopted by TPWC.

1990 – Revised period of seasonal closure in Gulf waters from June 1 to July 15, to May 15 to July 15.

1995 – First bay and bait vessel license entry program via a license buyback program.

2000 – License fee increase for commercial and recreational fishermen.

4. Evaluation Procedure

4.1. Assessment methodologies used

This pre-assessment report was prepared under The MSC Fisheries Certification Requirements and Guidance v2.0, Issued 1st October 2014 and Effective 1st April 2015.

4.2. Summary of site visits and meetings held during pre-assessment

No meetings were carried out during the pre-assessment. The information was shared by dropbox and email.

4.3. Stakeholders to be consulted during a full assessment

During the pre-assessment the identification of potential stakeholders in the fishery is undertaken. If the fishery passes into full-assessment the consultation of stakeholders will be an important step in the certification even more if the RBF is carried out by the assessor team. This means that stakeholders must be identified, contacted, and their opinions on the certification of the fishery solicited and reviewed by the CAB.

The Texas shrimp fishery is undertaken by otter trawl fishermen. Stakeholder groups that are largely involved in the fishery are noted below. Additional stakeholders are likely to be identified during preparations for a full assessment or fishery improvement project.

Management and Science:

- Texas Parks and Wildlife Department (TPWD)
- National Marine Fisheries Service/ National Oceanic and Atmospheric Administration (NOAA)
- Gulf of Mexico Fisheries Management Council

Fishery

- Southeast Fisheries Association
- Wild American Shrimp, Inc.
- Southern Shrimp Alliance
- Texas Shrimp Association
- Port Arthur Area Shrimpers Association
- Texas Sea Grant

Others Stakeholders

- WWF-US
- The Sustainable Fisheries Partnership
- The Ocean Conservancy
- The Environmental Defence Fund
- Oceana
- The Sea Turtle Conservancy
- Turtle Island Restoration Network

Other stakeholders could appear during preparations for a full assessment or fishery improvement project.

4.4. Harmonisation with any overlapping MSC certified fisheries

There are currently no overlapping MSC certified fisheries for Texas State and Federal Shrimp Fishery. If any other State or State/Federal combined fishery passes into full-assessment some PIs regarding P2 and P3 should be harmonized. Also, if a Gulf of Mexico shrimp fishery outside of USA passes into full assessment, harmonization may also be necessary for certain PI's.

5. Traceability (issues relevant to Chain of Custody certification)

5.1. Eligibility of fishery products to enter further Chains of Custody

The GSMFC ORDP has initiatives that are currently working to support national policies related to fish as food by addressing Gulf seafood marketing, traceability, sustainability, and seafood safety issues (Audubon Nature Institute, 2015).

Shrimp landings occur at many sites in Texas, and may include shrimp caught in waters of other states. Vessels of one state may land at ports in another state, but must provide landing information required by federal regulations and by the state in which the landing occurs. For the purposes of this pre-assessment, all Texas-licensed vessel would be eligible to form part of the certified fishery when distributed to any of the sponsors. All other landings from Texas State waters or from Federal waters are within the unit of assessment and hence eligible but not until they are part of the unit of certification.

Many shrimp vessels are privately owned, so the first point of sale occurs with landing of the product at a buying station or processing plant. Shrimp fishermen often fish off one state or more states, and land in another; some shrimp caught in the South Atlantic Region may be landed in the Gulf of Mexico Region or the Mid-Atlantic Region, and vice versa. Chain of custody would be required by all buying stations and processing plants that would receive product from the certified fishery.

6. Preliminary evaluation of the fishery

6.1. Applicability of the default assessment tree

The pre-assessment found that there is sufficient information available for conducting an assessment with the default assessment tree in some performance indicators, however regarding P2 some PIs would need to use RBF and the Productivity/Selectivity Analysis (PSA) tool. There are species captured by the fishery that have no updated information, to assess the outcome of these species, the RBF will be used.

6.1.1. Expectations regarding use of the Risk-Based Framework (RBF)

The pre-assessment found that there is sufficient information available that concludes the utilization Risk Based Framework (RBF) is needed in some PIs. An RBF is a set of risk-assessment methods used to evaluate certain performance indicators within the assessment tree in situations where quantitative data is too limited to use the default scoring guideposts.

P2 has limited information to classify the species into the MSC requirements and the RBF must be used in the PI that is listed below:

- **2.2.1-Secondary species outcome:** Atlantic croaker, longspine porgy, seatrout and bay anchovy described as secondary species in the fishery. The data are not enough to evaluate these species with the default tree that, then the RBF will be used to evaluate them.

6.2. Evaluation of the fishery

The main conclusions that the assessor team has reached after evaluating each of the MSC Performance Indicators (PIs) defined in the requirements are detailed below for each principle. The main concern being the bycatch species of the fishery and how to evaluate them against the MSC requirements.

Both UoAs show the same weakness and strengths in the same PIs, therefore to summarize the conclusions these are described in the same text for each principles.

➤ Principle 1

The results show that the brown and white shrimp species is above the reference points and the main conclusion regarding the stock status is:

- The stock abundance for brown and white shrimp is driven by environmental conditions rather than by parent stock size within the stock sizes observed

- The stocks are healthy and not overfished nor undergoing overfishing
- Spawning stock biomass for the stocks is decreasing but not until the point where the stock is hindered.
- Fishing mortality rates are less than the F-rate overfishing reference points

The Gulf of Mexico Fishery Management Council has implemented a plan for managing the shrimp in the Gulf since 1981. The main actions implemented in the original plan are:

- Establishing a cooperative Tortugas Shrimp Sanctuary with the state of Florida to close a shrimp trawling area where small pink shrimp comprise the majority of the population most of the time.
- Seasonal zoning of an area of Florida Bay for either shrimp or stone crab fishing to avoid gear conflict.

Some deficiency has been identified for this fishery in Principle 1. There has not been a well-defined harvest control rules (HCRs) established related to stock status. Some measures could be interpreted as HCRs but not enough to consider that the fishery has well-defined HCRs as MSC requires in the version 2.0

At the moment, the measures that could be considered HCRs are listed below:

If the MFMT (maximum fishing mortality threshold; overfishing limit) is exceeded for two consecutive years, the appropriate committees and/or panels (e.g. stock assessment panels, advisory panels, SSCs) would convene to review changes in apparent stock size, changes in fishing effort, potential alterations in habitat or other environmental conditions, fishing mortality, and other factors that may have contributed to the decline.” (Amendment 15).

There is no specific rule for shrimp regarding when the overfished threshold is met but, under MSA, the fishery is required to notify the Council if the overfished threshold is passed and the Council must implement rebuilding actions within two years. (Amendment 15)

Even though the changes made through Amendment 15 provide updated reference points and measures, the HCR does not specify measures to be taken in the event of overfished status and does not require the management agency to respond until two years of overfishing has occurred.

➤ **Principle 2**

The pre-assessment indicates the data regarding the bycatch could be enough to determine the status of these species if the RBF is used because this technique determines if the fishery could hinder the stock status. The main concern regarding P2 is the difficulty classifying the species under the new requirements of MSC v2.0. Total composition of catches is not available; therefore, there is a lack of information in the fishery. However, some classifications can be made with the information from the observer program in Federal waters and Texas state bycatch studies.

There is literature available from different programs carried out by NOAA to show that there is sufficient information available to adequately determine if there is minimal risk posed by the fishery

on ETP species identified. There is a strategy to effectively manage these species (mandatory live release requirements, enforcement checks and compliance thresholds, etc.).

Of note here, the eNGO, Oceana, has repeatedly called for setting limits on the number of sea turtles that can be killed, requirement and better enforcement of Turtle Excluder Devices (TEDs) and higher observer coverage on shrimp fishing boats in the region, stating that scientific observers on fishing vessels are essential for monitoring how many sea turtles are caught and killed and provide critical information in figuring out how to protect sea turtles from the impacts of fishing and that the Southeast shrimp trawl fishery is allowed to catch and kill the highest number of sea turtles in the country, more than all other U.S. Atlantic fisheries combined. However, only 1 percent of its fleet has been monitored for sea turtle bycatch in recent years. In 2015, this culminated in a law suit being filed by Oceana against the federal government to protect more than 53,000 sea turtles from shrimp trawl nets in violation of the Endangered Species Act. The progression and outcome of the lawsuit may have influence on the performance of the fishery in full assessment.

Information is also adequate to determine the risk posed to habitat types and ecosystems by the fishery and the effectiveness of the strategy to manage impacts on habitat types and ecosystems.

➤ **Principle 3**

The main fisheries authority is Gulf of Mexico Fishing Management Council (GMFMC) with the National Marine Fisheries Service (NMFS) who implement the Fishery Management Plan (FMP) for shrimp since 1981. The stock assessment is carried out by the National Oceanic and Atmospheric Administration (NOAA fisheries working group) who established the scientific advice and improvement in the prediction models. Long-term objectives to guide decision making, consistent with MSC Principles and Criteria are explicit within management policy.

Enforcement is carried out in most cases by TPWD enforcement agents, who are charged with monitoring the fleet's compliance with regulations consistent with the MSC governance and policy performance indicators. Also it's controlled by NOAA.

There is an understanding of the level of compliance, control and surveillance (MCS) for the shrimp fishery. Research is undertaken to achieve the objectives consistent with MSC's Principles 1 and 2, and research results are available to interested parties.

Overall Conclusion/Recommendation

Summarizing the PI for which the 60 and the 80 levels are not likely to be met is shown in the table (Table 3) below.

Table 3. PIs which 60 and 80 levels, rationale and principle likely overall score.

PI	Likely score	Rationale	Principle likely overall score
1.2.2 HCR	60-79	Generally understood HCR are available that are expected to reduce exploitation rate and	Likely aggregate >80 score achieved

		<p>there is some evidence that tools available to implement HCR are appropriate and effective in controlling exploitation. However, it cannot be said that a well-defined HCR is in place that ensures that the exploitation rate is reduced as the point where recruitment (PRI) would impair is approached. There is an overfished threshold defined.</p> <p>But, there are no explicit pre-defined actions that are triggered once the threshold is passed. And therefore, there are no explicit conditions under which these tools would be expected to be revised in the future.</p>	
2.1.3 Primary species-information		<p>The concern is the low % of coverage by on-board observer program. The observer coverage remains at around 2% for the federal otter trawl fleet. The state level information has not been review since 2002, the lack of information in last years can be a risk for the scoring.</p>	<p>The number of <80 scores in this Principle 2 will be a risk for the fishery to achieve an aggregate >80 score</p> <p>The likelihood to meet SG 80 in the P2 is dependent on the scoring of each PI. If the majority are close to 60 and few are above 80 the aggregate (weighted mean) is likely to fall below the required 80 score. The CAB cannot confirm that the fishery will pass this Principle at this stage.</p>
2.2.3 Secondary species-information	60-79	<p>Now the concern is the low % of coverage by on-board observer program. The observer coverage remains at around 2% for the federal otter trawl fleet. There was additional observer coverage added to the skimmer trawl fleet in northern Gulf (Louisiana, Mississippi, and Alabama) but does not include Texas (where skimmers are not used, and TEDs are already required by the state).</p>	
2.3.3 ETPs- Information	60-79	<p>The observer coverage remains at around 2% for the federal otter trawl fleet. There was additional observer coverage added to the skimmer trawl fleet in northern Gulf (Louisiana, Mississippi, and Alabama) but does not include Texas (since no skimmers allowed) or Florida (where TEDs are already required</p>	

		by the state).	
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6.2.1. Other issues specific to this fishery

No other issues have been identified

6.3. Summary of likely PI scoring levels

~ UOA 1 and 2

Principle	Component	Performance Indicator (PI)	Score
P1	Outcome	1.1.1 Stock status	>80 pass
		1.1.2 Stock rebuilding	N/A
	Management	1.2.1 Harvest strategy	>80 Pass
		1.2.2 Harvest control rules & tools	60-79 Pass with Conditions
		1.2.3 Information & monitoring	>80 Pass
		1.2.4 Assessment of stock status	>80 Pass

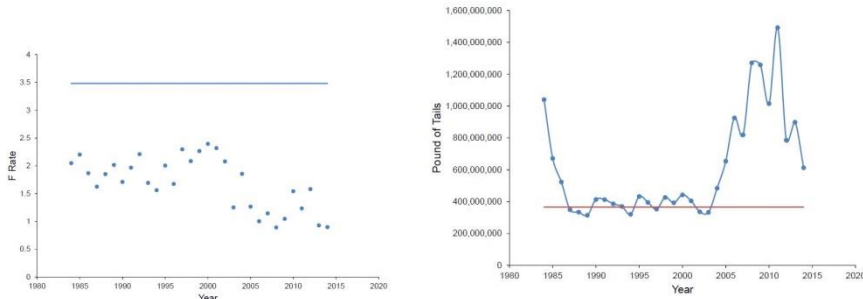
~ UoA 1 and 2

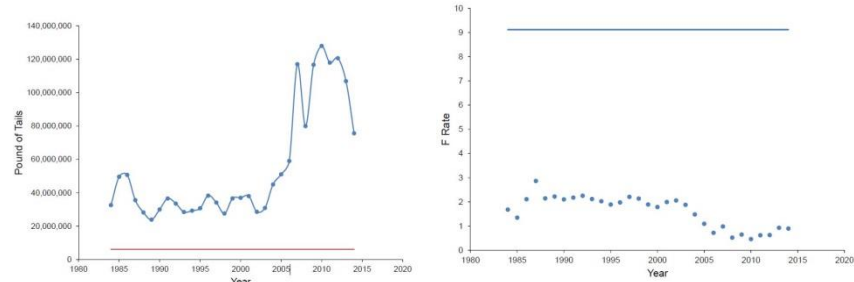
P2	Primary species	2.1.1	Outcome	>80 Pass
		2.1.2	Management strategy	>80 Pass
		2.1.3	Information/Monitoring	>60-79 Pass with Conditions
	Secondary species	2.2.1	Outcome	>80 Pass
		2.2.2	Management strategy	>80 Pass
		2.2.3	Information/Monitoring	60-79 Pass with conditions
	ETP species	2.3.1	Outcome	>80 Pass
		2.3.2	Management strategy	>80 Pass
		2.3.3	Information strategy	60-79 Pass with conditions
	Habitats	2.4.1	Outcome	>80 Pass
		2.4.2	Management strategy	>80 Pass
		2.4.3	Information	>80 Pass
	Ecosystem	2.5.1	Outcome	>80 Pass
		2.5.2	Management	>80 Pass
		2.5.3	Information	>80 Pass

~ UoA 1 and 2

P3	Governance and policy	3.1.1	Legal &/or customary framework	>80 Pass
		3.1.2	Consultation, roles & responsibilities	>80 Pass
		3.1.3	Long term objectives	>80 Pass
	Fishery specific management system	3.2.1	Fishery specific objectives	>80 Pass
		3.2.2	Decision making processes	>80 Pass
		3.2.3	Compliance & enforcement	>80 Pass
		3.2.4	Monitoring & management performance evaluation	>80 Pass

Table 6.3a Principle 1 – Scoring for UoA1 and UoA2

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
1	Outcome	1.1.1	Stock status	NO		<p>UoAs 1-White Shrimp</p> <p>The current fishing effort in the Gulf of Mexico white shrimp fishery is below the level that would produce MSY, and mortality is below the limits as well. So scientists consider that white shrimp are at or above a sustainable level. The figures show the values for the last assessment, carried out in 2015 by NOAA.</p>  <p>Figure 1. SSB above the limit reference point. F_{MSY} at 3.18 and mortality for fishing activities is below the F_{MSY}</p> <p>UoAs 2-BROWN Shrimp. The figures below show that the SSB is above the reference point and the mortality is less than F_{MSY}. As it was shown with the white shrimp, overfishing is not occurring for brown shrimp as it is noted in the mortality graphic and it is not overfished.</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						 <p>Figure 2. SSB above the limit reference point. F_{MSY} at 9.12 and mortality for fishing activities is below the F_{MSY}.</p> <p>The conclusion for the two stocks is:</p> <ul style="list-style-type: none"> • The stock abundance for brown and white shrimp is driven by environmental conditions rather than by parent stock size within the stock sizes observed • Both stocks are healthy and are not Overfished nor undergoing Overfishing • SSB is above MSY • Fishing mortality rates are less than the F-rate overfishing reference points
		1.1.2	Stock rebuilding	NO		Not relevant. The fishery meets SG 80 in the PI 1.1.1, therefore, stock rebuilding is not taking place.
	Management	1.2.1	Harvest Strategy	NO		<p>The Gulf of Mexico Fishery Management Council has implemented a plan for managing the shrimp fishery in the Gulf of Mexico since 1981. The main actions implemented in this plan for federal and the states involved in the fishery, are:</p> <ol style="list-style-type: none"> 1. Establishing a cooperative Tortugas Shrimp Sanctuary with the state of

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						<p>Florida to close a shrimp trawling area where small pink shrimp comprise the majority of the population most of the time.</p> <ol style="list-style-type: none"> 2. A cooperative 45-day seasonal closure with the state of Texas to protect small brown shrimp emigrating from bay nursery areas; 3. the assessment is considering possible potential risk over time-keep the nurseries for juveniles out fishing 4. Seasonal zoning of an area of Florida Bay for either shrimp or stone crab fishing to avoid gear conflict. 5. Further there are several amendments to regulate the fishery and improve the management plan. 6. Optimize the yield from shrimp recruited to the fishery. 7. Encourage habitat protection measures to prevent undue loss of shrimp habitat. 8. Coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible. 9. Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act. 10. Minimize the Incidental capture of finfish by shrimpers, when appropriate. 11. Minimize conflict s between shrimp and stone crab fishermen. 12. Minimize adverse effects of underwater obstructions to shrimp trawling. 13. Provide for a statistical reporting system. <p>The Harvest Strategy (HS) is defined by these points but, if the stock is starting to experience overfishing, it may be difficult to consider that the harvest strategy is well-defined based on the current HCR. However, the amendment 15 adopted in November 2015 adjusts the stock status determination criteria to be consistent</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						with the new population metrics for penaeid shrimp and modifies the framework procedure for the Shrimp FMP to make sure the corrections made in the amendment 13 regarding the parameters to control in the stock assessment are implemented correctly. The needs for the adopted actions are to determine the overfished and overfishing status of each penaeid shrimp stock while using the best available science, and to streamline the management process for Gulf shrimp stock in the last assessment. The CAB can consider that these strategies comply with scoring at level 80 because different elements work together to make sure the fishery is above Bmsy, the assessment is considering possible potential risk over time, testing with analogous fisheries is done and the measures are place, therefore, SG 80 is meet.
		1.2.2	Harvest control rules and tools	NO		<p>The fishery will have a condition in this PI because the MSC define Harvest Control Rules as a well-define rules and tools considering a well-define as follows: <i>“pre-agreed rules and management actions that will be taken in response to changes in indicators of stock status with respect to explicit or implicit reference points, and MSC expects these elements to be part of HCRs”</i>.</p> <p>In the management plan were set several measures that can be considered harvest measures rules as could be:</p> <ul style="list-style-type: none"> • Closed areas for the trawl • Closed areas to protect the juvenile shrimp • Regarding the discards, the use of TED and BRD are is mandatory • The amendment 13 the framework to implement the logbook should be considered a new rule to evaluate and control the bycatch in the landings. • The tickets from the dealer are considered a measure to control the catches. <p>All these measures are considered strategies in place but they are not a strategy for the future taking into account possible management measures if the stock</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						status is not above the reference points. On the other hand, the Council has limited entry to the fishery to a level such that, according to assessments, the fleet does not have the capacity to catch the MSY of any shrimp stock. Therefore, this set of rules is detailed in the management plan and can be considered well-defined for determining a management action in response to any change in the stock status of the species under assessment. Although these measures are defined in the FMP, the HCRs are not pre-agreed by the State or Federal Council and they don't use most of them until they consider overfishing is starting, therefore to get SG 60 is enough but to get a higher scoring the precautionary approach must be in place.
		1.2.3	Information and monitoring	NO		The pink, brown, and white shrimp are considered as single stocks across the entire Gulf of Mexico, but the three species have different distribution and they can be fished in the different areas. Depending on where the fishing activity is carried out, the composition of catches may show different % of these three species. Pinks occur predominantly off Florida, whites predominantly occur in coastal waters of the northern Gulf of Mexico in shallower waters and browns predominantly occur in waters deeper in the northern Gulf of Mexico. The stocks are highly productive with high fecundity. The fleet composition is also analyzed in the amendment 15 to improve the regulations regarding the harvesting of the fishery. Since 2003, a federal shrimp permit has been instituted requiring vessels to possess the permit when fishing for penaeid shrimp in the Gulf EEZ. A moratorium on the issuance of new federal shrimp permits was established in 2006. Currently, vessels must possess a shrimp moratorium permit (SPGM) when fishing for penaeid shrimp in the Gulf EEZ. A framework to implement a logbook is now available [Logbook Program in the Shrimp Fishery of the Gulf of Mexico (GMFMC 2013), Shrimp Amendment 16 (GMFMC 2014)]. The purpose of this action is to maintain the NMFS' ability to

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						<p>monitor and document offshore effort for the Gulf of Mexico (Gulf) shrimp fleet through an ELB program. The need is to base conservation and management measures on the best scientific information available and to minimize bycatch to the extent practicable, as required by the Magnuson-Stevens Fishery Conservation and Management Act.</p> <p>Further, dealers must report the landings frequently, once per month and many of them do more frequently. Florida, Louisiana, Mississippi and Alabama also require fish trip tickets, which provide information on individual landings.</p> <p>Monitoring is carried out every year to evaluate the stock status. There is some observer program coverage as well but is mainly aimed at collecting bycatch data.</p>
		1.2.4	Assessment of stock status	NO		<p>The assessment of the stock status is carried out by the scientists every year. Previously, the VPA model was used but this model is not accurate and analysts have now moved to a Stock Synthesis model for all penaeid shrimp assessments. Historically, Gulf shrimp stocks were assessed with a <i>virtual population analysis</i> (VPA), which reported output in terms of number of parents. The National Marine Fisheries Service (NMFS) has monitored the stock levels for all three penaeid species since 1970. The parent stock numbers for these species remained higher than the overfished threshold and lower than the overfishing threshold throughout this monitoring period; therefore, these stocks were not considered overfished or undergoing overfishing. However, scientists working for NMFS began investigating new stock assessment models for assessing the Gulf shrimp stocks (Hart and Nance 2010) after the 2007 pink shrimp stock assessment VPA incorrectly determined pink shrimp were undergoing overfishing because the model could not accommodate low effort (Nance 2008). The stock assessment analysts concluded that the Stock Synthesis model (Methot 2009) was the best choice for modelling Gulf shrimp. The Stock Synthesis model outputs parent stock size in terms of spawning biomass and also calculates a fishing mortality rate</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						(Methot and Wetzel 2013). The Gulf of Mexico Fishery Management Council's (Council) Scientific and Statistical Committee (SSC) accepted this new model, but the outputs were not comparable to the established stock status parameters. This resulted in an unknown status for the three species relative to overfished and overfishing. Thus, with the acceptance of a new assessment modelling approach, MSY, MFMT, and MSST were revised, through Amendment 15, to be comparable to the model outputs and determine the status of the stocks; therefore, there are new status determination criteria for penaeid shrimp and adjustments to the Shrimp Framework Procedure to review the status of brown, white, and pink shrimp, that are now consistent with the outputs of the new stock assessment model.
	Number of PIs less than 80					UoA 1 and UoA 2= PI 1.2.2

Table 6.3b. Simplified Scoring – Principle 2-Scoring for **UoA1** and **UoA2**

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
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Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
2	Primary Species	2.1.1	Outcome	Yes (PSA applicable for some species=scoring by elements)		<p>The list below shows the primary species identified in the fishery:</p> <ul style="list-style-type: none"> – Pink Shrimp- primary minor – Brown Shrimp when is not target species in the UoA- primary main – White shrimp when is not target species in the UoA- primary main – Royal Red Shrimp- primary minor – Gulf Menhaden - primary minor – Blacknose shark-primary minor – Red snapper-primary main – Blue crab-primary minor <p>PINK Shrimp- SSB_{MSY} - Pink shrimp spawn and recruit throughout the year. The current assessment method models these parameters on a continuous basis. Therefore, we derive an annual SSB_{MSY} by multiplying the terminal benchmark “year” SSB_{MSY} estimate by 12. This results in an annual SSB_{MSY} of 23,686,465 lbs. (10,744.2 metric tons) of tails. F_{MSY} - The SS model also estimates an F_{MSY} value. The terminal benchmark “year” value is multiplied by 12 to estimate an annual F_{MSY}.</p> <p>The sum of the monthly F_{STD} estimates calculated in the annual assessment is compared to this F_{MSY} estimate. F_{MSY} (annual) = 1.35</p> <p>Then, following the last assessment from NOAA the pink shrimp is above the TRPs as is shown in the figures Figure 12 and Figure 13</p> <p>The white and brown shrimp are primary main species of each other but it was explained above in the stock status performance the stock is above MSY and therefore the fishery does not hinder the health of these stocks.</p> <p>Other primary species evaluated in these fisheries are described in the section 3.4.1 (Table 1) such as:</p> <p>Royal Red Shrimp is not overfished and overfishing is not occurring, therefore is above the reference points. The likelihood of reaching the ACL and triggering accountability measures is very low; therefore, the shrimping is not hindering the stock status of this species. The same situation for red snapper, blacknose shark, Gulf of Menhaden and blue crab; the shrimp fishery doesn’t hinder the status of these species as it was explained in the section 3.4.1.</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
		2.1.2	Management	NO		<p>The retained species are evaluated into the Fishery Management Plan and the Gulf Council has several amendments regarding the management and control of these types of species.</p> <p>The use of BRDs is mandatory in Texas state waters and federal waters and high enforcement is in place to avoid any violations.</p> <p>NOAA conducts extensive research regarding BRDs (SEFSC Shrimp Research). The Pascagoula Lab in Mississippi houses the Harvesting Systems Unit, a team of biologists and gear specialists who perform critical research on fishing gear. The Harvesting Systems Unit does extensive research on BRDs for the Gulf of Mexico shrimp fishery, including cooperative research with commercial industry members to test improved gear designs, and also conducts trainings and courtesy inspections across the Gulf on commercial shrimp boats to ensure proper use of turtle excluder devices (TEDs) and BRDs. There are also educational initiatives led by NOAA Fisheries, Texas Sea Grant and the Gulf and South Atlantic Fisheries Foundation (GSAFF) that are aimed at fishermen education regarding BRDs. All three projects train shrimp fishermen across the Gulf of Mexico on proper BRD and TED installation (Helies et al. 2014).</p> <p>Therefore, the fishery has measures, such as BRD requirements, that are successful in the reduction of the bycatch, based on evidence from the fishery.</p>
		2.1.3	Information	NO		<p>ELB program provides data on Gulf shrimp fishing effort that is critical to the Gulf of Mexico Fishery Management Council (Council) and NOAA Fisheries in performing annual assessments of the status of shrimp stocks. The ELB program is also a key component in the Council's <i>red snapper rebuilding plan</i> because accurate estimates of juvenile red snapper mortality attributable to the shrimp fishery are essential to the rebuilding plan. Vessels selected to participate must carry data recording devices, which are simple time-stamped global positioning system (GPS) units that record and store a vessel's location at 10-minute time intervals. From these time-stamped locations, vessel speed between points (i.e.,</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points	
						<p>stopped, towing, moving between towing points) can be estimated and then evaluated with mathematical algorithms. Thus, effort by location can be calculated for a given fishing trip. Shrimp catch data for the trip are then used to estimate catch-per-unit-effort for the trip at various fishing locations. Shrimp effort estimates for various locations, time periods, or vessels are provided to NOAA Fisheries each trimester (i.e., 4-month time period). Vessels selected for the program must also provide the size and number of shrimp trawls deployed for each set and what kind of bycatch is retained in each set. All this information will be transmitted back to NMFS where it can be analyzed to establish new rules regarding the bycatch species.</p> <p>With the rationale above, the fishery can meet the SG 60 but the fishery will have a condition in this PI because most of the information available is more than 5 years old; the Texas state reports are from 2002 (for bycatch in state waters only) and the federal bycatch report (Scott-Denton) - for the Federal fleet was published in 2012, with data through 2010. Also, the low level of federal observer coverage and the lack of observer data for state vessels will likely draw serious criticisms from reviewers.</p> <p>More information is needed for bycatch in state waters and characterization of bycatch from the federal observer reports to get SG 80.</p>	
	Secondary species	2.2.1	Outcome	YES (PSA applicable for some species= scoring by elements)		Secondary minor species	Use of PSA (RBF)
						Atlantic Croaker	YES
						Bay Anchovy	YES
						Spot	NO
						Lesser blue Crab	NO
						Blue crab	NO
						Atlantic brief squid	NO
						Hardhead Catfish	NO

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points		
						Pinfish	NO	
						Sea trout	YES	
						Longspine porgy	YES	
						The majority of species considered as non-target species in the fishery will be considered secondary species in most cases. Between 2007 and 2010, 185 species were observed as bycatch in the shrimp fishery (Scott-Denton et al. 2012). By weight, approximately 57% of the catch was finfish, 29% was commercial shrimp, and 12% was invertebrates. The species composition is spatially and bathymetrically dependent, but for the Gulf overall, Atlantic croaker, sea trout and longspine porgy are the dominant finfish species taken in trawls (approximately 26% of the total catch by weight). Other commonly occurring species include portunid crabs, mantis shrimp, spot, inshore lizardfish, searobins, and Gulf butterfish. Regarding the information available in Scott-Denton (2012) and the TPWD report for bycatch in 2002 for Texas state waters, the Atlantic Croaker and Sea trout are considered as secondary main because their catches are more than 5%, normally in Federal waters. The rest of the species are classified as secondary minor, because they do not represent more than 5 % of total catch. Some of them need the PSA technique to know the outcome and the result was that all are low risk species and this is shown in the appendix 2. Therefore, the fishery doesn't hinder the stock status of these species and SG 80 could be met.		
2.2.2	Management	NO		BRDs technology transfer improves catch efficiency; this is the most important measure in place. Closed areas allow controlling the catches of some species and juveniles. There are many studies to improve the management of the bycatch in Federal waters and state waters. Bycatch is the major concern in this fishery and the problem is, the trip tickets and the information on landings from the dealers provides information of the retained species, but more effort is needed to know				

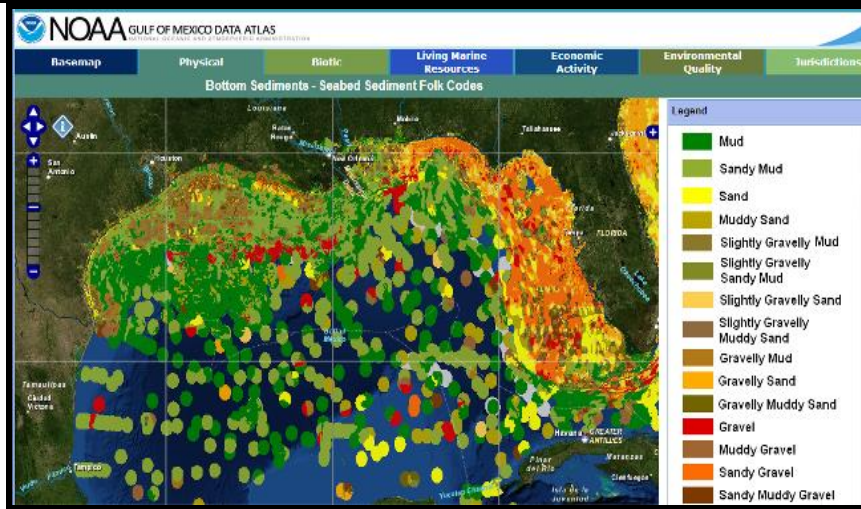
Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						the catches of all the species in the fishery, including discards, to evaluate the secondary species in the fishery. The quantitative data are limited and is not clear how the GMFMC or the Texas State regulations would respond to a depleted species in the incidental catch; therefore, it is difficult to assess the fishery against FCR V2.0. However, the SG 80 is met because all the species classified as secondary are minor species.
		2.2.3	Information	NO		<p>Trip tickets, landings, dealers, cELB and NOAA reports are the channels to get information. Now the concern is the low % of coverage by on-board observer program. The observer coverage remains at around 2% for the federal otter trawl fleet. There was additional observer coverage added to the skimmer trawl fleet in northern Gulf (Louisiana, Mississippi, and Alabama) but does not include Texas (where skimmers are not used and TEDs are already required by the state). More information regarding unclassified species as finfish and invertebrates is also needed.</p> <p>There was money awarded through The Deepwater Horizon Oil Spill Early Restoration Funds that is dedicated to increasing observer coverage, but this money was only recently approved and has not been implemented yet. The funding would support 300 additional observer sea days per year for a 10-year period; http://www.gulfspillrestoration.noaa.gov/sea-turtle-early-restoration-project Maybe with this funding this problem is solved and more effort to get data at sea is carried out.</p>
	ETP species	2.3.1	Outcome	NO		Species in the Gulf protected under the Endangered Species Act (ESA) include: five marine mammal species (sei, fin, humpback, sperm whales, and manatees); five sea turtles (Kemp's ridley, loggerhead, green, leatherback, and hawksbill); two fish species (Gulf sturgeon and smalltooth sawfish); and four coral species (elkhorn coral, lobed star coral, boulder star coral, and mountainous star coral). Seven species of fish and invertebrates in the Gulf are currently listed as species of

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						<p>concern. Otter trawls may directly affect smalltooth sawfish that are foraging within or moving through an active trawling location via direct contact with the gear. The long toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in any type of netting gear, including the netting used in shrimp trawls. Regulations requiring turtle excluder devices (TEDs) have reduced the catch of smalltooth sawfish in shrimp trawls (Shrimp Amendment 15: Status 31 Chapter 3. Affected Environment Determination). The biological opinion recommended measures to minimize the impacts of incidental take to sea turtles and smalltooth sawfish.</p> <p>The list of species identified in federal and state waters must be consulted in the section 3.4.3 of this report. Turtles in the federal and State waters are common. The NOAA Protected Resources Division has identified the list of species and their designations.</p> <p>There is required observer coverage on the fleet; therefore, the monitoring of the species that could be at risk due to interactions with the fishery is known. The fishery has interactions with turtles and for this reason, the use of TEDs and BRDs is mandatory. Due to these interactions the NMFS has set proxy limits for sea turtle takes using upper limits on shrimp otter trawling effort and minimum levels of TED compliance. The effort in the shrimp has decreased over the years and NOAA has carried out monitoring, education, and enforcement to control the proper use of the TEDs. The Biological Opinion of 2014 for sea turtles concluded that effort has continued below the limit and compliance has remained above the limit, such that the fishery meets national limits, and the fishery does not have direct or indirect effects that hinder recovery and doesn't have unacceptable impacts on the populations of turtles.</p>
		2.3.2	Management	NO		<p>The main types of management of ETP are:</p> <ul style="list-style-type: none"> TED- the TED regulation published on February 21, 2003 (68 FR 8456), represents a significant improvement in the baseline effects of trawl

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						<p>fisheries on sea turtles, though shrimp trawling is still considered to be one of the largest source of anthropogenic mortality for most of our sea turtle species (NMFS-SEFSC 2009a). In Texas, TEDs are also mandatory by state law.</p> <ul style="list-style-type: none"> • NOAA Protected Resources: Compliance Policy went into effect in September 2016. In that, it is defined a non-compliance window from 84 –88% when education and outreach efforts could be deployed to bring fleet to acceptable compliance levels, 2 consecutive periods of non-compliance will result in a closure of waters <p>In Texas States although Texas shrimp fishermen are not required to keep logbook records of turtle encounters there are measures to minimize the interactions with the turtles:</p> <ol style="list-style-type: none"> 1) partnering with others to protect nesting females and nests on Texas beaches along with documenting all strandings in Texas; 2) partnering with others to protect nesting females and their nests on Gulf nesting beaches in the State of Tamaulipas, Mexico; 3) Regulating the Gulf shrimping fleet for sustainability of marine resources, including shrimp and sea turtles along with other non-targeted species.
		2.3.3	Information	NO		<p>The observer coverage remains at around 2% for the federal otter trawl fleet and Texas shrimp fishermen are not required to keep logbook records of turtle encounters.</p> <p>There was additional observer coverage added to the skimmer trawl fleet in northern Gulf (Louisiana, Mississippi, and Alabama) but does not include Texas (since no skimmers allowed) or Florida (where TEDs are already required by the state). There was money awarded through The Deepwater Horizon Oil Spill Early Restoration Funds that is dedicated to increasing observer coverage, but this money was only recently approved and has not been implemented yet. The funding would support 300 additional observer sea days per year for a 10-year</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						<p>period.</p> <p>http://www.gulfspillrestoration.noaa.gov/sea-turtle-early-restoration-project</p> <p>On the other hand, depending on the outcome of the Oceana lawsuit, requirements for more information regarding the use of TEDs and that vessel use them in the correct form may be required.</p> <p>The research studies show that the TEDs may be up to 97% effective if they are used in the correct way. NOAA has some programs to review their effectiveness of TEDs through NOAA's Harvesting Systems Unit and Gear Monitoring Team (http://www.sefsc.noaa.gov/labs/mississippi/fishinggear.htm) and at-sea enforcement checks ensure that no manipulation happens during the fishing activities. The compliance rate with TED regulations, through dockside and at-sea inspections, is the primary way that sea turtle interactions are monitored in the fishery. The TED compliance policy went into effect in September 2016 (TED compliance policy.</p> <p>http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/).</p> <p>However, more data come from these new regulations in place are necessary to evaluate how the progress is regarding the interactions with these populations of turtles.</p>
	Habitats	2.4.1	Outcome	NO		<p>The fishery under evaluation takes place mainly on sand bottoms where the vulnerable species or main vulnerable ecosystems don't overlap. The grounds of shrimp fishery are different than the location of vulnerable marine ecosystems in the area. Deep water corals do not occur at the shallow depths of the shrimp trawl fishery, and are protected from fishing. The shrimp grounds are located in sand/mud bottom surfaces; therefore, the trawls are less of an impact than on hard substrates. It has been concluded that trawls in sandy/muddy habitat of the GOM had very low impact on habitat; Monterey Bay Aquarium Sea Watch acknowledged that no additional or more recent information on impacts of</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						trawling on Gulf of Mexico habitats has become available since Barnett's review in 2001.
		2.4.2	Management	NO		<p>The management of these habitats is controlled mainly with the closed areas and the limiting trawling. There are areas around the Gulf of Mexico where fishing activities with any types of trawl are forbidden. There are surveys to describe the types of habitats and determinate if areas must be controlled or allow fishing activities. NOAA has a project called "Integration of South Atlantic and Gulf of Mexico Fishing Intensity Data Sets into a Spatially Explicit Data Warehouse" which is focussed on the integration of data from observer and non-observer data that will provide fisheries managers with the ability to quantify fishing effort with increased precision, resulting in improved stock assessment and by-catch estimation capabilities. It will also allow the identification of potentially harmful fishing activities on critical habitats such as deep-sea corals, and will provide near real-time information on fishing activity by industry, region and other parameters relevant to management. Texas has a seagrass monitoring and management program and also the 2002 report to the TX legislature includes a description of TX coastal and marine habitats. The state has prohibited trawling in all shrimp nursery areas. This closure provides protection for seagrass.</p> <p>This information can be consulted in this link: http://tpwd.texas.gov/landwater/water/habitats/seagrass/</p>
		2.4.3	Information	NO		<p>NOAA has different research projects to evaluate the impacts of the fisheries in the different habitats over the Gulf of Mexico. The map below shows the seabed composition. These data are crossed with other data from NOAA where the effort of the shrimp fleet can be consulted and with other data from TPWD. The results of these research and scientific data are used to control, monitor and establish the regulations to make sure the habitat are protected in both Federal and State waters. Also, Texas state has information regarding the seagrass management areas and Essential Fish Habitat which are established to protect the habitat for survival and reproduction of the species.</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						
	Ecosystem	2.5.1	Outcome	NO		<p>Adverse effects from the fishery on ESA-listed corals are extremely unlikely to occur and are discountable given differences between shrimp and coral preferred habitats, and protective regulations in place prohibiting or limiting trawling in areas where corals are most likely to occur. White shrimp appear to prefer muddy or peaty bottoms when in inshore waters and soft muddy bottoms when offshore. Brown shrimp appear to prefer a similar bottom type and may also be found in areas of unconsolidated sediment (i.e., mud, sand, and shell). Acroporoid corals are found in waters less than 30 m and are considered to be environmentally sensitive, requiring relatively clear, well circulated waters with optimal water temperatures of 25°-29°C. Thus, shrimp habitats are extremely unlikely to support Acropora species. The other corals proposed for ESA listing extend north to Martin County, Florida and to depths of 100 m in hard bottom areas where light is not limited by water clarity. They occur in the Florida Garden Banks National Marine Sanctuary and other reefs in the Gulf of Mexico (e.g., Pulley's ridge). Like Acropora</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						species, they require relatively clear, well circulated waters and are unlikely to occur in shrimp habitat (SERO 2014 and NOAA Technical Memorandum NMFS-SEFSC-653). The importance of protecting the coral reef is because they are key elements of the ecosystems. They contribute to the ecosystem's characteristics and dynamics that can be affected by the fishing activities and for this reason must be protected. Irreversible harm in these varieties of habitats can disturb dynamic trends in the ecosystems that have impacts in the habitat where the shrimp fishing happens. Keeping these habitats safeguarded from fishing ensures the preservation of the whole ecosystem.
		2.5.2	Management	NO		<p>Protective regulations are in place prohibiting or limiting trawling in sensitive areas (i.e., East and West Flower Garden Banks, Tortugas Shrimp Sanctuary. NOAA has designated Critical Habitat for Elkhorn and Staghorn Coral. The proposed action (shrimp trawling) is not likely to adversely affect Acropora critical habitat. The potential effect from trawling on Acropora designated critical habitat is physical damage from NMFS-authorized trawling in federal waters. Areas of critical habitat occurring in the action area are limited to a small portion. The feature essential to the conservation of Acropora species is substrate of suitable quality and availability (i.e., "natural consolidated hard substrate or dead coral skeleton that is free from fleshy or turf macroalgae cover and sediment cover"), in water depths from the mean high water line to 30 m. Because of the habitat types of commercially exploited shrimp species, fishing targeting these species is unlikely to occur on hard substrate of suitable quality and availability. Thus, adverse effects from the fishery on Acropora critical habitat are extremely unlikely to occur. Further, NOAA has different projects to characterize the seabed and control where the fishing activities are occurring.</p> <p>Limited areas to allow sea turtle conservation are regulated. TEDs and tow time limits are regulated to make sure the fishery doesn't hinder the sea turtle populations. Therefore, there are measures in place and evidence that these</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						measures are working well regarding the management of the key components in the ecosystem. The key components ensure an interrelationship with the shrimp fishing activity, for this reason protecting and regulating the possible impacts must be managed in the UOAs.
		2.5.3	Information	NO		Recent advances in ecosystem modelling may provide better insight into the potential impacts of management regulations on biodiversity and ecosystem functions in the future. The Integrated Ecosystem Assessment (IEA) Program is being implemented in the Gulf of Mexico and it will give important data to evaluate the ecosystems in the fishing grounds. Ecopath-ecosim modelling suggest that the shrimp fishery does not present a risk to biodiversity, that the catch of shrimp does not adversely impact predators on shrimp, and that bottom trawling increases access of predators to infauna that increases productivity. The key conservation objective for the critical habitat units is to facilitate recruitment into the adult population by protecting juvenile nursery areas. The EFH (Essential Fish Habitat) mapper is a one-stop tool for viewing the spatial representations of fish species, their life-stages and important habitats. NOAA provides links to supporting materials, including fishery management plans through the mapping of these areas Some data of key ecosystems are being investigating by NOAA to protect the ecosystems and the areas where the fishing activities take place. Therefore, the fishery can reach 80 in this PI.
	Number of PIs less than 80:					UoA 1 and UoA 2= 3 PIs less than 80: 2.1.3;2.2.3;2.3.3

Table 6.3c. Simplified Scoring – Principle 3- Scoring for UoA1 and UoA2

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
3	Governance & policy	3.1.1	Legal and customary framework	NO		<p>The Texas shrimp fishery, which is fished within Texas state territorial waters and federal Exclusive Economic Zone (EEZ) waters of the Gulf of Mexico, is managed under the aegis of the Gulf of Mexico Fishery Management Council, as established by the Fishery Conservation and Management Act of 1976, NOAA Fisheries, the Texas state legislature, and associated regulatory bodies, including the Texas Parks and Wildlife Department (TPWD). Currently there is a framework established to control the federal fishery access that is listed below:</p> <ul style="list-style-type: none"> Gulf Shrimp Moratorium Permit: Limited access permit (currently around 1488 permits) to manage the number of vessels targeting shrimp in the area, further information can be found in this link SPGM Vessels. <p>Texas also has a limited entry system for shrimp licenses in state waters to control the number of vessels in the fishery.</p> <p>Additionally, the GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Endangered Species Act, the Marine Mammal Act, the Migratory Bird Treaty Act, the Coastal Zone Management Act. The MSA (first enacted in 1976, and amended in 1996 and 2006) is the primary law governing fisheries management in the U.S</p> <p>Texas Parks and Wildlife Department (TPWD) is the state agency charged with management of the shrimp fishery in Texas waters and manages the fishery separately, but consistent with, federal management. TPWD representatives sit on the GMFMC and associated scientific and advisory panels, and participate in research activities.</p> <p>TPWD Coastal Fisheries Division (CFD) conducts both fishery-dependent and fishery-independent data collection, which is reviewed annually to determine</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						trends and status of stocks. Management recommendations made to the TPWC are based on this scientific evidence and protocols are reviewed annually to ensure that best methods are being utilized. Therefore, the decision making process is completely transparent and all the part involved might participate in the voting that the Council makes to approve the changes.
		3.1.2	Consultation, roles and responsibilities	NO		<p>The roles and responsibilities are well defined as was mentioned above. The Council is in charge of the federal shrimp management plan which controls shrimp fishing in the EEZ. The shrimp fishery in Texas state waters is managed by Texas Parks and Wildlife Department.</p> <p>The Scientific research carried out by NOAA and TPWD, and recommendations are made based on advice from this research. The Council system has an effective and transparent consultation process. Management actions begin with a scoping process that allows stakeholder involvement in defining the goals and potential solutions for identified problems. Stakeholder advisory panels and a scientific panel provide input through the development of planning for management actions. Multiple public hearings occur before the Council decides on recommended final actions and can be easily consulted for participating. TPWD follows a similar decision making process that includes scoping, public comment and scientific advice/evidence.</p> <p>Also, The SEDAR (Southeast Data, Assessment and Review) process is a three step process for conducting stock assessments. It consists of a Data Workshop to compile available data, a stock assessment workshop to prepare the actual assessment, and an Assessment Review Workshop to provide an independent review of the assessment, conduct additional analyzes if necessary, and make recommendations regarding the status of stock and acceptable biological catch levels. In this process there are many different steps in each committee and panel of stakeholders and scientists are participating. Therefore, there are a clear understanding of each role and an open process to make decisions and evaluate</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						the fishery.
		3.1.3	Long term objectives	NO		<p>The Gulf Council has the fishery management plan where every year an assessment stock is carried out and the last one described that the fishery is not overfished and overfishing is not occurring. Then in the FMP there are several measures regarding the catches, ecological values and economical value of the target species to follow. This document can be considered a document where the long term objectives are defined.</p> <p>Within the FMP source document, these researches and studies are defined:</p> <ol style="list-style-type: none"> 1. the supply, economic value, environment and breeding habits of the various species of shrimp; 2. factors affecting the increase or decrease in shrimp abundance; 3. the use of trawls, nets and other devices for the taking of shrimp; 4. industrial and other pollution of the water naturally frequented by shrimp; and 5. Statistical information gathered by the department on the marketing, harvesting, processing and catching of shrimp landed at points in the state. <p>Scientifics committees and panels of experts complete these objectives with scientific data from the fishery.</p>
	Fishery specific management system	3.2.1	Fishery specific objectives	NO		<p>The FMP established specific objectives for the fishery as is described above. To comply with these objectives, the fishery has established several management measures that achieve the objectives according with MSC P1 and P2:</p> <ul style="list-style-type: none"> • Reporting Requirements • Permitting Requirements • Gear Requirements- TEDs and BRDs • Closed Areas • Vessel Monitoring Systems • Cold Weather Event Closures • Encourage habitat protection measures to prevent undue loss of shrimp habitat

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						<ul style="list-style-type: none"> • Promote consistency with the Endangered Species Act and the Martine Mammal Protection Act • Minimize the incidental capture of finfish by shrimpers, when appropriate • Minimize adverse effects of obstructions to shrimp trawling • Provide for a statistical reporting system <p>Following these objectives, the fishery has shown that the stock is not overfished and overfishing is not occurring. These objectives are well defined and implemented. Therefore, regarding P1 and P2 the FMP has established the objectives and the fishery can meet 80.</p>
		3.2.2	Decision making processes	NO		<p>The decision making process of the Council is clear and easy to understand. The Council drives the consultation process and all the stakeholders in the fishery can provide input. There is a hearing process that is open when and amendment is going to be applied. Through its planning and consultation process, the Council develops a series of alternatives for solving identified management problems. The Council decides in public with justification which alternative to select. The decisions must meet the standards of the MSA, which requires that the decisions comply with fishery-specific and national objectives. NMFS approves, partially approves, or disapproves Council actions, and subsequently implements them as regulations if approved.</p>
		3.2.3	Compliance and enforcement	NO		<p>TEDs, BRDs, license limitation, and closed areas comprise the main management measures for the shrimp fisheries. The NMFS Office of Law Enforcement, the U.S. Coast Guard, and state enforcement agencies have a joint operating agreement for consistent enforcement activities. Compliance is measure by enforcement checks, both at-sea and on the water, has shown a 97% compliance with TED and BRD regulations. NOAA has an observer program and has plans to improve the effort carried out in the % of coverage of observer program. There was money awarded through The Deepwater Horizon Oil Spill Early Restoration Funds that is dedicated to increasing observer coverage, but this</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						<p>money was only recently approved and has not been implemented yet. The funding would support 300 additional observer sea days per year for a 10-year period. http://www.gulfspillrestoration.noaa.gov/sea-turtle-early-restoration-project</p> <p>TPWD has the obligation to control any violations of the TEDs and BRDs requirements. Fishermen are informed of the fines that violations of any law would incur. There is a standardized TED enforcement boarding form, used by all enforcement agencies, to comply with the law. The form captures the most frequent TED violations. There are always still ways to violate the regulations but this type of measure makes more difficult its non-compliance. The form is shared with the captains of the vessels and is controlled by the local NOAA offices. The compliance must be reported publically by NOAA and the new Texas Commercial Fishing Guide published in September 2016 describes that if the fishery compliance drops below set thresholds should be shut down. Therefore, the degree of compliance and enforcement is enough to reach 80 in this PI</p>
		3.2.4	Management performance evaluation	NO		<p>No explicit review of the management system occurs but the Council decision making requires that there is review every time that a change must be implemented and an amendment is realized. These amendments must be reviewed and an open hearing process is always conducted. Therefore, these measures must be considered as a management performance evaluation. It has been demonstrated that the management system evaluates its performance and undertakes corrections as necessary. Management plan amendments undergo rigorous internal and external review. The Office of Law Enforcement is accredited by the International Commission on Accreditation for Law Enforcement Agencies, and undergoes periodic audits to be reaccredited and comply with the requirements.</p> <p>The TPWD needs to update data and information contained within the Shrimp FMP, to incorporate the results of scientific research projects and new data</p>

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						coming from the assessments results. All these data are used for future research and evaluations. An internal review of objectives was carried out by third-party, independent bodies. The American Fisheries Society reviewed the TPWD management system and gave a commendable rating.
	Number of PIs less than 60:					No conditions

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8. Appendix 1

BIO

Dr. Virginia Polonio (Lead Assessor)

She has a degree in Environmental Sciences (B.S.c. University of Cádiz). She has a Master degree (M.Sc. University of Cádiz) in Fisheries Management and Aquaculture and she obtained her PhD in Biodiversity and Natural resources at the University of Oviedo and during her PhD she gained experience in the field of research of fisheries and how protect the Vulnerable Marine Ecosystems (VMEs) as coral reefs versus fishing activities. She wrote several articles describing new species of corals under her thesis and she developed skills in the fields of benthic ecology and management of ecosystems.

Before her PhD, she was contracted as technician in the Spanish Oceanographic Institute where she realized work at sea and gained field experience to assessment fisheries stocks. She participated in the Spanish National Basic Plan of Data to collect and evaluate the fishing in the ICES and CECAF areas where Spanish fleets realize their activities. During this period, she carried out feeding habit and age/size studies of *Pagellus Bogaraveo* and others commercial species (hake, anchovy, sharks, mackerel, squid, etc.) to know how the trophic level and predation could affect the ecosystems and the distribution of the species in the Gulf of Cadiz and the Strait of Gibraltar.

She has worked on several full assessments such as Iceland Capelin, Celtic Sea Herring, Cantabrian Sardine, North Atlantic Albacore, Chilean Squat lobster, Blue sharks and Swordfish among others as team member and lead assessor. She has participated in several surveillances acquiring experience in the MSC certification. She has participated in several pre-assessments of shrimp in Argentina coasts.

Now, she is a full time employee at SAI Global and she will be the lead assessor and expert on the three principles in this pre-assessment. This assessment was conducted based on information and documents provided by the clients and available to the public. However, emails were exchanged and discussions occurred with individuals involved in the fishery for clarifications, additional information and documents requests.

9. Appendix 2

9.1. RBF-PSA preliminary results

Only main species scored?		Productivity Scores [1-3]														Susceptibility Scores [1-3]							
Scoring element	First of each scoring element	Family name	Scientific name	Common name	Species type	Fishery descriptor	Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level	Density Dependence	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	MSC PSA-derived score	Risk Category Name	MSC scoring guidepost
1	First	Sciaenidae	Micropogonias	Atlantic croaker	Non-invertebrate	Trawl	1	1	1	1	1	1	3		1.29	1	3	3	3	1.65	94	Low	≥80
2	First	Cynoscion	Cynoscion	Sea trout	Non-invertebrate	Trawl	1	2	1	2	1	1	3		1.57	1	3	3	3	1.65	91	Low	≥80
3	First	Sparidae	Stenotomus	Longspine pike	Non-invertebrate	Trawl	1	1	1	1	1	1	3		1.29	1	3	3	3	1.65	94	Low	≥80
4	First	Engraulidae	Anchoa mitchilli	Bay Anchovy	Non-invertebrate	Trawl	1	1	1	1	1	1	3		1.29	1	3	3	3	1.65	94	Low	≥80